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Managing Time: The Effects of Personal Goal Setting on Resource Allocation Strategy and Task Performance

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ABSTRACT. One key to understanding motivated behavior is examining the behavior of individuals as they work on multiple tasks under a time constraint. This article is an exploration of the influence of self-set goals on subsequent resource allocation to different tasks. Participants were given a variety of tasks from which they were to choose how to allocate their time and effort. Results indicated that the use of self-set goals structured the work pattern, with less switching between tasks relative to the work pattern of a group of participants who did not set goals. In addition, those who set goals reported less task-related cognitive interference, indicating that they were not as distracted while they worked. Participants who did not set goals, however, performed at a higher level on some of the tasks. It is suggested that self-set goals may often be chosen at an easily attainable level, creating a structured and focused work environment but not necessarily eliciting the motivational properties typically associated with goal setting.

Key words: cognitive interference, goals, motivation, multitasking, strategy

“SO MUCH TO DO, SO LITTLE TIME” describes the plight facing many people as they attempt to deal with the multiple tasks facing them, as there is often an overwhelming number of jobs from which to choose. The strategies people use to deal with these options are an integral part of understanding motivated behavior. Although several strides have been made in the dynamic study of motivation (Atkinson & Birch, 1986; Kuhl, 1985; Naylor, Pritchard, & Ilgen, 1980), one of the criticisms of most current theories is that they center around behavior on one task at one given time (Kanfer, 1992). Our purpose in the present study was to examine how the process of setting performance goals may influence people’s strategies as they work on multiple tasks.

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Various explanations have been provided for the robust effect of specific and challenging goals on performance. From the goal setting theory literature, the focus has typically been on the direct mediating mechanisms through which a goal may exhibit its effects (Locke & Latham, 1990). As commonly recognized (Mitchell, 1982), motivational processes act through increasing effort, persistence, and direction of attention to the task. Likewise, goal-setting theorists have examined each of these potential mediators as they help to explain the goal–performance relationship, and support has been found for each (Bandura & Cervone, 1983; Rothkopf & Kaplan, 1972; Sales, 1970).

Another somewhat more controversial mediating mechanism is the development of task strategies following goal setting. Terborg (1976) found that participants assigned goals were more likely to engage in remembering strategies than participants not assigned goals. Earley, Wojnaroski, and Prest (1987) demonstrated that participants given specific, difficult goals were more likely to develop plans for idea generation than participants given a “do your best” goal. These researchers suggested that task planning may be one of the ways in which goals exhibit a positive effect on performance, although subsequent research indicates that this effect may hold only for relatively simple tasks (Earley, Connolly, & Ekegren, 1989; Gist, Bavetta, & Stevens, 1990).

In research somewhat related to the idea of strategy development, Ilgen, Salas, Shapiro, and Weiss (1988) suggested that goals may affect individuals by providing structure to ambiguous situations. Individuals who set their own goals may have a higher level of intrinsic motivation, which, in turn, has a positive effect on performance. Intrinsic motivation refers to behavior that is performed for its own sake (Deci, 1975). Erez, Gopher, and Arzi (1990) found that performance was greater in self-setting goal conditions than when participants were assigned goals on dual tasks. Intrinsic motivation is connected to goal setting in that people are more apt to attain higher levels of performance on tasks when their perceived control is not affected by external influence.

The purpose of this article is to present research investigating the impact of goals on strategy development in situations of multiple tasks and time constraints. Kernan and Lord (1990) examined the impact of multiple tasks and goal setting under varying incentive conditions. These authors noted the lack of research in this area, although they cited suggestions that multiple goals lead to a reduction of task conflict via development of priority systems for ordering their goals. Kernan and Lord speculated that people use situational cues such as indicators of goal importance and the magnitude of perceived goal discrepancies. When importance cues, such as incentives, are present for one task, the associated goal will have priority over the other goal. However, when this information is not present, people rely on perceived goal discrepancies to develop their priority system. The authors speculated that “one essentially lowers the priority of the task with the higher discrepancy, a response that parallels what is known as disengagement from control systems in the social psychology” (p. 195). This
response is said to be adaptive in a work environment and enables people to cope with conflicting pressures.

Actually, this approach seems to be contradictory to that suggested by work in control theory (Campion & Lord, 1982). These authors found that participants' degree of dissatisfaction was larger when the goal–performance discrepancy was larger. Thus, if people do operate on a hedonistic basis (an assumption of several prominent motivation theories), it is a bit surprising that they would elect to widen a discrepancy in one area rather than minimize discrepancies across areas. The idea that it is organizationally adaptive to sacrifice one task for another also seems questionable. If no cues have indicated that one task is considered more important than another, it would seem preferable to have some degree of preparation across all tasks. This strategy would minimize the probability of looking incompetent if information regarding a particular task was requested by a supervisor.

With regard to behavior under multiple tasks, we predicted that the use of self-set goals would lead to different strategies and performance than would be observed in the absence of self-set goals. To explore this hypothesis, we compared two groups, one of which was given instructions to set personal performance goals and the other of which was not given any instructions. We predicted that the process of setting goals for the tasks would result in a strategy of sequentially working on each task, with minimal switching between tasks.

Initially, the goal-setting process is thought to clarify an ambiguous situation and lead to the development of a planning strategy for the multiple tasks (e.g., I will reach X amount on the first task, then move to the second to reach Y). Once the first task has begun, goals are predicted to operate in their highly documented fashion by directing attention to that task at the expense of others, by increasing effort on the task, and by increasing persistence on the task until the goal is reached. Thus, in total, the process of setting a goal under multiple tasks would result in a more planned approach to the tasks, with less switching between them. Thus, our first hypothesis was that participants who set performance goals would switch between tasks less frequently than participants who do not set performance goals.

In addition to strategy differences, we investigated potential performance differences between those who set goals and those who do not. Boyce (1992), Hall and Byrne (1988), and Lee and Edwards (1984) each conducted studies investigating goal setting and found significant differences between groups with goals (assigned and self-set) and the control group (no goal). They did not find significant differences between the groups with goals, either assigned or self-set. Erez et al. (1990) found that participants who self-set goals and did not receive monetary rewards had the highest levels of performance and that performance decreased when monetary rewards were connected.

We predicted that the use of self-set goals under multiple tasks would increase total performance in two ways. First, we expected the typically demonstrated increase in performance due to effort (the motivational impact of goals).
Second, a side-effect of the decrease in switching between tasks should also increase performance. Often in real work settings, as in the current experiment, a fair amount of time is required to acquaint oneself with a given task. In these cases, it would not be advantageous to switch tasks frequently. In the current experiment, we imposed a 5 s "penalty" for switching tasks, in which information about performance on the previous task is displayed. This, in addition to cognitive adjustments made as a result of switching, should contribute to a total performance advantage for the goal-setting group relative to the no-goal group. Thus, our second hypothesis was that participants who set performance goals would perform at a higher level than those who do not set goals.

We also explored the role of perceptions of cognitive interference as the participants attempted to work in the multiple-task environment. Cognitive interference can be referred to as the intrusive thoughts that distract an individual and direct attention away from a task (Sarason, Sarason, Hayes, & Shearin, 1986). These intrusive thoughts may either be task related (questions to one's self relating to the task on hand) and task unrelated (inner talk that is not related to the task). In this study, we used the task related Cognitive Interference subscale from the Cognitive Interference Questionnaire developed by Sarason et al. Our third hypothesis was consistent with the idea that goals provide structure to an ambiguous situation. Thus, cognitive interference would be higher for participants who do not set performance goals than for participants who do set performance goals.

Method

Participants

Participants were 116 undergraduate university students (73 women, 43 men) who participated in the study for course credit. Participants' average length of time at the university was 4 semesters, with a range of 1 to 11 semesters.

Task and Materials

We used the QuickBASIC programming language to generate a program that would allow participants to switch among three tasks. The experiment was run and responses were made on personal computers. Recorded output included demographic information, a practice trial score for each task, performance goals for each task chosen (in the appropriate condition), the time spent on each choice, and self-report information regarding task preferences.

We developed the three tasks to approximate the type of diversity that people experience in daily work. In fact, we hoped that the abilities needed for the various tasks would require different types of thought processes. In this way, switching from one task to another would result in a decrement in total performance because of the time needed to reacquaint oneself with a given task.
One task consisted of solving anagram puzzles, which presumably tapped into verbal abilities. A scrambled nonsense word was presented for the participant to unscramble to a common English word. For example, the nonsense word “ybo” was displayed, to be solved by typing “boy.” Pilot data revealed that the initial four-letter anagrams were too difficult for participants (relative to the other tasks) and that some items could be arranged to form more than one English word. To align this task with the other two, we used only three-letter words, and we checked the items used in this study to ensure that there was only one proper solution.

Another task, thought to depend on numeric ability, consisted of solving simple algebraic equations for an unknown variable, \( x \). For example, the expression “20/x = 4” was presented, and participants were to solve it by typing “5.” Equations contained a roughly equal amount of multiplication, division, subtraction, and addition problems. The solutions always consisted of integers to ensure that the items did not differ dramatically in terms of difficulty.

The other task was a spatial-relations task, which was thought to tap into spatial and perceptual abilities. Here, participants saw three pairs of letters that were displayed in randomly generated locations on the screen. To solve an item, participants were to type in the letter that corresponded to that having the furthest distance between pairs. For example, participants saw

\[
\begin{array}{ccc}
A & B & A \\
C & & B
\end{array}
\]

and they were to respond to this display by typing “C” as being the pair furthest apart. As in the previous two types of problems, the program was written such that there were no ties so that only one answer was correct.

**Procedure**

Participants were randomly assigned to either a goal-setting condition or a control condition and were seated in small cubicles containing a desk and a personal computer. They were given a brief overview of the experimental procedures and then were allowed to begin. Initially, demographic information (gender, semester in school) was requested. Participants were then given 2-min practice trials on each of the tasks, presented in a random order to prevent ordering effects. As participants worked on each task, a display in the right hand corner of the screen communicated the remaining time and the number of correct responses made by participants. When each 2-min practice period was complete, participants were again reminded how many correct answers they had given for each of the tasks.

The next part of the experiment consisted of a 10-min working period, in which participants were allowed to switch among the three tasks as they desired.
Instructions read:

Now you are to pretend that all 3 of these tasks are on your agenda of things to do. There will not be enough time to complete any of them, but you must try to decide how to spend your time on them during the next 10 minutes. A real life example of this situation would be that you have to: (1) clean your apartment, (2) study for a psychology exam, and (3) do your chemistry lab. However, you only have 1 hour before dinner. How are you going to spend your time among tasks? This is what you are to decide in this part of the experiment. You must spend the next 10 minutes working on some or all of the 3 tasks. You may move back and forth between tasks for any length of time that you want to. In other words, you may work on any task at any time that you would like.

At this time, participants in the self-set goal condition were asked to set performance goals. They were asked to indicate the number of correct responses they intended to reach for each task. The only difference between the experimental conditions was that half the participants were asked to provide performance goals, whereas half did not provide these goals.

As participants worked on the three tasks, a display in the upper right hand corner of the screen indicated the number of items that they had correctly answered and the time remaining in the 10-min period. A display in the upper left hand corner reminded participants that they could switch tasks by typing the word "switch."

At the end of the experimental session, participants answered a questionnaire assessing their cognitive interference. When the work period was complete, participants were debriefed and thanked for their participation.

Measures

Switching between tasks. Each time the participant typed "switch" in order to change tasks, this choice was recorded.

Performance. Final performance was measured as the number of items correctly answered on each of the three sections (anagram, numerical, and spatial).

On-task cognitive interference. Five items ($\alpha = .90$) assessed the extent to which participants experienced on-task cognitive interference: "I thought about how I was doing"; "I thought about how much time I had left"; "I thought about how I should work more carefully"; "I thought about how others have done on this task"; "I thought about the difficulty of the problems."

Results

We first compared pre-experimental performance for each of the experimental conditions to ensure that there were no initial group differences. Results
TABLE 1
Means for Switching, Cognitive Interference, and Performance Scores, by Experimental Condition

<table>
<thead>
<tr>
<th>Scores</th>
<th>Self-set goals</th>
<th>No goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching</td>
<td>3.52</td>
<td>5.03</td>
</tr>
<tr>
<td>Cognitive interference</td>
<td>3.75</td>
<td>4.31</td>
</tr>
<tr>
<td>Performance</td>
<td>2.04</td>
<td>2.32</td>
</tr>
</tbody>
</table>

showed no significant differences in spatial performance, t(114) = .04, ns; numerical performance, t(114) = .86, ns; or anagram performance, t(114) = .98, ns. Thus, we concluded that the groups did not initially differ in the extent to which they could complete the tasks.

The primary hypothesis regarding switching between tasks was supported, t(114) = 4.32, p < .05. Participants who self-set goals switched tasks significantly less often (an average of 3.52 times) than those who did not set goals (an average of 5.03 times). These results are presented in Table 1.

Cognitive interference was also explored as support for the idea that self-set goals provide a sense of structure while people work. The hypothesis that the process of setting goals would result in lower on-task distracting thoughts was supported, t(114) = 2.78, p < .05. Participants who set goals reported thinking about on-task concerns, on average, less frequently (3.75) than those who did not set goals (4.31).

We also hypothesized that the more structured approach to the multiple tasks (i.e., less switching) would give the self-set goal group a performance advantage over the no-goal group. This hypothesis was not supported. In fact, participants in the no-goal condition performed at a significantly higher level, t(114) = 2.45, p < .05, than those who did set goals (see Table 1).

A post hoc decision was made to explore whether on-task cognitive interference mediated the effect of the experimental condition on performance. That is, is it possible on these simple tasks that the increase in on-task thoughts (although perhaps stressful), also helped to motivate the no-goal participants? The full mediation analysis (described by Baron & Kenny, 1986) was halted when the proposed mediator (on-task interference) was not significantly related to performance, r(115) = -.09, ns.

A subsequent analysis of the self-set goal values provided some potential insight into the performance results. Anchoring from the practice trials, the time per task increased by 67%; however, the levels of self-set goals increased by an average of only 57%. Thus, participants in the self-set goal condition chose performance levels that were slightly lower, on average, than the performance they had reached during the practice trial.
Discussion

Our main purpose in this study was to examine individual behavior under conditions in which multiple tasks were to be performed. Research in goal setting has shown that goals can affect strategy formation and the planning of task behavior, and it has been suggested that goals can exhibit effects by structuring an ambiguous situation. Our primary hypothesis was that setting personal performance goals would result in a more systematic approach to the multiple tasks. Strategy use, the structuring effects of goals, and the motivational components typically activated during goal setting were all thought to contribute to this effect.

The data supported our hypothesis that participants who set performance goals switched tasks less frequently than did participants who were not asked to set goals. Therefore, this study has provided an important contribution to the motivational literature by documenting a relationship among self-set goals, cognitions, and strategy development in a multiple task environment. Prior to this study, it had merely been speculated that people may employ goal setting to reduce the ambiguity and potential stress associated with multiple tasks and time constraints.

Our findings support this idea and point to the role of self-set goals in a reduction in on-task related cognitive distractions. Thus, it appears that self-set goals may provide a structure that is associated with fewer switches between tasks and a stronger focus on the task at hand relative to concerns such as how one is doing, what one should be working on, and so forth.

However, our prediction that participants who set goals and switched tasks less frequently would outperform the participants who did not set goals was not supported. Our prediction that more time required to switch tasks and reacquaint oneself with a new task would result in performance decrements for participants who switched tasks more often was not supported.

It may be that performance increments are directly associated with goal difficulty. In fact, participants set goals that were fairly easy to complete in the 10-min period, considering their performance during the practice period. This finding is consistent with the work of Hinsz (1993), who found that individuals often set goals at a level they feel confident they can achieve. Thus, although self-set goals may provide a structuring function and a reduction in on-task stressful cognitions, they might not have the same motivational functions typically associated with assigned goal setting (Locke & Latham, 1990).

The experimental simulation presented in this research has many strengths. First, it responds to criticisms directed at much motivational research in which behavior is examined for only a single task. The problem with single-task research is that it does not approximate the types of daily pressures that most people experience, in which there are many tasks that they must choose between for their motivational resource allocation.

Another strength of this study is in the methodological rigor of the labora-
tory simulation. Participants were randomly assigned to experimental conditions and were not aware of the differences between the conditions, thus reducing the potential impact of participant effects. In addition, the experimenter had minimal interaction with the participants and was not aware of the hypotheses of the study. Therefore, the potential for experimenter effects was also minimized.

The measurement of the variables was another strength of the current study. The primary strategy and performance variables were collected unobtrusively and with little room for measurement error. The cognitive interference variable also reflected good measurement properties. In total, the methodological rigor of this study indicates that internal validity was a major strength of the study.

As with many laboratory simulations, an important limitation of this study lies in the lack of external validity. It is not clear that the types of goals the participants set match the types of goals that are set in real life. Here, only quantitative performance goals were set, and each task was fairly simple. It is unknown whether complex or creative tasks would yield the same results. In addition, the short time frame of this study did not allow for goal abandonment, which may occur in real life when the goals become incompatible, or a new opportunity is presented. Failure to attain goals in a multiple-task environment may actually lead to increased stress and on-task distractions. Thus, several external validity considerations limit the generalizability of the findings.

As a first step, however, this study has many implications for future research. For example, research could address the pros and cons of using self-set goals. The primary findings suggest that people who set goals in their daily lives may be more focused and may use a strategy in which they work on each task sequentially. Intuitively, it seems that this approach would be advantageous in many cases, as less time would be wasted adjusting to new tasks each time a switch is made. On the other hand, there may be situations in which this strategy could lead to gross deficiencies on some tasks relative to others. Further research should address these questions.

Another area for future research is the effect of self-set goals on intrinsic motivation to perform a task. Some researchers have compared self-set goals to goals imposed by others, with the suggestion that individuals who set their own goals have a higher level of intrinsic motivation (Erez et al., 1990). Intrinsic motivation is likely to be highest when perceived control is not affected by any external influence (Deci, 1975). The finding that monetary rewards actually decreased the intrinsic value of self-set goals (Erez et al.) suggests that the reduction of cognitive interference observed in the present study might not occur if self-set goals are seen as an external, or controlling, influence (vs. a structuring influence). Future research could address this proposition.

Finally, a worthwhile area for future research that was not investigated in the current study is need for achievement (McClelland, Atkinson, Clark, & Lowell, 1953). Need for achievement is a variable that describes a person's drive to excel and to set personal goals that are challenging but attainable. McClelland (1961)
documented the relationship between the number of achievement ideas in textbooks and the economic growth of countries, thus suggesting the role of the environment in shaping need for achievement. Given the potential link between need for achievement and goal-setting behavior, further research could explore the role of need for achievement in people's use of goal setting within a multiple-task environment and how this might affect the level of goals set and performance achieved.

In summary, future research could provide interesting insights regarding the impact of personal performance goals in situations containing multiple tasks. These scenarios seem to capture a real-life component of motivated behavior that is often missed in empirical research. For example, it is quite likely that some people employ goals during their progress through daily tasks, whereas others do not. However, little is currently known about what causes people to set goals spontaneously (Wright, 1990), or of the differences between people who adopt different strategies. It also seems likely that the practice of setting goals to structure one's work day has ramifications for task strategy, performance, and perhaps even job satisfaction. Further work in this area should provide useful information regarding this underrepresented aspect of human motivation.

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