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THE IMPACT OF GOAL SETTING AND SELF MONITORING CONDITION ON THE ACCURACY OF SELF GENERATED KNOWLEDGE OF RESULTS AND THE LEVEL OF TASK PERFORMANCE

Ph.D. 1983

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THE IMPACT OF GOAL SETTING AND SELF MONITORING CONDITION 
ON THE ACCURACY OF SELF GENERATED KNOWLEDGE OF RESULTS AND 
THE LEVEL OF TASK PERFORMANCE 

DISSERTATION 

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

By 
J. Kevin Ford, B.S., M.A. 

* * * * * 

The Ohio State University 
1983 

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INTRODUCTION

In organizational settings, self knowledge gained from performing in a task situation can lead to improved performance effectiveness. For example, research evidence indicates that individuals value the self knowledge derived from task accomplishment and tend to rely on that knowledge to determine whether job requirements are being met (Greller & Herold, 1975). In addition, there is evidence that learners often provide their own feedback from self knowledge when external cues are not available (Goldstein, 1974). In these and other situations, self knowledge has been obtained through the close self monitoring of task relevant activities. While the concept of self monitoring has become established in social and clinical psychology, few efforts have been made to apply the principles of self monitoring to organizational settings. Instead, theorists and researchers have mainly restricted the scope of research to external influences on task behaviors and performance effectiveness. This research explores the psychological literature relevant to self monitoring and integrates it with the task achievement literature of organizational behavior. More specifically, it is argued that the principles of self monitoring provide a novel and parsimonious framework from which to improve our understanding of the processes underlying the goal setting phenomenon. To build this framework, the notion of self systems is described followed by a detailed examination of the self monitoring concept.
Self Systems

The concept of self systems has had a long, controversial but fruitful history in psychological thought (e.g., see Epstein, 1973). The traditional conceptualization of self systems has been in terms of the self concept and global self images (Bandura, 1976). Recently, interest in self systems has concentrated on understanding how self systems impact on or explain behavior. This new research tradition includes self perception theories (Bem, 1967, 1972; Heider, 1958), the theory of objective self awareness (Duvall & Wickland, 1972; Wickland, 1975) and the expanding literature on self regulatory processes (Bandura, 1977, 1978; Kanfer, 1971).

Self Perception Approaches

The major approaches to self perception in the social psychological literature include Bem's work (1967, 1972) on Self Perception Theory and the various hybrid attributional theories (e.g., see Harvey, Ickes, & Kidd, 1978). The common theme of self perception approaches is the examination of the self as an explainer of behavior. It is assumed that people actively seek to determine the why of events. Therefore, an important research question is to determine the sources and motive states that individual's use to ascribe their (or others) actions. Self perception approaches postulate that people are often active observers of their own behavior and that they use this awareness to arrive at a causal explanation of performance outcomes. Jones and Nisbett (1971), for example, have demonstrated a tendency for individuals to attribute the causes of their behavior to stimuli in the environment while attributing the behavior of others to stable dispositions. Some
researchers have contended that such results indicate a motivated self
serving bias is operating. Other researchers have suggested a more
cognitive explanation of the phenomenon. Different causal attributions
are seen as a result of the fact that different informational cues are
salient to the individual who self monitors than when the individual
observes others.

Self perception approaches are mainly interested in how information
is interpreted once it is observed and stored in memory. Objective
self awareness and self regulatory approaches to the self system empha­
size the self monitoring process more directly.

Objective Self Awareness

Objective Self Awareness Theory (Duvall & Wickland, 1972; Wickland,
1975) states that people often direct attention to themselves. This
state of self focused attention heightens awareness of our personal
standards and the extent to which present actions are discrepant from
those personal standards. The theory postulates that this discrepancy
between the ideal and actual self results in negative affect in propor­
tion to the size of that discrepancy.

To activate self awareness, the attention of the individual must
be focused inward. It is suggested that any stimuli (such as mirrors,
tape recordings of the persons voice) which reminds the individual of
his/her "object" status will increase self awareness. As people become
more self aware, i.e., conscious of themselves, they will increasingly
engage in self evaluation (Mabe & West, 1982). The negative affect
that derives from the uncovered discrepancies either motivates an indi­
vidual to reduce that discrepancy or results in the individual actively
avoiding the stimuli which is focusing attention to him/herself. This avoidance tendency will often cause the individual to search for new stimuli which draws attention outward or away from self focused attention (Wickland, 1975).

To apply the principles of objective self awareness to task activities, Wickland (1975) suggests that successful performance on a task depends on both motivation and attention to the task. Self awareness can enhance motivation by making discrepancies between performance and aspiration levels more salient. Performance on the task will then increase provided that self focused attention is refocused on the elements of the task to be accomplished. Wickland also hypothesizes that the more simple the task, the more the attention of the individual can be trained to the self before reaching a point where self focused attention comes to interfere with task performance. While these ideas have potentially important implications for organizational behavior, they have not been empirically tested.

**Self Regulation**

During the last decade, self regulatory and self monitoring processes have become important concepts in psychological thought (Mischel, Ebbesen & Zeiss, 1973). This viewpoint stresses that most behavior is maintained or altered in the absence of external feedback. Therefore, individuals must have a degree of control over their own behavior and are affected by self generated influences. Some theorists (e.g., Mischel, 1968) have even suggested that successful socialization and personality development requires the gradual substitution of a self monitoring reinforcement system for externally imposed sanctions and demands.
Bandura (1976, 1977, 1978) has provided the most comprehensive analysis for the guiding and directing of one's own behavior through self regulation. The self system is perceived as consisting of cognitive structures for the perception, evaluation and ultimately the regulation of behavior. The hypothesized components of self regulation include self awareness, self monitoring, self evaluation and self rewarding.

To begin the self regulatory process, an individual must be activated (by internal events or external factors) to attend to and begin to monitor self relevant information (Bandura, 1978). Self monitoring leads to self evaluation in which the individual compares monitored behavior or performance to some personal standard. These self generated evaluations serve as a basis for self rewarding or self criticism which can have strong reinforcing properties.

The self regulatory process described above augments performance through its motivational and informational functions. By making self rewards conditional on attaining certain levels of performance, the individual creates self inducements to persist in the efforts to match self prescribed standards (Bandura, 1976). Self regulatory processes also provide the information necessary for an individual to modify, maintain or abandon task inappropriate actions.

Application of self regulation. The self regulatory system has been most successfully applied to clinical therapy through a cognitive behavioral self control approach (e.g., see Watson & Tharp, 1977). With cognitive self control, the control of therapeutic action is transferred from the therapist to the client. The client formulates action plans, sets goals, self monitors actions, self evaluates the progress
made towards the established goal and self rewards goal accomplishment. If the goal is not accomplished, an individual may modify his/her action plans to better achieve the set goal. This application of self regulatory principles to clinical therapy has been quite successful in treating such diverse problems as speech stuttering, anxiety, obesity, smoking, alcoholism and nervous habits (e.g., Goldfried & Merbain, 1973).

Integration of self regulation and objective self awareness. An examination of Figures 1 and 2 underscores a similarity in the components of the objective self awareness and self regulatory models. The two perspectives did, however, arise from different theoretical orientations. Objective self awareness was derived from earlier notions of cognitive dissonance (Festinger, 1957) and balance or self consistency theories (Heider, 1958). These orientations hypothesize internal psychic agents and discrepancy based motivation. Self regulatory theory arose from a social learning and operant conditioning paradigm. This perspective emphasizes a cognitive, information processing approach to self regulation. Recently, Carver and Scheier (1982) have proposed a cybernetic model labeled control theory which integrates the self awareness and self regulatory perspectives. The integration is accomplished, in part, by retranslating objective self awareness principles into an information processing approach and by rejecting self reinforcement as a useful explanatory variable for self regulation to occur. Control theory holds much promise for directing research by the providing of a parsimonious theory of self regulation.

The Concept of Self Monitoring

According to self regulation approaches, two critical components are self monitoring and self evaluation. In regards to these components,
Figure 1. Model of the Objective Self Awareness Process

Figure 2. Model of Self Regulatory Process
Defining Self Monitoring

Self monitoring includes self observation which leads to a level of self knowledge and ultimately self evaluation. It is a highly complex process which consists, in part, of an information search process (Halisch & Heckhausen, 1977). The concept of self monitoring has best been described as the deliberate attending to one’s actions and their effects (Kanfer, 1971, 1974; Mahoney & Thoreson, 1974). One form of self monitoring is the close examination of private thoughts or public behavior through introspection. Another form of self monitoring is the actual recording of one’s own behavior (Jones, Nelson & Kazdin, 1977). Regardless of its operationalization, self monitoring implies that individuals are actively processing current information about the self and are using that information to self evaluate.

Outcomes of Self Monitoring

Self monitoring has been defined as deliberate attention to one’s own actions. One potential outcome of this attention is a short term change in behavior. According to McFall (1970), this reactivity effect will occur whenever an individual pays unusually close attention to one aspect of his/her behavior. In other words, the very process of self observation may affect the behavior being observed.

Self monitoring can have longer lasting effects through its energizing and directing functions. An individual monitoring his/her own
behavior receives knowledge of results which when compared to a standard can be highly motivating (e.g., see Bandura, 1976; Locke, Shaw, Saari, & Latham, 1981). By initiating self evaluation, self monitoring can also lead to consideration of the desirability of current performance levels. Based on the discrepancy between performance standards and performance level, the individual can plan to change the current course of actions to become more effective (Kanfer, 1971). Therefore, the process of self monitoring can not only motivate behavior but also provide information to correct action.

Research evidence suggests that self monitoring can significantly affect response rates for both correct and incorrect responses as well as rating of task motivation (Wade, 1974). In clinical settings, self monitoring of target behaviors has been used successfully either as part of a treatment package or alone (Mahoney & Thoreson, 1974). Research by Hunt (1982) demonstrates that cognitive monitoring activities is beneficial to learning acquisition. Finally, Halisch and Heckhausen (1977) have pointed out that information received during the completion of a task through self monitoring has different effects than information received after task completion. These results support Vroom's (1969) call for distinguishing between task feedback (information received by the individual while doing the task itself) and outcome feedback (information received on how successful performance has been once the task is completed).

Despite these research efforts, there is very little direct evidence about the type of information actually gained from monitoring task performance or its impact on motivation or performance improvements. More
research is needed which demonstrates the power of self monitoring and the conditions under which it is most effective. More research attention also needs to be focused on factors which potentially minimize the benefits of the self monitoring process. Researchers who have examined self monitoring outcomes have made the implicit assumption that individuals seek information from their environment and can (and will) use the information obtained to improve effectiveness. This assumption is questioned by the Objective Self Awareness Theory (Wickland, 1975). The theory posits that one possible outcome of self monitoring is the active avoidance of continued self focused attention when a discrepancy between the standard and current actions is uncovered. Empirical support for this avoidance reaction is provided by Brickman and Bulman (1977) and Sachs (1982). They found that individuals often avoid meaningful evaluations of their abilities in order to preserve prior conceptions of their level of ability and protect their self esteem. Additionally, research evidence on perceiving the causes of behavior indicates that an individual will feel little pressure to improve performance effectiveness if failure (or discrepancy) is attributed to external factors such as task difficulty or bad luck (Weiner, Freize, Kukla, Reed, Rest, & Rosenbaum, 1971). Obviously, there is a critical need for a better understanding of the process underlying the effectiveness or ineffectiveness of self monitoring.

The Process of Self Monitoring

Observing one's own behavior is a common event and the knowledge gained from self monitoring is seen as an important source of information for individuals (Greller, 1980). Nevertheless, little systematic research has been conducted on the monitoring process (Bandura, 1978).
Recently, researchers have begun to call for a greater emphasis towards understanding the basic mechanics in the processing of self relevant information. This section reviews information relevant to the following four questions concerning self monitoring:

1. to what extent do people self monitor their activities?
2. what factors affect whether people will self monitor?
3. to what extent can individuals monitor accurately?
4. what forms can self monitoring take?

The section concludes with the presentation of a model which delineates factors relevant to the self monitoring process.

**Extent of Self Monitoring**

It is obvious that individuals can receive considerable information about their actions or performance outcomes (Annet & Kay, 1955). Researchers have suggested, though, that most people do not typically observe their own behavior in an organized, systematic fashion (Thoreson & Mahoney, 1974). Two lines of research are relevant to this issue. First, some researchers claim that there are important individual differences in the extent to which individuals typically monitor their own activities (e.g., Synder, 1974). A second line of research has directly questioned how often people are actually mindful of self relevant information (e.g., Langer, 1978).

**Individual differences in self monitoring.** Research evidence suggests that an individual's desire to direct attention to self relevant activities is to some degree related to the individual's frame of reference (Ilgen, Fisher & Taylor, 1979). Relevant individual difference variables include locus of control, self esteem, self monitoring and self consciousness.
Baron and his associates have determined that individuals with an internal locus of control perform better than externals when task feedback is the only information available in the environment. Conversely, external locus of control individuals performed better when receiving feedback from external sources (Baron, Cowan & Ganz, 1974; Baron & Ganz, 1972). The results imply that individuals with internal locus of control are more willing to self monitor task activities than externals.

In research on self esteem, Weiss (1977) has reported that people with high self esteem tend to rely less on environmental cues and more on information generated through self focused attention to guide their task related behaviors. Presumably, high self esteem individuals are more confident of their own abilities and self perceptions. Therefore, these people have little need to explore the environment for cues on how to interpret or perform a given task. This interpretation is supported by a recent goal setting study (Yukl & Latham, 1978). They found that high self esteem subjects showed greater performance improvement than those of low self esteem when goal attainment was not linked to important extrinsic rewards. Through more active self monitoring, high self esteem subjects had a more realistic view of their own performance for self evaluation and self reward. This self regulatory cycle could have provided the information necessary to improve performance as well as increase task motivation.

Synder (1974) has presented impressive evidence that there are striking and important differences in the extent to which individuals can and do monitor their self presentation and expressive behaviors. High self monitors often use cues from others as a guide to what aspects
of their behavior should be closely monitored while low self monitors tend to focus attention inward.

Similarly, Fenigstein, Scheier and Buss (1975) have noted a consistent tendency of persons to direct attention inward towards thoughts, feelings and behaviors or outward towards the reaction of others to the self. This trait, labeled self consciousness, differs from self awareness or self attention which they see as a transient situational state. A scale constructed to measure self consciousness has been found to be quite useful in research on social behavior.

Mindlessness. The psychological literature is replete with theories which take for granted that people think (Langer, 1978). Similarly, a basic assumption of self monitoring is that people attend to their world and derive behavior and motivational approaches based on current incoming information. Langer and her associates present convincing arguments that much of our seemingly mindful behavior is rather automatic (Langer, 1978; Langer, Blank & Chanowitz, 1978). These researchers are not questioning whether people are capable of thoughtful action. Instead they question the extent to which people are typically mindful of self relevant variables.

According to this viewpoint, it is as important to take into account what people systematically ignore as to examine what is systematically processed (Langer et al., 1978). Instead of processing information, individuals may simply reenact prior scripts or habits. Thorngate (1976) argues that prior scripts are often used because thought is costly in terms of time and mental efforts. Since many situations are similar or redundant, an individual's habits serve an extremely important
(although often neglected in research) function. The implication of this research is that even with tasks that appear to be complex, only a minimal amount of information may be attended to or monitored by an individual at any time. Such results may explain why individuals rarely engage in spontaneous tests of the appropriateness of their performance strategies even when it is to their advantage to do so (Hackman & Morris, 1975).

When Will Individuals Self Monitor

The research on mindlessness strongly suggests that while individuals are capable they often do not monitor their own task relevant behaviors. Other research shows that people attend selectively to certain aspects of their behavior and ignore variations on non salient dimensions (Bandura, 1975). A key issue, then, is to determine what environmental or internal events activate an individual's self monitoring capacity.

In everyday life, there are a number of cues which can trigger the self monitoring process. For example, Kanfer (1970) state that self monitoring will go into effect when the normal chain of behaviors is not run off smoothly or when a highly trained response (i.e., script) is not available. Failure to attain anticipated consequences often lead to questions of why did I fail with subsequent greater attention to task activities (Mahoney & Thoreson, 1974). Other research indicates that an individual's value orientation affects self monitoring (Bandura, 1976). There is also considerable evidence that increases in general arousal levels through evaluation apprehension (Zajonc, 1965), the presence of self focusing stimuli like mirrors and television monitors (Wickland, 1975) or even physical activities (Wegner & Guiliano, 1980) can make the self perceptually salient to the individual. More generally,
any outside intervention which attempts to regulate an individual's behavior can cause pressures which induce self monitoring. Finally, social pressures can also structure an individual's attention processes (Salancik & Pfeffer, 1978). Group members, for example, can note certain aspects of the environment and cue an employee as to what is important to monitor in accomplishing a task. In addition, the social context can structure attentional processes through normative information about correct and incorrect behaviors. A classic example of this process is the case of the "rate buster" who produced above the group standard. The rate buster was forced by group pressures to closely monitor his performance level so that his/her output matched the preferred group standard (Roethlisberger & Dickson, 1939).

In short, any activity which increases the saliency of a certain behavior will direct attention and possibly initiate self monitoring.

The Accuracy of Self Monitoring

Accurate self monitoring would seem essential for self regulation to work effectively. With accurate self monitoring, the individual should be able to take corrective actions when task activities deviate from a set standard which should increase effort regulation. Nevertheless, studies have found that complete accuracy is not essential for behavior change through self monitoring. Instead, there is some unknown lower limit to accuracy below which self monitoring effects are attenuated (Mahoney & Thoreson, 1974). Generally, as the quality of self monitoring decreases, the more difficult it is for self regulatory processes to lead to positive outcomes. The research evidence relevant to the accuracy issue and reasons why self monitoring may not be an accurate reflection of reality are discussed below.
Research evidence. Much of the research which has directly addressed the accuracy of self monitored behavior has come from clinical applications. Results are conflicting. Simkins (1971), for example, found sizable discrepancies between subjects and independent observers on a frequency count of smiles. Similarly, other researchers have reported the difficulties subjects face when monitoring their own activities (e.g., see Mahoney & Thoreson, 1974). On the other hand, Kazdin (1974) has reviewed a number of studies in which high agreement rates were found. In one study, a 98% agreement rate was found between self recording of pills taken by patients and observational records of hospital personnel. In another study, a correlation of .94 was reported between self monitored estimates of smoking behavior and estimates made by friends. In these and other similar studies, techniques were developed to aid the self monitoring process. It appears that self monitoring can be quite accurate if the individual continually records hits or misses on a task (Goldberg, 1968). The following subsections discuss the accuracy issue in more detail.

Self attention biases. While individuals can attend to their own behaviors, the self observation process is characterized to some degree by attention biases. In regards to this bias, the judgmental literature indicates that individuals tend to overattend to correct predictions and underattend to prediction errors (Cooper, 1981). This finding implies that individuals look for confirming rather than both confirming and disconfirming incidents. Additional evidence suggests the tendency to code (for later recall) events so that recalled successes exceed true success rates (Hogarth, 1981). Even in those situations in which
the criterion for success is simple and clear, individuals may ignore
the rate of percentage of successes and attend only to the frequency
of performance successes (Estes, 1976). These results have important
implications for the monitoring of task behaviors. As one example,
and employee who perceives success rates which exceed "reality" may
not recognize the need for corrective actions to improve task perfor-
man ce.

Self serving biases. The attribution literature describes a bias
in the recall of self relevant activities called a self serving bias
(e.g., see Bradley, 1978). A self serving bias is a tendency to take
credit for successes while denying responsibility for failure. It func-
tions as a tool to enhance and protect an individual's self concept.
Due to this bias to fabricate and revise history (Greenwald, 1980),
individuals may have inflated views of their abilities. In work set-
tings, this propensity may result in self ratings of performance which
are higher than independent observers (e.g., see Klimoski & London,
1974). An implication of the self serving bias is that, like attention
biases, individuals may overestimate successes on a task.

Discussion of the accuracy issue. In the self monitoring studies
described above, subjects could direct full attention towards the tar-
geted behavior. In most cases, the behaviors to be monitored were simple,
the criterion of succes was clearcut and techniques were developed (e.g.,
golf counters) to aid the recording (monitoring) process. Despite these
seemingly favorable conditions, discrepant results were found. Since
the studies failed to examine factors that may be related to accuracy
(individual differences in self monitoring, attention biases, motivation
of the monitor) it is difficult to understand the discrepant results. Nevertheless, it is safe to state that most performance related activities are more complex than depicted by the above studies i.e., tasks are multifaceted, behaviors are episodic rather than continuous, the criterion of success if often fuzzy and ambiguous and techniques to aid self monitoring are not available or may not be easy to develop for use.

The complexity of behavior has important implications for self monitoring. As Bandura (1978) states, the more complex the activities to be self regulated, the more judgmental factors enter the self monitoring process and the more likely the process will depart from "preset mechanical sensors." Therefore, under complex conditions, individuals may have a difficult time monitoring behavior (Cooper, 1981). These ideas remain speculative as no research has been conducted. Regardless, the complexity of the situation would appear to place some boundary or constraint on the effectiveness of self monitoring.

**Form of Self Monitoring**

Self monitoring has been defined as the deliberate attending to one's actions and their effects which leads to a level of self knowledge. The manner in which an individual can acquire self knowledge, though, will vary depending upon the constraints of the situation and the efforts of the individual. One form of self monitoring labeled incidental monitoring is through the mental recording of one's actions and their effects. A second form of self monitoring, purposeful monitoring, is the self recording of behaviors or their effects as they are being exhibited.

Incidental monitoring can be divided into two components or types. In some situations, self feedback is readily available to the individual
from completing the task itself. In other words, the individual's actions leave a trace which can be easily monitored. For example, a poker player can self monitor the success of his/her betting strategy by visually inspecting the number and color of the betting chips collected. This evidence of progress which remains while work on the task continues is called physical tracing.¹ In other situations, the task is structured such that few, if any, traces or cues are visible to aid the individual in monitoring. Instead, to acquire self knowledge, the individual must mentally record and store information about his/her actions or effects. To return to the poker example, if chips were not used and only verbal bets taken, an individual would have to mentally record loses and winnings in order to assess progress (or lack thereof) in the game. This component of incidental monitoring is called cognitive tracing.

The name, incidental monitoring, suggests that an individual must actively seek information available in the situation to provide self feedback. Consequently, the amount of mental effort an individual is willing to expend will largely determine the frequency and specificity of self knowledge. With minimal effort, an individual will still have some vague notion of how well he/she is doing especially on well learned tasks. With more maximal effort, the information gained can be quite complete and accurate.

¹Webb, Campbell, Schwartz and Sechrest (1969) have coined the phrase physical trace measure to describe the information that survives from past behavior.
While incidental monitoring relies on the mental recording of information, the second form of self monitoring labeled purposeful monitoring is the actual recording of behaviors or their effects as they are being exhibited. This self recording provides a continual trace for individuals to monitor. Purposeful tracing is most useful when feedback is not inherent in the task situation, the complexity of the task limits the effectiveness of incidental monitoring or when the task to be performed is novel. With purposeful monitoring, a device is usually developed to aid the individual in the recording of appropriate actions. In the poker example, an individual could purposefully monitor wins and losses by recording this information on a pad of paper after each round. Self recording has frequently been used in clinical settings to reduce dysfunctional behaviors. As one example, individuals have successfully reduced cigarette smoking by setting specific hard goals and counting each time a cigarette is smoked throughout the day (Watson & Tharp, 1977). This self recording of behavior should not only have motivating potential but also provide a quite reliable and accurate measure of an individual's progress.

A Model of the Self Monitoring Process

Self monitoring based approaches such as Objective Self Awareness Theory, Self Regulation Approaches and Control Theory have specified that self focused attention results in monitoring which promotes a tendency to compare one's present behavior (outcomes) against a salient standard (e.g., see Scheier & Carver, in press). Less attention has been placed on specifying the antecedents and consequences of self monitoring. Figure 3 presents a model of the self monitoring process which
Antecedents
- Attention and Self-Serving Biases
- Prior Scripts, Habits
- Individual Differences in Ability to Monitor
- External Pressures
- Social Influences
- Task Experience
- Failure to Attain Intended Consequences
- Task Complexity
- Self Monitoring Form

Self Monitoring
- Extent of Self Monitoring
- Focus of Self Monitoring (Behavior, Outcomes)

Comparison Process
- Self Evaluation
- Interpretation of the Discrepancy

Change States
1. Effort level
2. Performance Strategy
3. Standard Set
4. Maintain Status Quo

Withdrawal from Situation
Avoidance of Self Monitoring

Figure 3. Model of the Self Monitoring Process
incorporates potential antecedents and consequences. The model is based on the preceding discussion of the process and outcomes of self monitoring. As depicted in the model, there are a number of factors that can impact on the extent of self monitoring and the focus of self monitoring (i.e., behaviors or outcomes). Internal factors include an individual's ability to monitor, the extent to which prior scripts can be enacted, the use of attention and self serving biases to protect self esteem and the failure of past actions to result in intended consequences. External sources affecting self monitoring includes various external pressures, social influences, task familiarity and task complexity. In addition, it is recognized that the form self monitoring takes can impact on the extent and focus of self monitoring. For example, purposeful monitoring should provide more self relevant information than incidental monitoring.

As specified in Figure 3, a major consequence of self monitoring is the comparison of one's present actions to a relevant standard. Discrepancies uncovered through this self evaluation process are then interpreted by the individual. Depending on the interpretation of the discrepancies, an individual may seek to avoid the negative implications of the discrepancy by withdrawing from the situation or by discontinuing self monitoring activities. An individual may also perceive that the discrepancy can be reduced by increasing effort levels, changing performance strategies or by changing the standard that is set (especially if the task is seen as too difficult). Additionally, the individual may decide to maintain the status quo for the present time until more information relevant to the discrepancy is available for interpretation.
The model is based on an integration of research in the area. The components are speculative and the hypothesized linkages have not been tested. Nevertheless, the model does highlight the complexity of the self monitoring process which has not been fully appreciated by previous researchers.

Self Monitoring and Organizational Approaches to Motivation

The integration of self monitoring principles with theories of organizational behavior has been quite limited. In examining the cognitive components of behavioral modification, Blood (1978) has developed a model of organizational control and performance which is based on self regulation or monitoring. The model specifies that individuals must first have an accurate perception of the behavioral goals of the job that leads to performance. Subsequently, one must accurately attend to or monitor how he/she has performed relative to the behavioral goal. Finally, some unspecified accuracy threshold of these two cognitive components is necessary in order for self evaluation and self rewarding to result in increased job performance. While Blood has suggested the potential power of self regulation in controlling performance, empirical support is lacking.

Although self monitoring has not been explicitly studied, a number of research areas have incorporated self monitoring principles in their research design. As discussed previously, social pressures from workgroup members have been found to structure an individual's attention processes through cuing appropriate behavior or by sending normative information about correct and incorrect behavior (Salancik & Pfeffer, 1978). The effects of behavioral modification have similarly been
attributed to an increase in the saliency of desired behaviors (Komaki, Note 1). Komaki, Barwick and Scott (1978), for example, found that the delineation of performance related behavior, the specification of desired standards of performance and the posting of results led to substantial improvements in safety behaviors. It is posited that the intervention resulted in an increase of self monitoring (and perhaps of others) of the desired safety behaviors which upon termination of the intervention was refocused on other important aspects of the work environment.

As a final example, a reexamination of the Hawthorne studies (Parsons, 1973) has indicated that productivity improvements are partially explained by the creation of self monitoring capabilities that were not previously available to the workers. In the relay assembly room, counters were installed for each machine which enabled each operator to determine as frequently as desired the output for the day (at half hour intervals). The counters were found to be especially useful for operators when output for a given period was exceptional or below par (Parsons, 1973). Consequently, each operator received frequent and systematic feedback by monitoring their performance.

These research examples coupled with the theoretical work of Blood highlight the importance of self monitoring to organizational behavior. This section integrates self monitoring concepts with the well researched areas of task design and goal setting. This integration provides a sound basis for a deeper understanding of the processes underlying these approaches to motivated behavior.

Task Design and Self Monitoring

Feedback can be defined as any information an individual receives concerning his/her activities or performance. Vroom (1969) has divided
the types of feedback available into outcome feedback and task feedback. With outcome feedback, individuals receive information about how successful their performance has been once a task is completed. Task feedback provides a cuing function whereby individuals receive information from the task itself while performing the task. Both types of feedback information can be self generated or supplied by outside sources such as supervisors. Research evidence, though, indicates that individuals value the self knowledge they derive from monitoring task accomplishment (Greller & Herold, 1975). The most detailed description of self generated feedback in organizational settings is provided by the job characteristics approach (Hackman & Oldham, 1976) to job design.

Task feedback has received considerable attention through its status as one of the five core dimensions in Hackman and Oldham's (1976) theory of job design. In their model, task feedback is defined as the degree to which carrying out a work activity results in the employee obtaining direct and clear information about the effectiveness of performance. Task feedback leads to a critical psychological state of knowledge of results. With knowledge of results (KR), the individual knows and understands, on a continuous basis, how effectively he/she is performing on the job. Individuals can then use the KR from task accomplishment to judge their level of competency. This sense of competency is a powerful self reward (Deci, 1972). In addition, feedback from the job can increase the employee's feeling of personal control over work activities.

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2 Ouchi (1975, 1977) has argued for a distinction between control based on the monitoring and evaluation of behaviors or outputs. While the distinction is an important one with implications for self monitoring, this study focuses on performance or outcomes rather than behavior.
These valued outcomes are seen as leading to a self perpetuating cycle of positive work motivation.

To help employees learn how well they are performing or to determine whether performance is improving or deteriorating, Hackman and Oldham (1980) suggest that feedback channels to the job be opened or developed. Umstot, Bell and Mitchell (1976) have demonstrated this technique of opening feedback channels within a laboratory setting. To enrich a clerical type job, feedback from the task was manipulated by having completed cards left in a file box in front of the subjects so that the quantity of production could be easily observable. In addition, the enriched group was given a map to mark off areas when coding had been completed to provide immediate and continuous feedback of progress. In the unenriched condition, the cards were collected regularly and there was no map to monitor progress. In organizational settings, Hackman and Oldham (1980) suggest that jobs can often be restructured to open feedback channels. For example, many individuals can be their own quality control thus providing a natural source of task feedback. In other settings, production records could be posted so that employees would be aware of past performances and future needs. Computers and other automated equipment demonstrate other ways to open feedback channels that were previously inaccessible. Consoles, for example, can provide clerical workers with immediate feedback on errors made or on progress made over a period of time. Even without consoles, workers can simply be given their own chart in order to monitor their performance over time (Hackman & Oldham, 1980).

The importance of self monitoring and self evaluation for the success of task redesign has been demonstrated by the above examples.
An assumption of the task design approach is that opening feedback channels will activate an individual's self monitoring system. The information from self monitoring allows the individual to determine if job requirements are being met (Greller, 1980). Self generated rewards can then be given when job requirements are met. In other words, the process underlying the success of changing task feedback properties closely parallels the principles of self regulation as discussed by Bandura (1976, 1978) i.e., self monitoring, self evaluation and self rewarding.

While the parallel can be drawn, the task feedback literature has focused on examining the effects of changing job characteristics on valued outcomes. The approach has ignored the process of self monitoring and its implications about people e.g., mindlessness, individual differences in self monitoring, and attention biases. The important lesson from the self monitoring literature is that opening feedback channels does not automatically translate into active self monitoring. Similarly, increasing the information available about task performance does not necessarily mean individuals will use that information to increase efforts or monitor progress on their tasks. As stated by Kazdin (1974), individuals are not naturally accurate observers and are not used to being systematic about observing their own actions. Consequently, some researchers (e.g., Bandura, 1978; Kanfer, 1974) have advocated that individuals need to learn to monitor self relevant behavior for the proper application of self regulation. Tasks need not only be redesigned but individuals need to be trained in self observation. In this way, the individual can more readily determine how well he/she meets or falls
short of desired performance standards as well as making the individual aware of the information to use to make decisions on what strategies to take (Mahoney & Thoreson, 1974). With training, the potential benefits of opening feedback channels could be maximized. Unfortunately, there is such a dearth of research on the topic that Mahoney and Thoreson (1974) have lamented that developing training techniques to improve self observational skills is one of the most pressing and practical issues in the self monitoring literature.

Goal Setting and Self Monitoring

The beneficial effects of goal setting on task performance is one of the most robust finding in the organizational literature (Locke, Shaw, Saari & Latham, 1981). One of the major dimensions of goal content studied has been goal specificity i.e., the degree of quantitative precision with which a goal is specified. Research has consistently demonstrated that specific, hard goals lead to better performance than vague "do your best" goals. Nevertheless, a controversy has developed as to the relative impact of goal specificity as opposed to task feedback or knowledge of results (KR) on task performance. In earlier goal setting studies, researchers posited that KR effects were mediated by goal setting activity (e.g., see Locke, 1967; Locke, Cartledge & Koeppel, 1968). The large number of laboratory and field studies that followed have resulted in the current perspective that goals and feedback are reciprocally dependent i.e., neither goals or KR alone is sufficient to improve performance (Locke et al., 1981). This relationship of goal specificity and KR is summarized by the 2 x 2 research design presented in Figure 4 in which KR/No KR, specific/do your best goal conditions
<table>
<thead>
<tr>
<th>Specific Goal</th>
<th>KR</th>
<th>No KR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard</td>
<td>Cell 1</td>
<td>Cell 2</td>
</tr>
<tr>
<td>No specific</td>
<td>Cell 3</td>
<td>Cell 4</td>
</tr>
<tr>
<td>goal or do</td>
<td></td>
<td></td>
</tr>
<tr>
<td>best goal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4. Model of goal-KR Relationships\(^a\)

\(^a\)From Locke et. al., (1981)
are examined. Based on previous research, one would predict that performance levels for the specific goal/KR condition (cell 1) would be significantly higher than the three remaining cells. Additionally, the three remaining cells are not predicted to be significantly different from one another (see Locke et al., 1981). While the practical implications of these predictions are self-evident, the generalizability of the research on goal specificity and feedback has an important limiting boundary.

The limiting boundary of goal setting research concerns the source of feedback information. Researchers in the goal setting tradition have almost exclusively examined KR as a function of external feedback sources to the exclusion of self-generated information. While the simple dichotomy of feedback conditions in Figure 4 i.e., KR is or is not provided to the individual is valid when considering external feedback sources; it is totally inadequate with the inclusion of self-monitoring as a producer of KR.

As stated by Annet and Kay (1955), feedback or KR is inherent in virtually any situation in which an individual has some rudimentary idea of what he/she is trying to accomplish. Therefore, instead of viewing KR as a dichotomy, it is more realistic to conceive of KR as a continuum of the amount of performance related information being actively processed by the individual regardless of the feedback source. The two endpoints are conceptualized as a state of mindlessness in which only a minimal amount of current information is attended to or self monitored to a state of maximal attention to the processing of incoming information. This conceptualization based on self-monitoring principles...
challenges the traditional no KR condition in goal setting research and forces one to view an individual's knowledge of task performance as lying somewhere between the two extremes of the continuum.

**Goal setting and self monitoring.** While there is no direct empirical research on the relationship of goal setting and self monitoring, researchers have indirectly noted their potential impact. Locke and Bryan (1969), for example, have demonstrated the self directional component of goal setting. Drivers given feedback on five dimensions of driving effectiveness only improved performance on the one dimension for which goals had been set. Latham and Baldes (1975) as well as Latham and Kinne (1974) have noted the capacity of goal setting to impart meaning to a task and therefore increase awareness of KR. Additional support for this notion comes from Umstot et al. (1976) in which subjects assigned goals perceived a significantly greater amount of task feedback than subjects told to do their best. Finally, Scheier and Carver (in press) in the application of Control theory to task achievement situations have demonstrated that high levels of self attention lead to a seeking out of concrete information in order to facilitate the more abstract comparison between a person's own behavior or performance in an achievement situation and the salient behavioral standard. In sum, some evidence suggests that the process of assigning a goal results in active attempts to monitor goal related activities.

If the above contentions are correct, increases in self monitoring activity should provide the individual with a better idea of how he/she is performing relative to the set standard. The accuracy of KR gained through self monitoring has received scant attention in the goal setting
literature. Only one study (Strang, Lawrence & Fowler, 1978) could be found which indirectly examined the accuracy issue. For the study, subjects were asked to complete a number of simple addition and subtraction problems. After completing a number of problems which had been flashed individually on a screen subjects were asked to recall the number of correct solutions. Only those subjects with continuous external sources of feedback accurately recalled the number of correct solutions on the task regardless of the goal setting condition. Goal setting without external feedback did not lead to increased accuracy of recall over a do your best condition. The authors of the study contend that the results demonstrate the lack of implicit KR in the "goals only" group (which they see as a potential confound in goal setting studies). The research does not address, however, whether goals only group members attempted to monitor their progress on the task or why the group was not more accurate. While there is an obvious need for more research on the impact of goal setting on self monitoring and the accuracy of self knowledge, there is some data relevant to understanding the relationship of one aspect of self monitoring i.e., self monitoring form and goal setting condition, and its potential impact on performance.

The relationship of goal setting, self monitoring form and task performance. One hypothesized linkage of the self monitoring model of Figure 3 is that external pressures such as goal setting can increase the awareness and thus the monitoring of goal behaviors and task performance. As described earlier, this monitoring process can take two forms--incidental or purposeful tracing. No study has directly examined the relationship of goal setting and self monitoring forms. A number
of studies, though, suggest that such a relationship may have an impact on task performance.

In a number of studies in which goal setting was effective, tasks were structured so that physical tracing provided a readily available source for self feedback. One method of enhancing task feedback has been to allow completed products to be left in view of the individual worker. For example, workers have been instructed to place finished products on top of the work desk (Jackson & Zedeck, 1982), stack sketches on top of each other on a nearby shelf (Terborg & Miller, 1977), place coded cards into a workbox (Umstot, Bell & Mitchell, 1976) or affix coded cards onto pegs in front of the work area (Pritchard & Curtis, 1973). Another method of leaving a physical trace includes the listing of each new idea generated in a brainstorming task (Latham & Saari, 1979; Locke, 1982). Finally, studies with trace measures often include clocks so that individuals can monitor their time along with their progress on the task (e.g., Latham & Saari, 1979; Terborg & Miller, 1977). Despite this suggestive data, the relative impact of physical tracing on performance can not be determined since accuracy measures where not taken and external feedback was often an available source of information for the individual.

In other goal setting studies, self monitoring devices have been designed so that individuals could purposefully monitor performance and therefore enhance performance. For example, sawyers in a logging company have been provided with tally meters to monitor the number of trees cut (Latham & Kinne, 1974; Latham & Yukl, 1977). To improve supervisory effectiveness, recently trained supervisors were asked to self
record effective behaviors on a checklist once back on the job (Nemeroff & Casentino, 1979; Wexley & Nemeroff, 1975). Telephone service employees have self monitored the number of days absent, a safety score, the amount of money spent compared to amount budgeted as well as completing a subjective evaluation of their service quality (Kim & Hamner, 1976). In a study by Umstot et al. (1976), subjects not only had a trace measure of performance but also marked off a large map as each area of work was completed. In another study (Ivancevich & McMahon, 1982) engineers and technicians were assigned goals and also given a form to self monitor control costs, control citations and unexcused overtime throughout the quarter. The form had to be continually updated throughout the quarter to be properly completed. They found that self generated KR from purposeful tracing was not only accurate but when combined with goal setting had a more significant impact on control costs than goal setting with external feedback. As a final illustration, loggers placed under a goal setting condition developed their own monitoring device to provide a trace of their performance (Latham and Baldes, 1975). The loggers began recording the net weight of each truck loaded with trees on a trip sheet which had never been previously used for that purpose. In this situation as in other research studies, it is impossible to completely distinguish the impact of the purposeful monitoring, external feedback and goal setting on task performance. Nevertheless, studies which incorporated some form of purposeful tracing found increased performance effectiveness.

Research evidence suggests that purposeful monitoring and incidental physical tracing can interact with goal setting to improve performance.
Figure 3 hypothesizes that goal setting activates self monitoring of goal related activities. This implies that even when feedback is not readily available, individuals in goal setting conditions are likely to try to cognitively trace their own performance level. No research has examined the relationship of cognitive tracing, goal setting and performance directly. Nevertheless, in many goals only groups, incidental cognitive tracing is the only available source of feedback information. Research reviewed by Locke et al. (1981) indicates that goals only groups do not perform as well as goal/external feedback groups and tend to perform at levels closer to do your best groups. For example, at Emery Freight (1973), customer service and dock employees were given performance goals and performance was monitored externally by supervisors and personally through records kept by each employees. When external KR was removed and the purposeful monitoring eliminated, performance returned to baseline even though goals remained in effect. Similarly, Komaki et al. (1978) found that performance returned to baseline with the withdrawal of external KR. Strang et al. (1978) also found no effects for the goals only group on a simple arithmetic task. As a final example, Becker (1978) found that goals plus external feedback resulted in lower electrical consumption than a goals only group. While a goals only condition does not appear to be effective in these studies, it is not clear what kind of information was being processed by the individual while performing on the task. It is suggested that in the Emery Freight and Komaki et al. (1978) examples, the elimination of feedback sources probably reduced the saliency of the relevant goal behaviors which resulted in minimal attempts by the workers to cognitively self
monitor those behaviors. In the other two studies, the structure or complexity of the task precluded any attempts to accurately self monitor performance through cognitive means. Therefore, the argument being presented is that the above studies do not answer the question of whether goals only group members attempted to monitor performance (in fact in the study by Strang et al. it appears that the pressures of goal setting and the frustration of minimal KR led to more errors on the task than do your best groups). It is suggested that in situations where individuals can cognitively monitor performance, the "goals only" group can be quite effective.

Proposed Research

The model of the self monitoring process in Figure 3 presented a number of antecedent variables that could impact on the extent and accuracy of self monitoring. This study concentrates on the relationship of the two antecedent conditions—external pressures from goal setting and self monitoring form—and their impact on the accuracy of self monitoring and task performance. A simplified model of these relationships is presented in Figure 5. The model closely parallels Blood's (1978) contention that an individual must have an accurate perception of the behavioral goals and accurately attend to how he/she has performed relative to those goals in order for the self monitoring process to lead to enhanced task performance. As an additional component, goal setting has been separated into two types, i.e., assigned versus self set goal conditions. Based on the goal setting literature, self set goals may lead individuals to be more committed than individuals with assigned goals (e.g., see Locke et al., 1981 for a review). While speculative,
Figure 5. Relationship of Goal Setting Condition and Self Monitoring Condition
it is suggested that an increase in commitment to a goal could result in greater efforts to self monitor activities or to utilize self relevant information to improve effectiveness.

Although the model is a simplification of the underlying process presented in Figure 3, a number of testable hypotheses can be generated. The next section describes the expected impact of goal setting and self monitoring form on the accuracy of self knowledge followed by a section describing their expected relationships with task performance.

**Goal Setting, Self Monitoring Form and Accuracy**

Self monitoring has been defined as attention by an individual towards his/her performance related activities which leads to some level of self knowledge. An important issue in the self monitoring literature is the extent to which the self knowledge gained is an accurate representation of the true state of affairs. The goal setting literature has virtually ignored the self knowledge gained by individuals while completing a goal setting task. Consequently, goal setting researchers have not focused on the degree of accuracy as an important variable of interest. The model presented in Figure 5 indicates that goal setting and self monitoring form have a direct impact on the accuracy of self knowledge. The specific hypotheses to be tested are:

**H1:** Self monitoring form will have an independent effect on the accuracy of self feedback with the purposeful monitoring condition more accurate than the incidental physical tracing condition which in turn is more accurate than the incidental cognitive tracing condition.
H2: Accuracy will be differentially affected by goal setting condition with specific and difficult goals resulting in increased self monitoring attempts which leads to increased accuracy over the do your best goal condition.

Goal Setting, Self Monitoring Form and Task Performance

This research concentrates on various goal conditions where individuals perform a task without external feedback. Locke et al. (1981) have posited that goal setting without external feedback should result in similar performance levels as do your best conditions with or without external feedback. An examination of the self monitoring literature and the relationship of monitoring and goal setting has led to alternative hypotheses. It is expected that goal setting can lead to more effective performance in the absence of external feedback if self monitoring provides a valuable source of self feedback. The specific hypotheses to be tested in this research are:

H3: Goal setting will have an independent effect on performance level with specific difficult goals leading to higher performance than moderately difficult or do your best goals.

H4: The motivational consequences of self monitoring will lead to higher performance for the purposeful monitoring form than the incidental monitoring form. In addition, the combination of self monitoring with specific, difficult goals will lead the
incidental physical tracing condition to perform at a higher level than the incidental cognitive tracing condition. Performance for the two incidental conditions will not differ for the general do you best goal condition.
METHOD

General Introduction

Subjects for the experiment were undergraduate students who volunteered to participate for course credit. Subjects were randomly assigned to condition and tested individually. A brainstorming task was employed in which subjects were asked to generate ideas about a particular topic. The same task has been used successfully in previous goal setting research (e.g., Latham & Saari, 1979). Prior to the major research effort, a preliminary investigation was undertaken to examine the acceptability of the task, the power of the goal setting manipulation and the adequacy of the measures taken. The design, procedures, results and implications of the preliminary study are presented below followed by a description of the major research effort.

Preliminary Research

Design

Twenty-two subjects were assigned to either a do your best goal condition or a specific goal condition. The level of the goal for the specific goal condition was determined on the basis of a pilot study in which six subjects worked on the task under a no goal instructional set for ten minutes. A difficult but obtainable goal was defined as approximately 1½ times higher than the mean of the pilot study ($m = 29.4$)
or a goal of 45 ideas to be generated. In the do your best condition, subjects were instructed to try to do their best on the task, that is, try to generate as many ideas as possible within the ten minute time limit.

Procedure

The study was portrayed to subjects as a research project sponsored by a company interested in wood products. Subjects were given index cards and pencils and were asked to write down ideas, one per card, on the uses for wood for a period of ten minutes. After completing an index card, it was placed into a slot in the desk before the subject proceeded to the next idea. Consequently, subjects could not "see" their progress during the task and therefore had to rely on incidental cognitive tracing to monitor progress. Subjects were not told that they would be asked to recall their performance level once the task was completed. The instructions given the two goal conditions are presented in Appendix A.

After the experimental task, subjects were asked to complete two questionnaires (see Appendix A). The post experimental questionnaire contained a manipulation check for goal condition as well as items on goal difficulty, self rated effort, recall of performance and the self monitoring process. The second questionnaire was the self consciousness scale developed by Fenigstein, Scheier and Buss (1975). Subjects were then debriefed and thanked for their participation. The consent form and debriefing sheet are also presented in Appendix A.

Measures

The major dependent variables of interest were the level of performance on the task and the accuracy of self feedback. Task performance
was defined in terms of the quantity or number of ideas generated within the time period. To obtain a measure of accuracy, each subject had estimated the number of ideas that had actually been generated during the task period. With this information, one technique for calculating accuracy would be a correlation between that estimate and the actual performance on the task. The correlational index of accuracy was deemed inappropriate because it is based on the trend toward linearity rather than on each individual's ability to estimate accurately his/her own performance level. A second index of accuracy based on difference scores was seen as more appropriate since it provides information about over and under estimated performance levels per individual. Nevertheless, a difference score does not take into account the level of performance which becomes important for comparisons across individuals (e.g., an individual who generates 100 ideas and estimates his/her performance as 95 would have the same difference score or accuracy as someone who generated only 50 ideas but estimated 45). To account for these performance differences, the most appropriate measure of accuracy was seen as calculating an absolute difference score for each individual and dividing that score by the individual's actual performance level.

There was also an initial interest in examining the potential for individual differences in self monitoring tendencies. The self consciousness scale (Fenningstein et al., 1975) contains a subscale labeled private self consciousness which measures the extent to which an individual focuses on his/her thoughts, feelings and behaviors. The subscale was examined as a potential correlate with the major variables of interest.
Expected Results

It was expected that this study would replicate previous goal setting research and demonstrate that the specific goal subjects outperform the do your best goal subjects. It was also expected that the specific goal group would report a greater willingness to monitor progress on the task and be more accurate in recalling the number of ideas generated. No specific hypotheses were tested for the individual difference variable as it was examined as a guide for future research.

Results and Implications

The means, standard deviations and the results of the statistical analyses are presented in Table 1. The manipulation of goals was successful as individuals in the specific goal group perceived the assigned goal as more specific than the do your best condition (t(20) = 4.27; p < .01). In support of previous goal setting research, specific goal subjects generated a significantly greater number of ideas on the brainstorming task than the do your best subjects (t(20) = 2.9; p < .01). Despite this objective difference in performance, self rated effort levels were the same for the two goal conditions. Analysis of the accuracy index provided support (t(20) = 1.76; p < .05) for the proposition of greater accuracy for specific versus the do your best goal subjects. An examination of the difference scores revealed that the do your best subjects systematically underestimated their actual performance as demonstrated by a 95% confidence interval around the mean difference score for the condition (-10.1 < p < -0.5). Perceptual data provided some additional support for the accuracy results. Individuals in the specific goal condition reported more attempts to monitor performance than the
### TABLE 1
Results of the Preliminary Study
Means, Standard Deviations and Statistical Analyses

<table>
<thead>
<tr>
<th>Condition</th>
<th>Do Best Condition (N=11)</th>
<th>Specific Condition (N=11)</th>
<th>Statistical Analysis&lt;sup&gt;a&lt;/sup&gt; (d.f.=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>23.7/9.8</td>
<td>35.5/9.5</td>
<td>2.9; p &lt; .01</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.18/.19</td>
<td>.02/.25</td>
<td>1.76; p &lt; .05</td>
</tr>
<tr>
<td>Goal Specificity</td>
<td>2.8/1.5</td>
<td>4.7/.65</td>
<td>4.27; p &lt; .01</td>
</tr>
<tr>
<td>Cognitive Tracing</td>
<td>1.9/1.1</td>
<td>2.6/1.4</td>
<td>1.47; p &lt; .10</td>
</tr>
<tr>
<td>Desire for Information</td>
<td>2.0/1.2</td>
<td>3.4/1.6</td>
<td>2.27; p &lt; .03</td>
</tr>
<tr>
<td>Effort</td>
<td>3.5/1.0</td>
<td>3.5/.93</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Significance levels reported are based on one-tailed t-tests
do your best condition (t(19) = 1.47; p < .10) as well as a greater
desire to have been able to see their progress during the task (t(20) =
2.27; p < .03). Additional analyses failed to demonstrate any system-
atic relationship of the private self consciousness subscale with the
major variables of interest.

The results of the preliminary research have important implications
for the direction of the major research effort. The brainstorming task
was accepted by the subjects and allowed for performance variability.
Instructional clarity was perceived as high by the subjects. The opera-
tionalization of goal condition, the use of index cards and the placing
of completed cards in a slot in the desk (the operationalization of
the cognitive incidental monitoring condition in the major research
effort) proved effective. Responses to the post experimental question-
aire and informal discussions with the participants led to some minor
modifications in the content of the questionnaire for the major research
effort. The lack of systematic relationships with the private self
consciousness subscale seems to reflect more on the inappropriateness
of the item content for performance based tasks than the plausability
of individual differences in self monitoring tendencies. Overall, ten-
tative support was found for the impact of goal setting on monitoring
and accuracy. It was felt that the short duration of the experiment
minimized the need to closely self monitor to be fairly accurate in
an estimate of performance. To increase the demands on monitoring pro-
gress the time period for the major research effort was expanded from
ten to twenty minutes.
Design

A total of 162 subjects were randomly assigned to condition in a (goal setting condition) by (self monitoring condition) experimental design. Due to experimenter error or misinterpretation of instructions, seven subjects were eliminated from the study resulting in 155 participants. Sample sizes per cell ranged from 12 to 15. A brainstorming task was employed in which individuals generated ideas on a particular topic for twenty minutes.

Independent Variables

For the research, four levels of goal setting and three levels of self monitoring were manipulated. The goal setting conditions varied in terms of the degree of goal specificity and difficulty and the source of the goal set (assigned or self set). For specificity, one condition was a general do your best goal while the other three conditions had a more specific goal. Within these three specific goal conditions, two difficult goal conditions (assigned or self set) and one moderate goal condition (self set) were established. The degree of difficulty of the goal was determined based on previous research (Latham & Saari, 1979) which employed the same task and time interval. The researchers found that subjects perceived 80 ideas in twenty minutes as a hard but obtainable goal while subjects told to do their best tended to complete 55. Therefore, for one difficult goal condition subjects were assigned

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3 Three subjects in the cognitive condition inspected their cards in the desk during the task while four subjects were interrupted by the experimenter or subjects waiting to participate prior to the twenty minute time limit to the task.
a goal of 80 ideas by the experimenter. To insure that the difficult self set goal condition would center on the goal of 80, subjects were shown (before the task) a chart which apparently summarized the performance of previous subjects who had performed at certain levels. The chart displayed a normal curve of the percentage of previous subjects who had performed at certain levels. The range of the curve was between 30 to 130 with the largest percentage of subjects shown as generating between 70 to 90 ideas with the mean of 80. The values on the chart approximate the results found in the research by Latham and Saari (1979). For the moderate self set goal condition, subjects were shown a similar chart with a range from 5 to 105 with the largest percentage of subjects in the 45 to 65 range and a mean of 55 (the two charts are presented in Appendix B) ideas generated.

To summarize, four levels of goal setting were created: (1) do your best; (2) assigned difficult goal; (3) self set moderate goal; and (4) self set difficult goal.

The three self monitoring conditions were incidental cognitive, incidental physical and purposeful monitoring. To operationalize these aspects of monitoring, subjects differed in terms of what they did once an idea was written on an index card. As in the preliminary study, the incidental cognitive tracing subjects placed each completed card into a slot in the work desk so that there was no visual proof of their performance. For the incidental physical tracing, subjects placed completed cards in a workbox in front of them. Subjects were not told to focus on the number of cards being completed and placed in the workbox. Therefore, the incidental tracing condition provided an option to aid
in the monitoring of performance that could be ignored by the subject. In the purposeful monitoring condition subjects were given a check off sheet (Appendix B) to record each time an idea was generated resulting in a continuous monitoring of progress.

Procedure

The experiment was portrayed as a research project sponsored by a company interested in the uses of wood products. Subjects were given a box of index cards and pencils and were asked to write down ideas (one per card) on the uses for wood over a period of twenty minutes. Subjects were assigned to a combination of a goal setting and self monitoring condition. Subjects were either assigned a difficult goal, asked to self set a goal (difficult or moderate) or told to do their best. In addition, the subjects were told to place the completed cards into a slot in the desk (incidental cognitive), in a workbox on top of the desk (incidental physical) or given a check-off sheet to record each time an idea was generated and placed in the slot in the desk (purposeful). To illustrate the nature of the instructions given subjects, the following passage was read to the individuals in the assigned difficult goal/cognitive tracing condition:

The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see, in front of you there are index cards in a box and pencils. The desk has a slot in it to your left. Your task is to write down one idea for the use of wood per index card and then place the index card into the slot in the desk before continuing to the next card. You will have 20 minutes to do the task. Based on previous research, I will ask you to set a hard but obtainable goal of generating 80 ideas within the time period. Keep in mind that you are to write down one idea per index card and then place the card in the slot before beginning a new card. Also, try to reach the set goal of generating 80 ideas
within the time period. Are there any questions before you begin? As you can see, the clock shows it is blank. At the end of twenty minutes I will return to collect your work. You may now begin.

Complete instructions for the various goal setting and self monitoring conditions are provided in Appendix B.

After completion of the task, a post experimental questionnaire was completed (which differed somewhat for the self set goals conditions). Subjects were then debriefed as to the nature of the study and thanked for their participation (See Appendix C for the post experimental questionnaires).

Dependent Measures

The major dependent variables were the level of performance on the task and the accuracy of the individual's estimate of that performance. Task performance was defined in terms of the number of ideas generated within the twenty minute period. As in the preliminary study, accuracy was calculated by dividing the absolute difference score (actual performance from the estimate of performance) by the actual level of performance. Additional perceptual data relevant to the major variables were collected and manipulation checks obtained.

Statistical Analyses and Expected Results

A multivariate analysis of variance framework was adopted to analyze the impact of goal setting and self monitoring condition on performance and accuracy. To examine a network of relationships that would most effectively test the hypotheses of the study, three planned 2 (goal setting) X 3 (self monitoring) MANOVA's were conducted. The three planned comparisons included (1) do your best versus the assigned difficult goal; (2) self set moderate goal versus the self set difficult goal;
and (3) do your best versus the moderate goal condition. In this way, the hypotheses of the study could be tested for the traditional goal setting design (comparison 1) which differed on both dimensions of specificity and difficulty level and a more nontraditional design (comparison 3) in which the two groups differed in terms of specificity. Comparison 2 was used to aid in the interpretation of the results for the previous comparisons.

In terms of accuracy, it is expected that overall, individuals will be more accurate under goal conditions other than the general do you best goal condition. No difference in accuracy is expected between the self set goal conditions. It is expected that purposeful monitoring will lead to greater accuracy than incidental tracing and within the incidental monitoring form, physical tracing will lead to greater accuracy than cognitive tracing.

It is expected that goal setting and self monitoring form will combine in their effects on performance. Specifically, there will be an overall goal effect with difficult goals leading to higher performance than moderate or do your best goals. It is expected that performance will be enhanced with purposeful monitoring relative to incidental tracing. With incidental tracing, no difference is expected under do your best goal conditions but a difference will be seen with the other goal conditions with physical tracing leading to higher performance levels than cognitive tracing.

The expected pattern of results for each comparison and dependent variable is presented in Figure 6. An examination of the pattern of
Dependent Variable: Performance

Comparison 1

High

Low

Do Your Assigned
Best Difficult Goal

Comparison 2

High

Low

Self Set
Self Set
Moderate Difficult Goal

Comparison 3

High

Low

Do Your Self Set
Best Moderate Goal

Dependent Variable: Accuracy

High

Low

Do Your Assigned
Best Difficult Goal

Figure 6. Expected results of MANOVA analyses of Goal Condition and Self Monitoring Form on Performance and Accuracy.

PR = Purposeful Tracing; IP = Incidental Physical; IC = Incidental Cognition
results found will be examined to determine the extent to which self monitoring form and goal setting independently and combined impact on accuracy and performance.
RESULTS

Manipulation Checks

Responses to the post experimental questionnaire were examined to evaluate the effectiveness of the experimental manipulations. Descriptive results for the manipulation checks are presented in Table 2.

For the goal manipulation, analyses revealed that participants perceived the assigned difficult goal as more specific than the do you best condition ($F(1,82) = 29.12; p < .01$). Subject responses to the question "as your were completing the task did you have a specific goal or number of ideas you were trying to generate" were analyzed using a chi square test which revealed a strong difference in responses across the four goal conditions ($X^2(3) = 74.8; p < .05$). An examination of the data indicates that 95% of the assigned difficult goal subjects set goals while only 14% of the do you best goal condition spontaneously set goals. Those individuals who did set goals in the do your best condition were part of the purposeful monitoring condition. The use of the experimental chart to manipulate self set goals was also successful as 88% of the self set moderate goal subjects and 83% of the self set difficult goal subjects set a specific goal to obtain. As expected, the average of the goals self set by the subjects in the difficult and moderate goal conditions were significantly different ($t(70) = 3.2; p < .01$) with difficult goal subjects setting higher self set goals.
TABLE 2

Manipulation Checks for Goal Condition and Self Monitoring Form

**Goal Condition**

<table>
<thead>
<tr>
<th>Goal Condition</th>
<th>Goal Specification</th>
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<th>SD</th>
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<tbody>
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**Self Monitoring Condition**

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<th>Monitor Workbox</th>
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<tbody>
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<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>53</td>
<td>2.51</td>
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<tr>
<td>52</td>
<td>3.35</td>
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**Instructions**

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<th>Self Monitoring Condition</th>
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<th>Instructional Clarity</th>
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<td>Incidental Cognitive</td>
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</tr>
<tr>
<td>Assigned Difficult</td>
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<td>Incidental Physical</td>
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<td>6.62</td>
</tr>
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<td>Self Set Moderate</td>
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<td>Purposeful</td>
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<td>6.63</td>
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<tr>
<td>Self Set Difficult</td>
<td>6.55</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
than the moderate goal subjects. These results support the success of the goal manipulation.

The manipulation of self monitoring condition was also found to be effective. Post experimental interviews with subjects indicated that instructions were followed by subjects in the three self monitoring conditions. Subjects in the incidental cognitive tracing condition placed the completed cards into the slot as the task progressed and did not attempt to examine the contents in the desk. Responses to the post experimental questionnaire indicated that they had some desire to see their progress while completing the task ($m = 2.88$, $SD = 1.39$). Participants in the physical tracing condition placed the completed index cards in the workbox in front of them and stated that they monitored their progress to some degree during the task by examining the contents of the work box ($m = 2.86$, $SD = 1.05$). One subject mentioned that she had counted the cards in the workbox during the task. Participants in the purposeful tracing condition completed the check off sheet accurately as the number checked on the sheet corresponded with the actual number produced. In addition, results (Table 2) indicated that self monitoring condition significantly impacted on the extent to which subjects monitored their progress on the task ($F(2,152) = 9.24$; $p < .01$). As expected, purposeful monitoring subjects reported that they had monitored the number of ideas being generated during the task more closely than the subjects in the incidental monitoring conditions.

Finally, post experimental questionnaire responses indicated that instructional clarity was perceived to be quite high by subjects across all experimental conditions ($m = 6.56$, $SD = 0.79$).
Major Analyses

The two major dependent variables in this study were the quantity of performance and the accuracy of subjects' estimates of performance. The two independent variables of interest were the type of goal condition and the self monitoring form. For the analyses, planned comparisons resulted in three 2 (goal condition) by 3 (self monitoring condition) multivariate analysis of variance (MANOVA) for the variables of performance and accuracy in order to test the relationships between the independent and dependent variables.

Results for the overall test of MANOVA effects are presented in Table 3. The means and standard deviations for each dependent variable by experimental condition are given in Tables 4 and 5. Examination of the MANOVA results are described below followed by related supplementary analyses.

Comparison one. Comparison one involved the examination of the assigned difficult goal and the do your best goal condition. The MANOVA (see Table 3) revealed an overall goal and self monitoring condition effect with a nonsignificant overall interaction effect. While the MANOVA results revealed an overall relationship among treatment means with respect to the dependent variables, univariate F tests for the goal setting and self monitoring conditions were examined to determine the sources of the overall effects. Examination of the univariate F tests (Table 6) indicated that only the self monitoring condition had an impact on accuracy ($F(2,77) = 15.68; p < .01$). Analysis of the univariate means by the Duncan multiple range test indicated that as expected accuracy was significantly higher in the purposeful than the
TABLE 3

Summary of Manova Effects of Experimental Condition on Performance and Accuracy

<table>
<thead>
<tr>
<th>Goal</th>
<th>Multivariate Testa</th>
</tr>
</thead>
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<td></td>
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<td>D.F.</td>
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</tr>
<tr>
<td>cult vs. Self Set Moderate Go</td>
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</tr>
<tr>
<td>al</td>
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</tr>
<tr>
<td>Comparison 3: Do Your Best vs.</td>
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</tr>
<tr>
<td>Self Set Moderate Goal</td>
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</table>

aWilk's Criterion Used for Multivariate Significance Testing
**Significant at p < .05 level
*Significant at p < .10 level
TABLE 4

Descriptive Statistics by Experimental Condition for Performance

<table>
<thead>
<tr>
<th>Performance</th>
<th>N</th>
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<th></th>
<th>Physical</th>
<th></th>
<th>Purposeful</th>
<th></th>
<th>Overall</th>
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<tr>
<td></td>
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<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<td>M</td>
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<td></td>
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<tr>
<td>Do Your Best</td>
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<td>66.36</td>
<td>26.59</td>
<td>56.79</td>
<td>24.56</td>
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<td>22.05</td>
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<td>80.23</td>
<td>14.37</td>
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<td>19.58</td>
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<td>B. Comparison 2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Self Set Moderate</td>
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<td>24.87</td>
<td>61.82</td>
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<td>31.99</td>
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<td>C. Comparison 3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Do Your Best</td>
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<td>45.7</td>
<td>9.18</td>
<td>59.79</td>
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<td>13.90</td>
<td>64.06</td>
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<tr>
<td>D. Overall</td>
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<tr>
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</table>
### TABLE 5

Descriptive Statistics by Experimental Condition for Accuracy

**Accuracy**

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<tr>
<th></th>
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<th>Physical</th>
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<th>Overall</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>A. Comparison 1</td>
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<tr>
<td>Do Your Best</td>
<td>43</td>
<td>.35</td>
<td>.21</td>
<td>.24</td>
<td>.14</td>
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<td>.29</td>
<td>.18</td>
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<td>.15</td>
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</tr>
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<td>.35</td>
<td>.21</td>
<td>.24</td>
<td>.14</td>
</tr>
<tr>
<td>Self Set Moderate</td>
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<td>.20</td>
<td>.18</td>
<td>.20</td>
<td>.15</td>
</tr>
<tr>
<td>D. Overall</td>
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<td>.31</td>
<td>.19</td>
<td>.23</td>
<td>.14</td>
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<tr>
<td>N</td>
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<td>48</td>
<td>47</td>
<td>147</td>
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<td>F</td>
<td>p Value</td>
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<td>---------</td>
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<tr>
<td></td>
<td>Performance</td>
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<td>&lt; .01</td>
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<tr>
<td></td>
<td>Accuracy</td>
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<td>1.54</td>
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<td></td>
<td>Accuracy</td>
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<td>0.84</td>
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<tr>
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<td>2.26</td>
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<tr>
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<td>Accuracy</td>
<td>1,73</td>
<td>1.39</td>
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</table>

<sup>a</sup>Self Monitoring Condition
incidental monitoring conditions and that the incidental physical tracing subjects were more accurate than the cognitive tracing subjects. Although the expected interaction effect of self monitoring condition and goal setting was not found, an examination of Figure 7 suggests that the difference in accuracy can mainly be attributed to more accuracy for assigned difficult goal over the do your best goal subjects in the incidental cognitive condition.

For performance, the univariate F tests indicated significant impacts by both goal condition \( (F(1,77) = 14.94; p < .01) \) and by self monitoring condition \( (F(2,77) = 2.76; p < .07) \). Examination of the means indicated that assigned difficult goal subjects generated more ideas than subjects in the do your best condition. Duncan multiple range tests revealed that the purposeful monitoring subjects generated more ideas than the incidental cognitive subjects. The pattern of means (Figure 7) was opposite predictions as the self monitoring subjects differed more on performance level for the do your best goal than the assigned difficult goal condition. Therefore, while the results are supportive of the impact of goal setting and self monitoring on performance, the expected interactive effect was not found.

Comparison two. Comparison two involved the self set moderate and self set difficult goal conditions. The MANOVA (Table 3) showed an overall goal and self monitoring effect while the goal by self monitoring interaction effect was nonsignificant. An examination of the univariate tests (Table 6) revealed that the overall effect for accuracy was due to self monitoring \( (F(2,66) = 12.31; p < .01) \). Duncan range tests indicated that purposeful monitoring subjects were more accurate
Figure 7. Pattern of Means Relating Goal Condition and Self Monitoring Form to Accuracy and Performance for Selected Comparisons.

Comparison 1

Accuracy

High

.10

.25

.40

Low

Purposeful

Physical

Cognitive

Do Your Best Assigned Difficult

Goal Condition

Comparison 2

High

.10

.25

.40

Low

Purposeful

Physical

Cognitive

Do Your Best Self Set Moderate

Goal Condition
than incidental monitoring subjects. The expected difference in accuracy between cognitive and physical monitoring subjects was not found.

The univariate analyses revealed that performance level was affected by goal setting only ($F(1,66) = 6.05; p < .05$). An examination of the means indicated that the self set difficult goal subjects performed at higher levels than self set moderate goal subjects. The hypothesized effect of self monitoring on performance was not found as purposeful monitoring subjects did not perform at higher levels than incidental monitoring subjects.

**Comparison three.** Comparison three concerned the do your best and the self set moderate goal conditions. The MANOVA (Table 3) revealed an overall goal and self monitoring effect with a marginally significant overall interaction effect. The univariate test revealed that accuracy was affected by self monitoring condition only ($F(2,73) = 10.75; p < .01$). Duncan's test of means indicated that as expected purposeful monitoring subjects were more accurate than incidental monitoring subjects and that subjects in the incidental physical tracing condition were more accurate than those in the incidental cognitive condition. While the expected interaction of goal setting and self monitoring was not found, an examination of the means (Figure 7) suggests that incidental monitoring subjects were more accurate under moderate self set goal than the do your best goal condition.

Results for performance level (Table 6) showed no significance for goal or self monitoring condition and a marginal interaction effect ($F(2,73) = 3.38; p < .10$). These results combined with the marginally significant overall interaction effect place strong doubts as to the
importance of the univariate interaction effect. Therefore, no interpretation of the interaction effect was attempted. The results indicate little support for the hypothesized effects of self monitoring and goal setting on performance.

**Supplementary analyses.** The results of the major analyses indicate that performance was mainly a function of goal condition and that accuracy was mainly affected by self monitoring condition. In an attempt to increase understanding of these results, supplemental analyses were completed on subject responses to the post experimental questionnaire. The analyses concerned the extent to which goal setting and self monitoring conditions impacted on perceptions of (1) effort level and task difficulty (2) the self monitoring process and (3) task satisfaction. Descriptive statistics for the relevant variables by experimental condition are presented in Table 7 in Appendix D. Since there were no a priori hypotheses for these tests, the analyses were conducted with the total sample rather than separate tests for each planned comparison.

An examination of the descriptive statistics in Table 7 reveals no difference in perceptions of effort level due to the independent variables. Perceptions of task difficulty, though, were found to be related to self monitoring condition ($F(2,143) = 6.08; p < .01$). Duncan range tests indicated that the purposeful monitoring condition was seen as more difficult by participants than the incidental monitoring conditions. No difference in perceptions of task difficulty due to goal condition was found.

In terms of the self monitoring process variables, an individual's confidence in his/her estimate of performance was impacted by self moni-
toring condition \( (F(2,143) = 28.06; p < .01) \). Participants in the purposeful monitoring condition were more confident of their estimate than subjects in the two incidental tracing conditions which were not different from each other. An additional question concerning the extent to which participants monitored their time during the study revealed no difference by experimental condition. It was also found that goal condition did not affect the desire for task information while completing the task for cognitive monitoring subjects. Similarly, goal condition did not impact on the extent to which individuals monitored performance by examining the workbox in the physical monitoring condition. In other words, goal condition was not found to affect variables posited to be related to the self monitoring process.

For task satisfaction, a complex interaction between goal setting condition and self monitoring condition was indicated \( (F(6,144) = 3.24; p < .01) \). Examination of the patterns of means proved difficult to interpret. Satisfaction on the task was relatively lower for the do your best as opposed to specific goal conditions for purposeful monitoring subjects but was slightly higher than the specific goal conditions for the cognitive monitoring subjects. For physical monitoring subjects, satisfaction was higher in the do your best and self set moderate goal conditions than the assigned difficult and self set difficult goal conditions.
DISCUSSION

The present study explored the impact of goal setting and self monitoring on accuracy and performance. The major findings related to the research hypotheses are reviewed followed by an examination of unexpected findings. Implications of the study for understanding the goal setting and self monitoring approaches are addressed. Finally, future research needs are outlined and conclusions drawn.

Major Findings

The hypotheses for the study stressed the independent contributions and interactive effects of goal setting and self monitoring on performance and accuracy. In general, the results provide strong support for independent contributions of goal setting on performance and self monitoring on accuracy but weak support for any interactive effects. In regard to accuracy, hypothesis one was largely supported. For the three comparisons, purposeful monitoring subjects were significantly more accurate than the incidental monitoring subjects. In two of the three planned comparisons, incidental physical subjects were more accurate than incidental cognitive subjects. Hypothesis two which stated that accuracy would be differentially affected by goal condition for incidental monitoring subjects had limited support. Specific goals did not lead to significantly greater accuracy than the do your best goal condition. Nevertheless, the results are suggestive that specific goals
tended to lead to greater accuracy for incidental cognitive subjects over the do your best/cognitive tracing subjects.

For performance, the traditional goal setting hypothesis (hypothesis three) was supported as specific difficult goals subjects out-performed the self set moderate goal and general do your best goal subjects. Hypothesis four, which concerned the independent and interactive effects of self monitoring on performance received some support. For the more traditional goal setting comparison (assigned difficult goal versus the do your best goal condition), self monitoring condition had a significant impact on performance with purposeful monitoring subjects exhibiting a higher performance level than incidental monitoring subjects. The effect of self monitoring condition on performance was not replicated in the comparison of the self set goal conditions or the comparison of the self set moderate goal and the do your best goal conditions. Similarly, the expected combined effect of the incidental monitoring conditions and goal setting was not found as subjects in the two monitoring conditions performed at the same level regardless of the specificity or difficulty of the goal.

Examination of Unexpected Findings

The experimental findings support the expected impact of goal setting on performance and the effect of self monitoring on accuracy. The expected more complex interactive effects of the independent variables on the dependent variables were not found. These findings indicate that goal setting did not increase self monitoring attempts and subsequently accuracy was not affected. Self monitoring did not combine with goal setting to increase task motivation (through KR) and
subsequently performance was only related (except in one case) to the goal setting effect. Two potential methodological reasons for these unexpected results include (1) the operationalization of the independent variables did not permit an adequate test of the experimental hypotheses and/or (2) the experimental design and choice of task minimized the importance of the self monitoring manipulation. A discussion of each potential problem and their implications for the study are presented below followed by a revised model of the relationship between goal setting and self monitoring. Implications of the study for increasing our understanding of goal setting and self monitoring are described followed by future research needs.

The operationalization of the goal setting conditions appear to be adequate. Subjects perceived the assigned difficult goal as more specific than the do your best condition and the normative chart resulted in self set goals which closely matched expected levels. On the other hand, the operationalization of self monitoring is more problematic. Although the manipulation checks were successful, there is an underlying difficulty in the manipulation of self monitoring. The major difficulty is that the two incidental monitoring conditions are not powerful experimental manipulations. For both conditions, task information on performance level could be cognitively encoded by subjects. While the physical tracing subjects had visual access to performance information, attention was not specifically focused on the contents in the workbox by the experimenter. As a result, the two conditions could represent quite similar (or different) entities. The purposeful monitoring condition was by contrast a powerful manipulation as the subjects' attention was focused
continually on task performance. Despite its problematic nature, the operationalization of self monitoring does follow logically from the review of the literature and the results of the accuracy measure indicates that there is a difference between subjects in the incidental conditions. Consequently, while the manipulation of self monitoring appears to be a somewhat limiting feature, it does not seem to be a major source of difficulty for the study.

Further post hoc explanations reveal that the design and choice of experimental task may have placed limits to the interpretability of the study. Specifically, design features may have had the effect of maximizing the goal setting aspect while minimizing the importance of the self monitoring manipulation.

The theoretical underpinnings of self regulation theory suggest that self monitoring augments performance through its motivational and informational functions. It is plausible that the design of the study reduced the value of these two functions. First, the short time span (twenty minutes) and the single trial nature of the task potentially minimized the informational value of self monitoring. Over a longer time span and multiple trials the informational value of self monitoring is enhanced by the individual's desire for feedback as to the relationship between what he/she does or does not do and the goal to be reached. Second, the nature of the task when combined with goal setting possibly reduced the motivational value of self monitoring. While the brainstorming task had been used successfully in goal research, the nature of the task (as with many goal setting tasks) is such that the difficulty level and goal path multiplicity (the number of alternative ways to
complete a task) are low (Shaw, 1963). Effectiveness on the task is a simple monotonic function of performance (which in turn is based mainly on the mobilization of effort). As stated by Warm et al. (1972), when a task is simple, the facilitative effects of KR from self monitoring are primarily motivational rather than instructive. In their discussion of self regulation, Mahoney and Thoreson (1974) contend that performance goals often contribute more importantly to motivation and behavior change than KR or self feedback. Similarly, Wickland (1975) suggests that self focused attention to a well-learned or simple task may lead to detrimental interference effects which result in decreased effectiveness on the task. The implications of these research ideas to the present study are clear: (1) individuals can perform at a high level if the task is simple or well-learned and goals are set regardless of the extent of self monitoring; and (2) close self monitoring of performance on a simple task may actually lead to interference effects with performance. Data suggests that both aspects could be operating in the present study to minimize the importance of self monitoring.

Table 8 (presented in Appendix D) examines the correlations between performance and accuracy by goal condition for the two incidental monitoring conditions. The correlations indicate that except for the do your best condition, there is a systematic trend for individuals who are less accurate to perform at a higher level on the task. It is speculated that the pressures of specific goals which reduced the importance to monitor performance were less relevant for the do your best goal condition. Responses to the post experimental questionnaire also provided anecdotal evidence for the interference effect. A subject in
the assigned difficult goal condition succinctly summarized this effect by stating "my main goal was to keep jotting down ideas—I felt that if I kept track of the amount of ideas that would take away from concentrating on the ideas I was supposed to be writing down." Another subject in a specific goal condition mentioned that she "counted the number of ideas til twenty-six and then just went on." The evidence suggests that any potential self monitoring effect was overwhelmed by goal condition. If this premise is correct, this study provides an example of the exact opposite phenomenon found by Masters, Furman and Barden (1977) in which self monitoring and evaluation vitiated a highly significant goal setting effect.

To conclude, it is acknowledged that the operationalization of self monitoring and the design of the study limited the effectiveness of the self monitoring manipulation. Despite these limitations, the study has important implications for the study of the self monitoring process.

Implications for Self Monitoring

In the present study, self monitoring form and goal setting were hypothesized to be antecedents to self monitoring. The goal set was also seen as rendering possible a comparison of one's momentary performance level with the set goal. Through this comparison process, any discrepancies uncovered are interpreted by the individual which results in any of a number of possible consequences (see Figure 3). The evidence indicates that the self monitoring form had a significant (and expected) impact on the extent of self monitoring. On the other hand, goal setting was not found to be a powerful antecedent to self monitoring. It is
posited that when the task is simple (or well learned) and task effectiveness is a monotonic function of performance, the impact of goal setting on self monitoring is minimized (especially in relation to the self monitoring form). Nevertheless, the cycle of antecedents, monitoring, comparison and consequences described above (and depicted in Figure 3) is important because it highlights the dynamic nature of the self monitoring process. From this study, a dynamic view of the monitoring process is supported by evidence relevant to: (1) the setting and revision of goals, (2) task redefinition as a performance strategy, and (3) accuracy of recall and expectations of future success. Each issue is discussed below followed by future research directions.

**Setting and revision of goals.** The setting of an initial goal or referent is crucial for the comparison process to be effective. As stated by Warm, Kanfer, Kuwada, & Clark (1972), the motivational and informational effects of goals and monitoring on mediated by the individual's self evaluation in relation to the goals. In the present study, the setting and revision of initial goals were impacted by purposeful monitoring and the social comparison process.

Results for the traditional goal comparison (assigned difficult goal versus the do your best condition) indicated that purposeful monitoring led to higher performance levels than the incidental monitoring. Within the do your best goal condition, a comparison of the purposeful monitoring and the cognitive tracing subjects showed a significant difference in mean performance level ($t(27) = 3.26; p < .05$). A critical issue is the extent to which the difference could be due to the motivational effects of continuous monitoring on the setting of performance
goals. A post hoc analysis revealed that six of the fourteen subjects mentioned a specific goal they were trying to obtain. A comparison revealed that subjects who set goals tended to perform at a higher level ($m = 65.16; S.D. = 14.38$) than subjects who did not set a goal ($m = 54.75; S.D. = 17.49$). While any conclusion based on this data is tenuous, it appears that goal setting played a role in the performance effectiveness for subjects in the purposeful monitoring, do your best goal condition. It appears that some subjects used the continuous information from purposeful monitoring as a baseline to determine how many ideas they could generate within the 20 minute time period. It must be noted, though, that the elicitation of goal setting may be an artifact of the check-off sheet used to operationalize purposeful monitoring. It is unknown whether a different method for operationalizing purposeful monitoring (such as using a counter to monitor performance) would have led to the setting of performance goals.

The present study also employed an innovative strategy based on social comparison processes to elicit self set goals. Subjects were shown one of two normative charts which depicted performance levels by previous subjects in the experiment. For one chart, the mode, median and mean performance level was placed at 55 or the average number of ideas generated under do your best conditions. The second chart was similar except the mean level of performance was placed at 80 which reflected the assigned difficult goal condition. The charts not only resulted in the setting of specific goals but also led to two levels of goal difficulty. The effectiveness of the chart to elicit goal setting demonstrates the power of social comparison in the self monitoring
process. Most subjects in the two self set goal conditions reported that they either wanted to match the average performance level or exceed it. Other responses to the post experimental questionnaire indicated that subjects accepted the charts as an accurate portrayal of the performance levels of previous subjects (m = 3.76; S.D. = 1.15) and stated that the chart positively affected their desire to do their best (m = 3.72; S.D. = 1.02). More importantly, the use of social comparison to elicit initial goal setting allowed for an examination of revisions to the initial goals by individuals as the task progressed.

As discussed earlier, successful change is a function of one's ability to maintain an awareness of the dissonance of one's ideal self (or goal) and the current self (Wickland, 1975). It is posited that KR from self monitoring can result in the revision of an initial goal to a higher or lower level. By keeping a continuous record of progress towards a goal, subjects are continually reminded of the goal they are trying to achieve (Kolb & Boyatzis, 1970). This monitoring not only produces attempts to achieve the goal but also provides the individual with accurate information from which to revise the initial goal upward or downward. For the present study, self monitoring condition was significantly related to changes in self set goals during the completion of the task (F(2,47) = 3.15; p < .05). The pattern of means as analyzed by Duncan's multiple range test indicates that purposeful monitoring resulted in a greater number of changes in goal level than the incidental monitoring. An equal number of subjects revised the initial goal upward as downward.
Task definition as a performance strategy. Goal setting has traditionally been examined as a motivational technique (Locke et al., 1981). By incorporating goals within the self monitoring process, a cognitive informational processing perspective is highlighted. Goals, as a component of the comparison or self evaluation function can lead to other consequences besides motivated behavior. For example, research by Bravalas and Lee (1978) indicates that the pressures of goal setting often cause the individual to redefine the requirements of the task so that the difficult performance goals can be reached. The researchers found that in a number of creativity tasks, the quality of the responses changed as a systematic function of goal level with higher goal levels producing responses further from the ideal. Through the redefinition of the task, subjects developed a performance strategy which induced a systematic trade-off of quantity versus quality. By defining the requirements of the task liberally, an individual can more easily meet a difficult goal and therefore reduce any discrepancies. This intriguing notion is relevant to the present study which also used a creativity task. Although data was not collected to test this perspective, a post hoc examination of the responses to the task revealed a similar effect with the do your best condition providing more general or distinctly different ideas for the uses of wood than the difficult goal conditions. This perspective is supported by frequent requests of the experimenter to define the amount of detail acceptable on the task.

Accuracy and expectations of future success. In goal research, the process by which goal setting leads to performance effectiveness has not been clearly defined. Instead, the focus of the research has
been on the outcome measures of performance and satisfaction. The present research incorporated goal setting as an important component in the self monitoring and self regulatory process. By examining goal setting within a self monitoring perspective, a unique contribution of this study was the measurement of accuracy as an outcome variable. With the measurement of accuracy, it was found that subjects, regardless of goal or self monitoring condition, consistently underestimated their true performance level (see Table 9 in Appendix D for the mean differences in accuracy by experimental condition). For example, results from the assigned difficult goal condition (minus the purposeful monitoring group) indicate that of twenty-seven subjects, eleven met the assigned goal. Of these eleven, only one subject estimated their performance level as greater than the assigned goal of eighty. In other words, most of the individuals who actually reached the goal were unaware of that fact. If these results are generalizable to other contexts, it has important implications for understanding potential consequences of the self monitoring process. Continual perceptions by individuals of failure to reach a set goal can have detrimental effects on motivation, cause an individual to monitor performance more closely or result in the individual revising the standard downward. In this view, KR which allows the individuals who are successful on the task to realize their success can potentially lead to a cycle of increased confidence, motivation and performance effectiveness.

Future Research Directions

The present research effort has indicated the potential benefit of incorporating a self monitoring perspective into the theoretical
frameworks of organizational behavior. Moreover, the research has illustrated the need for an expanded knowledge base relevant to the self monitoring process. For example, information is lacking about the extent to which individuals can and typically do monitor their activities. The components and proposed linkages presented in Figure 3, while not definitive, provide directions for future research on the self monitoring process. The model highlights the need to determine the antecedents, the process and consequences of self monitoring in order to understand its dynamic nature.

Logically, the self monitoring process will only be activated if its informational or motivational value is needed to ensure effectiveness on the task. Kanfer (1970) noted this possibility and contended that the self monitoring process may only go into effect under conditions where the normal chain of behavior is not run off smoothly or when events provide cues for which no highly trained (habit, script) is available. This implies that with well learned (task familiarity) or simple tasks, the extent of self monitoring might be minimal. Additionally, the focus of self monitoring may differ depending on task familiarity and complexity, e.g., a task with low complexity may lead an individual familiar with the task to focus on outcomes rather than behaviors to maintain effectiveness. Regardless, more information is needed to determine the antecedent factors which affect the extent of and focus of self monitoring. A potentially useful direction is the examination of the extent to which self monitoring is rooted in the individual or in the situation or external environment. The use of the self consciousness scale (Fenigstein, Scheier & Buss, 1975) in the preliminary study to
measure individual differences in self monitoring did not prove successful. Regardless, there are theoretical and research support (e.g., Baron & Ganz, 1972) for the impact of personality variables in the propensity to self monitor. More research in performance based situations is necessary.

While the present study concentrated on the self monitoring process, only limited attempts were made to actually measure the extent to which individuals self monitored their performance. Further research is needed which focuses more attention on measuring the extent of self monitoring by individuals. Techniques such as unobtrusive observations, information search tasks or verbal protocol analysis which have been used successfully in the measurement of other psychological processes should be considered.

A number of consequences of self monitoring have been presented in Figure 3. Some of the consequences such as a change in effort level or goal level may be more functional for task effectiveness than other reactions such as active avoidance of monitoring, withdrawal from the situation or task redefinition. Regardless, there is a dearth of knowledge relevant to what factors affect the "path" the individual chooses to take. This research would have special implications for better understanding the differences between adequate and poor performers on a task. For example, a poor performer may uncover a discrepancy between current performance levels and the standard or goal and react by avoiding continued monitoring. An adequate performer who uncovers a similar discrepancy might use that information to increase efforts or change performance strategies in order to reduce the discrepancy. In other words,
the poorer performer may actually react in dysfunctional ways which results in a self defeating cycle of behavior. While these notions are speculative, they underscore the importance of training in self observational and self regulatory skills. Such training would strive to improve the observational skills of the individual to sense the environment and use the information in a functional manner to improve effectiveness. Unfortunately, little work has been accomplished on what the components of self observational training should be or how effective the training would be.

**Conclusion**

As mentioned at the beginning of this research, little systematic research on how information about the self is attended to and evaluated while working on a task has been completed. Instead, much of the research has restricted its scope to the impact of external influences on performance effectiveness. While the present study has its limitations, it has demonstrated that to increase our understanding of organizational behavior, researchers must examine the antecedents, the process and the consequences of self monitoring.
REFERENCES NOTES

LIST OF REFERENCES


Epstein, S. *The self concept revisited: Or a theory of a theory.*


Goldfried, M. R., & Merbaum, M. *Behavior change through self-control.*


Greller, M. M., & Herold, D. M. *Sources of feedback: A preliminary investigation.* *Organizational Behavior and Human Performance, 1974, 13, 244-256.*


Jackson, S. E., & Zedeck, S. Explaining performance variability: Contributions of goal setting, task characteristics, and evaluative contexts. Presented at the American Psychological Association Convention, Los Angeles, 1981.


APPENDIX A

Preliminary Study Materials
INSTRUCTIONS

Materials
1. desk and chair
2. index cards in shoebox
3. sharpened pencils
4. slot in desk
5. clock
6. post experimental questionnaires
7. consent forms and debriefing sheet

Procedure
The experimenter randomly assigns subject to condition. The subject is welcomed by the experimenter and asked to sit in the chair by the desk. The subject is asked to complete a consent form which describes the experiment. Any questions the subject may have are answered. After completion of the consent form, the following instructions are given depending upon the condition the subject is assigned to:

A. Do your best condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see, in front of you there are index cards in a box and pencils. The desk has a slot in it to your left. Your task is to write down one idea for the use of wood per index card and then place the index card into the slot in the desk before continuing to the next card. You will have 10 minutes to do the best you can in terms of the number of ideas generated. Keep in mind that you are to write down one idea per index card and then place the card in the slot before beginning a new card. Also, try to do the best you can within the time period. Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of 10 minutes, I will collect your work. You may now begin.
B. Specific goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see, in front of you there are index cards in a box and pencils. The desk has a slot in it to your left. Your task is to write down one idea for the use of wood per index card and then place the index card into the slot in the desk before continuing to the next card. You will have 10 minutes to do the task. Based on previous research, I will ask you to set a hard but obtainable goal of generating 45 ideas within the time period. Keep in mind that you are to write down one idea per index card and then place the card in the slot before beginning a new card. Also, try to reach the set goal of generating 45 ideas within the time limit. Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of 10 minutes, I will collect your work. You may now begin.

After completion of the task, subjects in both conditions are asked to complete two post experimental questionnaires. Once they are completed, subjects are debriefed and thanked for their participation. After the subject leaves, the experimenter collects the completed index cards, counts the number completed and places a rubber band around the stack with the subject number attached.
CONSENT FORM

For this study, you will be asked to brainstorm a list of ideas on a particular topic. Before the start of the experiment, you will be given complete instructions about the task and the role you are to play. The session will last approximately thirty minutes and you will receive credit for your participation. Participation in the experiment is voluntary and you may quit at anytime you feel uncomfortable. Any questions you may have will be answered by the experimenter. In addition, individual results will be kept confidential and no one will be identified or identifiable from the responses you make.

If you consent to participate in this study, please sign the form below. Results of the study will be available upon request.

I have read the above explanation of the procedures for the study and agree to participate. I understand that my participation is voluntary, that the results will be kept confidential and that I may withdraw from the study at any time.

Signature of subject

95
DEBRIEFING FORM

For this study, you were asked to generate ideas for the uses of wood and then asked to complete two short questionnaires. This study is part of a series of studies devoted to understanding the process by which individuals perceive, evaluate and regulate their own work behavior. While the task in this study was a simple one, it is hoped that the information gathered will uncover the extent to which individuals attend to or monitor their progress on a task. Therefore, you were asked questions concerning the amount of attention you gave to your progress while the task was being completed. This information can then be related to the amount of work (number of ideas) that were generated during the time period. These results have implications for organizations in that much behavior by workers are maintained or altered in the absence of external feedback from supervisory personnel. Therefore, the extent to which people regulate their own work behaviors is an important consideration.

Do you have any questions at this time? Do you have any concerns about the study or how it was conducted? Finally, since this is part of a large scale project, I would ask your cooperation in not discussing the specifics of the study to other students who may be participants in the research until the end of the quarter.

Thank you very much for your cooperation.

(sign experimental card if appropriate)
POST EXPERIMENTAL QUESTIONNAIRE

1. How specific was the goal given you to meet by the experimenter, that is, did you know how many ideas you were supposed to generate?

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>not specific at all</td>
<td>somewhat specific</td>
<td>extremely specific</td>
<td></td>
<td></td>
</tr>
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</table>

2. As you were completing the task, did you have a specific number of ideas that you were trying to generate or did you work on the task without any specific number in mind? Please explain.

3. How difficult did you find this task?

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<th>5</th>
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</thead>
<tbody>
<tr>
<td>not difficult at all</td>
<td>moderately difficult</td>
<td>extremely difficult</td>
<td></td>
<td></td>
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</tbody>
</table>

4. To what extent did you try to remember the number of ideas you were generating as you progressed on the task?

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<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
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</table>

5. How many ideas do you believe you actually came up with during the task?

6. How much effort would you say you put into working on this task?

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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimal amount</td>
<td>a moderate amount</td>
<td>a maximal amount</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. How satisfied are you with how well you did on this task?

1 2 3 4 5 6 7
completely completely unsatisfied satisfied

8. How would you describe the instructions given by the experimenter about how to complete the task?

1 2 3 4 5 6 7
very very confusing clear

9. To what extent would you have liked to have placed the completed index cards in front of you instead of the desk slot in order to see your progress on the task over time?

1 2 3 4 5
not at to some to a all extent extent considerable extent

Background Information:

Sex: Male ____ Female ____  Age: ______
Instructions

Please read the following statements and as accurately as possible decide how characteristic each statement is of your thoughts and actions. There are no correct or incorrect answers - just complete the statements in terms of how they best describe you. Use the following scale from 0 to 4 to rate the statements:

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<tr>
<th></th>
<th>0</th>
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<td></td>
</tr>
<tr>
<td></td>
<td>Extremely</td>
<td>Uncharacteristic</td>
<td>Characteristic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 1. I'm always trying to figure myself out.   ( )
2. I'm concerned about my style of doing things.   ( )
* 3. Generally, I'm not very aware of myself.   ( )
4. It takes me time to overcome my shyness in new situations.   ( )
* 5. I reflect about myself alot.   ( )
6. I'm concerned about the way I present myself.   ( )
* 7. I'm often the subject of my own fantasies.   ( )
8. I have trouble working when someone is watching me.   ( )
* 9. I never scrutinize myself.   ( )
10. I get embarrassed very easily.   ( )
11. I'm self conscious about the way I look.   ( )
12. I don't find it hard to talk to strangers.   ( )
* 13. I'm generally attentive to my inner feelings.   ( )
14. I usually worry about making a good impression.   ( )
* 15. I'm constantly examining my motives.   ( )
16. I feel anxious when I speak in front of a group.   ( )
17. One of the last things I do before I leave my house is look in the mirror.   ( )
* 18. I sometimes have the feeling that I'm off somewhere watching myself.   ( )
19. I'm concerned about what other people think of me.   ( )
* 20. I'm alert to changes in my mood.   ( )
21. I'm usually aware of my appearance. ___ ( )

* 22. I'm aware of the way my mind works when I work through a problem. ___ ( )

23. Large groups make me nervous. ___ ( )

* Private self consciousness scale items
APPENDIX B

Instructions by Experimental Condition

For the Major Study
INCIDENTAL
MONITORING CONDITIONS
INSTRUCTIONS

Materials
1. desk and chair
2. index cards in shoebox
3. sharpened pencils
4. slot in desk
5. clock
6. post experimental questionnaires
7. consent forms and debriefing sheet

Procedure
The experimenter randomly assigns subject to condition. The subject is welcomed by the experimenter and asked to sit in the chair by the desk. The subject is asked to complete a consent form which describes the experiment. Any questions the subject may have are answered. After completion of the consent form, the following instructions are given depending upon the condition the subject is assigned to:

A. Do your best condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see, in front of you there are index cards in a box and pencils. The desk has (workbox) (a slot in it) to your left. Your task is to write down one idea for the use of wood per index card and then place the index card into the (slot in the desk) before continuing to the next card. You will have 20 minutes to do the best you can in terms of the number of ideas generated. Keep in mind that you are (workbox) to write down one idea per index card and then place the card in the (slot) before beginning a new card. Also, try to do the best you can within the time period. Are there any questions before you begin? As you can see, the clock shows it is _______. At the end of 20 minutes, I will collect your work. You may now begin.
B. Specific goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see, in front of you there are index cards in a box and pencils. The desk has (workbox) (a slot in it) to your left. Your task is to write down one idea for the use (workbox) of wood per index card and then place the index card into the (slot in the desk) before continuing to the next card. You will have 20 minutes to do the task. Based on previous research, I will ask you to set a hard but obtainable goal of generating 80 ideas within the time period. Keep in mind that you are (workbox) to write down one idea per index card and then place the card in the (slot) before beginning a new card. Also, try to reach the set goal of generating 80 ideas within the time limit. Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of 20 minutes, I will collect your work. You may now begin.

After completion of the task, subjects in both conditions are asked to complete two post experimental questionnaires. Once they are completed, subjects are debriefed and thanked for their participation. After the subject leaves, the experimenter collects the completed index cards, counts the number completed and places a rubber band around the stack with the subject number attached.
PURPOSEFUL MONITORING

INSTRUCTIONS

Materials

1. desk and chair
2. index cards in box
3. sharpened pencils
4. clock
5. check off sheet
6. slot in desk
7. post experimental questionnaires
8. consent form and debriefing sheet

Procedure

The experimenter randomly assigns subjects to condition. The subject is welcomed and asked to sit in the chair by the desk. The subject completes a consent form which describes the experiment. After completion of the consent form, the following instructions are given depending on the condition the subject is assigned to:

A. Do your best condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood and wood products. As you can see, in front of you there are index cards, pencils and a piece of paper called a check off sheet. Your task is to take one index card at a time from the box and write down an idea for the use of wood. After writing down the idea, place the card in the slot in the desk to the left. Then cross off the number on the check off sheet to record that an index card has been completed before continuing to the next card. You will have twenty minutes to do this task. I will ask you to try to do the best you can, that is, try to generate as many ideas as possible within the twenty minute period. Keep in mind that you are to write down one idea per index card, place the card in the slot and then check off the number on the sheet before continuing to the next card. Also try to do the best you can within the time...
limit. Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of 20 minutes I will return to collect your work. You may now begin.

B. Specific goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood and wood products. As you can see, in front of you there are index cards, pencils and a piece of paper called a check off sheet. Your task is to take one index card at a time from the box and write down an idea for the use of wood. After writing down the idea, place the card in the slot in the desk to the left. Then cross off the number on the check off sheet to record that an index card has been completed before continuing to the next card. You will have twenty minutes to do this task. Based on previous research, I will ask you to set a hard but obtainable goal of generating 80 ideas or more within the twenty minute period. To remind you of this goal, please circle the number 80 on the check off sheet. Keep in mind that you are to write down one idea per index card, place the index card in the slot and then check off the number on the sheet before continuing to the next card. Also try to generate 80 ideas or more within the time period. Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of 20 minutes, I will return to collect your work. You may now begin.

After completion of the task, subjects are asked to respond to two questionnaires. Before completing the questionnaires, the check off sheet is collected. Subjects are then debriefed and thanked for their participation. The experimenter collects the completed cards, counts them and places a rubber band around the cards with the subject number on top.
INCIDENTAL MONITORING CONDITIONS

INSTRUCTIONS

Materials

1. desk and chair
2. index cards in box
3. slot in desk
4. pencils
5. clock
6. norm reference chart
7. questionnaires
8. consent form and debriefing

Procedures

Subjects for the study have been randomly assigned to condition. The subject is welcomed by the experimenter and asked to sit in the chair by the desk. After a brief introduction to the study, the subject is asked to read a consent form prior to participating in the experiment. After completion of the form, the following instructions are given depending upon the goal condition the subject is assigned to:

A. Self set moderate goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see in front of you there are index cards in a box and some pencils. Your task is to write down one idea for the use of wood (anything that comes into your mind) on an index card and then place the card in the (slot in) the desk before continuing to the next card. You will have twenty minutes to do the best you can, that is, try to come up with as many ideas for the use of wood as possible.

To provide you with information that you might find is helpful in doing the best that you can on the task, we have constructed a chart which summarizes the results of the study. So far, approximately 300
students, similar to yourself, who were enrolled in introductory psychology classes at Michigan State and other universities have participated in this study. The chart summarizes the results of the study for those 300 students who have already participated. As you can see, there is a list of the number of ideas students have come up with within the twenty minute period. Students have varied a great deal in the number of ideas generated—from 5 to 105 ideas. More specifically, approximately 33% (15 of the 300 students) of the students wrote between 5 to 25 ideas while another 33% (N = 15) of the students came up with 85 to 105 ideas. In addition, approximately 20% (60 out of 300) of the students who completed the study generated between 25 to 45 ideas while another 20% wrote between 65 to 85 ideas (show shaded areas). The largest number of students, about 50%, generated between 45 to 65 ideas within twenty minutes. The number in the box (point to)—55, refers to the number of ideas students tended to come up with in the study. Do you have any questions about the chart and what it means? (make sure they understand).

Regardless of what other people have done, keep in mind that you are to write down one idea per index card and to try to do the best you can in terms of writing as many ideas as possible within the time period. (workbox)
Place each completed card in the (slot) before going to the next card.
Are there any questions before you begin? As you can see, the clock shows it is ______. At the end of twenty minutes, I will return to collect your work. You may now begin.

B. Self set difficult goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood. As you can see in front of you there are index cards in a box
and some pencils. Your task is to write down one idea for the use of wood (anything that comes into your mind) on an index card and then place the card in the slot in the desk before continuing to the next card. You will have twenty minutes to do the best you can, that is, try to come up with as many ideas for the use of wood as possible.

To provide you with information that you might find is helpful in doing the best that you can on the task, we have constructed a chart which summarizes the results of the study. So far, approximately 300 students, similar to yourself, who were enrolled in introductory psychology classes at Michigan State and other universities have participated in this study. The chart summarizes the results of the study for those 300 students who have already participated. As you can see, students have varied a great deal in the number of ideas generated—from 30 to 130 ideas. More specifically, approximately 5% (15 of the 300 students) of the students wrote between 30 to 50 ideas while another 5% (N = 15) of the students came up with 110 to 130 ideas. In addition, approximately 20% (60 out of 300) of the students who completed the study generated between 50 to 70 ideas while another 20% wrote between 90 to 110 ideas (show shaded areas). The largest number of students, about 50%, generated between 70 to 90 ideas within twenty minutes. The number in the box (point to)—80, refers to the number of ideas students tended to come up with in the study. So you have any questions about the chart and what it means? (make sure they understand).

Regardless of the information you just received, keep in mind that you are to write down one idea per index card and to try to do the best you can in terms of writing as many ideas as possible within the time
period. Place each completed card in the slot before going to the next card. Are there any questions before you begin? As you can see, the clock shows it is ____. At the end of twenty minutes, I will return to collect your work. You may now begin.
A. Self set moderate goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood and wood products. As you can see in front of you there are index cards, pencils and a piece of paper called a check off sheet. Your task is to take one index card at a time from the box and write down an idea for the use of wood. After writing down the idea, place the card in the slot in the desk to the left. Then cross off the number on the checkoff sheet to record that an index card has been completed before continuing to the next card. You will have twenty minutes to do this task. I will ask you to try to do the best you can, that is, try to generate as many ideas as possible within the twenty minute period.

To provide you with information that you might find is helpful in doing the best you can on the task, we have constructed a chart which summarizes the results of the study. So far, approximately 300 students, similar to yourself, who were enrolled in introductory psychology classes at Michigan State and other universities have participated in this study. The chart summarizes the results of the study for those 300 students who have already participated. As you can see, here is a list of the number of ideas students have come up with within the twenty minute period. Students have varied a great deal in the number of ideas generated – from 5 to 105 ideas. More specifically, approximately 5% (15 out of 300 students) of the students wrote between 5 to 25 ideas while another 5% (N=15) of the students came up with 85 to 105 ideas. In addition, approximately
20% (60 out of 300) of the students who completed the study generated between 25 to 45 ideas while another 20% wrote between 65 to 85 ideas. The largest number of students, about 50%, generated between 45 to 65 ideas within twenty minutes. The number in the box – 55 refers to the number of ideas students tended to come up with in the study. Do you have any questions about the chart and what it means?

Regardless of what other people have done, keep in mind that you are to write down one idea per index card and to try to do the best you can in terms of writing as many ideas as possible within the time period. Place each completed card in the slot before going to the next card and mark the check off sheet. Are there any questions before you begin?

As you can see, the clock shows it is __. At the end of twenty minutes, I will return to collect your work. You may now begin.

B. Self set difficult goal condition. The research you are about to participate in today is sponsored by a company interested in the uses of wood and wood products. As you can see in front of you there are index cards, pencils and a piece of paper called a check off sheet. Your task is to take one index card at a time from the box and write down an idea for the use of wood. After writing down the idea, place the card in the slot in the desk to the left. Then cross off the number on the check off sheet to record that an index card has been completed before continuing to the next card. You will have twenty minutes to do the best you can, that is, try to come up with as many ideas for the use of wood as possible.

To provide you with information that you might find is helpful in doing the best that you can on the task, we have constructed a chart which summarizes the results of the study. So far, approximately 300 students, similar to yourself, who were enrolled in introductory psychology classes.
at Michigan State and other universities have participated in this study. The chart summarizes the results of the study for those 300 students who have already participated. As you can see, students have varied a great deal in the number of ideas generated — from 30 to 130 ideas. More specifically, approximately 5% (15 of the 300 students) of the students wrote between 30 to 50 ideas while another 5% (15) of the students came up with 110 to 130 ideas. In addition, approximately 20% (60 out of 300) of the students who completed the study generated between 50 to 70 ideas while another 20% wrote between 90 to 110 ideas. The largest number of students, about 50%, generated between 70 to 90 ideas within twenty minutes. The number in the box - 80 refers to the number of ideas students tended to come up with in the study. Do you have any questions about the chart and what it means?

Regardless of the information you just received, keep in mind that you are to write down one idea per index card and to try to do the best you can in terms of writing as many ideas as possible within the time period. Place each completed card in the slot and mark the check off sheet before going to the next card. Are there any questions before you begin? As you can see, the clock shows it is ___. At the end of twenty minutes, I will return to collect your work. You may now begin.
MICHIGAN STATE UNIVERSITY
Department of Psychology

DEPARTMENTAL RESEARCH CONSENT FORM

1. I have freely consented to take part in a scientific study being conducted by: ___________________________

under the supervision of: ___________________________

Academic Title: ___________________________

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed: ___________________________

Date: ___________________________

TITLE OF RESEARCH PROJECT: ___________________________
## CHECK OFF SHEET

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<td>99</td>
<td>124</td>
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<tr>
<td></td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
</tr>
</tbody>
</table>

114
APPENDIX C

Post Experimental Questionnaires

For the Major Study
1. How specific was the goal given you to meet by the experimenter, that is, did you know how many ideas you were supposed to generate?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not specific</td>
<td></td>
<td></td>
<td></td>
<td>somewhat</td>
<td>extremely</td>
</tr>
<tr>
<td>at all</td>
<td></td>
<td></td>
<td>specific</td>
<td></td>
<td>specific</td>
</tr>
</tbody>
</table>

2. As you were completing the task, did you have a specific number of ideas that you were trying to generate or did you work on the task without any specific number in mind? Please explain.

3. How difficult did you find this task?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not difficult</td>
<td></td>
<td></td>
<td>moderately difficult</td>
<td></td>
<td>extremely difficult</td>
</tr>
<tr>
<td>at all</td>
<td></td>
<td></td>
<td>difficult</td>
<td></td>
<td>difficult</td>
</tr>
</tbody>
</table>

4. To what extent did you try to keep in mind the number of ideas you were generating as you progressed on the task?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>to no extent</td>
<td></td>
<td></td>
<td>to some extent</td>
<td></td>
<td>to a considerable extent</td>
</tr>
</tbody>
</table>

5. How many ideas do you believe you actually came up with during the task? (please give one number)

6. How confident are you that the estimate above (question 5) is close to the actual number of ideas you generated?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not confident</td>
<td></td>
<td></td>
<td>somewhat confident</td>
<td></td>
<td>extremely confident</td>
</tr>
<tr>
<td>at all</td>
<td></td>
<td></td>
<td>confident</td>
<td></td>
<td>confident</td>
</tr>
</tbody>
</table>

7. How much effort did you put into doing this task?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>minimal amount</td>
<td></td>
<td></td>
<td>moderate amount</td>
<td></td>
<td>maximal amount</td>
</tr>
</tbody>
</table>
8. At what point in the experiment did you feel that you worked the hardest?

1  2  3  4
first five minutes  second five minutes  third five minutes  last five minutes

9. How satisfied are you with how well you did on this task?

1  2  3  4  5  6  7
completely unsatisfied  completely satisfied

10. How would you describe the instructions given by the experimenter about how to complete the task?

1  2  3  4  5  6  7
very confusing  very clear

11. To what extent would you have liked to have placed the completed index cards in front of you instead of the desk slot in order to see your progress on the task over time?

1  2  3  4  5
not at all  to some extent  to a considerable extent

12. To what extent did you glance or look at the clock in the room to check the time you had left to complete the task?

1  2  3  4  5
not at all  to some extent  to a considerable extent

13. How many times did you glance or look at the clock in the room to check the time you had left to complete the task? (please give one number)

---

Background Information:

Sex: Male   Female   Age: _____
PHYSICAL MONITORING CONDITION
POST EXPERIMENTAL QUESTIONNAIRE

1. How specific was the goal given you to meet by the experimenter, that is, did you know how many ideas you were supposed to generate?

   1  2  3  4  5
not specific  somewhat  extremely
at all       specific

2. As you were completing the task, did you have a specific number of ideas that you were trying to generate or did you work on the task without any specific number in mind? Please explain.

3. How difficult did you find this task?

   1  2  3  4  5
not difficult  moderately  extremely
at all        difficult

4. To what extent did you try to keep in mind the number of ideas you were generating as you progressed on the task?

   1  2  3  4  5
 to no extent to some extent
to a considerable extent

5. How many ideas do you believe you actually came up with during the task? (please give one number)

6. How confident are you that the estimate above (question 5) is close to the actual number of ideas you generated?

   1  2  3  4  5
not confident  somewhat  extremely
at all        confident

7. How much effort did you put into doing this task?

   1  2  3  4  5
minimal amount moderate amount
maximal amount

120
8. At what point in the experiment did you feel that you worked the hardest?

<table>
<thead>
<tr>
<th></th>
<th>1st five minutes</th>
<th>2nd five minutes</th>
<th>3rd five minutes</th>
<th>4th five minutes</th>
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<tr>
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</table>

9. How satisfied are you with how well you did on this task?

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<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>completely</td>
<td>unsatisfied</td>
<td>completely</td>
<td>satisfied</td>
<td></td>
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</tbody>
</table>

10. How would you describe the instructions given by the experimenter about how to complete the task?

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<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>very</td>
<td>confusing</td>
<td>very</td>
<td>clear</td>
<td></td>
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</tr>
</tbody>
</table>

11. To what extent during the twenty minute period did you look at the index card in the workbox to see how well you were doing on the task?

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<th>1</th>
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<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
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</tr>
</tbody>
</table>

12. To what extent did you glance or look at the clock in the room to check the time you had left to complete the task?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>not at all</td>
<td>to some extent</td>
<td>to a considerable extent</td>
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</tbody>
</table>

13. How many times did you glance or look at the clock in the room to check the time you had left to complete the task? (please give one number)

__________________________

Background Information:

Sex: Male _____ Female _____ Age: _____
POST EXPERIMENTAL QUESTIONNAIRE

1. Briefly describe the information on the chart that was presented to you before starting the task.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. What were your first reactions to the information presented on the chart?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

3. In what way, if any, did the information from the chart affect your thoughts as to how many ideas you could come up with within the twenty minute period?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

4. As you were completing the task, did you have a specific goal or number of ideas you were trying to generate or did you work on the task without any specific goal in mind? Please explain.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

a. If you did set a specific goal, what was the number of ideas you were trying to reach?

__________________________________________________________________________

b. Why did you select that number to be your goal?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

c. Did your goal change at any time during the task? yes ____ no ____

   If you answered yes please explain what you did and why.

__________________________________________________________________________
5. How difficult did you find the task?

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>not difficult</td>
<td>moderately</td>
<td>difficult</td>
<td>extremely</td>
<td></td>
</tr>
<tr>
<td>at all</td>
<td></td>
<td></td>
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</tbody>
</table>

6. To what extent did you try to keep in mind the number of ideas you were generating as you progressed on the task?

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. How many ideas do you believe you actually came up with during the task? (please give one number)

8. How confident are you that the estimate above (question 7) is close to the actual number of ideas you generated?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not confident</td>
<td>somewhat confident</td>
<td>extremely confident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. How much effort did you put into doing the task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a minimal amount</td>
<td>a moderate amount</td>
<td>a maximal amount</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. To what extent did the information from the chart increase your desire or willingness to do the best that you could on the task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please explain: ____________________________________________________________

11. At what point in the study did you feel that you worked the hardest?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>first five minutes</td>
<td>second five minutes</td>
<td>third five minutes</td>
<td>last five minutes</td>
</tr>
</tbody>
</table>

123
12. How satisfied are you with how well you did on this task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>completely unsatisfied</td>
<td>completely satisfied</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. How would you describe the instructions given by the experimenter about how to accomplish the task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>very confusing</td>
<td>very clear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. How many times during the study did you glance at the clock in the room to check on the time you had left?

15. How many times did you look at the chart once you started the task? _____

What was the reason for looking at the chart?

16. To what extent did you accept the information on the chart as an accurate reflection of how other students had done on the task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Why do you think you were given the information from the chart?

18. To what extent during the twenty minute period did you look at the index cards in the workbox to see how well you were doing on the task?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>to no extent</td>
<td>to some extent</td>
<td>to a considerable extent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Background Information:

Sex: Male _____ Female _____ Age: _____
APPENDIX D

Descriptive Statistics for Supplementary Analyses
<table>
<thead>
<tr>
<th>Condition</th>
<th>Confidence M</th>
<th>Confidence SD</th>
<th>Task Difficulty M</th>
<th>Task Difficulty SD</th>
<th>Effort Level M</th>
<th>Effort Level SD</th>
<th>Monitor Time M</th>
<th>Monitor Time SD</th>
<th>Desire for Task Feedback M</th>
<th>Desire for Task Feedback SD</th>
<th>Satisfaction M</th>
<th>Satisfaction SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Your Best Goal Condition (N=43)</td>
<td>3.16</td>
<td>1.09</td>
<td>1.88</td>
<td>0.88</td>
<td>3.91</td>
<td>0.75</td>
<td>4.52</td>
<td>3.18</td>
<td>5.21</td>
<td>1.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Monitoring (N=15)</td>
<td>2.53</td>
<td>0.83</td>
<td>1.53</td>
<td>0.83</td>
<td>3.67</td>
<td>0.82</td>
<td>4.00</td>
<td>2.25</td>
<td>2.80</td>
<td>1.52</td>
<td>5.47</td>
<td>1.12</td>
</tr>
<tr>
<td>Physical Monitoring (N=14)</td>
<td>3.14</td>
<td>0.66</td>
<td>1.71</td>
<td>0.91</td>
<td>4.07</td>
<td>0.62</td>
<td>4.21</td>
<td>2.33</td>
<td>3.14</td>
<td>1.03</td>
<td>5.86</td>
<td>1.02</td>
</tr>
<tr>
<td>Purposeful Monitoring (N=14)</td>
<td>3.86</td>
<td>1.29</td>
<td>2.43</td>
<td>0.64</td>
<td>4.00</td>
<td>0.78</td>
<td>5.36</td>
<td>4.50</td>
<td>4.29</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assigned Difficult Goal Condition (N=40)</td>
<td>3.47</td>
<td>0.82</td>
<td>2.23</td>
<td>0.97</td>
<td>4.05</td>
<td>0.85</td>
<td>3.79</td>
<td>2.23</td>
<td>4.98</td>
<td>1.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Monitoring (N=14)</td>
<td>3.21</td>
<td>0.97</td>
<td>1.93</td>
<td>0.92</td>
<td>4.00</td>
<td>0.87</td>
<td>2.85</td>
<td>0.99</td>
<td>2.92</td>
<td>1.38</td>
<td>4.79</td>
<td>1.31</td>
</tr>
<tr>
<td>Physical Monitoring (N=13)</td>
<td>3.23</td>
<td>0.44</td>
<td>2.54</td>
<td>0.88</td>
<td>4.08</td>
<td>0.64</td>
<td>4.69</td>
<td>2.63</td>
<td>2.54</td>
<td>0.97</td>
<td>4.66</td>
<td>1.77</td>
</tr>
<tr>
<td>Purposeful Monitoring (N=13)</td>
<td>4.00</td>
<td>0.71</td>
<td>2.23</td>
<td>1.09</td>
<td>4.08</td>
<td>1.04</td>
<td>3.85</td>
<td>2.44</td>
<td>5.69</td>
<td>0.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Set Moderate Goal Condition (N=36)</td>
<td>3.31</td>
<td>1.09</td>
<td>1.97</td>
<td>0.94</td>
<td>4.00</td>
<td>0.68</td>
<td>4.26</td>
<td>2.33</td>
<td>5.06</td>
<td>1.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Monitoring (N=12)</td>
<td>2.58</td>
<td>0.90</td>
<td>1.75</td>
<td>0.97</td>
<td>3.92</td>
<td>0.67</td>
<td>3.67</td>
<td>1.97</td>
<td>3.17</td>
<td>1.47</td>
<td>4.50</td>
<td>1.65</td>
</tr>
<tr>
<td>Physical Monitoring (N=12)</td>
<td>3.09</td>
<td>1.04</td>
<td>2.00</td>
<td>0.95</td>
<td>3.91</td>
<td>0.94</td>
<td>4.73</td>
<td>2.45</td>
<td>3.09</td>
<td>0.70</td>
<td>5.55</td>
<td>1.29</td>
</tr>
<tr>
<td>Purposeful Monitoring (N=12)</td>
<td>4.15</td>
<td>0.68</td>
<td>2.17</td>
<td>0.94</td>
<td>4.15</td>
<td>0.38</td>
<td>4.45</td>
<td>2.62</td>
<td>5.15</td>
<td>1.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Set Difficult Goal Condition (N=36)</td>
<td>3.03</td>
<td>1.03</td>
<td>2.00</td>
<td>0.91</td>
<td>4.11</td>
<td>0.89</td>
<td>3.94</td>
<td>2.66</td>
<td>4.96</td>
<td>1.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Monitoring (N=12)</td>
<td>2.58</td>
<td>1.08</td>
<td>2.00</td>
<td>1.12</td>
<td>4.25</td>
<td>0.75</td>
<td>3.67</td>
<td>2.31</td>
<td>2.67</td>
<td>1.30</td>
<td>5.00</td>
<td>1.28</td>
</tr>
<tr>
<td>Physical Monitoring (N=12)</td>
<td>2.67</td>
<td>0.78</td>
<td>1.50</td>
<td>0.81</td>
<td>3.75</td>
<td>0.97</td>
<td>4.82</td>
<td>3.84</td>
<td>2.67</td>
<td>1.30</td>
<td>4.67</td>
<td>1.67</td>
</tr>
<tr>
<td>Purposeful Monitoring (N=12)</td>
<td>3.83</td>
<td>0.72</td>
<td>2.50</td>
<td>0.52</td>
<td>4.33</td>
<td>0.89</td>
<td>3.36</td>
<td>1.12</td>
<td>4.92</td>
<td>1.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 8

**Correlation of Performance Level and Accuracy by Goal Condition for the Incidental Monitoring Conditions**

<table>
<thead>
<tr>
<th>Goal Condition</th>
<th>N</th>
<th>Accuracy - Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Your Best</td>
<td>29</td>
<td>.14</td>
</tr>
<tr>
<td>Assigned Difficult</td>
<td>27</td>
<td>.33**</td>
</tr>
<tr>
<td>Self Set Moderate</td>
<td>23</td>
<td>.58***</td>
</tr>
<tr>
<td>Self Set Difficult</td>
<td>24</td>
<td>.30*</td>
</tr>
</tbody>
</table>

* p < .10  
** p < .05  
*** p < .01

*The higher the score on the accuracy measure the lower the accuracy of the individual.*
Table 9
Mean Accuracy Indices by Experimental Conditions

<table>
<thead>
<tr>
<th>Goal Condition</th>
<th>Cognitive</th>
<th>Physical</th>
<th>Purposeful</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>A. Do Your Best</td>
<td>14.07</td>
<td>12.57</td>
<td>18.36</td>
<td>17.35</td>
</tr>
<tr>
<td>B. Assigned Difficult</td>
<td>16.35</td>
<td>21.73</td>
<td>17.15</td>
<td>14.03</td>
</tr>
<tr>
<td>D. Self Set Difficult</td>
<td>26.36</td>
<td>20.03</td>
<td>20.25</td>
<td>16.09</td>
</tr>
<tr>
<td>Overall</td>
<td>18.49</td>
<td>18.24</td>
<td>16.12</td>
<td>15.58</td>
</tr>
</tbody>
</table>

*Mean Accuracy Index was calculated by subtracting actual performance quantity from the estimate of performance by the subject.*