Task experience, assigned goals, and performance norms as determinants of goal choice and performance

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TASK EXPERIENCE, ASSIGNED GOALS, AND
PERFORMANCE NORMS AS
DETERMINANTS OF GOAL CHOICE AND PERFORMANCE

A Thesis

Presented to the
Department of Psychology

and the
Faculty of the Graduate College
University of Nebraska at Omaha

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Psychology
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by
Jon Shanahan
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THESIS ACCEPTANCE

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Abstract
A cognitive mediation model of goal setting (Garland, 1985; Meyer & Gellatly, 1988) is explored from a perspective that combines the social information processing, expectancy-valence, and control systems literatures. Assigned goals, performance norms, and task experience are viewed as information sources that influence goal choice, and therefore effort and performance, through performance expectancy (expectancy of success) and performance valence (anticipated satisfaction with any given performance level). Subjects were 100 introductory psychology and sociology students who participated in exchange for extra credit. Subjects performed a card sorting task and were assigned to one of five treatment conditions. Each experimental subject was assigned either a difficult or easy goal in conjunction with a high or low performance norm. Control subjects did not receive assigned goals, nor were they provided with normative information. Following a baseline period used to assess ability, all subjects participated in four trials which served as repeated measures of the task experience effect. Contrary to hypotheses, there were no goal or norm main effects on any of the five dependent variables contained in the cognitive mediation model (performance, effort, personal goal, performance expectancy, or performance valence). Goal x experience and norm x experience interactions were anticipated for each of the five dependent variables. However, there were no interactions of norms with experience, and only two of the goal x experience interactions emerged: Relative to easy goals, difficult goals initially were associated with higher personal goals and lower valences, but the differences rapidly diminished. A strong effect of experience on performance was found, with performance increasing in later trials. However, the term "practice effect" may not be applicable because there were strong experience effects on
all four antecedent variables: As subjects gained experience, they reported higher performance expectancies, lower valences, higher personal goals, and greater effort. These findings are consistent with a past performance interpretation in which individuals ignore social cues such as assigned goals and performance norms, and set personal goals according to their own previous performance levels. The findings offer limited support for the proposed cognitive mediation model. A revised model in which past performance is substituted for goals and norms would better fit the data.

The notion that challenging goals enhance performance has become more of an axiom than a research question, and researchers have turned to the antecedents of goal acceptance and commitment. But few goal setting studies have addressed the role of experience. A possible explanation of the present findings is that subjects with experience overlook assigned goals and other social cues in favor of their own previous performance levels. They then form expectancy-valence attitudes which, as in the original model, directly influence personal goals. In turn, personal goals influence effort, which determines performance. The regression results offer some support for this past performance argument and for portions of the proposed cognitive mediation model. However, an essential element of the model was not supported: There was no evidence for the path between personal goal and performance. Without this path, there is no mechanism by which expectancies and valences may influence performance.

Conclusions are at best speculative due to certain limitations of the study. For example, in real work settings there exist strong incentives for accepting challenging assigned goals; the study lacked these incentives. The experimental setting also lacked the social pressures that exist in actual work situations. Suggestions for future research are discussed.
Chapter 1

Introduction

Goal setting is an effective method for improving task performance. According to meta-analyses by Mento, Steel, and Karren (1987) and Tubbs (1986), laboratory and field studies usually confirm the notion that difficult goals enhance performance. However, certain boundary conditions influence this relationship. Goals must be specific (Locke, 1968) and accepted (Erez & Zidon, 1984), and adequate feedback must be available (Erez, 1977).

Research questions no longer concern whether goal setting is effective. Instead, the focus is on goal commitment (see Locke, Latham, & Erez, 1988), which is influenced by the same variables as goal choice (Locke, Shaw, Saari, & Latham, 1981). Goal choice is an internalized personal goal, similar to the concept of aspiration level (Lewin, Dembo, Festinger, & Sears, 1944).

The present study explores how personal goals are chosen and how they influence task performance. The central argument is that various information sources alter expectancies and valences. In turn, these cognitive mechanisms control goal choice, which influences task performance (Meyer & Gellatly, 1988; Meyer, Schacht-Cole, & Gellatly, 1988). A control systems perspective (Campion & Lord, 1982; Carver & Scheier, 1981) is combined with expectancy-valence theory (Vroom, 1964), and with a social information processing approach (Salancik & Pfeffer, 1978).

Control Systems

According to control systems theory, a comparator mechanism continuously monitors feedback from the environment, so that one may detect a discrepancy between one's personal goal and current performance level. When a negative
discrepancy is noted, it induces a drive for corrective action, which can take one of several forms. Goal setting "works" when the response is an increase in effort (Campion & Lord, 1982); it does not work when the goal is revised downward.

A control systems perspective explains the well-known boundary conditions of goal setting. A goal must be specific if it is to function as a performance standard, and must be difficult to produce a large performance deficit. The relationship between goal difficulty and goal choice is important because "different levels of performance between easier and harder goals reflect different levels of force within a subject to attain the two goals" (Matsui, Okada, & Mizuguchi, 1981, p. 54). This explains why goal acceptance and commitment are necessary conditions of the goal difficulty-performance relationship. For example, Erez and Zidon (1984) found a positive, linear relationship between goal difficulty and performance (i.e., goal setting works), but only when goals are accepted. Otherwise, the relationship is negatively linear. Finally, the necessary condition of feedback (Erez, 1977) is explained. Without feedback, the worker cannot compare current performance with a standard; unable to perceive a performance deficit, the worker cannot determine whether corrective action is necessary.

Social Cues, Expectancies, and Valences

A control systems framework is useful, but it does not explain how personal goals are chosen. Reviews of the goal setting literature (e.g., Hollenbeck & Klein, 1987; Locke et al., 1981; Locke, Latham, & Erez, 1988) point to numerous factors, many of which are social cues, such as assigned goals and performance norms. Other factors are cues derived from task experience, such as previous successes and failures, and past performance levels. All of these information sources influence goal choice through expectancies and valences.
Citing Locke, Frederick, Lee, and Bobko (1984), Locke and Latham (1990) attempted to clarify the role of expectancies and valences in the goal setting process. According to their explanation, individuals derive personal goals from what they desire (valence) and from their own judgments of their capabilities (expectancy). In other words "goal choice is an integration of what one wants and what one believes is possible" (Mento, Locke, & Klein, 1992, p. 404).

Two types of expectancy measures must be distinguished. First, "expectancy of goal attainment" (or "expectancy of success") is the perceived likelihood of attaining a specific goal. This measure, which is consistent with Vroom's (1964) multiplicative equation for motivation (expectancy x valence = motivational force) is negatively related to goal difficulty (Matsui, Okada, & Mizuguchi, 1988).

Garland (1984) argued that this measure is difficult to interpret when goal difficulty is manipulated because "the performance level that represents success varies across goal conditions" (p. 83). Comparisons between different norm conditions create similar difficulties. To resolve this issue, Garland (1984, 1985) proposed a different expectancy measure: Subjects assign subjective probabilities of goal attainment to several possible performance levels, and the ratings are averaged to obtain a measure of "performance expectancy" for each subject.

Performance expectancy is a measure of self-efficacy, which is a "generalized belief concerning one's task-relevant capabilities" (Meyer & Gellatly, 1988, p. 411), and unlike expectancy of goal attainment, tends to increase with goal difficulty (Garland, 1984; Meyer, Schacht-Cole, & Gellatly, 1988). Indeed, there is evidence that higher self-efficacy is related to higher personal goals, greater goal commitment (Bandura, 1982; Locke, Frederick, Lee, & Bobko, 1984), and greater effort (Bandura, 1982; see
Gist, 1987, for a review of the self-efficacy literature; see Klein, 1991, for a meta-analytic review comparing the two types of expectancy measures).

Garland's measure of performance expectancy is consistent with a control systems framework. Vance and Colella (1990), using this measure, found that subjects who fail to reach their goals are likely to set lower goals in subsequent work periods. Apparently, this increases the probability of receiving positive feedback, which in turn, increases self-efficacy.

As with expectancies, two kinds of valence measures must be distinguished. "Valence of success" refers to the attractiveness of reaching a specific goal, and it increases with goal difficulty (Matsui, Okada, & Mizuguchi, 1981). Like expectancy of goal attainment, however, this measure is difficult to interpret. The problem is that "individuals with lower goals would be more satisfied with lower levels of performance than would those who set higher goals" (Garland, 1984, p. 83). Therefore, comparisons between subjects in different goal conditions may be inappropriate; norm manipulations present the same problem.

Again, a suitable measure has been devised by Garland (1984, 1985): Subjects rate their anticipated satisfaction with each of several performance levels, and a measure of "performance valence" for each subject is obtained by averaging these ratings. Performance valences decline as assigned goals increase (Garland, 1985; Meyer & Gellatly, 1988; Meyer, Schacht-Cole, & Gellatly, 1988; see Klein, 1991, for a meta-analysis of valence research), so that someone who has been assigned a difficult goal will be less satisfied with a moderate level of performance, relative to someone assigned an easy goal (Garland, 1984).
Like Garland's measure of performance expectancy, performance valence fits within a control systems framework (Earley & Lituchy, 1991). These authors, citing Garland's (1985) argument, note that "as valence increases for a given level of performance, an individual will exert less effort to perform at increasingly high levels." From this perspective, an extremely high performance level will be undesirable because it allows no opportunity for reducing a performance deficit (negative feedback discrepancy).
Chapter 2
Goals, Norms, and Experience as Information Sources

Diverse social cues influence goal choice and performance through their impact on expectancies and valences (see Hollenbeck & Klein, 1987; Locke et al., 1981). According to Salancik and Pfeffer, "the social context of work and the presence of consequences from previous actions . . . can be combined in a social information processing approach to develop new insights into people's attitudes at work" (1978, p. 224). The present focus is on three particularly salient information sources: Assigned goals, performance norms, and task experience.

Assigned Goals

In most goal setting studies, difficult, assigned goals are readily accepted, and their impact on goal choice is stable: When encouraged to set their own standards, subjects usually base them on goals assigned in earlier trials (see Locke, Latham, & Erez, 1988). In research by Harrison et al. (1989), subjects in some conditions were encouraged to revise their assigned goals whenever they so desired. Only about half these subjects did so, though most failed to reach their assigned goals. Also, most goal revisions occurred late in the work period. Goal change is apparently a last resort, a "slower acting and long term solution to discrepancies" (Campion & Lord, 1982, p. 272).

In some cases, however, personal goals may vacillate throughout a work period. Therefore, initial goal acceptance is not sufficient for performance enhancement (Campion & Lord, 1982). This is why goal acceptance is distinguished from goal commitment, with the former referring to initial goal choice and the latter to persistence (Hollenbeck & Klein, 1887; Locke et al., 1988).
Expectancy theory predicts that goals will be accepted only when they are viewed as attainable. Consistent with this notion, there is evidence of an inverse relationship between goal difficulty and expectancy of success: the harder the goal, the lower the perceived likelihood of reaching it (Matsui, Okada, & Mizuguchi, 1981). But this implies that challenging goals are rarely accepted, and is therefore inconsistent with the fundamental hypothesis of goal setting.

The contradiction is explained by considering the other type of expectancy measure: As discussed previously, performance expectancy increases with goal difficulty (Garland, 1984; Meyer, Schacht-Cole, & Gellatly, 1988), and is positively correlated with goal choice (Bandura, 1982), effort and goal commitment (Bandura, 1982; Locke et al., 1984), and with task performance (e.g., Bandura, 1982; Bandura, Adams, & Beyer, 1977; Locke et al., 1984).

In Vance and Collella's (1990) research, subjects increased their personal goals when feedback was positive, but reacted to performance deficits by reducing their difficult assigned goals. The authors describe these results as consistent with Campion and Lords' control systems model and with the proposal by Ashford & Cummings (1983) of a feedback-seeking mechanism. When a personal goal is reduced upon failure (or imminent failure) to attain it, positive feedback becomes more likely. This restores "feelings of competence," (p. 75), or self-efficacy. Conversely, an increase in personal goal, upon goal attainment, is a way to seek additional positive feedback.

The conflicting predictions of expectancy theory and goal setting are further explained by considering valences. A challenging goal may induce a low expectancy of success, but attainment of such a goal is a desirable outcome: Valence of success
increases as assigned goals increase (Matsui, et al., 1981). Thus, a high valence for success can override a low expectancy of success.

The other type of valence, "performance valence", decreases as assigned goals increase (Meyer, Schacht-Cole, & Gellatly, 1988). That is, subjects who are assigned difficult goals report less satisfaction with lower performance levels, relative to subjects assigned easy goals (Garland, 1984, p. 83), and are therefore more motivated to perform well. Consistent with this notion, performance valence is negatively related to goal choice and task performance (Meyer & Gellatly, 1988).

Assigned goals may work, in part, by serving as data for inferring normative information. Evidence for this social information processing explanation was obtained by Meyer & Gellatly (1988). Citing that study, Earley and Erez (1991) explain that "an assigned goal is perceived as a norm for performance. This norm is used to define what is attainable and acceptable by an individual so it acts as a basis for determining performance expectancies and valences, personal goals, and performance" (p. 717).

Performance Norms

Cues that provide normative information are particularly salient. High norms lead to challenging personal goals and superior task performance, relative to low norms or an absence of normative data. This holds true whether a norm is presented as an "average performance level" in a task booklet (as in Meyer & Gellatly, 1988) or through the performance of a single, videotaped model (as in Rakestraw & Weiss, 1981).

White, Mitchell, and Bell (1977) manipulated social cues through the actions and comments of confederates posing as co-workers. There was no main effect of
social cue, but when the effects of neutral cues were removed, cues that conveyed high norms led to higher performance levels than cues that conveyed low norms.

Not only do normative cues influence goal choice and performance, they also may weaken the impact of assigned goals (Mitchell, Rothman, & Liden, 1985). In research by Earley and Kanfer (1985), subjects observed either a low or a high performing model. Subjects in the high norm condition were more committed to their goals than subjects observing the inferior performer, and they demonstrated superior performance.

Norms, like assigned goals, exert their effects on goal choice and performance through expectancies and valences (Garland, 1985; Meyer & Gellatly, 1988; Meyer, Schacht-Cole, & Gellatly, 1988). With regard to performance expectancy, it has been shown that high performing models can increase the observer's self-efficacy (Bandura, 1977; Bandura, Adams, & Beyer, 1977).

Research by Earley & Erez (1990) suggests that assigned goals and explicit normative information have "roughly equivalent" (p. 722) effects on self-efficacy, personal goals, and performance. Their research further suggests that when there is both an assigned goal and an explicit normative cue, the cue that has most recently been encountered is more salient, and has the greatest impact on performance, and on intermediate variables such as performance expectancy and goal choice.

With respect to valences, Rakestraw and Weiss (1981) found that performance satisfaction was lower for subjects exposed to high-performing models; Meyer and Gellatly (1988) observed a similar effect. This may explain the effect of competition, which can lead to personal goals that are so difficult, they are not feasible (Forward & Zander, 1971).
**Task Experience**

Several studies have shown that personal goals are a function of past performance (e.g., Cummings, Schwab, & Rosen, 1971; Feather, 1966, 1968; Lopes, 1976). Pointing to research on aspiration level (e.g., Hertzman & Festinger, 1940; Lewin et al., 1944), Campion and Lord reasoned that personal goals should somewhat exceed past performance (1982, p. 271); their study supported this hypothesis.

The concept of enactive mastery, defined as "repeated performance accomplishments" (Bandura, 1982), may explain why experience influences expectancies (Bandura, 1977; Bandura, Adams, & Beyer, 1977). Bandura (1977) suggests that modeling is merely a form of vicarious experience for persons lacking direct experience. In any case, performance expectancies seem to influence personal goals (Bandura, 1982; Locke et al., 1984; Motowidlo, Loehr, & Dunnette, 1978) and effort (Bandura, 1982).

Earley and Lituchy (1990), reporting three studies they conducted, interpreted their results as evidence that self-efficacy and personal goals influence performance. However, experience appeared to play a role: Their findings suggest that self-efficacy may "shift from effect to cause (of personal goals) as an individual gains experience" (p. 94).

Task experience also may influence valences. Individuals who differ in their experience should express unequal levels of satisfaction at any given performance level. For example, a novice golfer may boast of scoring a 90, while a more experienced golfer may express disappointment with that score. A path between task experience and performance valence is therefore included in the proposed cognitive mediation model.
Performance Norms and Task Experience

Citing research by Crawford (1974) and Katz (1980), Rakestraw and Weiss assert that "new workers turn to the social environment for guidance" but "as uncertainty is reduced through personal task experience social influences will diminish" (1981; p. 316). Rakestraw and Weiss reasoned that a model's performance level should influence an observer's personal goals and task performance, but that experience should weaken this effect. In their study, all subjects participated in a card sorting task. After receiving task instructions, subjects observed what ostensibly was a training film, but was actually a way to manipulate normative cues. For half the subjects, the film featured a low-performing model; for the other half, a high performer. Within each modeling condition, half the subjects participated in a brief practice session (thereby acquiring task experience), and half did not. As expected, subjects who observed the low-performing model set lower goals and performed at inferior levels, but this effect was weaker for those in the experience condition.

Meyer and Gellatly (1988) found evidence for a cognitive mediation model, which holds that performance norms and assigned goals influence norm perceptions, performance expectancies, and performance valences. In turn, these cognitive mechanisms control goal choice, which influences performance. Thus, performance expectancy mediates the impact of assigned goals on performance. For example, workers assume that standards set by their supervisors are feasible (Salancik, 1977). This assumption bolsters self-efficacy and leads to difficult self-set goals. In turn, increased effort enhances performance.

Valences are also important. Workers who report low performance valences (i.e., are satisfied only if they perform well), and who have high performance
expectancies (i.e., believe they are capable of doing well), are even more likely to choose difficult goals and to perform at high levels.

The present study addresses these issues but also considers the role of experience. The Rakestraw and Weiss (1981) study is important for two reasons. First, it demonstrates that low norms lead to lower standards and performance levels than high norms. Second, it shows that task experience can override the impact of norms. However, Rakestraw and Weiss manipulated experience as a between-subjects variable and they did not manipulate goal difficulty. Other researchers (Garland, 1985; Meyer & Gellatly, 1988) have manipulated both goals and norms without addressing the role of task experience.
Chapter 3
A Cognitive Mediation Model

Figure 1 displays the proposed cognitive mediation model. According to the model, Effort directly influences Task Performance and is the only variable to do so. Effort, in turn, is determined by Personal Goal. For example, individuals who aspire to high performance levels will exert greater effort than individuals who possess comparable ability, but who choose lower personal goals. The model assumes that individual differences in task ability are controlled for, which is the case in the present study.

The question is, how is a personal goal chosen? According to the model, a personal goal is determined by beliefs about one's own capabilities (expectancies), and the extent of personal satisfaction with one's own performance (valences). Therefore, the model contains a path leading from Performance Expectancy to Personal Goal, and a path from Performance Valence to Personal Goal.

Expectancies and valences are determined by various task relevant information sources. The model focuses on three particularly salient sources: assigned goals, performance norms, and task experience. From the perspective of this model, an assigned goal is a cue that conveys information about one's abilities. For example, the assignment of a challenging goal by a supervisor implies confidence that the subordinate can perform at a high level. In addition, the worker might link goal attainment with possible rewards, or with the avoidance of negative outcomes.
Figure 1. Cognitive mediation model.
Like assigned goals, cues that convey normative information influence expectancies and valences. For example, an awareness that one's cohorts typically attain a given performance level should influence self-efficacy (performance expectancy), and should influence satisfaction with similar performance levels (performance valence).

A third, critical information source is task experience. With increasing experience, beliefs about one's capabilities become better developed, and one's concept of an acceptable performance level also changes. Therefore, two key elements of the model are the Assigned Goal x Experience and Performance Norm x Experience interactions. Responses to assigned goals, and to cues conveying explicit normative information, change as additional trials are performed.

To summarize, social cues interact with experience to alter expectancies and valences. These changes in beliefs lead to a shift in Personal Goal and a corresponding change in Effort. The end result is a change in Task Performance.
Chapter 4
Summary and Hypotheses

Previous studies have investigated the effects of assigned goals, performance norms, and experience on task performance. A unique contribution of the present study is the combination of all three information sources (assigned goals, performance norms, and experience) in one design. The study manipulates 2 two-level factors: goal difficulty (difficult and easy) and performance norm (high and low). Four experimental trials serve as repeated measures of experience. The study also includes a no goal-no norm control group, producing a 2 (goal difficulty) x 2 (performance norm) + 1 (control group) x 4 (trial) design.

The control group is essentially a zero-level condition of the goal and norm factors; for subjects in this group, the only basis for choosing personal goals is task experience. The error term is obtained by pooling the within-cell variation of the control group with the within-cell variation of the factorial part of the experiment (see Winer, 1971, pp. 468-473).

Analysis of Variance Hypotheses

Performance

Hypothesis 1a. A main effect of assigned goal on performance is anticipated; the performance means of subjects assigned difficult goals will exceed the performance means of subjects assigned easy goals.

Hypothesis 1b. A goal x trial interaction is predicted, such that the goal effect will decline in later trials. In later trials, subjects will have additional information, including their past performance levels, on which to base subsequent goals.
Hypothesis 1c. A main effect of performance norm is hypothesized; the performance means of subjects who encounter high norms will exceed the performance means of subjects who encounter low norms.

Hypothesis 1d. A norm x trial interaction is anticipated, with the norm effect weakening in later trials. As with assigned goals, additional information gained through task experience will override the impact of normative information.

Effort

The pattern of findings for effort will parallel the predictions for performance.

Hypothesis 2a. Assigned goal difficulty will exert a main effect on effort.

Hypothesis 2b. There will be a goal x trial interaction, with the goal effect diminishing in later trials.

Hypothesis 2c. Performance norms will exert a main effect on effort.

Hypothesis 2d. There will be a norm x trial interaction, with the norm effect declining in later trials.

The patterns of findings for personal goal, performance expectancy, and performance valence will be similar to the findings for performance and effort. Goals and norms will exert independent main effects on these variables but the effects will diminish with experience.

Personal Goals

Hypotheses 3a through 3d. Difficult assigned goals will lead to higher personal goals than will easy goals (Hypothesis 3a), but this effect will weaken in later trials (Hypothesis 3b). High performance norms will lead to higher personal goals than low norms (3c), but this effect also will weaken with experience (Hypothesis 3d).
Performance Expectancy

Hypotheses 4a through 4d. Subjects assigned difficult goals will report higher performance expectancies than subjects assigned easy goals (Hypothesis 4a), but this effect will weaken in later trials (Hypothesis 4b). Similarly, subjects encountering high performance norms will report higher expectancies than subjects encountering low norms (4c), but this effect also will weaken in later trials (Hypothesis 4d).

Performance Valence

Hypotheses 5a through 5d. Difficult assigned goals will lead to lower performance valences than easy goals (Hypothesis 5a), but this effect will weaken in later trials (Hypothesis 5b). High performance norms will lead to lower valences than low norms (5c), but this effect also will weaken with experience (Hypothesis 5d).

Multiple Comparisons

Subjects in the control group will have no information, except experience, to use in setting their standards. In contrast, subjects in three of the four experimental groups will encounter difficult goals or high performance norms or both (the exception is the easy goal-low norm, or EL, group). Therefore, except for the EL group, the experimental groups will set higher personal goals, exert more effort, and perform at superior levels, relative to the control group. Multiple comparisons for repeated measures will be used to test these hypotheses, which are specified below (Hypotheses 6a, 7a, and 8a).

Subjects in the EL group will encounter two distinct cues that, though unrelated, provide consistent information: Both cues suggest low standards. Subjects in the control group will not encounter these cues. The only basis that control subjects
will have for choosing their personal goals will be their own past performance levels. Therefore, compared to the control group, subjects in the EL group should set lower personal goals, exert less effort, and perform at inferior levels. However, this effect will not emerge until trials 3 and 4, when control subjects have acquired information on which to base their personal goals. Hypotheses 6b, 7b, and 8b concern contrasts between the control group and easy goal-low norm group in terms of performance, effort, and personal goals, respectively. Each of these hypotheses will be tested with four separate contrasts, one for each trial.

Performance

**Hypothesis 6a.** The difficult goal-high norm (DH), difficult goal-low norm (DL), and easy goal-high norm (EH) groups will outperform the control group. A contrast that combines the DH, DL, and EH groups vs. the control group will be used to test this hypothesis.

**Hypothesis 6b.** Control group and EL group performance means will not differ in Trials 1 and 2, but a difference will emerge in Trials 3 and 4. In the latter trials, the control group will outperform the EL group.

Effort

**Hypothesis 7a.** A contrast similar to the one described in hypothesis 6a will be computed, but the dependent variable will be effort. A similar pattern of results is hypothesized: The control group will exert less effort than the DH, DL, and EH groups.

**Hypothesis 7b.** Control subjects will exert more effort than EL subjects, but this effect will emerge only in trials 3 and 4.
Personal Goal

Hypothesis 8a. Subjects in the control group will choose lower personal goals than subjects in the DH, DL, and EH groups.

Hypothesis 8b. Control subjects will set higher personal goals than subjects in the easy goal-low norm group, but only in trials 3 and 4.

Regression Hypotheses

In Hypotheses 9 through 12, correlations are computed for each trial with the control group excluded. Each hypothesis involves a correlation between two variables contained in the cognitive mediation model (see Figure 1).

Effort and Performance

Hypothesis 9. The correlation between effort and task performance will be positive; the greater the effort, the better the performance.

Personal Goal and Task Performance

Hypothesis 10. The correlation between personal goal and task performance will be positive.

Personal Goal and Performance Expectancy

Hypothesis 11. The correlation between expectancy and personal goal will be positive. For example, individuals who believe they are capable of high performance levels are more likely to choose difficult personal goals.

Personal Goal and Performance Valence

Hypothesis 12. As discussed previously, performance valence (unlike valence of goal attainment) refers to satisfaction with any given performance level: An individual reporting low performance valence will be less satisfied with any given performance level, relative to someone reporting a high valence. Therefore, low
performance valences will be associated with high personal goals, and the reverse will also be true. A negative correlation between personal goal and performance valence is anticipated.
Subjects

Subjects were 100 undergraduate psychology and sociology students (63 females and 37 males) participating for extra credit.

Design

Four experimental conditions were created by crossing two levels of goal (easy and difficult) with two levels of performance norm (low and high). There was also a control condition in which there were no assigned goals and no explicit normative cues were available. Subjects were randomly assigned to one of the five conditions. All subjects completed four experimental trials (5 minutes each) that served as repeated measures of experience.

A baseline session, used to assess ability, preceded the four trials. To minimize confounding of the experience variable by this task pre-exposure, there were only two baseline trials, and their duration (2.5 minutes each) was shorter than that of the experimental trials. Also, subjects were not informed of the length of these trials, and no time or performance feedback was provided.

Task

Subjects sorted cards into categories according to information printed on one side of each card. The information specified a college major (business administration or accounting), an income level (high, medium, or low), and sex (male or female). Thus, there were 12 (2 x 3 x 2) categories of cards.

Each card was punched with a pattern of holes unique to its category. In turn, each hole pattern matched a set of pegs that extended vertically from a "sorting board;"
the peg patterns were labeled accordingly. The task was to place each card on the appropriate set of pegs by matching card labels with sorting board labels.

The suitability of this task for goal setting research was discussed by Rakestraw and Weiss (1981). Quality is controlled because a card will not fit on the board unless it is placed on the correct set of pegs. Since performance can vary only in terms of quantity, it is primarily a function of effort, and therefore corresponds closely to intentions. Finally, the task has been used successfully in several goal setting studies concerning normative cues (e.g., Pritchard & Curts, 1973; Rakestraw & Weiss, 1981; White, Mitchell, & Bell, 1977).

During the experimental trials, cards were dispensed in packets of 10. Cards had been thoroughly shuffled before being placed in the packets. The packets were arranged in two rows of six on a "feedback board" (see Rakestraw & Weiss, 1981). The top row contained packets 1 through 6 (from left to right) and the bottom row packets 7 through 12. A label affixed to each packet indicated its number. Beginning with packet 1, the subject removed one card at a time and placed it on the sorting board. After sorting all 10 cards in this packet, the subject continued with packet 2 and then across the row. In each packet, a tag under the last card indicated the number of cards sorted up to that point. Thus, subjects generated their own performance feedback after every 10 cards. Time feedback was conveyed through a digital clock that the experimenter reset to zero before each trial.

**Independent Variables**

**Task experience.** All subjects participated in four trials of equal length (5 minutes). Each successive trial represented an increment in experience.
Goal manipulation. Each subject (unless in the control condition) was assigned either a difficult or an easy goal that was based on his or her ability. For each subject, baseline performance was aggregated across two trials, and the total number of cards sorted provided an ability measure. The ability measure was multiplied by 1.3 to set difficult goals. In pilot testing, this difficulty factor led to goals that appeared reasonable but were somewhat difficult, even after three five-minute trials had been completed; about one half of the pilot subjects who had been assigned goals of this magnitude attained their goals in the fourth trial. To set easy goals, the ability measure was multiplied by .9. In pilot testing, subjects tended to attain goals of this magnitude, but reported that some degree of effort was required, even in later trials. In the control condition, subjects were told to sort as many cards as possible, just as in the baseline session. Assigned goals were held constant across the experimental trials, and no rationale was provided for the goal levels.

Norm manipulation. Norms, like assigned goals, were set for each subject according to their baseline performance, and were held constant across the four trials. The difficulty factors used for assigning goals were also used for establishing norms (i.e., a subject's ability measure was multiplied by .9 in the low norm conditions and by 1.3 in the high norm conditions). However, the resulting products were increased by three cards so that norms in the difficult-high and easy-low conditions would not be identical to assigned goals.

Dependent Measures

Except task performance, all dependent variables consisted of self-report measures assessed through a questionnaire (see Appendix A). Unless otherwise indicated, questions were answered before each experimental trial. According to
previous research (e.g., Earley & Kanfer, 1985; Locke & Bryan, 1969), it does not matter whether introspective measures are taken before or after performance (cited in Locke et al., 1988, p. 25). To enhance the quality of introspective data, subjects were told that the study dealt with manual dexterity, and distractor questions were included in the questionnaire.

**Task performance.** The measure of interest was not raw performance, but the extent to which individuals surpassed their baseline performance. For each subject, four measures were obtained (one for each trial) by dividing the number of cards sorted in a trial by the number sorted in the baseline session. A value greater than 1.0 for any trial indicates that performance in that trial surpassed baseline performance.

**Personal goal.** Personal goal was assessed before each trial by asking subjects in all conditions, "How many cards are you going to try to sort in this work period?" After each trial, all subjects were asked to indicate the magnitude of the goal they were working toward when the trial ended. The latter measure was obtained for exploratory purposes.

**Effort.** Following Campion and Lord (1982), at the end of each trial, subjects completed the sentence, "In trying to reach my personal goal during the last work period, I exerted: " with responses ranging from 1 ("no effort") to 7 ("all possible effort"). Before each trial, subjects were asked, "Compared to the work period you just completed, how much effort do you intend to exert in the upcoming work period?" (compared to the previous work period). Responses ranged from 1 ("much less effort") to 5 ("much more effort"). This measure was obtained for exploratory purposes only.
Performance expectancy. A measure of performance expectancy was taken from Garland (1984, 1985). Before each trial, subjects estimated the likelihood that they would attain each of several possible performance levels. Specifically, they assigned a number between 0 and 100 to each of the following intervals: 30-39 cards sorted; 40-49 cards; . . . 110-119 cards. Ratings were averaged to obtain a measure of "performance expectancy" for each subject. Following Locke et al. (1984), and Meyer and Gellatly (1988), only the ratings for the middle performance intervals were used (i.e., 50-59, 60-69, 70-79, and 80-89). A high score reflects a high level of performance expectancy, or self-efficacy.

Performance valence. The valence measure is also taken from Garland (1984, 1985). First, subjects estimated their anticipated satisfaction with each of several performance intervals. The first interval was 30-39 cards sorted; the second was 40-49 cards; and so on to the last interval, which was 110-119 cards. A measure of "performance valence" for each subject was then calculated by averaging the ratings for the middle performance intervals (50-59, 60-69, 70-79, and 80-89). The expected satisfaction scale ranged from 1 ("I would be extremely dissatisfied if I performed at this level") to 7 ("I would be extremely satisfied if I performed at this level"). A score that is high relative to other subjects indicates anticipated satisfaction with relatively low performance levels.

Goal commitment. Experimental subjects were asked, after each trial, "How important to you is reaching the goal set by the experimenter"; the importance scale ranged from "not important at all" (1) to "extremely important" (7). Subjects in the control condition were not asked this question. Also after each trial, subjects in all five conditions indicated the number of times they had revised their personal goals, and also
indicated how important it was to them to reach their final goals. Available responses ranged from 1 ("not important at all") to 7 ("extremely important"). Measures of goal commitment were obtained for exploratory purposes.

**Procedure**

Subjects, who were run one at a time, were seated at a table and given preliminary instructions. For each of two baseline trials (2.5 minutes each), subjects were given 60 cards and were instructed to sort as many as possible before time was called. After initiating each trial, the experimenter left the room.

The experimenter returned at the end of each baseline trial, collected all cards, and took them to an adjacent room to determine the number sorted. After the second trial, the subject remained seated while the experimenter returned to the adjacent room and prepared the goal and norm stimuli. The subject was then moved to this room and seated at a table, which contained a task booklet, a feedback board, and the sorting board used in the baseline session. A performance goal was assigned at this time. In the control (no norm-no goal) condition, the subject was simply told to sort as many cards as possible, as in the baseline trials.

After assigning a performance goal, the experimenter pointed to a placard across the table from the subject. It was explained that the placard showed the number of cards sorted by the previous subject in the last trial. The figure on the card was actually a function of the present subject's ability, and was used to manipulate the norm variable (in the control condition, the placard was blank). The placard remained in the subject's field of vision throughout the four experimental trials. Subjects were instructed to keep working regardless of goal attainment.
After having the subject answer the first set of questionnaire items, resetting the clock and initiating the first trial, the experimenter left the room for five minutes, and then returned to announce the end of the trial. At this time, the subject wrote the number of cards sorted on a placard which was identical to the one used for the norm manipulation. While the subject answered additional questionnaire items, the experimenter removed all cards from the sorting board and replenished the feedback board using a shuffled supply of cards. This procedure was carried out three additional times.

Subjects were debriefed immediately after participating in the experiment. The true purpose of the experiment was explained, as was the reason for disguising it as a study of manual dexterity. In addition, subjects were informed that the "normative information" and assigned goal levels were based on their own individual ability, as measured by baseline performance. Subjects were thanked and given an opportunity to ask questions about the experiment and their participation in it, and were then dismissed.
Chapter 6
Results

Ability Differences

A one-way analysis of variance (ANOVA) was used to test for pre-manipulation ability differences among the five groups. The groups did not differ in terms of baseline performance, $F(4, 95) = .37$, ns.

Variability in Performance

Figure 1 displays the frequency distributions for performance in Trials 1 and 2, as well as the standard deviation for each trial; Figure 2 displays the same information for Trials 3 and 4. Based on inspection of these figures, the performance measure appears to be adequately sensitive to performance differences across individuals.

Trial-to-Trial Reliability

Table 1 displays trial-to-trial reliability coefficients for each of the five dependent measures. All coefficients are positive and are significant at the .01 level. These data suggest that differences between subjects were consistent across trials, especially consecutive trials. For example, the subjects who reported the highest effort levels in Trial 1 tended also to report the highest effort levels in Trial 2.

Tests of Hypotheses 1-5

To analyze the results of the $2$ (goal difficulty) x $2$ (performance norm) + $1$ (control group) x $4$ (trial) design, the control treatment was treated as a zero-level condition of the goal and norm factors. The appropriate error term was obtained by pooling the within-cell variation of the control group with the within-cell variation of the factorial part of the experiment (see Winer, 1971). This was accomplished by conducting two contrasts, one for the goal effect and one for the norm effect. Therefore, instead of performing a multivariate analysis of variance with goals and
Figure 2. Frequency distributions of performance measure for Trials 1 and 2. Performance measure for each trial is the ratio of cards sorted in that trial, relative to the baseline period.
Figure 3. Frequency distributions of performance measure for Trials 3 and 4. Performance measure for each trial is the ratio of cards sorted in that trial, relative to the baseline period.
### Table 1

**Trial-to-Trial Reliability Coefficients for each Dependent Variable**

<table>
<thead>
<tr>
<th>Performance</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>.87**</td>
<td>.82**</td>
<td>.76**</td>
</tr>
<tr>
<td>Trial 2</td>
<td>—</td>
<td>.89**</td>
<td>.86**</td>
</tr>
<tr>
<td>Trial 3</td>
<td>—</td>
<td>—</td>
<td>.94**</td>
</tr>
<tr>
<td>Trial 4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal Goal</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>.59**</td>
<td>.50**</td>
<td>.47**</td>
</tr>
<tr>
<td>Trial 2</td>
<td>—</td>
<td>.90**</td>
<td>.85**</td>
</tr>
<tr>
<td>Trial 3</td>
<td>—</td>
<td>—</td>
<td>.93**</td>
</tr>
<tr>
<td>Trial 4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effort</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>.81**</td>
<td>.62**</td>
<td>.61**</td>
</tr>
<tr>
<td>Trial 2</td>
<td>—</td>
<td>.74**</td>
<td>.66**</td>
</tr>
<tr>
<td>Trial 3</td>
<td>—</td>
<td>—</td>
<td>.72**</td>
</tr>
<tr>
<td>Trial 4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valence</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>.65**</td>
<td>.59**</td>
<td>.56**</td>
</tr>
<tr>
<td>Trial 2</td>
<td>—</td>
<td>.91**</td>
<td>.88**</td>
</tr>
<tr>
<td>Trial 3</td>
<td>—</td>
<td>—</td>
<td>.96**</td>
</tr>
<tr>
<td>Trial 4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expectancy</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>.58**</td>
<td>.49**</td>
<td>.40**</td>
</tr>
<tr>
<td>Trial 2</td>
<td>—</td>
<td>.86**</td>
<td>.76**</td>
</tr>
<tr>
<td>Trial 3</td>
<td>—</td>
<td>—</td>
<td>.91**</td>
</tr>
<tr>
<td>Trial 4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

** p < .01
norms as separate factors, the analysis was conceptualized as a one-way ANOVA with one between-subjects factor (consisting of five goal-norm treatments), and one within-subjects factor (four trials). This approach was used to test main effects and interactions of goals, norms, and experience on five dependent variables: performance, effort, personal goal, performance expectancy, and performance valence.

Tables 2 through 6 contain cell means and ANOVA summaries for the first five hypotheses. Figures 4 through 8 display goal effects collapsed across norm conditions, and norm effects collapsed across goal conditions. The figures are line graphs with means plotted for each of the five groups in each experimental trial.

Performance

Table 2 contains the means and ANOVA summary for performance. The performance measure indicates the number of cards sorted in each trial as a percentage above baseline performance. For example, the measure of 1.14 for the Difficult Goal-High Norm condition in Trial 1 indicates that in the first trial, subjects in this condition exceeded their baseline performance by 14%, on average. Figure 4 displays the effects of goals and norms, as well as their interactions with trial.

Hypothesis 1a. A main effect of assigned goal on performance was hypothesized, with difficult goals leading to greater performance than easy goals. This hypothesis was not supported. As shown in Table 2, subjects who were assigned difficult goals (M = 1.26) did not significantly outperform those who were assigned easy goals (M = 1.20).

Hypothesis 1b. A goal x trial interaction was anticipated, with the goal effect weakening in later trials. As Figure 4 shows, this hypothesis was not supported. The ANOVA summary in Table 2 supports this conclusion.

Hypothesis 1c. A main effect of norm level on performance was hypothesized, with high norms leading to greater performance than low norms. However, as Table 2
shows, the performance mean of subjects who encountered high norms ($M = 1.26$) was not significantly larger than the mean for subjects who encountered low norms ($M = 1.20$).

**Hypothesis 1d.** A norm x trial interaction was hypothesized, with the norm effect weakening in later trials. This hypothesis was not supported. As shown in Figure 4, the pattern of results resembles the pattern observed in Hypothesis 1b, which predicted a goal x trial interaction. Table 2 contains the ANOVA summary.

**Effort**

Effort was self-reported with available responses ranging from 1 ("no effort") to 7 ("all possible effort"). Cell means and the ANOVA summary for effort are displayed in Table 3, and the data are presented graphically in Figure 5.

**Hypothesis 2a.** A main effect of assigned goal on effort was hypothesized, with difficult goals leading to greater effort than easy goals. As shown in Table 3, this hypothesis was not supported. Subjects assigned easy goals reported essentially the same effort levels ($M = 5.63$) as those assigned difficult goals ($M = 5.60$).

**Hypothesis 2b.** A goal x trial interaction was anticipated, with the goal effect weakening in later trials. This hypothesis was not supported (see Table 3 and Figure 5).

**Hypotheses 2c.** A main effect of norm level on effort was hypothesized, with high norms leading to greater effort than low norms. However, subjects in the high norm conditions reported essentially the same effort level ($M = 5.64$) as those encountering low norms ($M = 5.59$); the difference was not significant (see Table 3).

**Hypotheses 2d.** The hypothesized norm x trial interaction for effort, with the effect of norms declining in later trials, was not observed (see Figure 5). This conclusion is supported by the ANOVA summary in Table 3.
Table 2
Cell means and ANOVA Summary for Performance

Cell means

<table>
<thead>
<tr>
<th>Goal-Norm Group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult-High</td>
<td>1.14</td>
<td>1.25</td>
<td>1.32</td>
<td>1.41</td>
<td>1.28</td>
</tr>
<tr>
<td>Difficult-Low</td>
<td>1.06</td>
<td>1.21</td>
<td>1.29</td>
<td>1.37</td>
<td>1.23</td>
</tr>
<tr>
<td>Easy-High</td>
<td>1.09</td>
<td>1.18</td>
<td>1.32</td>
<td>1.38</td>
<td>1.24</td>
</tr>
<tr>
<td>Easy-Low</td>
<td>1.03</td>
<td>1.13</td>
<td>1.21</td>
<td>1.26</td>
<td>1.16</td>
</tr>
<tr>
<td>Control</td>
<td>1.10</td>
<td>1.24</td>
<td>1.32</td>
<td>1.39</td>
<td>1.26</td>
</tr>
<tr>
<td>Mean</td>
<td>1.08</td>
<td>1.20</td>
<td>1.29</td>
<td>1.36</td>
<td></td>
</tr>
</tbody>
</table>

Note: Larger values indicate greater performance relative to the baseline period.

ANOVA Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
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<td>.27</td>
<td>1.94</td>
<td>.167</td>
</tr>
<tr>
<td>Norm</td>
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<td>1</td>
<td>.34</td>
<td>2.47</td>
<td>.119</td>
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<tr>
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<td>1</td>
<td>.03</td>
<td>.19</td>
<td>.667</td>
</tr>
<tr>
<td>Trial</td>
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<td>3</td>
<td>1.48</td>
<td>219.91</td>
<td>.000</td>
</tr>
<tr>
<td>Goal x Trial</td>
<td>.02</td>
<td>3</td>
<td>.01</td>
<td>1.00</td>
<td>.392</td>
</tr>
<tr>
<td>Norm x Trial</td>
<td>.01</td>
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<td>.00</td>
<td>.42</td>
<td>.738</td>
</tr>
<tr>
<td>Goal x Norm x Trial</td>
<td>.04</td>
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<td>.01</td>
<td>1.86</td>
<td>.136</td>
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</table>
Figure 4. Effects of goals and norms on performance in each experimental trial. Performance measure for each trial is the ratio of cards sorted in that trial, relative to the baseline period.
Table 3
Cell means and ANOVA Summary for Effort

Cell means

<table>
<thead>
<tr>
<th>Goal-Norm Group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult-High</td>
<td>5.30</td>
<td>5.50</td>
<td>5.85</td>
<td>5.80</td>
<td>5.61</td>
</tr>
<tr>
<td>Difficult-Low</td>
<td>5.20</td>
<td>5.50</td>
<td>5.60</td>
<td>6.05</td>
<td>5.59</td>
</tr>
<tr>
<td>Easy-High</td>
<td>5.40</td>
<td>5.55</td>
<td>5.85</td>
<td>5.85</td>
<td>5.66</td>
</tr>
<tr>
<td>Easy-Low</td>
<td>5.30</td>
<td>5.55</td>
<td>5.80</td>
<td>5.70</td>
<td>5.59</td>
</tr>
<tr>
<td>Control</td>
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<td>5.65</td>
<td>5.90</td>
<td>6.15</td>
<td>5.83</td>
</tr>
<tr>
<td>Mean</td>
<td>5.36</td>
<td>5.55</td>
<td>5.80</td>
<td>5.91</td>
<td></td>
</tr>
</tbody>
</table>

Note: Larger values indicate greater self-reported effort.

ANOVA Summary

<table>
<thead>
<tr>
<th>Source</th>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
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<td>.05</td>
<td>.02</td>
<td>.895</td>
</tr>
<tr>
<td>Norm</td>
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<td>.20</td>
<td>.07</td>
<td>.791</td>
</tr>
<tr>
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<td>.05</td>
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</tr>
<tr>
<td>Trial</td>
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<td>.000</td>
</tr>
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<td>.17</td>
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<td>Goal x Norm x Trial</td>
<td>.95</td>
<td>3</td>
<td>.32</td>
<td>1.14</td>
<td>.334</td>
</tr>
</tbody>
</table>
Figure 5. Effects of goals and norms on self-reported effort in each experimental trial. Responses ranged from 1 (no effort) to 7 (all possible effort).
Personal Goal

Subjects provided a measure of personal goal before each work period by indicating the number of cards they intended to try to sort in the next work period. Table 4 displays cell means and the ANOVA summary for personal goal. The data are illustrated graphically in Figure 6.

Hypothesis 3a. A main effect of assigned goal on personal goal was hypothesized; difficult assigned goals were expected to lead to higher personal goals than were easy assigned goals. However, as Table 4 shows, subjects in the difficult-goal conditions did not choose significantly higher personal goals ($M = 88.98$) than subjects in the easy-goal conditions ($M = 83.92$).

Hypothesis 3b. A goal x trial interaction was anticipated, with the goal effect weakening in later trials. As shown in Figure 6, strong support for this hypothesis was obtained. Subjects in the difficult goal conditions ($M = 85.5$) initially selected higher personal goals than subjects in the easy goal conditions ($M = 70.7$), but the effect gradually weakened. By trial 4, personal goals in the easy goal conditions ($M = 94.18$) had become essentially the same as in the hard goal conditions ($M = 93.63$). The ANOVA summary in Table 4 supports this conclusion.

Hypothesis 3c. A main effect of norm level on personal goal was hypothesized, with high norms leading to higher personal goals than low norms. However, as Table 4 shows, there was essentially no difference in personal goal between subjects in the high norm group ($M = 86.76$) and those in the low-norm group ($M = 86.14$).

Hypothesis 3d. A norm x trial interaction was anticipated, with the norm effect weakening in later trials. The hypothesis was not supported (see Figure 6 and Table 4).
Table 4
Cell means and ANOVA Summary for Personal Goal

**Cell means**

<table>
<thead>
<tr>
<th>Goal-Norm Group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult-High</td>
<td>82.95</td>
<td>85.45</td>
<td>88.90</td>
<td>92.30</td>
<td>87.40</td>
</tr>
<tr>
<td>Difficult-Low</td>
<td>88.05</td>
<td>86.35</td>
<td>92.85</td>
<td>94.95</td>
<td>90.55</td>
</tr>
<tr>
<td>Easy-High</td>
<td>71.10</td>
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<td>90.85</td>
<td>97.95</td>
<td>86.11</td>
</tr>
<tr>
<td>Easy-Low</td>
<td>70.30</td>
<td>80.10</td>
<td>86.10</td>
<td>90.40</td>
<td>81.73</td>
</tr>
<tr>
<td>Control</td>
<td>62.00</td>
<td>83.35</td>
<td>91.40</td>
<td>94.95</td>
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</tr>
<tr>
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<td>74.88</td>
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<td>90.02</td>
<td>94.11</td>
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</tr>
</tbody>
</table>

Note: Larger values indicate higher personal goals.

**ANOVA Summary**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
<td>2045.25</td>
<td>1.87</td>
<td>.175</td>
</tr>
<tr>
<td>Norm</td>
<td>30.63</td>
<td>1</td>
<td>30.63</td>
<td>.03</td>
<td>.868</td>
</tr>
<tr>
<td>Goal x Norm</td>
<td>1136.28</td>
<td>1</td>
<td>1136.28</td>
<td>1.04</td>
<td>.311</td>
</tr>
<tr>
<td>Trial</td>
<td>20948.33</td>
<td>3</td>
<td>6982.78</td>
<td>68.44</td>
<td>.000</td>
</tr>
<tr>
<td>Goal x Trial</td>
<td>2712.41</td>
<td>3</td>
<td>904.14</td>
<td>8.86</td>
<td>.000</td>
</tr>
<tr>
<td>Norm x Trial</td>
<td>248.08</td>
<td>3</td>
<td>82.69</td>
<td>.81</td>
<td>.489</td>
</tr>
<tr>
<td>Goal x Norm x Trial</td>
<td>79.53</td>
<td>3</td>
<td>26.51</td>
<td>.26</td>
<td>.854</td>
</tr>
</tbody>
</table>
Figure 6. Effects of goals and norms on personal goal in each experimental trial.
Performance Expectancy

For each trial, subjects indicated the probability, from 0 percent to 100 percent, that they would perform at each of several performance intervals, in terms of the number of cards they would be able to sort. Probabilities for specific performance intervals (50-59, 60-69, 70-79, and 80-89) were averaged for each subject in each experimental trial. Table 5 contains cell means and the ANOVA summary table for performance expectancy. Figure 7 displays the data in graphic form. Three of the groups (DH, EL, and control) each lack data for one subject. For each of these groups, expectancy statistics are based on 19, rather than 20 subjects.

Hypothesis 4a. A main effect of assigned goal on expectancy was hypothesized, with difficult goals leading to higher expectancies than easy goals. As Table 5 shows, however, there was very little difference between subjects assigned difficult goals (M = 71.14) and those assigned easy goals (M = 70.31); the hypothesis was not supported.

Hypothesis 4b. A goal x trial interaction was anticipated, with difficult goals leading to higher expectancies but only in early trials. As shown in Figure 7 the predicted pattern did not emerge and the interaction was not significant (see Table 5).

Hypothesis 4c. A main effect of norm level on performance expectancy was hypothesized, with high norms leading to greater expectancies than low norms. Based on inspection of Figure 7, the data appear to support this hypothesis. However, the difference in performance expectancies between the high-norm conditions (M = 72.89) and the low-norm conditions (M = 68.57) was not significant (see Table 5).

Hypothesis 4d. A norm x trial interaction was anticipated, with higher norms leading to higher performance expectancies, but only in early trials. The trend depicted in Figure 7 is consistent with this hypothesis, but the interaction is not significant (see Table 5).
Table 5
Cell means and ANOVA Summary for Performance Expectancy

Cell means

<table>
<thead>
<tr>
<th>Goal-Norm Group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult-High</td>
<td>69.94</td>
<td>71.31</td>
<td>75.44</td>
<td>77.10</td>
<td>73.45</td>
</tr>
<tr>
<td>Difficult-Low</td>
<td>58.79</td>
<td>71.68</td>
<td>75.07</td>
<td>69.80</td>
<td>68.84</td>
</tr>
<tr>
<td>Easy-High</td>
<td>62.12</td>
<td>76.42</td>
<td>76.05</td>
<td>74.72</td>
<td>72.33</td>
</tr>
<tr>
<td>Easy-Low</td>
<td>56.91</td>
<td>72.93</td>
<td>70.06</td>
<td>73.29</td>
<td>68.30</td>
</tr>
<tr>
<td>Control</td>
<td>39.76</td>
<td>71.05</td>
<td>73.96</td>
<td>76.66</td>
<td>65.36</td>
</tr>
<tr>
<td>Mean</td>
<td>57.50</td>
<td>72.68</td>
<td>74.12</td>
<td>74.31</td>
<td></td>
</tr>
</tbody>
</table>

Note: Larger values indicate greater performance expectancies.

ANOVA Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>53.48</td>
<td>1</td>
<td>53.48</td>
<td>.02</td>
<td>.877</td>
</tr>
<tr>
<td>Norm</td>
<td>1455.86</td>
<td>1</td>
<td>1455.86</td>
<td>.65</td>
<td>.421</td>
</tr>
<tr>
<td>Goal x Norm</td>
<td>6.54</td>
<td>1</td>
<td>6.54</td>
<td>.00</td>
<td>.957</td>
</tr>
<tr>
<td>Trial</td>
<td>19232.15</td>
<td>3</td>
<td>2410.72</td>
<td>29.54</td>
<td>.000</td>
</tr>
<tr>
<td>Goal x Trial</td>
<td>700.74</td>
<td>3</td>
<td>233.58</td>
<td>1.08</td>
<td>.359</td>
</tr>
<tr>
<td>Norm x Trial</td>
<td>463.44</td>
<td>3</td>
<td>154.48</td>
<td>.71</td>
<td>.546</td>
</tr>
<tr>
<td>Goal x Norm x Trial</td>
<td>559.51</td>
<td>3</td>
<td>186.50</td>
<td>.86</td>
<td>.463</td>
</tr>
</tbody>
</table>
Figure 7. Effects of goals and norms on performance expectancy for each experimental trial.
Performance Valence

For each trial, subjects indicated their anticipated satisfaction with each of several possible performance intervals. Satisfaction ratings ranged from 1 (extreme dissatisfaction) to 7 (extreme satisfaction). Ratings for specific performance intervals (50-59 cards sorted; 60-69; 70-79; and 80-89) were averaged to compute a measure of performance valence for each subject, in each of the four trials. Larger values indicate greater anticipated satisfaction with any possible performance level; an individual with a low performance valence would be satisfied with marginal performance. Cell means and the ANOVA summary for performance valence are displayed in Table 6; Figure 8 illustrates the results in graphic form.

Hypothesis 5a. A main effect of assigned goal on performance valence was hypothesized, with greater goal difficulty leading to lower valences. However, the difference in means was at almost a chance level (see Table 6). Subjects assigned easy goals reported essentially the same valence levels ($M = 3.08$) as those assigned difficult goals ($M = 2.97$).

Hypothesis 5b. A goal x trial interaction was anticipated, with the goal effect weakening in later trials. Based on inspection of Figure 6, it appears that limited support was obtained for this hypothesis. The interaction was significant (see Table 6).

Hypothesis 5c. A main effect of norm level on performance valence was hypothesized, with high norms leading to lower valences than low norms. However, this hypothesis was not supported. As shown in Table 6, performance valences in the low-norm conditions ($M = 3.21$) were not significantly higher than valences in the high-norm conditions ($M = 2.85$).
Table 6
Cell means and ANOVA Summary for Valence

<table>
<thead>
<tr>
<th>Cell means</th>
<th>Goal-Norm Group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difficult-High</td>
<td>3.45</td>
<td>2.76</td>
<td>2.63</td>
<td>2.49</td>
<td>2.83</td>
</tr>
<tr>
<td></td>
<td>Difficult-Low</td>
<td>3.54</td>
<td>3.21</td>
<td>2.96</td>
<td>2.73</td>
<td>3.11</td>
</tr>
<tr>
<td></td>
<td>Easy-High</td>
<td>3.69</td>
<td>3.03</td>
<td>2.55</td>
<td>2.20</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>Easy-Low</td>
<td>4.00</td>
<td>3.48</td>
<td>2.99</td>
<td>2.74</td>
<td>3.30</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>4.45</td>
<td>3.31</td>
<td>2.94</td>
<td>2.68</td>
<td>3.34</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>3.83</td>
<td>3.16</td>
<td>2.81</td>
<td>2.57</td>
<td></td>
</tr>
</tbody>
</table>

Note: Larger values indicate greater anticipated satisfaction with any possible performance level.

ANOVA Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
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<td>1</td>
<td>1.01</td>
<td>.23</td>
<td>.633</td>
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<tr>
<td>Norm</td>
<td>10.15</td>
<td>1</td>
<td>10.15</td>
<td>2.30</td>
<td>.132</td>
</tr>
<tr>
<td>Goal x Norm</td>
<td>.49</td>
<td>1</td>
<td>.49</td>
<td>.11</td>
<td>.740</td>
</tr>
<tr>
<td>Trial</td>
<td>89.74</td>
<td>3</td>
<td>29.91</td>
<td>99.72</td>
<td>.000</td>
</tr>
<tr>
<td>Goal x Trial</td>
<td>3.21</td>
<td>3</td>
<td>1.07</td>
<td>3.56</td>
<td>.015</td>
</tr>
<tr>
<td>Norm x Trial</td>
<td>.70</td>
<td>3</td>
<td>.23</td>
<td>.78</td>
<td>.505</td>
</tr>
<tr>
<td>Goal x Norm x Trial</td>
<td>.26</td>
<td>3</td>
<td>.09</td>
<td>.29</td>
<td>.830</td>
</tr>
</tbody>
</table>
Difficult Goal vs. Easy Goal conditions collapsed across Norm conditions.

High Norm vs. Low Norm conditions collapsed across Goal conditions.

Figure 8. Effects of goals and norms on performance valence for each experimental trial.
Hypothesis 5d. A norm x trial interaction was hypothesized, with the norm effect weakening in later trials. There was no support for this hypothesis (see Table 6 and Figure 8).

Tests of Hypotheses 6-8: Multiple Contrasts

Differences between the control group and the experimental groups were tested with a series of multiple contrasts. For hypotheses 6a, 7a, and 8a, a repeated measures ANOVA for one between-subjects factor (goal-norm condition) and one within-subjects factor (trial) was used to contrast the control group with the groups that encountered high norms, difficult goals, or both.

For hypotheses 6b, 7b, and 8b, a one between-subjects factor ANOVA was performed for each of the four trials. Contrasts between the control and EL groups were computed for each trial. Tests were based on pooled variance estimates.

Performance

Hypothesis 6a. Contrary to expectations, the contrast of the control group (M = 1.26) against the DH, DL, and EH groups (M = 1.25) did not reveal a significant performance difference, F(1, 95) = .04, ns. There was no contrast x trial interaction, F(3, 285) = .23, ns.

Hypothesis 6b. Control group performance means were expected to exceed EL means in Trials 3 and 4, but not in the earlier trials. Table 7 displays the results of four one-way contrasts (for Trials 1 through 4) involving the control and EL groups. Each contrast isolates performance in a specific trial. Differences were insignificant in all four trials.
Table 7
Performance Contrasts

<table>
<thead>
<tr>
<th>Group</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Means</td>
<td>1.10</td>
<td>1.24</td>
<td>1.32</td>
<td>1.39</td>
</tr>
<tr>
<td>EL Means</td>
<td>1.03</td>
<td>1.13</td>
<td>1.21</td>
<td>1.26</td>
</tr>
<tr>
<td>df</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>S.E.</td>
<td>.05</td>
<td>.06</td>
<td>.06</td>
<td>.08</td>
</tr>
<tr>
<td>T</td>
<td>-1.46</td>
<td>-1.84</td>
<td>-1.70</td>
<td>-1.62</td>
</tr>
<tr>
<td>T Sig.</td>
<td>.15</td>
<td>.07</td>
<td>.09</td>
<td>.11</td>
</tr>
</tbody>
</table>

Note: Higher values indicate greater performance relative to baseline performance. EL = Easy goal-low norm group.
Effort

Hypothesis 7a. Contrary to the hypothesis, the control group reported essentially the same effort level ($M = 4.1$) as the DH, DL, and EH groups ($M = 3.9$). This difference was not significant, $F(1, 95) = 1.51$, ns. In addition, there was no contrast x trial interaction, $F(3, 285) = .38$, ns.

Hypothesis 7b. Control group means for self-reported effort were expected to exceed EL means in Trials 3 and 4, but not in the earlier trials. Table 8 displays the results of four one-way contrasts between the control and EL groups, with effort as the dependent variable. Differences were insignificant in all four trials.

Hypothesis 8a. As anticipated, the DH, DL, and EH groups set higher personal goals ($M = 88.02$) than the control group ($M = 82.93$), but the difference was not significant, $F(1, 95) = 1.42$. Although not predicted, a contrast x trial interaction was observed, $F(3, 285) = 12.28$, $p < .001$. Specifically, DH, DL, and EH subjects chose higher personal goals in Trial 1 ($M = 80.7$) than control subjects ($M = 62.0$), but the effect was not present in any of the subsequent trials (see Table 4).

Hypothesis 8b. Personal goal means for the control group were expected to exceed EL means in Trials 3 and 4, but not in the earlier trials. Table 9 displays the results of four one-way contrasts between the control and EL groups, with personal goal as the dependent variable. Differences were insignificant in all four trials.
Table 8
Self-reported Effort Contrasts

<table>
<thead>
<tr>
<th>Group</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Means</td>
<td>5.60</td>
<td>5.65</td>
<td>5.90</td>
<td>6.15</td>
</tr>
<tr>
<td>EL Means</td>
<td>5.30</td>
<td>5.55</td>
<td>5.80</td>
<td>5.70</td>
</tr>
<tr>
<td>df</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>S.E.</td>
<td>.30</td>
<td>.30</td>
<td>.29</td>
<td>.31</td>
</tr>
<tr>
<td>T</td>
<td>-.99</td>
<td>-.33</td>
<td>-.34</td>
<td>-1.44</td>
</tr>
<tr>
<td>T Sig.</td>
<td>.33</td>
<td>.74</td>
<td>.73</td>
<td>.16</td>
</tr>
</tbody>
</table>

Note: Higher values indicate greater effort. EL = Easy goal-low norm group.
Table 9  
**Personal Goal Contrasts**

<table>
<thead>
<tr>
<th>Group</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Means</td>
<td>62.00</td>
<td>83.35</td>
<td>91.40</td>
<td>94.95</td>
</tr>
<tr>
<td>EL Means</td>
<td>70.30</td>
<td>80.10</td>
<td>86.10</td>
<td>90.40</td>
</tr>
<tr>
<td>df</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>S.E.</td>
<td>6.74</td>
<td>5.51</td>
<td>5.66</td>
<td>5.69</td>
</tr>
<tr>
<td>T</td>
<td>-1.23</td>
<td>.59</td>
<td>.94</td>
<td>.80</td>
</tr>
<tr>
<td>T Sig.</td>
<td>.22</td>
<td>.56</td>
<td>.35</td>
<td>.43</td>
</tr>
</tbody>
</table>

Note: Higher values indicate higher personal goals. EL = Easy goal-low norm group.
Hypotheses 9 through 12: Correlations

Table 10 displays Pearson correlation coefficients for the relationships among the cognitive mediating variables and task performance. A correlation matrix for each trial is displayed.

Hypothesis 9. As predicted, the correlation coefficient for effort and task performance was positive in all four trials. However, the relationship was significant only in Trial 4 (see Table 10). As discussed previously (see Hypothesis 1 results), there were strong effects of practice on performance and effort, which may have influenced the magnitudes and signs of the correlation coefficients.

Hypothesis 10. Contrary to the hypothesis, the correlation coefficients for personal goal and task performance were not significant in any of the four trials (see Table 10). Again, the strong practice effect may have played a role.

Hypothesis 11. As anticipated, the relationship between performance expectancy, which is a measure of self-efficacy, and personal goal was positive in each of the four trials (see Table 10). All four correlation coefficients were significant at the .01 level. Individuals who believe they are capable of high performance levels tend to choose more difficult personal goals than individuals with low performance expectancies.

Hypothesis 12. The relationship between performance valence and personal goal was negative in all four trials, as hypothesized. As shown in Table 10, all correlation coefficients were significant at the .01 level.
Table 10

Interrelations among the Cognitive Mediating Variables and Performance at each Trial

<table>
<thead>
<tr>
<th>Trial 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance</td>
<td>-.22</td>
<td>.20</td>
<td>.14</td>
<td>-.15</td>
</tr>
<tr>
<td>2. Personal Goal</td>
<td>—</td>
<td>-.07</td>
<td>-.60**</td>
<td>.55**</td>
</tr>
<tr>
<td>3. Effort</td>
<td>—</td>
<td>.11</td>
<td>—</td>
<td>-.11</td>
</tr>
<tr>
<td>4. Valence</td>
<td>—</td>
<td>—</td>
<td>-.58**</td>
<td>—</td>
</tr>
<tr>
<td>5. Expectancy</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial 2</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance</td>
<td>-.18</td>
<td>.19</td>
<td>.16</td>
<td>-.06</td>
</tr>
<tr>
<td>2. Personal Goal</td>
<td>—</td>
<td>.16</td>
<td>-.70**</td>
<td>.49**</td>
</tr>
<tr>
<td>3. Effort</td>
<td>—</td>
<td>-.09</td>
<td>.13</td>
<td>—</td>
</tr>
<tr>
<td>4. Valence</td>
<td>—</td>
<td>—</td>
<td>-.37**</td>
<td>—</td>
</tr>
<tr>
<td>5. Expectancy</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial 3</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance</td>
<td>-.10</td>
<td>.21</td>
<td>.18</td>
<td>-.12</td>
</tr>
<tr>
<td>2. Personal Goal</td>
<td>—</td>
<td>.16</td>
<td>-.67**</td>
<td>.43**</td>
</tr>
<tr>
<td>3. Effort</td>
<td>—</td>
<td>-.19</td>
<td>.25**</td>
<td>—</td>
</tr>
<tr>
<td>4. Valence</td>
<td>—</td>
<td>—</td>
<td>-.37**</td>
<td>—</td>
</tr>
<tr>
<td>5. Expectancy</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial 4</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance</td>
<td>-.01</td>
<td>.23*</td>
<td>.13</td>
<td>-.07</td>
</tr>
<tr>
<td>2. Personal Goal</td>
<td>—</td>
<td>.19</td>
<td>-.69**</td>
<td>.38**</td>
</tr>
<tr>
<td>3. Effort</td>
<td>—</td>
<td>-.15</td>
<td>.18</td>
<td>—</td>
</tr>
<tr>
<td>4. Valence</td>
<td>—</td>
<td>—</td>
<td>-.28*</td>
<td>—</td>
</tr>
<tr>
<td>5. Expectancy</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* p < .05  ** p < .01
Chapter 7

Discussion

A key premise of this study is that difficult assigned goals enhance performance only if they are adopted as personal goals. A second premise is that the process of choosing a personal goal is influenced by task experience and by social cues, such as assigned goals and performance norms. An experiment which includes task experience as a within-subjects variable, and which measures several dependent variables at different stages of experience, was conducted.

Experience played a major role but not in ways that were anticipated. Experience was expected to moderate the relationships of goals and norms with all dependent variables, but most of the hypothesized interactions were not observed. Instead, experience directly influenced performance and all antecedent variables. As subjects gained experience, their performance expectancies increased, their anticipated satisfaction with various performance levels (performance valences) declined, they set higher personal goals, exerted greater effort, and improved their performance.

These findings suggest that the term "practice effect" may be inappropriate. In the context of the present experiment, a more accurate label may be "experience effect," or more precisely, "past performance effect." An individual's previous performance level is a salient cue; a large body of research has shown that personal goals are a function of past performance (e.g., Campion & Lord, 1982; Cummings, Schwab, & Rosen, 1971; Feather, 1968; Lewin et al., 1944; Lopes, 1976).

Performance

Assigned goals did not exert a main effect on performance. Given the robust nature of the goal effect in over two decades of research, this finding is unusual.
possible explanation is the strong experience effect that was observed: In all treatment conditions, performance increased steadily across trials (see Table 2 and Figure 4).

**Effort**

Like performance, effort was not influenced by goals or norms, and there were no interactions with experience (see Table 3). And as with performance, there was a strong unanticipated effect of experience, with effort increasing in later trials. Perhaps subjects worked harder in later trials because they were trying to surpass their previous performance levels. It is interesting that subjects intensified their effort in later trials. It would be logical to expect effort to decrease as individuals gain skill and task familiarity.

**Personal Goals**

Consistent with the past performance notion, experience unexpectedly influenced personal goals, which increased as subjects gained experience. Contrary to hypotheses, there were no goal or norm effects, but personal goals (unlike performance and effort) were influenced by a goal difficulty x experience interaction. As shown in Figure 6, the goal effect appeared strongest in the first trial when subjects had little experience (as hypothesized). Perhaps as individuals gain experience, they begin to overlook assigned goals, and set personal goals based on their own past performance. As Rakestraw and Weiss (1981) suggest, new employees "turn to the social environment for guidance" but social cues become less influential as "uncertainty is reduced through personal task experience." However, the nature of the social cue may be an important factor: While a goal x experience interaction on personal goals emerged (as expected), a norm x experience interaction did not.
Performance Expectancy

The expectancy and valence findings further support the past performance interpretation of the results. Contrary to hypotheses, there were no goal or norm effects on performance expectancy, and there were no experience interactions (see Table 5). There was, however, an unexpected experience effect, with expectancies increasing in later trials.

The strong experience effect on expectancies is intriguing. As shown in Figure 7, performance expectancies increased as subjects gained experience. This trend, while not hypothesized, is consistent with previous research (Bandura, 1977; Bandura, Adams, & Beyer, 1977). Performance expectancy is a measure of self-efficacy, which increases over time as individuals acquire skills. Through experience, workers acquire up-to-date information about the performance levels they are capable of and about the amount of effort required to reach these levels. Further, skill increases with experience, so that goals previously viewed as difficult are eventually regarded as easy. As a result, performance expectancies increase.

The changes in expectancies and personal goals for control subjects between Trials 1 and 2 are particularly striking. Control subjects reported substantially lower expectancies than experimental subjects in Trial 1 (see Table 5 and Figure 7), and chose substantially lower personal goals (see Table 4 and Figure 6), but these differences were not observed in any of the subsequent trials. In Trial 1, control subjects had no information with which to form expectancies or set personal goals but in Trials 2 through 4, they had one cue: Their own past performance.
Performance Valence

Contrary to hypotheses, there was no goal or norm effect on performance valence, nor was there a norm x experience interaction. Experience did, however, interact with goal difficulty: As hypothesized, difficult assigned goals were associated with lower valences, but only in early trials. As subjects gained experience, the effect weakened.

Like performance expectancies (and all other dependent variables), performance valence was directly influenced by experience. And as would be expected, valences moved in the opposite direction of the other variables. Performance expectancies, personal goals, effort, and performance all increased with experience while performance valences declined. That is, with increasing experience, subjects expressed less satisfaction with various possible performance levels. This negative relationship of performance valence with experience makes sense intuitively but should be explored further. Few (if any) studies have investigated this phenomenon.

Cognitive Mediation Model

The overall pattern of findings fails to support the cognitive mediation model (see Figure 1, p. 16). As discussed previously, multivariate analyses of variance indicated that there were no goal effects on any of the five dependent variables. In addition, none of the five expected norm effects emerged, and only two of five goal difficulty x experience interactions emerged: Difficult goals led to higher personal goals and lower valences, relative to easy goals, when subjects had little experience. There was no support for any of the five norm x experience interaction hypotheses.

While there were no goal or norm effects on performance or on any of the hypothesized antecedents of performance, experience influenced all dependent
variables: Personal goals, effort, and performance expectancy all increased with experience, while valences declined. As discussed previously, these finding suggest that the strong experience effect on performance may not be a practice effect, but rather a "past performance" effect in which subjects attempted to surpass their previous performance levels while ignoring goal difficulty and normative cues.

The trial-to-trial reliability coefficients displayed in Table 1 suggest stability in the measures of all dependent variables. These data strengthen any conclusions based on the correlational findings. Consistent with the cognitive mediation model, the correlational data indicate that personal goals were positively associated with expectancies and negatively associated with valences (see Table 10). Regardless of experience level (i.e., in each of the four trials) these correlations are in the hypothesized directions and are significant at the .01 level. However, personal goals and performance are uncorrelated at all experience levels, a finding which contradicts the model. The path from personal goal to performance, with or without effort as an intermediate variable, is a key element of the model. Without this path, there is no mechanism by which expectancies and valences may influence performance.

The observation that performance expectancy increased with experience is consistent with previous research (see Earley & Lituchy, 1990). Also consistent with previous research (Klein, 1991; Meyer & Gellatly, 1988), the relationship of performance valence with performance expectancy was negative in each of the four trials (see Table 10). This negative correlation, while not hypothesized, makes sense from a theoretical standpoint and affords some degree of construct validity.
Multiple Comparisons

The multiple comparison results are mixed in terms of their support for the "past performance" notion and the cognitive mediation model. Hypothesis 6a contrasted Control Group performance with the performance of the Difficult Goal-High Norm (DH), Difficult Goal-Low Norm (DL), and Easy Goal-High Norm (EH) groups; the Easy Goal-Low Norm (EL) group was omitted. Hypotheses 7a and 8a were similar, but examined effort and personal goals, respectively.

Relative to the control group, the experimental groups were expected to set higher personal goals, exert greater effort, and achieve superior performance. While none of the three contrasts were significant, an unexpected interaction with experience emerged: Subjects in the experimental groups set higher personal goals than control subjects in Trial 1, but the difference disappeared in Trial 2 and did not resurface. This pattern of findings suggests that for subjects with little experience, those exposed to social cues consistent with reasonable performance goals will set higher personal goals than subjects who have no basis for choosing their goals. However, the difference disappears rapidly and is not reflected in effort or performance.

Hypothesis 6b involved a series of four contrasts, one for each trial, between Control Group and EL Group performance. The purpose of this contrast was to explore differences between individuals who have encountered no social cues (the control group) with individuals who have encountered a combination of "negative" cues but no "positive" cues (the EL group). Hypotheses 7b and 8b were similar but involved effort and personal goals, respectively.

Regardless of experience level, none of the three contrasts were significant. In all trials, EL subjects' personal goals were essentially the same as control subjects'
personal goals. In addition, there were no between-group differences in effort or performance in any trial. The implication is that an environment containing multiple "negative" social cues will not suppress motivation at any experience level, even if there is a complete lack of offsetting "positive" cues.

However, all interpretations of the results are speculative. A primary concern is that there is much room for improved external validity. The most fundamental obstacle to external validity is the laboratory itself. As Tubbs (1986) points out in a meta-analysis of goal setting research, researchers investigating goal setting should invent more realistic situations for their subjects. For example, White, Mitchell, and Bell (1977) "hired" subjects in an "actual" work setting.

An additional barrier to external validity is the self-report method of measuring personal goals, effort, and expectancy-valence attitudes. In real work contexts, these cognitions may never exist on a verbal level. A further complication is the manipulation of performance norms; post-experimental interviews revealed skepticism that the normative data were genuine.

The goal manipulation is suspect as well, since the absence of a goal effect on performance contradicts a robust finding in the goal setting literature. It is possible that difficult goals were not set at a sufficiently high level, but this fails to explain the absence of a performance-personal goal relationship. Insufficient variability in the performance measure would explain the absence of a goal effect, but this apparently is not the case. The histograms and standard deviations displayed in Figures 2 and 3 suggest that the failure to find a goal effect is not due to restriction of range.

It is conceivable that individual differences suppressed the effects of goal difficulty and normative information. For example, there is evidence that personal
factors such as need for achievement and locus of control influence goal commitment directly and through interactions with situational variables (Hollenbeck, Williams, & Klein, 1989). Future studies in which subjects provide self-reported expectancy theory measures could easily include questions designed to measure personal factors.

With regard to the strong effect of experience on all dependent variables, it may be that subjects were trying to surpass the performance levels they had attained in previous trials. An alternative to this past performance argument is that subjects mastered the task in early trials and began choosing higher personal goals as a strategy for relieving boredom. Mossholder (1980) demonstrated that high personal goals can foster interest in intrinsically boring tasks; to attain an extremely difficult goal, one must focus all of one's attention on the task at hand. The task becomes more interesting, perhaps by virtue of strategy development, or perhaps through intense effort exertion: Difficult goals may make a task more engaging by heightening physiological arousal.

In addition, a practice effect cannot be ruled out. Steps were taken to prevent a practice effect: There were few trials (4) and trials were of short duration (five minutes each), but perhaps further steps should be taken, such as reducing the amount of baseline experience or the length of experimental trials.

Alternative explanations notwithstanding, the notion that subjects set personal goals based on their own past performance remains tenable. The data suggest that as subjects gained experience, they believed they would perform at higher levels (performance expectancy increased). At the same time, various possible performance outcomes became increasingly dissatisfactory (performance valence declined). In addition, as subjects gained experience, they began to adopt more ambitious goals and
to boost their effort levels. However, the past performance notion must be considered speculative, at best. Along with alternative explanations, it should be noted that the argument is a conjectural one; no experience effects were hypothesized.

In summary, over two decades of goal setting research have led to the almost universal conclusion that difficult assigned goals enhance performance, provided the goals are specific and reasonable, and adequate feedback is available. More recent research has focused on the antecedents of goal acceptance and commitment, but few studies have addressed the role of experience, which may attenuate the goal setting effect.

There are two patterns of findings from the present study which, taken together, provide a suggestion for future research: The strong relationships among suspected antecedents of goal commitment, such as expectancies, valences, and personal goals, along with the unexpected trial effect on each of these variables, should be explored. Future studies should investigate the cognitive mediation model in conjunction with task experience, while addressing the limitations of the present study.
References


Appendix A
IDENTIFICATION #: 

Have you ever held a job that required a high level of manual dexterity?  

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PRE-QUESTIONS: PERIOD 1 The first work period will be initiated after you answer the 7 questions which follow. Please read the instructions carefully.

1. Do you feel the task would be an effective way to improve manual dexterity?  

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<th>Yes</th>
<th>Not Sure</th>
<th>No</th>
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2. How many cards do you think most people can sort in five minutes?  

3. Several performance levels are listed below. For each level, assign a number between 0 and 100 to show how likely it is that you will perform at that level. For example, if you write "0" after a given performance interval, then you feel that there is no chance that the number of cards you sort will fall in that range. If you write "100", then you are positive that the number of cards you sort will fall in that range. Remember, you should write a number between 0 and 100 for each performance level, starting with Box A and ending with Box H.

How likely is it that you will sort:

<table>
<thead>
<tr>
<th>A. 30-39 cards</th>
<th>E. 70-79 cards</th>
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<th>B. 40-49 cards</th>
<th>F. 80-89 cards</th>
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<th>C. 50-59 cards</th>
<th>G. 90-99 cards</th>
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<th>D. 60-69 cards</th>
<th>H. 100-109 cards</th>
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4. How important to you is reaching the goal assigned by the experimenter? (If no goal was assigned, skip this question).

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<th>IMPORTANCE</th>
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<td>NOT IMPORTANT AT ALL</td>
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</table>
5. Personal Goal: How many cards are you going to try to sort in this work period?

6. Satisfaction: Using the 5 point scale displayed below, indicate how satisfied you would be if your performance fell in each of the categories listed. You should place a number between 1 and 5 in each box, starting with Box A and proceeding to Box H.

"If I performed at this level, I would be: "

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<th>2</th>
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<tr>
<td>VERY DISSATISFIED</td>
<td>SOMewhat DISSATISFIED</td>
<td>NEITHER SATISFIED NOR DISSATISFIED</td>
<td>SOMewhat SATISFIED</td>
<td>VERY SATISFIED</td>
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</tbody>
</table>

A. 30-39 cards 
B. 40-49 cards 
C. 50-59 cards 
D. 60-69 cards 
E. 70-79 cards 
F. 80-89 cards 
G. 90-99 cards 
H. 100-109 cards

7. Compared to the practice trials, how much effort do you intend to exert in the upcoming work period? Use the following scale and write the number which best describes your answer in the box:

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<th>4</th>
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<tbody>
<tr>
<td>MUCH LESS EFFORT</td>
<td>SOMewhat LESS EFFORT</td>
<td>ABOUT THE SAME LEVEL OF EFFORT</td>
<td>SOMewhat MORE EFFORT</td>
<td>MUCH MORE EFFORT</td>
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</table>

STOP. Please put your pencil down and wait for further instructions.

POST-QUESTIONS (Period 1)

1. Under Item Number 5 in the first set of questions, you indicated that you intended to sort a certain number of cards.

   Did this goal change at any point during the work period?

   Yes  No
1. If you answered “yes”, please indicate how many times you revised your goal: [ ]

2. Regardless of your answer, what goal were you working toward when the period ended? [ ]

2. How important was it for you to reach this goal? Using the scale below, indicate your answer by writing the appropriate number in the box:

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<th>IMPORTANCE</th>
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<td>7</td>
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</table>

1. NOT IMPORTANT
2. LOW IMPORTANT
3. SOMEWHAT IMPORTANT
4. MODERATELY IMPORTANT
5. SOMEWHAT IMPORTANT
6. HIGH IMPORTANT
7. EXTREMELY IMPORTANT

3. Using the scale below, complete the following statement by writing the appropriate number in the box:

“In trying to reach my personal goal during the last work period, I exerted”:

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<th>EFFORT</th>
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<tbody>
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</table>

1. NO EFFORT
2. VERY LITTLE EFFORT
3. LITTLE EFFORT
4. MODERATE EFFORT
5. MUCH EFFORT
6. VERY LITTLE EFFORT
7. ALL EFFORT

ANSWER THE PRE-QUESTIONS FOR PERIOD 2.

PRE-QUESTIONS: PERIOD 2 The 7 questions which follow apply to the second work period. Please read the instructions carefully.

1. Do you feel the task would be an effective way to improve manual dexterity?

   Yes [ ]
   Not Sure [ ]
   No [ ]

2. How many cards do you think most people can sort in five minutes? [ ]
3. Several performance levels are listed below. For each level, assign a number between 0 and 100 to show how likely it is that you will perform at that level. For example, if you write "0" after a given performance interval, then you feel that there is no chance that the number of cards you sort will fall in that range. If you write "100", then you are positive that the number of cards you sort will fall in that range. Remember, you should write a number between 0 and 100 for each performance level, starting with Box A and proceeding to Box H.

How likely is it that you will sort:

A. 30-39 cards
B. 40-49 cards
C. 50-59 cards
D. 60-69 cards
E. 70-79 cards
F. 80-89 cards
G. 90-99 cards
H. 100-109 cards

4. How important to you is reaching the goal assigned by the experimenter? (If no goal was assigned, skip this question).

IMPORTANCE

1 2 3 4 5 6 7

NOT IMPORTANT LOW MODERATELY IMPORTANT HIGH EXTREMELY IMPORTANT

5. Personal Goal: How many cards are you going to try to sort in the upcoming work period?

6. Satisfaction: Using the 5 point scale displayed below, indicate how satisfied you would be if your performance fell in each of the categories listed. You should place a number between 1 and 5 in each box, starting with Box A and proceeding to Box H.

"If I performed at this level, I would be:"

A. 30-39 cards
B. 40-49 cards
C. 50-59 cards
D. 60-69 cards
E. 70-79 cards
F. 80-89 cards
G. 90-99 cards
H. 100-109 cards
7. Compared to the work period you just completed, how much effort do you intend to exert in the next period? Use the following scale and write the number which best describes your answer in the box:

- 1: Much less effort
- 2: Somewhat less effort
- 3: About the same level of effort
- 4: Somewhat more effort
- 5: Much more effort

STOP. Please put your pencil down and wait for further instructions.

POST-QUESTIONS (Period 2)

1. Under Item Number 5 in the previous set of questions, you indicated that you intended to sort a certain number of cards.

Did this goal change at any point during the work period?

- Yes
- No

If you answered "yes", please indicate how many times you revised your goal: __

Regardless of your answer, what goal were you working toward when the period ended? __

2. How important was it for you to reach this goal? Using the scale below, indicate your answer by writing the appropriate number in the box:

- 1: Not important at all
- 2: Low importance
- 3: Somewhat low importance
- 4: Moderately low importance
- 5: Somewhat high importance
- 6: High importance
- 7: Extremely high importance

___
3. Using the scale below, complete the following statement by writing the appropriate number in the box:

"In trying to reach my personal goal during the last work period, I exerted":

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<tr>
<td>NO</td>
<td>VERY LITTLE</td>
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<td>MODERATE</td>
<td>MUCH</td>
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Answer:

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**PRE-QUESTIONS: PERIOD 3**

The 7 questions which follow apply to the third work period. Please read the instructions carefully.

1. Do you feel the task would be an effective way to improve manual dexterity?

   Yes
   Not Sure
   No

2. How many cards do you think most people can sort in five minutes?

   Answer:

3. Several performance levels are listed below. For each level, assign a number between 0 and 100 to show how likely it is that you will perform at that level. For example, if you write "0" after a given performance interval, then you feel that there is no chance that the number of cards you sort will fall in that range. If you write "100", then you are positive that the number of cards you sort will fall in that range. Remember, you should write a number between 0 and 100 for each performance level, starting with Box A and proceeding to Box H.

   How likely is it that you will sort:

   A. 30-39 cards
   B. 40-49 cards
   C. 50-59 cards
   D. 60-69 cards
   E. 70-79 cards
   F. 80-89 cards
   G. 90-99 cards
   H. 100-109 cards
4. How important to you is reaching the goal assigned by the experimenter? (If no goal was assigned, skip this question).

**IMPORTANCE**

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5. Personal Goal: How many cards are you going to try to sort in the upcoming work period?

6. Satisfaction: Using the 5 point scale displayed below, indicate how satisfied you would be if your performance fell in each of the categories listed. You should place a number between 1 and 5 in each box, starting with Box A and proceeding to Box H.

"If I performed at this level, I would be:"

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<tr>
<td>VERY DISSATISFIED</td>
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<td>NEITHER SATISFIED NOR DISSATISFIED</td>
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<td>SOMEWHAT SATISFIED</td>
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A. 30-39 cards
B. 40-49 cards
C. 50-59 cards
D. 60-69 cards
E. 70-79 cards
F. 80-89 cards
G. 90-99 cards
H. 100-109 cards

7. Compared to the work period you just completed, how much effort do you intend to exert in the next period? Use the following scale and write the number which best describes your answer in the box:

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<td>MUCH LESS EFFORT</td>
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<td>LESS EFFORT</td>
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<td>ABOUT THE SAME LEVEL</td>
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<td>MORE EFFORT</td>
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<tr>
<td>MUCH MORE EFFORT</td>
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STOP. Please put your pencil down and wait for further instructions.
POST-QUESTIONS (Period 3)

1. Under Item Number 5 in the previous set of questions, you indicated that you intended to sort a certain number of cards.

Did this goal change at any point during the work period?

Yes  No

If you answered "yes", please indicate how many times you revised your goal:

Regardless of your answer, what goal were you working toward when the period ended?

2. How important was it for you to reach this goal? Using the scale below, indicate your answer by writing the appropriate number in the box:

IMPORTANCE

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<td>7</td>
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</tr>
<tr>
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<td>SOMewhat</td>
<td>Moderately</td>
<td>SOMEwhat</td>
<td>HIGH</td>
<td>EXTREMELY IMPORTANT</td>
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<tr>
<td>AT ALL</td>
<td>LOW</td>
<td>IMPORTANT</td>
<td>HIGH</td>
<td>IMPORTANT</td>
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</table>

3. Using the scale below, complete the following statement by writing the appropriate number in the box:

"In trying to reach my personal goal during the last work period, I exerted":

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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>NO EFFORT</td>
<td>VERY LITTLE EFFORT</td>
<td>LITTLE EFFORT</td>
<td>MODERATE EFFORT</td>
<td>MUCH EFFORT</td>
<td>VERY EFFORT</td>
<td>ALL EFFORT</td>
<td></td>
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STOP. Turn the page and answer the pre-questions for Period 4.
PRE-QUESTIONS: PERIOD 4  The 7 questions which follow apply to the fourth work period. Please read the instructions carefully.

1. Do you feel the task would be an effective way to improve manual dexterity?

   Yes   No
   ___   ___   ___

   Yes   Sure   No
   ___   ___   ___

2. How many cards do you think most people can sort in five minutes?

   ___

3. Several performance levels are listed below. For each level, assign a number between 0 and 100 to show how likely it is that you will perform at that level. For example, if you write "0" after a given performance interval, then you feel that there is no chance that the number of cards you sort will fall in that range. If you write "100", then you are positive that the number of cards you sort will fall in that range. Remember, you should write a number between 0 and 100 for each performance level, starting with Box A and proceeding to Box H.

   How likely is it that you will sort:

   A. 30-39 cards
   B. 40-49 cards
   C. 50-59 cards
   D. 60-69 cards
   E. 70-79 cards
   F. 80-89 cards
   G. 90-99 cards
   H. 100-109 cards

   ___   ___   ___   ___   ___   ___

4. How important to you is reaching the goal assigned by the experimenter? (If no goal was assigned, skip this question).

   IMPORTANCE

   1  2  3  4  5  6  7
   1  2  3  4  5  6  7
   NOT IMPORTANT AT ALL LOW SOMEWHAT LOW IMPORTANT MODERATELY IMPORTANT SOMEWHAT IMPORTANT HIGH HIGH EXTEMELY IMPORTANT

   ___

5. Personal Goal: How many cards are you going to try to sort in the upcoming work period?

   ___
6. Satisfaction: Using the 5 point scale displayed below, indicate how satisfied you would be if your performance fell in each of the categories listed. You should place a number between 1 and 5 in each box, starting with Box A and proceeding to Box H.

"If I performed at this level, I would be:

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<th>5</th>
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</thead>
<tbody>
<tr>
<td>VERY DISSATISFIED</td>
<td>SOMEWHAT DISSATISFIED</td>
<td>NEITHER SATISFIED NOR DISSATISFIED</td>
<td>SOMEWHAT SATISFIED</td>
<td>VERY SATISFIED</td>
</tr>
</tbody>
</table>

A. 30-39 cards [ ] E. 70-79 cards [ ]
B. 40-49 cards [ ] F. 80-89 cards [ ]
C. 50-59 cards [ ] G. 90-99 cards [ ]
D. 60-69 cards [ ] H. 100-109 cards [ ]

7. Compared to the work period you just completed, how much effort do you intend to exert in the next period? Use the following scale and write the number which best describes your answer in the box:

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<th>5</th>
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<tr>
<td>MUCH LESS EFFORT</td>
<td>SOMEWHAT LESS EFFORT</td>
<td>ABOUT THE SAME LEVEL OF EFFORT</td>
<td>SOMEWHAT MORE EFFORT</td>
<td>MUCH MORE EFFORT</td>
</tr>
</tbody>
</table>

STOP. PLEASE PUT YOUR PENCIL DOWN AND WAIT FOR FURTHER INSTRUCTIONS.

POST-QUESTIONS (Period 4)

1. Under Item Number 5 in the previous set of questions, you indicated that you intended to sort a certain number of cards.

Did this goal change at any point during the work period?

Yes [ ] No [ ]

. If you answered "yes", please indicate how many times you revised your goal:

[ ]

. Regardless of your answer, what goal were you working toward when the period ended?

[ ]
2. How important was it for you to reach this goal? Using the scale below, indicate your answer by writing the appropriate number in the box:

IMPORTANCE

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<tr>
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<td>4</td>
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<tr>
<td>NOT</td>
<td>LOW</td>
<td>SOMewhat</td>
<td>MODERATELY</td>
<td>SOMEWHAT</td>
</tr>
<tr>
<td>IMPORTANT</td>
<td>LOW</td>
<td>IMPORTANT</td>
<td>HIGH</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>AT ALL</td>
<td>LOW</td>
<td>IMPORTANT</td>
<td>HIGH</td>
<td>EXTREMELY</td>
</tr>
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</table>


3. Using the scale below, complete the following statement by writing the appropriate number in the box:

"In trying to reach my personal goal during the last work period, I exerted":

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<td>LITTLE</td>
<td>MODERATE</td>
<td>MUCH</td>
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<tr>
<td>EFFORT</td>
<td>LITTLE</td>
<td>EFFORT</td>
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STOP. Please notify the experimenter that you have completed the questionnaire.
Appendix B
CONSENT FORM

Title of The Research Study

FACTORS INFLUENCING PERFORMANCE ON TASKS OF MANUAL DEXTERITY

Invitation to Participate

You are invited to participate in a study of manual dexterity.

Basis for Subject Selection

You were selected as a potential subject because you are an English-speaking adult.

Purpose of the Study

The purpose of this study is to examine performance on a particular task which requires manual dexterity.

Explanation of Procedures

This study requires about 50 minutes to complete. You will be asked to sort cards according to data printed on them, and you may be assigned a goal. You will complete six trials, all five minutes or less in length, with short breaks after each. You will be asked to answer a few questions in between trials. The investigator will explain the purpose of the study in detail after the last trial.

Potential Risks and Discomforts

Some participants may experience anxiety in trying to achieve goals.

Potential Benefits

The benefits of participating are the opportunity to learn about an area of current interest in psychology, and to learn something about how this type of research is conducted.

Alternatives to Participation

Your psychology or sociology course instructor has alternatives to research participation available to you as means of earning extra credit toward your course grade.

Compensation for Participation

Should you choose to participate in this study, you will receive 2 extra credits toward your course grade.
Assurance of Confidentiality

Your responses during the study are recorded by subject number rather than by name. Thus your identity will not be associated in any way with the information that you provide.

Withdrawal from the Study

Participation is voluntary. Regardless of whether you choose to participate, your relationship with the University of Nebraska will not be affected. You are free to withdraw from this study at any time.

Offer to Answer Questions

If you have any questions, you may ask them at this time or during the study. If you think of any questions in the future, please feel free to contact one of the investigators listed below.

If you have any questions concerning your rights as a research subject you may contact the University of Nebraska Institutional Review Board (IRB), telephone (402) 559-6463.

YOU ARE VOLUNTARILY MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE CERTIFIES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ AND UNDERSTOOD THE INFORMATION PRESENTED. YOUR SIGNATURE ALSO CERTIFIES THAT YOU HAVE HAD AN ADEQUATE OPPORTUNITY TO DISCUSS THIS STUDY WITH THE INVESTIGATOR AND THAT YOU HAVE HAD ALL YOUR QUESTIONS ANSWERED TO YOUR SATISFACTION. YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP.

__________________________  __________________________
SIGNATURE OF SUBJECT       DATE

IN MY JUDGMENT THE SUBJECT IS VOLUNTARILY AND KNOWINGLY GIVING INFORMED CONSENT.

__________________________  __________________________
SIGNATURE OF INVESTIGATOR    DATE

INVESTIGATORS

Jon Shanahan, B.A.
554-4812

Wayne Harrison, Ph.D.
554-2452