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Effects of Task Autonomy on Performance: An Extended Model Considering Motivational, Informational, and Structural Mechanisms

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A model explaining the relationship between task autonomy and performance is proposed that incorporates 3 different causal mechanisms. The performance benefits of task autonomy may be realized by increased motivation (motivational mechanisms), by capitalization of information asymmetries (informational mechanisms), or by better alignment with task and organizational structures (structural mechanisms). Further, it is proposed that these performance benefits are moderated by a variety of variables ranging from individual traits to organizational design. This model may provide a means for accounting for the sometimes inconsistent findings in the empirical literature exploring the relationship between autonomy and performance. The model also offers guidance in the search for additional boundary conditions as well as prescriptive guidelines for the allocation of autonomy in practice.

> Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.
>
> —General George S. Patton

The notion of task autonomy—giving the individual who performs a task considerable discretion and control in deciding how to carry it out—is as old as organizations themselves. The widespread and organized use of task autonomy in organizations, however, is a relatively modern phenomenon. Rarely used systematically before 1980, by the mid 1990s, task autonomy and related forms of employee participation were used in more than 90% of Fortune 1000 companies (Lawler, Mohrman, & Ledford, 1995). Giving task autonomy to employees is generally expected to result in higher motivation, satisfaction, and performance (Argote & McGrath, 1993; Dwyer, Schwartz, & Fox, 1992; Loher, Noe, Moeller, & Fitzgerald, 1985; Spector, 1986). Researchers have explored how best to design individual jobs (Hackman & Oldham, 1976) as well as teams (Cohen & Ledford, 1994; Cordery, Mueller, & Smith, 1991; Langfred, 2000) so as to take advantage of the benefits of increased task autonomy.

Although, in general, there is empirical support for the relationship between task autonomy and performance (Spector, 1986), the effect size remains modest ($r = .26$). In addition, the positive effects of task autonomy have shown themselves to be much more elusive in practice than existing theoretical models have suggested (Godard, 2001; Wall, Kemp, Jackson, & Clegg, 1986), and negative effects on performance and satisfaction have been found (Farh & Scott, 1983). Unfortunately, there is no theoretical model to which practitioners or researchers can turn to identify and understand the effects (both positive and negative) of granting task autonomy to individuals in organizations.

We believe it would be beneficial to develop a comprehensive model of the causal linkages between individual task autonomy and performance and to explore multiple mechanisms or processes that explain how task autonomy influences performance as well as the boundary conditions of these influences. Thus, the phenomenon of interest that our theory attempts to explain is the relationship between individual task autonomy and performance. As such, we are interested in factors that explain how and why autonomy affects individual performance. To these ends, we propose that there are three distinct mechanisms by which individual task autonomy may affect performance, namely motivational, informational, and structural. Further, we propose moderators that operate on these relationships to explain how and why the performance benefits of autonomy are contingent on factors ranging from individual differences to task structure. In addition to extending theory, our model also carries significant practical implications, as it informs organizational decisions about when, how, and to whom to grant autonomy.

In describing the development of the theory, we first discuss how task autonomy relates to task performance via motivation (motivational mechanisms). In terms of this motivational effect, we also propose that the relationship is moderated by a variety of factors, which are based on both individual traits and situational states. Second, we explore how informational benefits derive from task autonomy (informational mechanisms), which depend on the amount of unique task-relevant information held by the individual and the complexity of the task itself. Third, we discuss the extent to which the effects of autonomy on performance depend on structural features of the task or organization (structural mecha-

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nisms), including task interdependence, task variability, and organizational formalization. Finally, the implications of our extended model for job design and organizational decisions regarding autonomy granting are discussed.

Task Autonomy Defined

In this article, *task autonomy* is defined as the degree to which an individual is given substantial freedom, independence, and discretion in carrying out a task, such as scheduling work and determining procedures to follow (Hackman, 1980). Task autonomy is more specific than job autonomy. We have chosen to focus on task autonomy because a job can consist of multiple tasks, with variations in the amount of autonomy granted across those tasks. For many factors included in our model, it is variation at the level of the task that is most important. As defined, task autonomy is distinct from participation, which is generally defined as joint decision making among more than one person (usually a job incumbent and a supervisor) (Evans & Fischer, 1992; Wagner & Gooding, 1987). Task autonomy is also conceptually distinct from empowerment, which is a psychological state that represents an individual's orientation with his or her work role (Spreitzer, 1996). Although there may be some commonality among these constructs, we build on theoretical roots in job design by focusing on task autonomy specifically and its relationship with performance.

Current Theory on the Relationship Between Task Autonomy and Performance

Drawing from the job design literature, the generally accepted causal mechanism linking task autonomy to task performance is motivation. The most explicit model of a motivational effect of task autonomy can be found within Hackman and Oldham's (1976) job characteristics model, one of the most influential, broad theories of work motivation. According to Hackman and Oldham, autonomy is one of five job characteristics that determine the motivating potential of a job. As one of a set of job characteristics, autonomy leads to the outcomes of increased motivation and work effectiveness. Generally speaking, this motivational effect of autonomy is commonly accepted and is an underlying assumption in other autonomy-related research.

Much has been learned about the relationship between autonomy and performance from the research surrounding the job characteristics model. For researchers attempting to explore why task autonomy in reality only has a modest effect on performance (Spector, 1986), the level of specificity in the job characteristics model is limiting. The model is a more general theory, focused on several job characteristics, not just task autonomy, and the motivational effects of these job characteristics. The model is silent on other mechanisms by which task autonomy might influence performance.

We have developed a more specific, mid-range theory regarding task autonomy and performance. We incorporated the ideas from the job characteristics model but moved beyond the motivational mechanisms derived from that model by including two other mechanisms by which task autonomy influences performance, that is, informational and structural. Before discussing these two more novel mechanisms, we review the more commonly regarded mechanism by which task autonomy is expected to influence performance: motivation.

Our Extended Model: Motivational Mechanisms

As noted above, the job characteristics model provides a motivational explanation for how task autonomy relates to performance. More specifically, according to Hackman and Oldham (1976), autonomy leads to the critical psychological state of "experienced responsibility for outcomes of the work," which in turn leads to outcomes such as high work effectiveness and high internal work motivation. We have incorporated these relationships into our model with only slight modification. More specifically, we suggest that task autonomy will influence performance (high work effectiveness) through its effect on motivation. That is, motivation is one mechanism that explains the relationship between task autonomy and performance.

> *Proposition 1:* The relationship between task autonomy and performance is mediated by motivation such that greater task autonomy leads to higher performance by increasing motivation.

Although Proposition 1 suggests that all individuals will be more motivated when granted more autonomy, individual differences can potentially alter this relationship. Hackman and Oldham (1976) recognized this as well with the construct of growth needs strength, which refers to the extent to which individuals have a strong need for personal accomplishment, learning, and developing themselves on their job. Because growth needs strength is a broad construct (discussed in greater detail below), others have begun to develop more autonomy-specific individual difference variables. Wageman (1995), Landeweerd and Boumans (1994), and Strain (1999) have suggested that individual differences, such as different preferences for autonomy, explain why not everyone is motivated by autonomy all of the time.

Knowing that needs fulfilled by task autonomy vary across individuals begs the question of whether they also vary within individuals across situations. To a certain extent, this issue is one of trait versus state. *Traits* are individual differences that are stable across a wide variety of situations. *States* are differences that are evoked or activated by particular situations and are, therefore, more transient in nature. In previous research on autonomy, variations in needs or desires for autonomy have been treated as a combination of state and trait. More specifically, Wageman (1995) defined a construct referred to as *autonomy preferences*. She uses the term *preferences* specifically as it represents personal characteristics that are more stable than states but can be influenced by experience (Chaplin, John, & Goldberg, 1988). In other studies, individual differences in preference for autonomy have been measured as state-specific, implying some susceptibility to situation factors (Dwyer, Schwartz, & Fox, 1992; Strain, 1999). Thus, there is conceptual and empirical support for expecting both inter- and intraindividual differences in reactions to task autonomy, similar to the expectation for anxiety as a state–trait construct (Endler, Kantor, & Parker, 1994). Thus, there is reason to believe that individuals will differ with regard to their motivational reactions to task autonomy and that such differences occur both across and within individuals.

We contend that there are multiple factors on which individuals may differ that will affect the relationship between autonomy and performance. These differences are caused by both general individual personality traits and situational factors specific to each job or task.

Trait-Based Determinants

The influence of more enduring traits is expected to potentially moderate the motivating effect of task autonomy on performance. Whereas Hackman and Oldham's (1976) growth needs strength construct might appear to be a strong candidate for trait-based individual differences to incorporate in our model, the somewhat general nature of the construct (i.e., it applies to enriched jobs more generally, not just autonomy) precludes this. Instead, we have chosen variables more appropriate to the level of generality of our theory by being specific to task autonomy (Fishbein & Ajzen, 1972). We have also avoided Wageman's (1995) autonomy preference variable, as it focuses more on an individual's preference for working independently from other team members. Conceptually, a desire for independence from team members may not necessarily be derived from a desire for control or other autonomy-related needs or drives, as other individual differences may explain why one would want to work independently (e.g., introversion or avoidance of conflict). In addition, responses to measures of this variable did change over a relatively short period of time, suggesting it is perhaps more a state-based than a trait-based concept.

In our model, both need for autonomy and need for achievement are expected to influence the extent to which individuals are motivated by task autonomy. The need for autonomy (Ryan & Deci, 2000) is defined as an innate need that all humans have to some extent, representing the need to be self-determining or self-initiating. Need for achievement (McClelland, 1975) represents an individual's desire to achieve success through one's own efforts and to take personal responsibility and credit for outcomes. Empirical evidence has found that both need for autonomy and need for achievement influence individuals' responses to task autonomy (Orpen, 1985), suggesting a role for these stable traitlike characteristics in the relationship between autonomy and motivation.

> *Proposition 2:* Need for autonomy moderates the relationship between task autonomy and motivation; when need for autonomy is high, the relationship between autonomy and motivation is positive, and when need for autonomy is low the relationship between autonomy and motivation is null or negative.

> *Proposition 3:* Need for achievement moderates the relationship between task autonomy and motivation; when need for achievement is high, the relationship between autonomy and motivation is positive, and when need for achievement is low the relationship between autonomy and motivation is null or negative.

State-Based Determinants

To generate a more specific, mid-range theory of task autonomy, we believe it is important to consider more contextually specific individual differences as well. As such, we have incorporated several state-based individual differences. We draw largely on Bandura's (1997) framework of social–cognitive theory to propose relationships about how context might influence the motivating effect of task autonomy. Social–cognitive theory (Bandura, 1997) suggests that people exercise control in order to realize benefits. According to Bandura (1997), "the ability to secure desired outcomes and to prevent undesired outcomes therefore provides a powerful incentive for the development and exercise of personal control" (p. 2). This also suggests that if there are no desirable outcomes to gain or undesirable outcomes to avoid, there is no need for personal control. In other words, the desire for increased personal control is not an unfocused innate drive but rather a calculated and goal-specific state. In essence, people exercise control (or want control) for the benefits it can give them.

This more cognitive and situational viewpoint has an important implication, specifically, that the overall utility of task autonomy will influence the motivational effect of actual autonomy. Utility represents the net of expected benefits minus expected costs of a given course of action, event, or transaction (Samuelson & Marks, 1992). In the context of task autonomy, this suggests that the combination of perceived benefits and costs associated with task autonomy from the individual's perspective will influence his or her perceived utility of being granted autonomy and will subsequently affect the motivational effect that such autonomy will have. Giving autonomy to an employee who perceives great benefit and little cost to autonomy is likely to be motivating, just as giving autonomy to the employee who perceives little benefit but great cost to autonomy is likely to harm motivation.

The potential perceived benefits and costs of autonomy are numerous. One example of a benefit would be the case in which an individual considered productivity a desirable outcome and perceived that autonomy would allow him or her to be more productive. Other benefits include physical and psychological well-being (Langer, 1983) as well as interest, creativity, cognitive flexibility, better learning, and higher self-esteem (Deci & Ryan, 1987). In terms of costs, it has been suggested that autonomy can be a subtle form of control, in that individual employees become more accountable and responsible for their own performance (Alexander, 1991) and, therefore, to the extent to which individuals do not want accountability, autonomy can lead to negative outcomes. The perception that more autonomy in the job can result in more work, involving more difficult and uncomfortable decisions and greater stress (Spector, Dwyer, & Jex, 1988), can also lead to the perception of autonomy as an undesirable outcome. Existing or new incentive systems and compensation plans would also affect whether autonomy is perceived as more costly versus more beneficial. Some incentive plans might reward initiative and innovation, whereas others might make a greater portion of compensation variable or tied to individual performance. Again, individual perception of the cost or benefit of various schemes will vary among individuals.

The notion that human beings pursue and prefer things that they believe benefit them and will avoid things that they believe harm them underlies many theories of human behavior, from social–cognitive theory to microeconomics. It is important to note, however, that perceptions of benefits and costs are subjective. Two employees faced with the same stimulus may interpret it differently; one may interpret it to be positive and the other may interpret it to be negative. Thus, the exact same task autonomy can

be perceived and framed differently by two employees; one may perceive autonomy as an opportunity to perform and excel at work in order to impress superiors, whereas another might perceive it as a shameless attempt by management to extract more work and effort for the same pay. As a result, the motivational effects of such different perceptions are likely to be very different. In addition to the subjective nature of perceptions, there is also the possibility of inaccurate perceptions of the costs and benefits of the task, which could result from a lack of information or understanding about the task itself on the part of the individual.

This notion of the effects of the utility of task autonomy has been observed before. Lawler, Hackman, and Kaufman (1973) encountered a situation where increased task autonomy did not lead to greater, but in fact decreased, satisfaction and motivation. Their explanation for this effect was tied to the individual's perceived higher costs of increased task autonomy. We propose that the perceived benefits and costs of task autonomy—or perceived utility of task autonomy—will moderate the relationship between autonomy and motivation.

> *Proposition 4:* Perceived utility of task autonomy moderates the relationship between task autonomy and motivation; when the perceived utility is high, the relationship between autonomy and motivation is positive, and when the perceived utility is low, the relationship between autonomy and motivation is null or negative.

Using Bandura's (1997) framework also leads to the suggestion that people will be motivated by autonomy only if they believe they have the ability to take advantage of it. If an individual does not believe that he or she can successfully perform the job with increased autonomy, then he or she will most likely not be able to secure the perceived benefits. Therefore, beyond utility, an individual's self-efficacy with regard to exercising task autonomy will contribute to his or her desire for autonomy and any resultant motivational effect. For example, a skilled software engineer who has written code for particular types of applications for many years is much more likely to want discretion in the job than an inexperienced new employee who has just completed training and is writing code alone outside the classroom for the first time. The experienced employee is much more likely to believe that he or she can successfully take advantage of task autonomy to improve his or her performance and is therefore more likely to express a preference for autonomy than is the second employee. The new employee, on the other hand, will have lower self-efficacy for a new and relatively unfamiliar task and is likely to not want autonomy over the task but rather to prefer more structure and guidance.

> *Proposition 5:* Self-efficacy moderates the relationship between task autonomy and motivation; when an individual's self-efficacy is high, the relationship between autonomy and motivation is positive, and when an individual's self-efficacy is low, the relationship between autonomy and motivation is null or negative.

The propositions above are all contingencies that suggest the importance of "fit" between perceptions, values, or personality traits of individuals and the level of autonomy in their task. This notion of fit is conceptually similar to other models in organizational behavior and leadership, such as situational leadership (Hersey & Blanchard, 1993). Hersey and Blanchard suggested that the amount of discretion and autonomy given to an individual must match that individual's maturity or *readiness level,* a concept that, while not explicitly defined, certainly is consistent with the arguments made above.

In summary, we propose that motivational effects of task autonomy are contingent on a variety of factors that reside at the individual level, representing both state- and trait-based individual differences that differ both across and within individuals. As such, the relationship between individual task autonomy and performance is dependent on both situationally specific variables (perceived utility of task autonomy and self-efficacy of exercising task autonomy) and more enduring personal characteristics (need for autonomy and need for achievement). Ideally, the amount of autonomy granted to an individual by the organization would be consistent with all of these moderators to maximize motivational benefits of autonomy and to minimize any possible motivational losses. However, motivation is just one of three paths between task autonomy and performance. We propose that another means by which autonomy affects performance is through informational mechanisms.

Our Extended Model: Informational Mechanisms

Beyond motivational mechanisms, we suggest that autonomy affects individual performance because of issues related to information and decision making. Although not explicitly stated in task autonomy literature, an informational mechanism has been explicitly developed in the related literature on participation (Locke, Alavi, & Wagner, 1998). Specifically, informational benefits are expected from allowing participation in job-related decisions when the individual performing the job has information about the task that is not available to the supervisor (Locke & Schweiger, 1979; Miller & Monge, 1986). For example, the experienced software engineer may have more current and technical knowledge about a particular project she is working on than does the supervisor who oversees not only the software engineer but also a graphics developer and a technical writer. Hence, there will be information-related performance gains from allowing the software engineer to participate in decisions regarding the programming of the project, as he or she will be able to take advantage of that task-specific knowledge when making decisions about how to do the task.

The logic of this informational mechanism is compelling regardless of whether the issue is the sharing of information between employee and supervisor (as in participation) or the employee is being given discretion or decision-making authority (as in autonomy). If the software engineer has better information than the supervisor about effectively programming code for that particular project, granting substantial autonomy to her would seem to be a good way to ensure that she can best take advantage of that knowledge. Taking advantage of that knowledge means that better decisions are made by the employee regarding how and when to complete the task. These informational benefits of autonomy are entirely separate from any motivational benefits (Locke & Schweiger, 1979; Miller & Monge, 1986).

Considering only the informational mechanism, the relationship between autonomy and performance is dependent on the informa-

tion asymmetry between the subordinate and the supervisor; the more task information the individual has, the greater the potential performance benefit of granting autonomy to that individual. If the individual has no more knowledge about the task than the supervisor, there will be no informational benefits from granting autonomy, as there is no information asymmetry to be exploited.

> *Proposition 6:* The relationship between autonomy and individual performance is dependent on information asymmetries between the subordinate and the supervisor such that the greater the asymmetries, the more positive the relationship between autonomy and individual performance.

Whereas the performance benefits of granting autonomy to those individuals with the best information about the task seem self-evident, the introduction of the informational benefits of autonomy raises questions as to what other cognitive effects may also occur. The fact that negative effects of autonomy on performance have been found when individual, contextual, and motivational differences are controlled for (Farh & Scott, 1983) suggests that the benefits attributable to informational mechanisms may be more complex than described above. Drawing from the cognitive psychology literature (Pashler, 1998; Rubinstein, Meyer, & Evans, 2001), we propose that there is a downside to autonomy related to these informational mechanisms based on cognitive distraction.

The essential difference between a worker with task autonomy and a worker without task autonomy is that the former has the opportunity to make decisions about task implementation, whereas the latter simply carries out the task as instructed. We suggest that the worker with autonomy is more *cognitively distracted* from the performance of the task, as he or she is involved in two distinct activities simultaneously. One of these is the activity of performing the task itself. The other is the cognitive activity involved in evaluating earlier choices and making decisions about future choices. With attention focused simultaneously on task performance and decision making, individuals with autonomy experience additional cognitive activity that distracts them from performance of the task. We base this idea of cognitive distraction on the literature on dual-task processing.

Dual-task processing refers to the cognitive activity that occurs when someone attempts to perform multiple tasks, either simultaneously or consecutively in rapid alternation (Rubinstein et al., 2001). Research has shown that dual-task processing leads to slowing of performance or loss of efficiency when two tasks are performed at the same time (Levy & Pashler, 2001; Osman & Moore, 1993). The explanation for these performance decrements is attributable to two different cognitive processes: interference and switching costs (Rubinstein et al., 2001). *Interference* is the reduction of cognitive resources or attention for one task either because two responses cannot be processed at the same time or because the cognitive processing of one task is harmful to the processing of the other (Temprado, Zanone, Monno, & Laurent, 2001). Switching costs occur because cognitive resources are spent in the actual cognitive processes required to switch back and forth between tasks. The degradation of performance in dual-task situations has been well documented (Bowers et al., 2000; Pashler, 1994; Rubinstein et al., 2001; Temprado et al., 2001). With either interference or switching costs, the performance decrements associated with dual-task processing are heightened when tasks are more complex (Rubinstein et al., 2001).

These findings regarding dual-task processing have been related to the managerial term of multitasking as well (Wickens, 1992). That is, *multitasking* will result in the cognitive distraction associated with interference and switching costs and will ultimately have negative effects on performance. Although relatively little research in organization settings has been conducted to supplement the considerable laboratory research, at least one applied study found performance decrements of multitasking in an organizational setting (Pesante, Williges, & Woldstad, 2001).

We suggest that the attention paid to task decision making that comes with autonomy is a form of dual task processing (or multitasking), as autonomy changes a job from the single task of performance to the dual tasks of performance and evaluation and decision making. We believe that these two tasks, occurring either simultaneously or consecutively in rapid alternation, cause dual-task processing effects. It is our argument that the cognitive processes that occur when one is engaged in this autonomy-related dual task processing distract cognitive resources away from performing the task itself and that these distraction effects are heightened when tasks are more complex. This cognitive distraction then leads to lower task performance.

On the basis of these concepts, we propose that when individuals are given autonomy, cognitive distraction will occur, and attention will be drawn away from task performance. Further, the more complex the task, the greater we expect the cognitive distraction to be.

> *Proposition 7:* Task autonomy leads to cognitive distraction, as cognitive resources are spent on decision making, evaluation, and switching costs.

> *Proposition 8:* The cognitive distraction associated with autonomy increases in proportion with the complexity of the task.

We further argue that the cognitive distraction associated with task autonomy will detract from task performance, as proportionally less cognitive attention is focused on the actual performance of the task.

> *Proposition 9:* Increases in cognitive distraction resulting from autonomy lead to decreases in performance.

It is worth noting, however, that the cognitive distraction effects outlined above may decrease in severity as learning increases. It is especially during the early stages of tasks that individuals with autonomy will be experimenting with different ways to carry them out and will suffer the most cognitive distraction. Similarly, errors and poor performance are likely to occur more often early in tasks and will be greatly reduced as familiarity with the task grows.

Overall, we propose that the informational benefits of autonomy discussed previously will co-occur with the downside of cognitive distraction. We are not suggesting that the informational benefit of autonomy does not exist. Rather, we are drawing attention to the cognitive costs occurring simultaneously with the informational benefit. The overall information-related effect of autonomy on performance is thus the sum of the informational effect, which can

range from zero to a large positive value, and the cognitive distraction effect, which can range from zero to a large negative value.

Understanding these informational mechanisms is but one element of the larger question of how autonomy relates to performance. These mechanisms operate independently, but cumulatively, in relation to motivational mechanisms. That is, being allowed to make task-related decisions will not only have the informational effects noted above but simultaneously may have the effect of influencing motivation, depending on the motivational mechanisms at work. In addition, we believe there is a third set of mechanisms that will alter the relationship between task autonomy and performance, namely, structural mechanisms.

Our Extended Model: Structural Mechanisms

When exploring the relationship between autonomy and performance, it is important to do so in the context of characteristics of the task and the organization. Benefits of task autonomy may depend on a variety of structural mechanisms, related to both the task itself and the organization in which it is embedded. One task may be characterized by a particular structure that is incompatible with a high level of task autonomy, for example, whereas another task might have a structure that is especially suited to task autonomy. In one instance, autonomy might harm task performance, while in another it may have significant benefit, or even be necessary for successful task completion. Thus, the effects of autonomy on performance are contingent on a number of features associated with the task and the organizational structure, and we therefore consider task and organizational structures to be important mechanisms in our theory.

We elaborate on two categories of structural mechanisms—task and organizational structure—in the following sections. First, we propose two structural characteristics of the task that will influence the effect of autonomy on performance via task processes: task interdependence and task variability. Second, we consider a structural characteristic of the organization, formalization, and how it influences the effects of autonomy on performance.

Task Structures

Although tasks can be described in a variety of ways, we believe that task interdependence and task variability are of particular importance to the relationship between autonomy and performance. Both have strong implications for how work processes should be structured in organizations, and both are key features of tasks in organizational units (in the sense that all tasks can be described in terms of interdependence and variability).

Task interdependence represents the degree to which completion of a task is dependent on coordination with other tasks in order to be accomplished. It is a feature central to organizations (Thompson, 1967), has been studied extensively (Saavedra, Earley, & Van Dyne, 1993), and is considered of critical importance to group effectiveness (Wageman, 1995). Slocum and Sims (1980) have pointed out that task interdependence is one factor that should be critical to job design in terms of determining the amount of control and autonomy to assign to different organizational levels.

It has been noted that individual autonomy can be at odds with tasks that require high interdependence within units, as such tasks require high levels of interaction and close coordination of members' actions in timing and sequence (Wageman, 1995). High task interdependence, by definition, means that individuals need to coordinate their efforts in order for unit tasks to be accomplished. Granting autonomy increases the freedom to act more independently. As a result, giving autonomy to individuals in a situation requiring high coordination could at best accomplish nothing and at worst incur severe process losses as interaction and coordination decrease. Such process losses could lead to a complete breakdown of performance if individual members deviate too far from the coordinated workflow of the unit or organization. Particularly in the face of critical reciprocal or sequential task interdependence, high individual autonomy can harm the performance of other organizational members as well as individual performance. When interdependence is high, individual responsibility generally decreases (Stewart & Barrick, 2000), and mutual, not individual, adjustment is necessary for coordination and effectiveness (Pearce & Ravlin, 1987).

In contrast, when tasks are characterized by lower interdependence, individuals can work relatively independently, and greater individual autonomy would allow them to take advantage of unique task-specific knowledge (the informational mechanism discussed above) without interfering with any required coordination with others. Orton and Weick (1990) pointed out how important it is for individuals to adapt and independently adjust to change when interdependence is low, which individual autonomy allows team members to do. Similarly, Stewart and Barrick (2000) emphasized the benefits of individual responsibility and learning when task interdependence is low, both of which are facilitated and emphasized when individuals are given autonomy.

The logic outlined above suggests that the benefits and costs of individual autonomy can be very dependent on task interdependence. Although granting individual autonomy when task interdependence is low allows individuals to take advantage of informational and motivational benefits of autonomy without any loss in performance associated with process or coordination losses, granting it under conditions of high task interdependence can result in lowered performance, as necessary coordination with other organizational members is jeopardized.

> *Proposition 10:* Task interdependence moderates the relationship between task autonomy and performance such that the performance benefits of task autonomy are greater when task interdependence is lower.

We expect a disordinal moderating effect of task interdependence on the relationship between individual autonomy and performance, suggesting, among other things, that individuals with high individual autonomy and high task interdependence will perform worse than those with high individual autonomy and low task interdependence.

A second characteristic of task structure that we believe influences the performance effects of autonomy is task variability. *Task variability* refers to the number of exceptional cases in the work requiring different methods or procedures for doing the work (Perrow, 1967) and reflects the extent to which task accomplishment requires process variation. Because task variability affects the extent to which activities can be structured in a systematized or routinized way (Perrow, 1967; Van de Ven & Delbecq, 1974), it

has often been measured as the stability or routinization of work (Hage & Aiken, 1969).

We believe that task variability will influence the extent to which autonomy has positive process-related effects on performance. Individuals performing highly variable tasks need to be able to change or modify their procedures to successfully complete those tasks. When individuals have task autonomy, they can do so efficiently, as they have discretion over the implementation of tasks. When individuals do not have task autonomy, however, they either cannot complete tasks characterized by high variability or they must wait for new instructions from their supervisor or manager before proceeding. The combination of high variability and low autonomy is highly inefficient at best and completely dysfunctional at worst.

Thus, when task variability is high, some degree of individual autonomy is necessary to successfully carry out the task. On the other hand, if task variability is low, individual task autonomy is not necessary and the absence of it will not be catastrophic. In that instance, task autonomy may not have great benefit but is unlikely to cause harm, as it can in the case of high task interdependence. Therefore, we suggest that task autonomy moderates the relationship between autonomy and performance such that the benefits of task autonomy are greatest when task variability is highest.

> *Proposition 11:* Task variability moderates the relationship between task autonomy and performance such that the performance benefits of task autonomy are greater when task variability is higher.

Organizational Structure

In addition to the structural characteristics associated with the task itself, we suggest that there are contingencies resulting from organizational structures, such as the degree of formalization the organization imposes on tasks. Whereas task interdependence and variability are driven by the task, organizational structures can be driven by a variety of other factors, such as management beliefs and preferences or the organization's culture, history, or degree of bureaucratization.

We consider the degree of formalization in the organization to be a characteristic of organizational structure that is of critical importance. Formalization refers to the degree of job codification and rule observation (Hage & Aiken, 1969) imposed by an organization. Formalization at the level of the task is often accomplished by task standardization. It has been described as an organizational device for prescribing how, when, and by whom tasks are to be performed (Hall, 1977) and may derive from highly bureaucratized or hierarchical organizational structures or cultures (Mintzberg, 1979; Scott, 1987). Formalization may be the organizational response to a particular task technology, in that certain tasks may require a very specific procedure to complete. However, it may also emerge as an organizational choice resulting from the organization's desire for zero-defect or high-quality outputs, organizational interventions to reduce deviation (such as Six Sigma programs), or organizational values or culture. Thus, whereas formalization can be a result of task requirements or technology, it can also be caused by factors completely unrelated to the particular task.

High task formalization presents a problem when granting task autonomy, in that it limits the extent to which the individual can actually exercise discretion in carrying out the task. The more formalized a particular task, the less discretion is possible in its implementation. This has been demonstrated in a variety of settings, particularly with respect to professionals and knowledge workers (Bailyn, 1985; Raelin, 1985). It has long been argued that high formalization in an organization undermines the ability of individuals to deal with change, uncertainty, and complexity (Bennis, 1966; Fry & Slocum, 1984). By the same token, the lower the level of task formalization, the more opportunity there will be for an individual to take advantage of task autonomy and explore alternative methods for carrying out a given task. This logic is consistent with the leadership literature, which suggests that formalization can function as a leadership substitute in that formalization takes the place of instrumental and directive leadership behaviors (Kerr & Jermier, 1978), which are also at odds with individual discretion.

Beyond the issue of the exercise of discretion, there are other possible negative effects of autonomy under the condition of high formalization. Although it may be possible to exercise autonomy in carrying out a task when formalization is high, doing so would violate organizational rules and procedures and possibly work-unit norms and values. The findings that groups and organizations sanction those who violate norms are consistent, ranging from the literature on small groups (Feldman, 1984) to larger social systems (Heckathorn, 1990). In addition, Schminke, Cropanzano, and Rupp (2002) found that employee perception of justice and fairness can be strongly influenced by formalization. Furthermore, ignoring organizational rules and procedures can result in formal sanctions from the organization, such as demotion, termination, or other costs. Thus, although it sometimes may be possible for an individual to successfully exercise autonomy despite a highly formalized task, other negative consequences are likely to result and ultimately have a negative effect on task performance.

These considerations suggest the following proposition:

> *Proposition 12:* Task formalization moderates the relationship between task autonomy and performance such that the performance benefits of task autonomy are greater when formalization is lower.

It is worth noting that Adler and Borys (1996) pointed out that formalization can be enabling (as opposed to coercive). Enabling formal procedures and rules are designed such that they facilitate employees' ability to deal more effectively with task contingencies, whereas coercive procedures are designed to force reluctant compliance and to extract recalcitrant effort. This suggests that enabling formalization perhaps would not be as much at odds with autonomy as coercive formalization, yet both would still be more constraining on an individual's ability to take advantage of autonomy than would a lack of formalization.

The influence of task and organizational structures outlined above suggests that the realization of positive performance effects from autonomy will partially depend on the structural context in which autonomy is granted, encompassing both task and organizational structure. Again, we are not suggesting that autonomy will not have motivational or informational benefits but rather that these benefits must be balanced against any process-related costs that might emerge if autonomy is granted in a structural context

that does not fit, such as high task interdependence, low task variability, and/or high formalization.

Discussion

In this article, we have developed theory regarding the relationship between task autonomy and performance. Existing models and studies of task autonomy have not only fallen short of providing a complex model incorporating several different mechanisms but also have not addressed the mechanisms that might contribute to null or negative effects of autonomy. We have attempted to remedy those shortcomings by presenting a model that combines multiple mechanisms and explores multiple contingencies by which task autonomy affects performance. In particular, our model illustrates a variety of ways in which autonomy can have null or negative effects on performance, processes that have not previously been theorized or studied.

Overall, we argue that the effect of task autonomy on performance is the sum of three independent mechanisms. One mechanism is the motivational effect of autonomy, which is contingent on state- and trait-based individual differences. Another mechanism is the informational effect, as autonomy may capitalize on the asymmetry of information between those who do the work and those who supervise it, although this positive effect may be limited by increased cognitive distraction. Finally, structural features of the task may enhance or limit the process benefits of task autonomy, as illustrated in our discussion of the moderating effects of task interdependence, task variability, and organizational formalization.

We believe that our elaboration and integration of current thinking creates a much more complete picture of the relationship between task autonomy and performance and illuminates why—and under what conditions—task autonomy will and will not lead to performance gains. With this model, we hope to bring the theory of autonomy closer to the reality of practice. In the next sections, we discuss the general research contribution and implications of our theory. We then discuss the implications for practice of this expanded view of task autonomy and performance and attempt to clarify the issue of when and under what conditions organizations should grant autonomy to individuals. Finally, we include suggestions for empirical research and thoughts on measures and possible study designs.

Research Contribution and Implications

By exploring motivational, informational, and structural mechanisms in the same model, we emphasize the balance among various forces in their effect on performance. When considering individuals in specific situations and contexts, the general need or desire for autonomy and control can be overwhelmed by situational factors, for instance. One example of this is self-efficacy. Given a particular task, an individual with considerable task experience and skill is much more likely to want more control over various aspects of the task than is an individual who has no experience at the task. Overall, it can be said that we are presenting an interactionist view of the motivational effects of autonomy, driven by both internal traits and situational factors specific to the setting and context. We believe that using both views enriches the construct, allowing for further exploration of how both stable individual differences and the context in which an individual works might influence motivation.

We also add to theory on task autonomy by considering the informational mechanisms linking task autonomy to performance. We adopted ideas from the participation literature by formally incorporating the concept that granting task autonomy can have positive effects on performance by capitalizing on information asymmetry between supervisor and worker. An important implication of this informational effect is that it offers an explanation for situations in which there may be null effects of task autonomy on performance, specifically when the individual granted autonomy does not have better information than the supervisor and thus has no information asymmetry on which to capitalize. Incorporation of this effect may be primarily a formalization of a generally accepted or implicit effect of autonomy but offers a more complete formal theory of how task autonomy relates to performance.

In addition, incorporation of contingent motivational effects as well as the informational effects of task autonomy allowed us to describe how autonomy can have negative effects on motivation and performance. With respect to informational effects, we proposed that task autonomy redirects cognitive attention away from the focal task to decision making and evaluation. This cognitive distraction is always going to occur, a natural by-product of task autonomy. Cognitive distraction thus provides an important refinement to the informational mechanism. Although the current implication for informational effects is that without information asymmetry, there will not be a positive effect of task autonomy on performance, the inclusion of cognitive distraction suggests that in fact there will be a negative effect. In other words, without the gain from information asymmetries, asking individuals to make decisions merely drains cognitive resources and distracts them from task performance.

Finally, the addition of task and organizational structure to our theory of autonomy is a significant step toward developing a more comprehensive and complex model of autonomy. By taking into account the effects of structural task characteristics such as interdependence and variability, as well as organizational characteristics such as formalization, we are adding a new dimension to the study of individual autonomy. Although the organizational design literature has discussed the effect of task variability on how to structure an organization, for example, it has not been applied to individual task autonomy. It is also worth considering that there may be other organization structure factors that moderate the relationship between task autonomy and performance. The degree of access to organizational resources, for instance, may be a valuable future addition to this theory. In terms of developing this theory further, incorporating task structure and organizational structure into our model of individual autonomy also opens the door to considering cross-level determinants and contingencies of the relationship between task autonomy and performance.

Implications for Practice

Our expanded model of task autonomy has several implications for organizations or managers who wish to incorporate task autonomy, or have already incorporated task autonomy, in organizational settings. In general, our expanded model helps delineate the conditions under which autonomy might be most appropriate as well as the conditions under which it might be most inappropriate.

The model highlights the importance of considering multiple factors at once when trying to determine whether granting task autonomy will result in improved performance. The model also implies possible avenues for actions that could be taken to improve performance effects in situations in which task autonomy already exists.

Supplementing the conventional wisdom of hiring people who desire autonomy, our model suggests that some of the contingencies affecting the motivational mechanism are partially malleable. Organizations can work to improve either individual's self-efficacy or their perceptions of the utility of task autonomy in order to reap better performance gains. From the rich research in social–cognitive theory (Bandura, 1997), there are many interventions that could be used to improve an individual's self-efficacy, including training, feedback on performance, and modeling. With regard to utility, organizations could attempt to influence the perceived benefits and costs individuals associate with the introduction of task autonomy. For example, organizations could consider increasing pay, decreasing hours, or other means for attaching benefits to the introduction of task autonomy (as long as such incentives are framed as being directly related to the introduction of autonomy). Such interventions, and the resulting effects on self-efficacy and utility perceptions, are a means for increasing the motivating effect of task autonomy. Most important, our model points organizations in these new directions and gives them additional options for improving the performance effects of task autonomy.

It is worth noting that although an organization might be able to manipulate employees' preference for (and motivation from) autonomy with some of the interventions discussed above, this does not suggest that the organization should not also select employees on the basis of personality traits. If the organization has a particular task structure that is particularly well suited to individual task autonomy (e.g., the combination of low task interdependence and high task variability), then the organization should definitely employ a selection system to identify employees who have a strong trait-based preference for autonomy.

The practical implications of the costs of cognitive distraction involve a closer look at the allocation of autonomy in two ways. First, it is very important to balance the expected benefits of autonomy against this performance loss. That is, in situations where individuals do not have adequate information to make decisions, the introduction of task autonomy may actually have overall negative effects due to cognitive distraction. In addition, in tasks where cognitive attention demands are high (e.g., safety or inspection jobs), the distracting effects of autonomy may be difficult to overcome. Therefore, organizations need to carefully consider both the nature of the individuals being granted task autonomy (how informed, how well trained, how prepared to make decisions) as well as the nature of the task (complex task, high cognitive attention demands). In general, our model points to additional avenues for organizations to consider for improving the informational gains of introducing task autonomy.

The structural contingency of task interdependence has clear, but not necessarily easy-to-implement, implications. If the task technology dictates high levels of task interdependence in the organization, in which individuals' work is tightly coupled, then organizations need to be very careful about implementing task autonomy, and must try to balance the structural cost against other potential motivational or informational benefits. By the same token, the contingency effects of task variability must be carefully attended to by organizations. If task variability is high, task autonomy is practically a requirement for successful task completion (in lieu of tight supervisory monitoring and continual feedback), and the cost of not granting autonomy to individuals under these conditions is expected to be considerable. The extent to which a task is formalized into rules and procedures also has clear implications for the granting of autonomy, to the extent that individual autonomy is clearly at odds with restrictive procedures and rules for carrying out tasks. The contingent nature of the relationship between autonomy and performance as it depends on these structural factors illustrates the complex balance implied by our model.

The more comprehensive nature of our model is what makes it useful both for prescriptive purposes and to guide directions for future research. The notion of balance is crucial, as all three of the mechanisms can be occurring simultaneously, and the benefit of one mechanism may be offset by the cost of a second mechanism or, alternatively, completely dependent on a third mechanism. One contingency may have a positive effect, for example, whereas another simultaneously occurring contingency may have a negative effect. Depending on combinations and distributions of individual traits, motivational states, information asymmetries, and task and organizational structures, there are practically limitless combinations spawned by our model. Table 1 summarizes the different factors that affect the relationship between autonomy and performance and illustrates (through the use of selected examples) how different combinations can have very different implications.

Ideally, for a manager to be able to decide whether to grant a particular individual autonomy on a specific task, he or she would have perfect information about a range of different questions relating to how motivated the employee is by autonomy (both in general and for this specific task), how much task-specific knowledge the employee has about the task, how complex the task is, how interdependent it is with other tasks, how much variability there is (and is likely to be) for the task, and how formalized the rules and procedures governing the task are. Given this information, the manager then must be able to judge the relative strength of one mechanism versus another. For example, should autonomy be granted to an employee who values it and would be very motivated by it but does not have much task-specific knowledge on which to draw? Further, how would that balance be influenced by a moderate degree of task interdependence but a low degree of task variability?

In general, we can certainly conclude that autonomy should definitely not be granted to an employee who is not motivated by autonomy and who has little knowledge about a complex and highly interdependent task that has low variability and many rules and procedures. We can also conclude that autonomy should definitely be granted to an employee who is motivated by autonomy and who has considerable knowledge about a relatively simple task that can be performed independently and has high variability but few rules and procedures.

Although our theory can only provide general answers to these questions, it does present a clear framework within which to explore all three mechanisms simultaneously and a guide by which managers and organizations can understand the mechanisms that are important to take into account and the ways in which each one influences the relationship between autonomy and performance.

Table 1
Performance Effects of Task Autonomy: Illustrative Examples and Practical Implications

Condition							Effects			
Perceived utility (state)	Preference (trait)	Distraction	Information asymmetry	Task interdependence	Task variability	Formalization	Motivation	Information	Structure	Implications
high	high	low	high	low	high	low	very positive	very positive	very positive	Best case scenario—many benefits and no costs.
low	high	low	high	low	high	low	mixed	very positive	very positive	Mostly beneficial, but try to increase perceived utility (with incentives, plans, rewards, framing).
high	high	high	low	low	high	low	very positive	very negative	very positive	Informational costs can perhaps be outweighed by motivational and structural benefits. Try to increase training of employee (i.e., information asymmetry), or wait until individual has more task experience.
low	low	low	high	low	high	low	very negative	very positive	very positive	If individual neither wants autonomy nor sees utility of it, try to increase perceived utility or consider selecting different employee, as both task and organization are very appropriate to autonomy.
high	high	low	high	high	low	high	very positive	very positive	very negative	Considerable structural costs are likely to negate any benefits of autonomy and likely to harm performance despite informational and motivational benefits.
high	low	high	high	low	low	high	mixed	mixed	mixed, probably negative	Significant structural costs, motivation losses, and cognitive distraction will probably not be outweighed by benefits.
low	low	high	low	high	low	high	very negative	very negative	very negative	Worst case scenario—many costs and no benefit.

Directions for Future Research

Table 1 illustrates how much is not known at this time and will need to be explored through future empirical research. Many of the "prescriptions" implied by Table 1 are quite ambiguous, as the balance between the positive and negative effects will depend on the relative magnitudes between, for example, the motivational benefit of granting autonomy to an individual who wants autonomy (based on trait- and state-based considerations) and has high self-efficacy and the structural cost of a setting with high task interdependence and only medium task variability and the cognitive distraction of a complex task.

Some of these relationships should clearly be tested in controlled laboratory settings, whereas others could be conducted with survey instruments in organizational settings. For example, the negative effects of autonomy resulting from the cognitive effects of dual task processing would ideally be studied in a laboratory setting, as it is difficult to envision a field setting in which to study such an effect. Depending on the experimental design, outcome measures could be task performance, but modern technology would also allow for the measurement of cognitive activity during task performance for autonomy and no-autonomy conditions. The laboratory might also be a useful setting for the first steps in a research program examining the moderating effects of task interdependence or task variability on the relationship between individual autonomy and performance, but such research could also be conducted in organizational settings, given good measures of task variability (for example, Van de Ven & Delbecq, 1974) and task interdependence (for example, Kiggundu, 1983). The moderating effect of formalization could also be studied with multiple methods and might lend itself particularly well to first establishing an effect in a laboratory setting and subsequently studying this aspect in a field setting across multiple organizations. Fortunately, whether manipulated in a lab setting, or measured by surveys, autonomy has well-defined and validated scales (see Breaugh, 1985).

Another avenue for future research is further investigation of possible boundary conditions and contingencies of the effects we have proposed. The issue of time, for example, is one that can be further explored. Wageman (1995) found that autonomy preference changed over time, as employees began working in teams. This is not inconsistent with our theory, as the effects of autonomy are partially determined by situational factors, but it raises interesting possibilities. Time might also be an interesting factor to explore in terms of cognitive distraction. Although distraction is expected to be an unavoidable by-product of autonomy, perhaps the distracting effect of decision making and evaluation is not constant over time. It is quite likely that the negative effects of cognitive distraction and poor performance will decrease as experience and learning increase. From a practical perspective, the issue of weighing the performance loss of early cognitive distraction against the potential gains in learning and task implementation over time is also an important consideration.

Overall, we hope that our model will be of benefit to researchers as well as those in practice. For researchers, we hope our model generates new testable research questions as to the conditions that enhance or diminish the effects of task autonomy on performance. For practitioners, we hope to illuminate both the individual and contextual factors that must be taken into account to reap the hoped for benefits of granting task autonomy to employees.

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