Three Papers on Managerial Discretion

by

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Chapter 1: Introduction

My dissertation contains three papers, each written as an independent research study. Each provides its own motivation and literature review. I do not repeat these here, but rather summarize each paper briefly to highlight the links between them. The three papers are concerned with managerial discretion, which is as a manager's freedom of action at work. Though I focused on managers, my goal was to contribute to the development of a general theory of discretion in organizations. Developing such a theory of discretion is important. As each paper emphasizes, discretion is a fundamental aspect of organized behavior. Discretion is the key to understanding agency in organizations. Individuals can only influence organizations through discretion, and the inevitable presence of discretion makes the individual essential to the organization.

I chose to study managers because they offered several advantages. For one, managers promised to bridge the literatures that had already studied aspects of discretion. The job control and organizational citizenship literatures have examined the discretionary behavior of line workers and staff, while the executive discretion literature has focused exclusively on CEOs and other upper echelon members. As such, my focus on middle managers filled two important gaps. First, it gave specific attention to the levels of organizational hierarchy where discretion has been least studied. Additionally, middle managers offered a reasonable compromise between the extremes found in previous work. Middle managers are like workers, in that they have their own productive tasks to complete. At the same time, middle managers are also like senior executives, having subordinates and responsibility for directing them toward effective performance. Managerial discretion can thus be expected to share at least some features with both staff discretion and executive discretion, and thereby provide a

bridge to link them.

Beyond this bridging role, understanding managerial discretion is also valuable in its own right. Discretion is the hallmark of managerial behavior. Managers are responsible for producing outcomes through the integration of people and resources within an organizational framework. The elements of this integration that can be routinized or prescribed in advance will be; this is the function of rules and procedures. Therefore, the manager is most important in addressing the uncertain, locally idiosyncratic, and contingent needs that arise. In essence, the manager does most of his or work by exercising discretion. This is clear in all studies of managerial behavior, from the foundational work of Mintzberg (1971), through Stewart (1982) and on into the most recent examinations (e.g., Tengblad, 2006). Understanding managerial discretion is key in understanding management.

Another advantage of studying managers is there intrinsic importance in organizations. Modern work is changing in many ways, including portfolio careers, reduced hierarchy, greater job mobility, and increased use of project-based teams. These changes combine to make the manager of a project team more important than ever before. With portfolio careers, job mobility, and project-based work, individual members of a team are less likely to know each other or to share common organizational history and perspective. Managers thus have a larger role in coordinating the team. This increased role is enhanced by the way in which reduced hierarchy gives the remaining managers more freedom and control. Given the rising importance of managers, plus the other advantages they offered, I focused on managerial discretion, examining its consequences, antecedents, and internal structure in three papers.

The first paper, "Competing Predictions about the Performance Consequences of Managerial Discretion," was a test of the alternative predictions of ecology theory, agency theory, and strategic choice theory about managerial discretion's effect on unit performance. I used structural equation models of archival survey responses from R&D managers in six European countries. The results showed contingent support for ecology theory and strategic choice theory,

finding that unit performance was best predicted by a mix of structural and individual factors. The paper concludes with a discussion of these finding's implications for organization theory and for the study of discretion.

The second paper, "Sources of Managerial Discretion," built on the results of paper one with two analyses of the same archival survey. In the first, I confirmed the prevalent intuition that managers perceive their discretion as multidimensional. Exploratory factor analysis revealed two dimensions: discretion over work processes and discretion over resources. The second analysis extended the first to test a range of structural, interpersonal, and individual antecedents that had been hypothesized to influence managerial discretion. Regression revealed that the antecedents for each dimension of discretion were different, and that structural and individual antecedents were most important. These findings have important implications for the definition, measurement, and future study of managerial discretion.

The final paper, "Clarifying the Dimensional Structure of Discretion," extended paper two by defining the complete dimensional structure of discretion. I used literature review, meta-synthesis, and template analysis to integrate research from the literatures of job control, executive discretion, and organizational citizenship. The result was a four-level hierarchical structure with 12 distinct dimensions of discretion. This dimensional structure unites the three literatures, clarifies previously anomalous research results, and can serve as a foundation for improved future investigation of discretion.

As a set, these three papers made some progress toward a distinct theory of discretion. The first paper was firmly grounded in traditional organization theory, and used established perspectives to begin understanding managerial discretion. The second paper advanced this, moving beyond the limits of existing theory to integrate a range of findings and partial theories to better understand discretion. The final paper went further still. It combined three disparate literatures on discretion in service of a single, coherent theory.

Chapter 2: Competing Predictions about the Performance Consequences of Managerial Discretion

The idea of a "flat" organization has been established in the business community and popular press for some time (Coulson-Thomas & Coe, 1991). The archetypal flat organization is one which has empowered mid- or lower-level managers by simplifying its structure, reducing hierarchy and bureaucracy, and eliminating many rules and procedures (Joyce, 2005). Despite skepticism from some researchers (e.g., Gittell, 2000), observers associate flat organizing with a range of desirable outcomes, including agility, creativity, responsiveness, speed, innovation, knowledge creation, and capacity development (Holland & Davis, 2005; Perry, 1995; Svelby, 1992). It has been suggested that the flat organization is inevitable, that it will become the dominant organizational form, and that managers at lower levels in organizations will be the leaders of the future (Malone, 2004).

These claims raise questions about the desirability of such changes. The popular press on flat organizations seems to assume that increased discretion for middle and lower level managers will benefit organizations. However, there are dissenting opinions, particularly among subordinates of newly empowered managers in flattened organizations. Anecdotal evidence suggests that those being managed in flat organizations are unhappy; they question whether their managers are making effective use of the increased discretion (e.g., Heuer, 2003; Kruger, 1996; Rothman, 2005; Sinofsky, 2005). It is thus not clear whether increased discretion for middle mangers actually benefits the organization.

Unfortunately, organization science offers no clear answer. Research evidence suggests that increased discretion benefits individuals who have it, since discretion has been linked to greater well-being (Ganster, 1989), physical

health (Karasek, 1990), and job satisfaction (Dwyer & Ganster, 1991). However, it is less clear whether increased discretion has any performance benefits beyond those of the recipient. In fact, the foundational theories of organization science make incompatible predictions in this matter. Ecology theory suggests that discretion is irrelevant to organizational performance, agency theory predicts that managerial discretion reduces performance, and strategic choice theory presumes that discretion can benefit performance. Admittedly, these are simplified statements of complex theoretical positions, but they are useful for highlighting the ambiguity besetting organization theory's understanding of managerial discretion. With the current state of theory, we simply do not know what to expect from increased managerial discretion.

The aim of this paper was to resolve the uncertainty. I conducted an empirical test of ecology, agency, and strategic choice theories' competing predictions about the performance consequences of managerial discretion. Doing so makes three contributions. The first is to developing a theory of discretion, by clarifying the organizational consequences of increased managerial discretion and the mechanisms underlying those consequences. The second contribution is to the theories being tested, by extending their use to an important practical phenomenon and a new level of analysis. I used survey data from R&D units to examine the effect of managerial discretion on unit performance, and in so doing advanced ecology, agency, and strategic choice theory by refining their application to intra-organizational units. The final contribution combines the first two and offers direction for future research. By clarifying the performance consequences of managerial discretion and identifying which theoretical perspectives best explain them, this paper provides direction for future study and for policy concerning flat organizations.

Background

Perceived Managerial Discretion

Discretion is the freedom of action available to an individual (March & Simon, 1958; Williamson, 1963). Managerial discretion is thus a manager's freedom to manage as s/he deems best. It is the latitude of action and choice

available to a manager when s/he sets the unit's work (Hambrick & Finkelstein, 1987). Consider a manager whose every action is closely monitored and reviewed by organizational superiors. This individual has little discretion, particularly when compared to a manager whose work is mostly unsupervised. Similarly, a manager who must satisfy lengthy and detailed requirements, or one whose approach is tightly circumscribed, has relatively little discretion compared to a manager who is given only vague or negotiable goals and complete freedom in pursuing them. In simplest terms, managerial discretion refers to the amount of freedom and control that managers have in doing their work.

The research presented here focused on perceived managerial discretion, as distinct from objective discretion. Most prior work has focused on objective managerial discretion, and particularly the freedom provided by formal organizational structures or industry characteristics (e.g., Dobbin & Boychuk, 1999; Hambrick & Abrahamson, 1995; Hendrickson & Harrison, 1998; Magnan & St-Onge, 1997; Olk & Elvira, 2001; Perrone et al., 2003; Shalley, 1991; Zohar & Luria, 2005). This research has provided a good understanding of how environmental features make discretion objectively available to managers. For example, the long-term investment required in capital-intensive industries tends to limit managerial discretion, while healthy growth in an industry provides a munificent environment and greater discretion (Finkelstein & Boyd, 1998). What remains to be understood is how managers respond to this objective discretion.

The fact that all managers in a given industry do not behave identically, nor do they all achieve identical results, underscores the important role of perception in understanding discretion. Suppose that an industry provides enormous freedom to a manager; s/he is free to pursue a range of possibilities. If the manager fails to recognize this freedom, if the manager is convinced that s/he has no choice in acting, then his or her behavior will not reflect the objective discretion available. Likewise, a manager who perceives more freedom than is actually available may waste time and resources on fruitless efforts. Such considerations have prompted study of perceived discretion, and shown it to be a better predictor of managerial behavior than objective discretion (Carpenter &

Golden, 1997). In addition, the literature on employee job control reveals the supporting result that perceived control is more closely related to behavior than is objective control (Ganster, 1989). Since my concern in this paper was with the manager's effect on unit performance, the analysis concentrated on perceived managerial discretion as the best indicator of subsequent behavior.

Level of Analysis

This paper examined managers of autonomous science-based R&D units within larger organizations. I chose to conduct the analysis at the unit level rather than the organization level because intra-organizational units offered three advantages. The first advantage was in the nature of R&D work, which is inherently uncertain and potentially contradictory (Lewis et al., 2002). R&D success is often dependent on using intuition, following hunches, and making sudden changes in approach (Glaser, 1995). As a result, R&D could be expected to offer managers a relatively high level of discretion, which allowed for greater potential variance in managers' perceived discretion. Variance in the independent variable was clearly important for examining its potential consequences.

The second advantage offered by intra-organizational units was clarity of evaluation. Each R&D unit was embedded in a larger organization, and each unit had a designated superior who was responsible for evaluating its performance. In all cases, this evaluator was external to the unit and its routine work. As an example, imagine a unit developing oncology drugs in a pharmaceutical firm. The unit manager reports to the head of the oncology department, and that department head evaluates the unit's performance. These evaluations determine future promotions, rewards, and resource allocations, so they are the primary metric for the unit's success. This clarity can be contrasted with the challenge of judging the performance of an entire organization, which must satisfy multiple stakeholders with different priorities (Clarkson, 1995). The presence of a designated evaluator for each unit simplified performance measurements.

The final advantage of using intra-organizational units was the opportunity to extend ecology theory, agency theory, and strategic choice theory to a lower

level of analysis. Although these three theories are most often applied at the organization level of analysis, doing so is not inherently necessary. In each case, the theory is applicable at multiple levels of analysis. For example, the original statements of agency theory emphasized its generality as a model applicable to any situation where responsibility is delegated: "The problem of inducing an 'agent' to behave as if he were maximizing the 'principal's' welfare is quite general. It exists in all organizations and in all cooperative efforts – at every level of management" (Jensen & Meckling, 1976, p. 309). Even ecology theory, the least-evidently applicable to sub-organizational levels of analysis, has recognized the value of studying ecological processes as intra-organizational phenomena Baum and Singh (1994). For example, Usher and Evans (1996) simultaneously studied the population dynamics of organizations and their sub-units in the retail gasoline industry. Their analysis demonstrated the applicability of ecology theory to sub-organizational levels: the population of units within an organization responded to ecological pressures as predicted by ecology theory. Moreover, those unit-level dynamics were central in understanding the population dynamics at the organization level. Extending organizational theories to different levels of analysis offers the double benefit of explaining observed behavior and refining the theory.

This approach does not commit the ecological fallacy (Robinson, 1950), or more properly its converse, the individualistic fallacy. I did not infer relationships at the organization level from measurements at the unit level. My aim was to assess the multi-level applicability of ecology, agency, and strategic choice theories by examining whether relationships previously observed at the organizational level also held at an intra-organizational one (see Rousseau, 1985). This approach has been called sociological miniaturism, for its focus on the similarities of relationships in small and large social situations (Stolte et al., 2001). Sociological miniaturism seems particularly applicable to modern organizational settings where work is increasingly organized as projects completed by small to mid-sized groups, groups that effectively function as small organizations within the larger one (Edmondson, 2002; Engwall, 2003;

Soderlund, 2004).

Hypotheses

This paper tested competing predictions about the effect of perceived managerial discretion on unit performance. In simple terms, the difference among the three theories is whether they predict a null, negative, or positive relationship between discretion and performance. As described below, this stark difference in predictions results from differing assumptions about the efficacy and motivation of managers. This section summarizes each theoretical perspective, with its assumptions and attendant prediction. It also details a series of related issues that must be taken into account to properly test each theory.

Perceived Managerial Discretion and Performance

Ecology theory. Ecological theories of organization seek to understand changes in organizational populations by applying the logic of evolution and natural selection to organizational phenomena (Baum, 1996; Singh & Lumsden, 1990). While these theories are primarily concerned with diversity in organizational populations, they are premised on strong assumptions about managerial efficacy, and by implication, the link between managerial action and performance. One of the important features uniting the many variants of ecology theory is the assumption that intentional managerial action is relatively unimportant. Some ecological theories treat organizations as inert, precluding managerial influence (e.g., Hannan & Freeman, 1977). Others recognize that managers may create change in organizations, but assume that such changes are either a deterministic result of structural forces or of limited benefit to the organization (Carroll, 1988; Hannan & Freeman, 1984). The common theme is that external or structural forces are so powerful that managers cannot have any significant effect on organizations. Ecology theory therefore assumes that intentional managerial action is impossible, externally determined, or effectively no better than random variation. To the extent that this is true, there should be no systematic relationship between managerial discretion and performance.

H1a: Perceived managerial discretion is unrelated to unit performance.

Agency theory. In contrast to ecology theory, which understands

organizations through analogy to biological life, agency theory treats an organization as a system of contracts among participating individuals. Owners and investors ("principals") delegate authority to managers ("agents") to act on their behalf (Fama, 1980; Jensen & Meckling, 1976). Principals are thus highly concerned about whether agents honor their contracts. This concern is merited, because agency theory assumes that agents have personal interests that conflict with those of the principals. These personal interests cause agents to use their discretion in pursuit of their own goals, instead of the organization's (Kiser, 1999). In other words, agency theory assumes that the primary challenge for principals is to curb the inappropriate behavior of agents so they remain focused on organizational performance. As such, managerial discretion is predicted to harm performance by allowing managers to divert resources away from performance matters.

H1b: Perceived managerial discretion reduces unit performance.

Strategic choice theory. Like agency theory, strategic choice theory assumes that managers are able to effect meaningful change in organizations. However, where agency theory assumes that managers will use this power for personal gain at the expense of the organization, strategic choice theory assumes that managers will often use their power to benefit the organization (Child, 1972; Hrebiniak & Joyce, 1985; Keats & Hitt, 1988). The difference depends on assumptions about the ability of organizational forces to influence the manager's personal interests. Agency theory does not recognize organizations as entities, focusing instead on only the contract between a manager (agent) and a principal (Fama, 1980). In this contract-only framework, issues such as promotion opportunity, organizational commitment, and job dependence are not meaningful. In contrast, strategic choice theory considers such issues important, and thus assumes that it is often in the manager's best interest to help the organization succeed. If s/he has no better job prospects, the manager's fate is tied to the organization's. Moreover, benefiting the organization can lead to promotions that benefit the manager. With the inclusion of organizations as entities, strategic choice theory predicts that managers will want

to help their organization succeed. In this context, managerial discretion will increase performance by letting managers adjust in response to unexpected changes in a dynamic environment (Marlin et al., 1994).

H1c. Perceived managerial discretion increases unit performance.

Qualifications to the Hypotheses

As noted earlier, the three alternate versions of H1 are highly simplified. While each theory derives from basic assumptions about managerial behavior, each theory also qualifies its assumptions with significant contingencies. These contingencies lead to the following additional hypotheses.

Age. To provide a fair test of the ecology theory prediction that discretion does not influence performance, it is necessary to account for potential spurious correlations between managerial discretion and unit performance. Organizational age is one source of a potential spurious correlation. Age has consistently been found to predict organizational success and survival (Freeman, 1984). Since younger organizations are more likely to fail, this pattern is called the liability of newness (Stinchcombe, 1965). There are several disadvantages associated with newness: the time spent learning and creating routines is directed away from immediately productive behavior (Stinchcombe, 1965), social networks have yet to be established so one must rely on the goodwill of strangers (Freeman et al., 1983), and newness precludes having a reputation for reliability and predictability, which are preferentially selected for by the environment (Hannan & Freeman, 1984). All of these combine to make newness a significant impediment to success. At the same time, the lack of routines and formal procedure associated with newness should contribute to managerial discretion, since formal structure has been shown to reduce freedom (Zohar & Luria, 2005). As a result, age should predict both increased performance and decreased discretion.

H2a: Organizational age increases unit performance.

H2b: Organizational age is negatively associated with perceived managerial discretion.

Size. Another important ecological effect is the liability of smallness (Singh & Lumsden, 1990). Smaller size typically means fewer resources. It is also more

difficult for small entities to take advantage of economies of scale. Moreover, large size supports the routines and predictability that are favored by environmental selection (Baum, 1996). Smallness therefore increases the likelihood of failure. However, the lack of routines associated with smallness, as well as the reduced inertia associated with smaller groups, could lead to greater managerial discretion (Tushman & Romanelli, 1985; Zohar & Luria, 2005).

H3a: Unit size increases unit performance.

H3b: Unit size is negatively associated with perceived managerial discretion.

Functionally similar units. As with ecology theory, there are important contingencies that apply to the prediction derived from agency theory. One of these is the possibility of using efficient information systems to prevent agents' opportunism (Jensen & Meckling, 1976; Levinthal, 1988). If the principal is able to acquire information about what the agent does and knows, this can prevent the misuse of organizational resources (Fama, 1980; Fama & Jensen, 1983). In the context of intra-organizational units, the most relevant source of information for principals would be functionally similar units. If there are multiple independent managers and units performing a task, they can provide second opinions and more information to principals. Consistent with this, previous work has shown that the presence of other agents improves the efficiency of the principal-agent relationship (Levinthal, 1988).

H4: Functionally similar units reduce the negative effect of perceived managerial discretion on unit performance.

Commitment. An important source of agent opportunism is the presumed difference between their own goals and those of the principals (Fama, 1980; Levinthal, 1988). An extreme example would be a manager who is more concerned with having a large office and an easy work schedule than s/he is with the performance of the unit. In such a situation, managerial discretion would hurt performance. However, if the principal and agent have common interests, then discretion need not be harmful; the agent will act as the principal would wish. Within organizations, such alignment of interests has been called organizational

commitment (Cook & Wall, 1980). To the extent that the manager is committed to pursuing organizational goals rather than personal ones, his or her discretion will not be detrimental to performance.

H5: Managerial commitment reduces the negative effect of perceived managerial discretion on unit performance.

Expertise. The key contingency for strategic choice theory is the manager's ability to use discretion effectively. Giving a manager more freedom allows his or her unique experiences, perspectives, and management style to have more influence on outcomes. Therefore, even if it is generally true that increased discretion benefits performance, the extent of the benefit will vary by manager. What the manager does with the discretion determines its effect on performance (Bass et al., 2003; Peterson et al., 2003). One would expect a talented, skillful manager to use discretion to greater benefit than would a manager with less ability. Consistent with this, a link between expertise and performance has been found both for managers' formal education (Hitt & Barr, 1989) and their on-the-job experience (Hitt & Tyler, 1991).

H6. Managerial education increases the positive effect of perceived managerial discretion on unit performance.

H7. Managerial experience increases the positive effect of perceived managerial discretion on unit performance.

Figure 2.1 summarizes these hypotheses. In the figure, H2b and H3b, the discretion-related contingencies introduced by ecology theory, are marked with two-headed arrows. This reflects the fact that these hypotheses are not truly predictions of ecology theory. The hypothesized relationships of age and size with discretion do not derive from selective environmental pressures. These two hypotheses are rather like control variables; they account for a potential association that would lead to model misspecification if not addressed. As such, H2b and H3b were modeled as covariances, rather than regression coefficients.

Methods

Sample

The research described here analyzed survey responses from the *International Comparative Study on the Organization and Performance of*

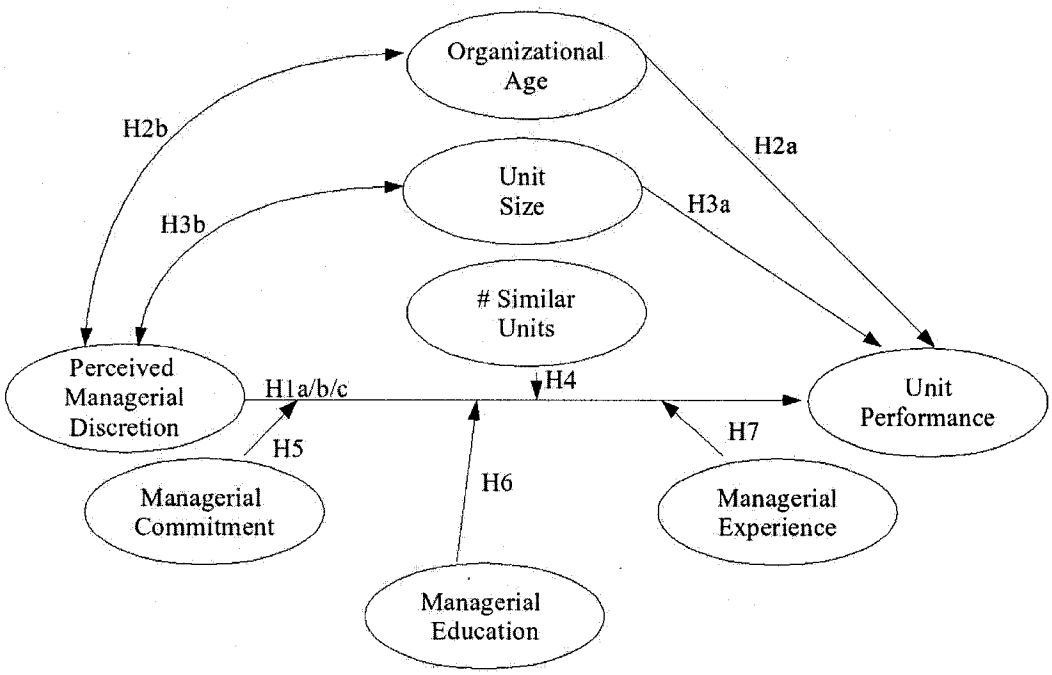


Figure 2.1: Summary of Hypotheses

Research Units (Knorr et al., 1999). This was a large-scale survey project initiated by six European countries and conducted under the auspices of the secretariat of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). UNESCO is a specialized agency of the United Nations, responsible for collecting and sharing information. The *International Comparative Study* was undertaken for the participating national governments to better understand the organization and performance of scientific research in their countries (Hungary, Austria, Finland, Sweden, Poland, and Belgium).

Each country had a designated research team that administered standardized questionnaires to participating units. A sample of approximately 200 units was selected for each country to be representative of the population distribution. A range of psychological, sociological, and structural questions were

asked of unit managers, scientists, support staff, and external superiors. The participating units all met three criteria: having a designated leader who was a participating member, having at least three members in regular communication, and having an expected life span of at least one year. The full data set consists of responses from 1,222 units in nine different scientific fields.

For the analysis described here, a subset of 718 units was used. These were from all six countries: Hungary (26%), Austria (21%), Finland (18%), Sweden (8%), Poland (20%), and Belgium (7%). However, units in only five scientific fields were included (chemistry 25%, life sciences 22%, agriculture 14%, technology 31%, and medical science 8%), as the other four fields had few responses and little distribution among countries. Each of the 718 units was embedded in one of five types of larger organization (university 39%, university-affiliated research center 11%, nonprofit or public service organization 25%, commercial enterprise 19%, and federal or state research body 6%). Each unit was from a different organization (i.e., units were independent), and only those units with an external superior who was familiar with and responsible for evaluating the unit's work were included.

Measures

Unless otherwise stated, items were measured on 5-point scales of increasing strength or agreement.

Unit performance. Unit performance was measured with four items, concerning innovation, quality, success in reaching R&D goals, and contributions to the scientific field (Cronbach's $\alpha = 0.87$). These ratings were provided by the organizational superior responsible for evaluating the unit's performance, rather than by the manager or members of the unit. Details of the exact relationship between evaluator and unit were not specified, and presumably varied by organization type. However, each manager indicated whether s/he felt the evaluator in question was familiar with the work of the unit. To ensure the validity of the performance measure, the analysis only included those units where the manager indicated good familiarity on the part of the evaluator.

Perceived managerial discretion. Each manager rated his or her

freedom and control in four areas central to the management of an autonomous unit: use of training resources, hiring, firing, and the assignment of specific tasks in the unit (Cronbach's $\alpha = 0.71$). Managers reporting greater control over these issues were assumed to perceive themselves as having more discretion. For example, consider the assignment of tasks in the unit. If the manager feels free to determine which tasks are undertaken by subordinates, then s/he feels free to manage the work of the unit. Such freedom is discretion; the manager has latitude of action.

Organizational age. Managers reported the age of their organization. I used a logarithmic transformation to reduce the variable's skewness.

Unit size. Each manager reported how many scientists s/he supervised in the unit. This number was log-transformed to reduce skewness.

Number of functionally similar units. Managers reported the number of units in the organization that performed "the same or similar" work. To reduce skewness in the distribution, the analysis below used a square-root transformation of the reported counts.

Managerial commitment to the organization. Commitment was measured by reverse-scoring an item about the manager's intention to leave the unit. Responses ranged on the 5-point scale from "I rarely ever consider leaving" to "I would leave if I had a suitable opportunity." Therefore, reverse-scoring created a measure of the manager's intention to stay. Presumably, managers who intended to stay with an organization saw their fates as entwined with that of the organization, and thus would be more committed to its success.

Managerial education. Managers reported their years of full-time equivalent education, including post-graduate work.

Managerial experience. Managers reported their total years of R&D experience.

Multiple Imputation

The data set had many missing values; only 489 (68%) of the 718 cases had complete data. However, the largest missing data rate for any one variable was only 11%. This suggests that the data were missing at random, rather than

from some systematic censoring effect. Such randomly missing data is best addressed through multiple imputation, rather than with deletion or mean substitution (Schafer & Olsen, 1998). Simulation studies show that deletion and mean substitution often generate biased, inefficient estimators (Little & Rubin, 1987; Wothke, 2000).

Multiple imputation (MI) is a simulation technique that uses the observed data to generate plausible values for each missing data point (see Schafer, 1999a for an overview). However, rather than substituting a single value such as the mean, multiple potential values are generated, leading to several complete but different data sets. Each data set has different random values substituted for the missing data, and is then analyzed independently, generating multiple sets of results (e.g., factor loadings or regression coefficients). These results are combined by adjusting their standard errors to reflect how much data was missing and how variable the imputed values were (see Little & Rubin, 1987). The result is better estimates for a single set of familiar statistical results, with standard errors that reflect the additional uncertainty introduced by imputing missing values. Simulation studies have shown that five to ten imputed data sets are sufficient for reliable estimates (Schafer & Olsen, 1998). The results in this paper were derived from ten imputed data sets, using an MI implementation developed by Schafer (1999b).

Structural Equation Modeling

I tested the hypotheses using maximum likelihood structural equation modeling (SEM). SEM was the best technique to account for the measurement error resulting from the use of archival survey data. However, the common moderation-testing approach of using multiple group comparisons was unworkable, given the need to simultaneously test four continuous moderators (Raykov & Marcoulides, 2000). Instead, I used the technique described by Ping (1995), which allowed simultaneous testing of all moderated relationships. In brief, the technique is to sum the mean-centered indicators of each interacting latent variable and then multiply those sums, using the result as a single indicator for an exogenous latent variable which represents the moderation effect. This

technique necessarily violates the SEM assumption of multivariate normality, but a review of work on this technique suggests that maximum likelihood estimation is robust to the violation (Cortina et al., 2001).

I compared the primary structural model to three alternative models that included each unit's nation, scientific field, or type of organization as predictors. While none of these work context features were directly relevant to my hypotheses, previous evidence suggested that they might influence the dynamics of discretion in R&D units (e.g., Cheng, 1983; Dobbin & Boychuk, 1999). To assess the importance of such effects, each of the alternative models added dummy-coded, observed variables and discretion moderation variables for the relevant contextual feature. For example, one alternative model included observed variables for each of the scientific fields (chemistry yes/no, life science yes/no, etc.) as predictors of unit performance. This model also included moderation variables to test whether a given scientific field influenced the link between discretion and performance (e.g., does managerial discretion affect a chemistry unit's performance differently than an agricultural unit's?). Important differences across these alternative models would indicate the need to take the relevant aspect of work context into account.

Results

Table 2.1 provides descriptive statistics for the variables in the analysis. Following Kline (1998), the modeling was conducted in two stages. First, I fit a measurement model, without moderation terms, to confirm convergent and discriminant validity. This model achieved an acceptable fit with the data (χ^2_{79} = 225.42, χ/df = 2.85, CFI = 0.93, TLI = 0.92, RMSEA = 0.05), suggesting that the measurement model was appropriate. In the second step, I fit a structural model, including moderation terms and all hypothesis tests. This model also fit the data acceptably (χ^2_{121} = 220.23, χ^2/df = 1.82, CFI = 0.96, TLI = 0.95, RMSEA = 0.03). In comparison with this structural model, none of the three alternative models offered a better fit ($\Delta\chi^2$ *n.s.*). Moreover, in each of the three alternative models, the substantive results were unchanged. There were some direct effects from contextual features (e.g., university-based units had higher average performance

ratings than units in any other type of organization, $p = 0.02$). However, there were no significant interactions between work context and discretion, and the results for the individual hypothesis tests were unchanged by the inclusion of work context variables. For parsimony, the results reported here were taken from the initial structural model, without the inclusion of work context variables.

Concerning a direct relationship between perceived managerial discretion and unit performance, the data supported H1a. I found no direct effect ($p = 0.22$). The other ecology theory predictions received mixed support. H2 was not supported. There was no association between organizational age and unit performance (H2a, $p = 0.29$). Also, the significant correlation between organizational age and perceived managerial discretion was positive, rather than the predicted negative (H2b, $r = 0.19$, $p < 0.01$). In contrast, unit size did predict unit performance as hypothesized (H3a, $p = 0.01$). There was also a significant correlation between unit size and managerial discretion, but it was positive, rather than the predicted negative (H3b, $r = 0.12$, $p = 0.01$).

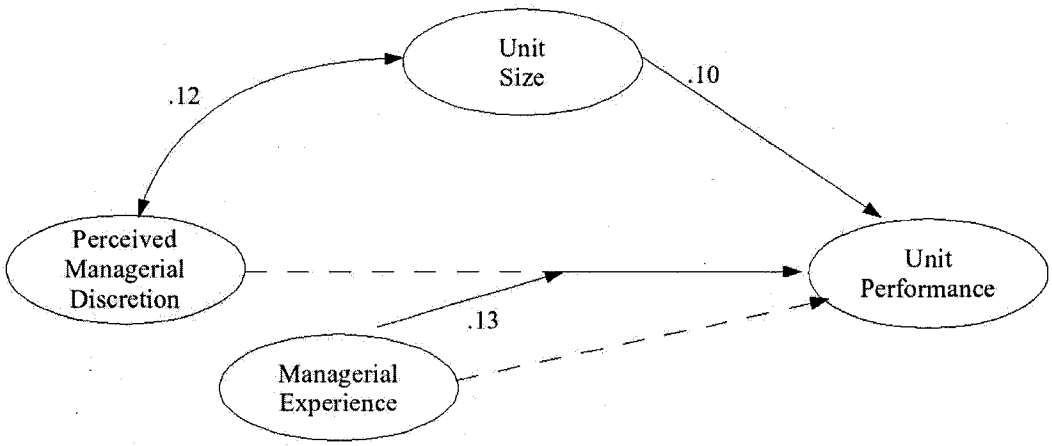
The agency theory predictions received no support. The number of functionally similar units did not affect the relationship between perceived managerial discretion and unit performance (H4, $p = 0.46$), nor was the relationship altered by managerial commitment (H5, $p = 0.28$). The predictions derived from strategic choice theory had mixed support. H6 was not supported; managerial education did not influence the link between discretion and performance ($p = 0.88$). However, H7 was supported. As predicted, managerial experience had a positive moderating effect on the relationship between perceived managerial discretion and unit performance ($p < 0.01$).

All direct effects outside the hypotheses of interest were non-significant. That is, unit performance was not predicted by the number of functionally similar units ($p = 0.70$), managerial commitment ($p = 0.39$), managerial education ($p = 0.68$), or managerial experience ($p = 0.09$). Figure 2.2 summarizes these results by presenting the significant predictors of unit performance.

Table 2.1: Descriptive Statistics for Study Variables

	Unit Performance	Perceived Managerial Discretion	Organization age	Unit size	Functionally similar units	Managerial commitment	Managerial education	Managerial experience
Unit Performance	(.33)							
Perceived Managerial Discretion	.10	(.20)						
Organization age (log)	.05*	.18*	(1.52)					
Unit size (log)	.12	.16*	-.04	(1.86)				
Functionally similar units (sq. root)	.02	-.05	-.06	-.02	(.82)			
Managerial commitment	-.02	.28*	.06	.05	.02	(1.14)		
Managerial education	-.01	.06	.04	.01	.02	-.01	(11.91)	
Managerial experience	.08	.18	.19*	.26*	.05	.24*	.11*	(88.58)

N= 718
variance in the diagonal
* $p \leq 0.05$



* All standardized regression and correlation coefficients, $p < .05$

Figure 2.2: Summary of Results

Discussion

This paper had three aims. The first was to advance understanding of discretion by examining the link between managerial discretion and unit performance. The results indicated a contingent relationship. Perceived managerial discretion had no direct relationship with unit performance, but there was a significant interaction between discretion and experience: experienced managers who reported higher discretion also had better performing units.

One possible interpretation of this pattern is that managerial discretion can benefit unit performance, but only if the manager has sufficient experience to make effective use of it. As an example, contrast two hypothetical managers for a pharmaceutical R&D unit. The first is a thirty-year veteran of multiple projects and several corporate mergers; the second is a recent graduate from the country's leading PhD program. Both are capable scientists, and both are given great

discretion by their superiors. It seems clear that the first manager, with thirty years of experience, will be better able to use that discretion to benefit his or her unit. The PhD graduate, having limited management experience, cannot be expected to make best use of freedom in hiring subordinates, for example. The logic here is familiar, as it underlies strategic choice theory, selective recruitment efforts, and human resource management.

However, the results showed that in assessing the effect of managerial discretion, one must also consider the role of structural forces. If this analysis had ignored the positive relationships among performance, unit size, and discretion, it would have overestimated the link between discretion and performance. The results presented here thus indicate the mutual importance of ecology theory and strategic choice theory for understanding the effects of discretion in organizations. While ecology predictions about the importance of unit size were supported, such structural forces did not preclude all managerial influence. The data were consistent with the strategic choice theory prediction that a skilled manager can make a positive difference. The best way to understand managerial discretion in organizations therefore seems to be as a process of effective adaptation within environmental constraints, which has been called *differentiation*, to distinguish it from pure ecological selection and unfettered strategic choice (Hrebiniak & Joyce, 1985).

Of course, this conclusion can only be made tentatively, given the significant limitation of using cross-sectional data. Cause cannot be inferred from these results, and alternative interpretations could be offered. For example, ecology theory predicts that larger units enjoy better performance because small units have fewer resources, lose economies of scale, and have less of the stable predictability that is preferred by environmental selection. Consistent with this prediction, I found a positive association between unit size and performance. However, because the data are cross-sectional, the positive association could as easily have resulted from opposite causality: units that perform at a high level attract more resources and are thus able to grow larger. Most likely, both explanations apply and create a self-reinforcing cycle, but there is no way to

distinguish that with the current data. Thus it must be stressed that the findings herein are consistent with predictions, but do not prove them. Longitudinal study is needed.

The second aim of this paper was to explore the utility of ecology theory, agency theory, and strategic choice theory for explaining intra-organizational phenomena. In this regard, both ecology and strategic choice theories had predictive power. As noted above, the findings were consistent with ecology theory's liability of smallness, as larger units had higher performance. However, no liability of newness was observed; there was no relationship between performance and age. This suggests that organization-level findings about the effects of size generalize to intra-organizational units, but those concerning age do not. This latter point is consistent with another study at the unit level that found lagged change did not predict failure rates (Usher & Evans, 1996). The authors interpreted this as evidence that the liability of newness did not apply to intra-organizational units, and my findings concur. This implies an important modification is required when applying ecology theory at intra-organizational levels. Unlike size, age does not appear to have the same effect at all levels of analysis. Internal promotion and existing relationships provide the likeliest explanation: while a unit may be new, the individuals within it could already have established reputations and contacts within the organization, eliminating most of the liability of newness. However, further investigation is required to confirm this.

Strategic choice theory also had mixed results at the unit level. The findings were consistent with the prediction that experienced managers could make use of discretion to benefit unit performance, but the same was not true of managerial education. There was no link, direct or moderated, between managerial education and unit performance. Two explanations seem possible. The first is lack of variance; the sample mean was almost 20 years of formal education. It seems possible that beyond a certain point, more years of schooling provide little performance benefit. The alternative explanation is that practical experience is more important than formal training in allowing managers to make the best use of discretion (see Dreyfus & Dreyfus, 1986). This would be an

interesting direction for future research that would benefit both theory and practice.

Additionally, there is a need to determine the specific mechanisms driving the experience-discretion interaction observed in the data. Years of experience may have served as a proxy for raw managerial skill, but it might also have reflected the tendency for managers of different ages to use different management styles (e.g., Hambrick & Mason, 1984; Hitt & Barr, 1989; Hitt & Tyler, 1991). The experience measure might also have been capturing the effects of tenure, whereby relationships, reputation, and familiarity with organizational routines may have contributed to higher performance for the manager's unit (e.g., Finkelstein & Hambrick, 1990; Mouly & Sankaran, 1999; Perrone et al., 2003). Focused investigation will be needed to distinguish among these potential mechanisms.

A striking feature of these findings is the failure of agency theory; its predictions were refuted entirely. This presumably resulted from agency theory's dependence on the assumption of opportunism. Agency theory predictions only apply to managers who exhibit selfish or shirking behavior, so the findings here suggest that there was little opportunism among managers. Doubts about the assumption of opportunism are not new (Perrow, 1986), but seem worth restating, given the cultural and intellectual dominance that agency theory has achieved (Zajac & Westphal, 2004). As an analytic tool, agency theory has generated many useful insights (Shapiro, 2005), but the findings presented here question its utility as an explanatory theory of organizational behavior at the unit level.

However, one could legitimately debate this conclusion on the grounds that the results are unique to R&D units. This is a genuine concern, and represents a potential limitation of this study. R&D units were an attractive setting because the uncertainty of the work allowed for greater variance in perceived discretion. At the same time, the uncertain and creative nature of R&D could have combined with the incumbents' high levels of skill and education to produce significant intrinsic motivation (Csikszentmihalyi, 1996). The nature of R&D work

may offer enough engagement and appeal that agent opportunism was offset. Therefore, it remains to be seen whether the observed failure of agency theory generalizes to other work contexts.

The third aim of this paper was to serve as a guide to research and policy. In this regard, it has several implications. A number of research directions have already been discussed, including the use longitudinal data to confirm causality, explaining the absence of liability of newness effects on intra-organizational units, re-examining the role of education in a more diverse sample, explicating the precise mechanisms of the experience-discretion interaction on performance, and confirming the generalizability of agency theory's predictive failure. More generally, this paper demonstrates the potential importance of discretion for unit performance and the theoretical benefit available from studying traditional organization theories at intra-organizational levels of analysis. For example, if the finding of this paper and that of Usher and Evans (1996) is supported, if the liability of newness does not apply to organizational units, further investigation is needed to determine why, and such investigation will surely benefit ecology theory as a whole by more clearly explicating its mechanisms and boundaries.

These findings also offer a clear warning to practice. Despite some glowing claims for the benefits of flat organizations, there is reason to doubt their universal value. It remains to be determined whether the key mechanism is skill, management style, or established networks, but the results presented here suggest that many managers' units will not benefit from the increased discretion of flatter organizations. As such, a rush to flat organizational forms is likely to produce poor overall results. More specifically, the rich are likely to get richer as those organizations that are already doing well will have the experienced management to benefit most from flattening. Until the dynamics of discretion in organizations are better understood, flat organizing should be examined with somewhat more skepticism than is currently the norm.

Chapter 3: Sources of Managerial Discretion

Discretion, defined as freedom of action, is a fundamental part of organized behavior (Hambrick & Finkelstein, 1987; March & Simon, 1958; Williamson, 1963). Discretion arises from the need to act in situations that are ambiguous or equivocal. Such uncertainty is at the heart of organizing, where structures are driven by uncertainty (Thompson, 1967) and rewards go to those who can deal with it (March & Simon, 1958). Moreover, current practice makes discretion increasingly important for all organization members, as discretion is no longer reserved for senior management. The current popularity of flattened hierarchy, customer responsiveness, empowerment, and similar practices suggests a trend toward increased discretion for all employees (Coulson-Thomas & Coe, 1991; Malone, 2004; OECD, 2000). Even the United States Army, an archetype of hierarchy with more than 20 formal ranks, has adopted the slogan "Army of One" in an effort to increase soldiers' perceived discretion (Army, 2005).

Consistent with this practical importance, the literatures of strategic discretion, work autonomy, and job control have linked discretion to many consequential outcomes. These include corporate investment (Aragon-Correa et al., 2004), affirmative action (Weisman, 1994), strategy persistence (Finkelstein & Hambrick, 1990), procedural fairness (Hendrickson & Harrison, 1998), creativity (Shalley, 1991), compensation (Finkelstein & Boyd, 1998), mental health (Bond & Bunce, 2001), job satisfaction (Dwyer & Ganster, 1991), and safety behavior (Zohar & Luria, 2005). In apparent support of practical intuition, scholarly research has demonstrated the wide-ranging importance of discretion.

However, surprisingly little is known about the nature and sources of discretion. Most previous research has studied the effects of discretion, rather than its origins (e.g., Aragon-Correa et al., 2004; Hendrickson & Harrison, 1998;

Olk & Elvira, 2001; Shalley, 1991). In fact, most of the proposed antecedents of discretion have never been tested (Carpenter & Golden, 1997). Moreover, there is some need for concern about the accuracy of those predictions. As described below, there is a striking discontinuity between theoretical discussions of discretion and its operationalization. The result is uncertainty about the antecedents of managerial discretion.

This paper reports analyses addressing this uncertainty. It begins with a clarification of the discretion construct, and then derives hypotheses from the literatures of strategic discretion, work autonomy, and job control. Using survey responses from managers of scientific R&D units, this paper provides the first empirical support for the prevalent intuition that managerial discretion is a multidimensional phenomenon. Subsequent analysis presents the first simultaneous test of many existing predictions about the antecedents of discretion.

Managerial Discretion

Discretion is defined as the freedom of action available to an individual (Hambrick & Finkelstein, 1987). The research described here studied the discretion of managers, because theirs is the most general form of discretion. Managers have the potential to choose both means and ends, which presents them with maximal uncertainty and freedom (Stewart, 1982). This makes managers an ideal population for testing theories of discretion.

Perceived versus Objective Managerial Discretion

The analyses here focused on managers' perceived discretion. The distinction between objective and perceived discretion is a crucial one (Spector, 1987). A high level of objective freedom is irrelevant if the manager fails to recognize it. Similarly, some managers may perceive themselves to have more freedom than is actually the case (Carpenter & Golden, 1997). In both instances, it is the perception that most influences behavior (Ganster, 1989). However, most prior studies have focused on objective measures of discretion (e.g., Dobbin & Boychuk, 1999; Finkelstein & Boyd, 1998; Hambrick et al., 1993). As such, little is known about how managers perceive discretion. For example, Hambrick and

Abrahamson (1995) showed that the pharmaceutical industry offers less objective discretion than the engineering industry, but it remains to be explained what this means for the managers in each industry. Thus, the next logical step for advancing theory was to understand how managers perceive their discretion (Carpenter & Golden, 1997).

Dimensions of Managerial Discretion

Reviewing work on managerial discretion reveals as striking discontinuity between theoretical discussion and empirical operationalization. When discussing discretion, most authors imply it is a multidimensional phenomenon. They refer to it as varying by "domain" (Hambrick & Finkelstein, 1987) or being of different "kinds" (March & Simon, 1958). However, these domains and kinds are not specified, nor do they appear in formal hypotheses or measures. Instead, existing hypotheses refer to a uni-dimensional discretion that presumably encompasses every aspect of a manager's job. For example, Hambrick and Finkelstein (1987) noted that

> If the chief executive is constrained in domains of real significance, it is expected that his or her attention will be drawn to relatively insignificant domains where discretion does exist (p. 392).

Despite this, none of their 17 empirical propositions about the antecedents of discretion mentioned "domains" or any other dimensionality. Each proposition implied that managerial discretion was uni-dimensional.

This discrepancy between theory and operationalization is problematic. If one assumes that individuals perceive their discretion as multidimensional, then the antecedents of discretion in each dimension may differ. For example, consider the CEO in the Hambrick and Finkelstein (1987) quote above. S/he perceives great discretion in one domain and little in another, with no change in industry, organization, personality, or any other antecedent. Therefore, since the antecedent conditions are identical, but the discretion varies by domain, it must be assumed that the antecedents of each domain are different. If so, then theoretical predictions must distinguish among the dimensions of discretion.

The analyses in this paper moved theory toward such multidimensional

precision. Based on the multidimensionality implied in discussions of managerial discretion, and the fact that staff workers have been shown to perceive their discretion as multidimensional (e.g., Breaugh, 1985; Wall et al., 1995), it was predicted that managers would perceive their discretion as multidimensional. However, existing theory was insufficient to hypothesize specific dimensions. As noted above, theories of managerial discretion have not addressed this issue explicitly, and the measurement of staff-level discretion is conflicted as to discretion's dimensionality (e.g., Smith et al., 1997). Therefore, this paper reports the result of an inductive investigation, using managers' responses to define the relevant dimensions.

H1: Managers perceive their discretion as multidimensional.

Antecedents of Managerial Discretion

Given the wide-ranging importance of discretion, it is not surprising that many different perspectives have been used to theorize about it. Diverse literatures offer important predictions about discretion. However, many of these predictions have not been tested (Carpenter & Golden, 1997). Moreover, many were developed in isolation from one another. The result is that no overall framework exists to organize the hypothesized antecedents of discretion.

One important aim of this paper was to draw such isolated theories together for simultaneous testing and integration. To that end, this section derives 13 hypotheses about the antecedents of managerial discretion. These address all of the important antecedents previously linked to discretion, with two exceptions. The first exception is the exclusion of industry-level antecedents; the successful testing (Hambrick & Abrahamson, 1995) and replication (Finkelstein & Boyd, 1998) of Hambrick and Finkelstein's (1987) model of industry-level antecedents was taken as sufficient. The second exception was the exclusion of fixed personality traits (e.g., tolerance for ambiguity, locus of control). It was assumed that mature theories in personality psychology allow reliable predictions for such antecedents (e.g., Carpenter & Golden, 1997).

While the antecedents below shared no organizing framework, there were similarities in the basic mechanisms by which each was hypothesized to work.

That is, the underlying reason why antecedent X was predicted to influence discretion consistently took one of three forms: structural, interpersonal, or individual. Structural antecedents affect discretion through formal authority, based on official control or the application of policy, routine, or procedure. In contrast, the effect of interpersonal antecedents derive from less formal sources. Interpersonal effects depend on the influence of unofficial, and often unspoken, forces in the organization. Whereas structural antecedents involve the effect of the formal organization on the individual, interpersonal antecedents depended upon interaction among individuals; they arise from social practices. The final category of antecedents is individual, involving the effect of person-specific attributes (other than personality). The hypotheses presented below are arranged in these three categories, reflecting which of the basic explanatory mechanisms informed the proposed effect on discretion

Structural Antecedents

Extra-organizational influence. Building on Pfeffer and Salancik's (1978) analysis of the power of external stakeholders, it was predicted that influence from outside the organization would limit managers' perceived discretion (Hambrick & Finkelstein, 1987). Extra-organizational parties with the power to affect the unit's work will infringe upon the manager's freedom. Discretion could be reduced by having to seek approval before acting or by having to honor specific requirements. For example, consider a research unit that depends on external funding. Grants from governments and private foundations often include stipulations about how the money can be spent (e.g., not on overhead). Such stipulations limit the unit manager's discretion. Moreover, other external stakeholders, such as environmental groups or professional organizations, could apply similar restrictions to the manager. Thus, the ability of extra-organizational parties to influence the unit's work will be perceived as limiting managerial discretion.

H2: Extra-organizational influence on the unit decreases perceived managerial discretion.

Senior management influence. To the manager of an autonomous unit

within an organization, senior staff may resemble external stakeholders. That is, the expectations of the manager's superiors are another set of extra-unit constraints that must be met (Hambrick & Finkelstein, 1987). As such, the logic of H2 should also apply to a manager's superiors. A manager who feels closely supervised will perceive less freedom than one who is given more sovereignty.

H3: Senior management influence on the unit decreases perceived managerial discretion.

Organizational size. Organizations tend to resist change, a phenomenon that has been explained through analogy to the concept of inertia (Hannan & Freeman, 1984). The logic is that certain organizational characteristics impede efforts at change, neutralizing managers' influence (Hannan & Freeman, 1977). Such neutralization limits the options that a manager could consider, and thereby reduces perceived discretion. One of the most important of sources of inertia is organizational size (Baum, 1996). Size creates complexity and coordination challenges that make change difficult. Therefore, larger organizations have greater inertia, and thus reduce managerial discretion.

For units within larger organizations, there are two potentially important aspects of size: the unit and the whole organization. At the unit level, managing many scientists involves more inertia than managing just a few. Simultaneously, inertia in the larger organization affects the unit's immediate environment. A slow, unchanging organization would impede managerial action. Therefore, predictions were made for both unit size and organization size as sources of inertia to reduce discretion.

H4a: Unit size decreases perceived managerial discretion.

H4b: Organization size decreases perceived managerial discretion.

Functional uniqueness. March and Simon (1958) argued that discretion arises from using specialized knowledge to control information. Those who interpret information have greater freedom because they can set the terms by which decisions are made. In the context of this study, the more unique the unit's work, the more its manager has access to the freedom described by March and Simon (1958). For example, imagine a manager who tells superiors that a

specific task requires two weeks to complete. If there is no other unit to do the work, or even to offer a second opinion, this estimate is more likely to be accepted. Thus, the more unique the manager's unit and work, the greater the manager's perceived discretion.

H5a: Functionally similar units decrease perceived managerial discretion.

However, Hambrick and Finkelstein (1987) can be understood to offer a competing prediction. They proposed that CEOs of oligopolies have relatively little discretion because they participate in "oligopolistic bargains" (Hambrick & Finkelstein, 1987, p. 381). Since oligopolists are powerful enough to be influential, but do not have the complete control of monopolists, unofficial norms develop; oligopolists limit their actions in consideration of others. Hambrick and Finkelstein (1987) thus predicted that monopoly and competitive conditions would be comparable in yielding greater discretion than oligopoly.

If one assumes that a parallel can be drawn between firms operating in an industry and autonomous units operating within an organization, then an alternative to H5a is implied. The manager of a unit that performs a unique function has some similarity with the CEO of a monopoly. S/he controls the only supply of a desired commodity. Likewise, one can imagine that in an organization where two or three managers control the commodity, they might settle into agreements about how to conduct work and deal with senior management, while such agreement would be impractical if there were many similar units. Some organizations literally create such competitive internal markets, pitting units or projects against each other (Engardio & Einhorn, 2005), and there is some research evidence that the forces of environmental selection operate on units much as they do on larger organizations (Usher & Evans, 1996).

H5b: There is a curvilinear relationship between the unit's functional uniqueness and perceived managerial discretion, such that a few functionally similar units decrease perceived managerial discretion relative to none or many functionally similar units.

Resource availability. Slack resources are an important source of discretion, providing the ability to pursue a variety of possibilities and to accept risks (Finkelstein & Hambrick, 1990). If a unit has insufficient resources to carry

out its tasks, its manager will perceive little freedom; his or her actions will be governed by necessity. In contrast, a situation of abundant resources provides the security and wherewithal to consider a range of alternatives. The adequacy of resources available should therefore contribute to perceived managerial discretion.

H6: The availability of resources for the unit increases perceived managerial discretion.

Formal planning. Zohar and Luria (2005) described how the formalization of routines lessened discretion. They argued that the more formal the routine, the more predictable behavior would be, thus reducing possibilities to exercise discretion. For R&D units, the most likely context for formalization is in planning. In many instances, the conduct of scientific procedures is already highly formalized (e.g., how to conduct a given statistical analysis, the process for cooling a chemical reaction, etc.). Therefore, formalization and subsequent discretion would be most variable in the planning stages, such as choosing which procedures to use. Extensive use of formal planning, where codified techniques are used to make decisions that would otherwise be at the discretion of the planner, should reduce discretion. If the manager chooses to follow a specified protocol, its behavioral direction reduces freedom of action (Hambrick & Finkelstein, 1987).

H7: Use of formal planning in the unit decreases perceived managerial discretion.

Interpersonal Antecedents

Supportive climate. Climate refers to members' shared perceptions of the work environment, and the psychological meaning they assign to those perceptions (Rentsch, 1990). Climate guides behavior by shaping attention, interpretation, and attitude, and is thus important for discretion (Hambrick & Finkelstein, 1987). A unit with an non-supportive climate, where people are bickering and recalcitrant, would reduce managerial discretion, relative to one where the manager has great support. Actions in non-supportive climates would be limited to those that would not exacerbate an already bitter atmosphere.

H8: Supportive unit climate increases perceived managerial discretion.

Congruent climate. Ironically, while a supportive climate may increase perceived managerial discretion, greater strength or congruence could reduce discretion. Climate congruence refers to the degree of agreement among members in their climate perceptions (Schneider et al., 2002). Managing in a strongly congruent climate would reduce discretion directly by limiting the range of options that the manager would consider (Anderson & West, 1998) and also indirectly through subordinates expecting climate-consistent behaviors (Guzley, 1992). Climate congruence should thus reduce the freedom managers perceive (Hambrick & Finkelstein, 1987).

H9: Unit climate congruence decreases perceived managerial discretion.

Personal Power. Managerial discretion can be increased by various social and interpersonal sources of power. For example, political acumen will contribute to successful negotiations and greater freedom (Hambrick & Finkelstein, 1987). Similarly, accumulated trust and social capital contribute to managerial freedom by predisposing others to follow the manager's lead (Perrone et al., 2003). Approaching key stakeholders the right way, knowing which issues are negotiable, having the connections to gain access, and other such intangible assets will contribute to a manager's available options, and hence perceived discretion.

H10: Managerial personal power increases perceived managerial discretion.

Goal alignment. Management typically involves balancing competing demands (Dawkins & Lewis, 2003; Quinn, 1988), and the alignment among these demands has implications for discretion (March & Simon, 1958). Competing goals (i.e., low alignment) could contribute to discretion by allowing the manager to set them against each other, and thereby gain more freedom (Pfeffer & Salancik, 1978). For example, imagine a manager who is expected to be environmentally sensitive and to reduce costs. S/he could claim high costs come from using expensive, environmentally friendly materials, or s/he could claim poor environmental performance results from using the cheapest material

available. Being able to set these two goals against each other gives the manager more freedom. (This hypothesis is labeled H11a because there is an alternative prediction described later as H11b.)

H11a: Unit goal alignment decreases perceived managerial discretion.

Individual Antecedents

Goal alignment. Based on interpersonal mechanisms, goal alignment was predicted to decrease managerial discretion (H11a above). However, a contrary perspective is offered if one assumes that individual-level phenomena are more important. From the perspective of individual cognition, poorly aligned goals would place competing demands on the finite mental resources of the manager. Diverse, conflicting goals could create ambiguity and confusion that overwhelm the manager (Curley et al., 1986; Nisbett & Ross, 1980). In response, the manager would revert to routine and familiar behaviors (Forgas & George, 2001). This would limit the manager's perceived discretion, as default behavior would prevent consideration of other possibilities. This reasoning suggests an alternative to H11a.

H11b: Unit goal alignment increases perceived managerial discretion.

Age. Dobbin and Boychuk (1999) found a significant correlation between age and discretion in their cross-national survey of workers. While they did not explain this finding, other research suggests that stereotypes about age are the likely explanation. Assumptions about the proper roles and abilities of older versus younger adults are common in many countries (Schaie, 1988) and have been documented in many contexts (Kimmel, 1988). Stereotypes may imply that older individuals should be more responsible and involved, causing older managers to be assigned additional ancillary duties. These responsibilities would reduce the freedom available for discretionary use.

H12: Managerial age decreases perceived managerial discretion.

Job dependence. Managers who feel insecure in their current position will experience less discretion because of threat rigidity responses. Fear reduces information processing and control (Staw et al., 1981), and fear for one's job in particular leads to conservative and routine behaviors (Cameron et al., 1987).

Therefore, a manager who feels s/he could not find another, equally appealing job, or who feels otherwise dependent on a current position, will perceive less discretion. Reluctant to imperil their jobs, dependent managers may avoid actions jeopardizing their standing and employment. Thus, a feeling of dependence on one's job will limit the options a manager is willing to consider.

H13: Managerial job dependence decreases perceived managerial discretion.

Expertise. As noted earlier, March and Simon's (1958) discussion of discretion centered on the control of specialized knowledge; those who determine the interpretation of ambiguous information gain discretion thereby. Functional uniqueness is a structural source of such discretion; specialized expertise is an individual one. The effect of expertise is shown in studies where listeners accord more credibility and trustworthiness to those they consider experts (Petty & Wegener, 1998). If an individual is the only person with crucial knowledge, then that person has a significant advantage. It is difficult to question or evaluate the individual's actions, giving him or her great discretion (Williamson, 1975). Studies of expert performance show that specialized knowledge can take two forms: formalized knowledge from training or tacit, intuitive knowledge from practical experience (Dreyfus & Dreyfus, 1986; Polanyi, 1969). Both are part of expert performance, so both formal knowledge and practical experience should contribute to expertise and subsequently to discretion.

H14a: Managerial formal knowledge increases perceived managerial discretion.

H14b: Managerial practical experience increases perceived managerial discretion.

Taken together, these 13 hypotheses represented the range of organizational and individual antecedents that have been proposed for discretion. As noted, they shared no unifying framework, and in fact, they were premised on different general mechanisms influencing discretion. The analysis in this paper can thus be understood as testing the antecedents of perceived discretion at two levels: the particular antecedent (i.e., each particular hypothesis) and the general

mechanism (i.e., structural, interpersonal, or individual).

Method and Results

Analysis was conducted in two stages. H1 was tested first, as it predicted that managers perceive their discretion as multidimensional. The results of this analysis were then used to construct measures of discretion for testing H2 through H14, which concern the structural, interpersonal, and individual antecedents of perceived managerial discretion. For clarity, the analyses and results are presented in this two-stage order as well, with the second stage following a full report of the first.

Description of Sample

All hypotheses were tested using survey responses from the *International Comparative Study on the Organization and Performance of Research Units* (Knorr et al., 1999). This was a large-scale survey project initiated by six European countries and conducted under the auspices of the secretariat of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). UNESCO is a specialized agency of the United Nations, responsible for collecting and sharing information. The *International Comparative Study* was undertaken for the participating national governments to better understand the organization and performance of scientific research in their countries (Hungary, Austria, Finland, Sweden, Poland, and Belgium).

Each country had a designated research team that administered standardized questionnaires to participating units. A sample of approximately 200 units was selected for each country to be representative of the population distribution. A range of psychological, sociological, and structural questions were asked of unit managers, scientists, support staff, and external superiors. The participating units all met three criteria: having a designated leader who was a participating member, having at least three members in regular communication, and having an expected life span of at least one year. The full data set consists of responses from 1,222 units in nine different scientific fields.

For the analysis described here, a subset of 800 units was used. These were from all six countries: Hungary (23%), Austria (22%), Finland (17%),

Sweden (8%), Poland (18%), and Belgium (12%). However, only units in five scientific fields were included (chemistry 24%, life sciences 22%, agriculture 12%, technology 35%, and medical science 7%), as the other four fields had few responses and little distribution among countries. All of the research units used in this paper were embedded in larger organizations, which were of five sorts: universities (40%), university-affiliated research centers (10%), nonprofit or public service organizations (23%), commercial enterprises (22%), and federal or state research bodies (5%).

Four features made this data set particularly useful for studying managerial discretion. The most important feature was having responses from both managers and subordinates. This permitted manager-independent assessment of potentially subjective issues, thereby reducing common method bias. For example, the assessment of each unit's climate was based on responses from research scientists, rather than managers, since discretion has been linked to work attitudes (Dwyer & Ganster, 1991) and could have influenced the manager's assessment of organizational climate. The second advantage was that studying units within larger organizations allowed for analysis of multiple sources of influence. Each unit manager was responsible to organizational superiors, and many were also accountable to external funding bodies (even in commercial organizations, it is relatively common for research scientists to seek external funding). The third advantage was that the managers were highly educated scientists (mean of 19.9 years of education), and thus potentially representative of professional workers more generally. The final consideration favoring this data set was its comprehensiveness. Although it was not designed specifically to study managerial discretion, it included measures of the relevant variables.

Stage One

Measuring Managerial Discretion. To understand how managers perceive their discretion, it was first necessary to measure it. However, measuring discretion is problematic, because it requires knowing not only what a manager does, but also what s/he might have done instead (Hambrick &

Finkelstein, 1987). Therefore, the first essential step was developing a measure of perceived managerial discretion.

One might initially assume that the best measure of discretion would have the manager list all possible responses for each situation s/he encounters. The measure of discretion could then be either a simple count (with more possibilities indicating more discretion) or some estimate of the range in the possibilities (with greater range indicating more discretion). However, this approach is suspect for two reasons. The most obvious is practical: data collection would be burdensome and intrusive. Moreover, even if such data were available, it would likely be inaccurate. Evidence shows that managers' actions rarely arise from a considered choice among every possible option (March & Shapira, 1987). Managers do not formalize all the possibilities in their minds before acting, so trying to provide them to a researcher would be unnatural for the manager.

Rather than analyze individual incidents, this analysis measured discretion with a summative evaluation. This approach respected the fact that many actions are intuitive, rather than fully planned (Bargh & Chartrand, 1999). Specifically, each manager reported how much control s/he had over nine different aspects of the unit's work. These included matters such as selecting methods and goals, work assignments, staffing, and purchasing (see Table 3.1 for a complete list). These nine aspects represent the most important elements of managing science-based R&D, and therefore offered a good overview of the manager's work.

Managers who reported greater control in these nine areas were assumed to perceive themselves as having more discretion. For example, consider the allocation of work in the unit. If the manager is in control of allocating work, s/he is free to do what s/he judges best. Such freedom is discretion; the manager has great latitude of action. Therefore, the managers' ratings of control in the nine areas most important to R&D work provided a good overall assessment of perceived discretion.

Exploratory Factor Analysis. Managers' discretion in the nine work areas was used in a maximum likelihood exploratory factor analysis (EFA) with orthogonal rotation. EFA is a statistical technique for detecting latent variables

that produce common variance in responses. In this particular case, EFA was used because it would detect any patterns in managers' responses arising from underlying categories in their thinking (i.e., different dimensions of discretion).

Missing values. The data set had many missing values. These appeared to be randomly distributed. Although less than half of the 800 cases had complete data, the largest missing data rate for any one variable was less than 19% (Table 3.2 presents rates of missing information along with descriptive statistics for the entire data set). Many researchers deal with missing data through deletion or mean substitution, but simulation studies indicate that these methods often generate biased and inefficient estimators (Little & Rubin, 1987; Wothke, 2000). Multiple imputation (MI) is a better way of dealing with missing information (Schafer & Olsen, 1998).

MI is a simulation technique that uses the observed data to generate plausible values for each missing data point (Schafer, 1999a). However, rather than substituting a single value such as the mean, multiple potential values are generated, leading to several complete but different data sets. Each data set has different random values for the missing data. These data sets are analyzed independently, generating multiple sets of results (e.g., factor loadings or regression coefficients). These results are combined by adjusting their standard errors to reflect how much data was missing and how variable the imputed values were (Little & Rubin, 1987). The result is better estimates for a single set of familiar statistical results, with standard errors that reflect the additional uncertainty introduced by imputing missing values. Simulation studies have shown that five to ten imputed data sets are sufficient for reliable estimates (Schafer & Olsen, 1998). The results in this paper were derived from ten imputed data sets, using an MI implementation developed by Schafer (1999b).

Results. Table 3.1 presents the EFA results. Scree plot analysis and the traditional eigenvalue cut-off of 1.0 both suggested a two-factor structure for managers' perceptions of discretion. The two factors accounted for 40.3% of the observed variance and were clearly interpretable. The first factor involved freedom in choosing methods and research tasks, control of research results,

and the ability to allocate work to subordinates. This factor measured the managers' discretion over how the unit's work was conducted, and was labeled Process Discretion. The second factor, derived primarily from control over hiring, firing, training facilities, and purchasing, measured managers' discretion with regard to relatively fixed assets, and was labeled Resource Discretion.

Table 3.1: Maximum Likelihood Factor Analysis of Managerial Discretion

Item Manager's rating of his/her degree of control over	Rotated factor loadings for Factor 1 Process Discretion	 Factor 2 Resource Discretion
1. Choice of methods used	**0.603**	-0.018
2. Choice of specific research tasks	**0.580**	0.271
3. Publication and circulation of research results	**0.573**	0.258
4. Allocation of work within the unit	**0.574**	0.101
5. Coordination and/or cooperation with other units	**0.505**	0.301
6. Hiring personnel	0.076	**0.823**
7. Termination of employment of personnel	0.145	**0.716**
8. Use of training and career development facilities	0.293	**0.494**
9. Hiring or buying low-cost equipment	0.135	**0.456**
Sum of squared loadings	1.744	1.883
Variance explained	19.4%	20.9%

N=800

Readers familiar with principal components analysis, rather than factor analysis, may be struck by the values in Table 3.1. Because principal components analysis is a purely numerical technique, it produces components that explain the data exactly as observed. In contrast, factor analysis uses statistical modeling and assumes there is measurement error in the data. Thus, while principal components analysis assumes the data are measured with perfect accuracy, factor analysis imposes penalties for random variance associated with measurement error. Since there was no reason to believe these data were perfectly measured, factor analysis was the more appropriate technique. Conducting the same analysis with principal components would have yielded the same two groups of items, but with higher loadings (0.58 to 0.82) and more variance explained (53%) because of the failure to account for measurement error.

The two-factor structure that emerged appeared to be appropriate, given the easy interpretation and face validity of factor memberships. As well, the cross-loadings were consistent with the labels. For example, training and career development was the most equivocal of the items (loading 0.29 on process discretion and 0.49 on resource discretion). This is reasonable, as using training facilities is clearly a resource control issue, but the skills developed have implications for the way the unit conducts its work.

Implications. A full discussion of these results appears later, but it is important to note that H1 was clearly supported. The managers' responses indicated that they perceive their discretion as varying in two distinct dimensions, rather than being uni-dimensional. While this fact is implicit in prior discussion of managerial discretion, this was the first empirical demonstration of multidimensionality, and it has important implications for theory. In particular, these results imply that each of H2 through H14 should be qualified. Since perceived discretion is multidimensional, antecedents presumably have different effects on different dimensions. Therefore, Bartlett factor scores were extracted for each manager's process discretion and resource discretion, to be used as dependent variables in Stage Two of the analysis.

Stage Two

The second part of the analysis tested the antecedents of perceived managerial discretion. Two dependent variables, process discretion and resource discretion, were used to determine which antecedents best predicted managers' perceived discretion. All control and predictor variables were entered simultaneously in two regression equations. Categorical variables were converted to binary sets of predictors with effect codes, rather than dummy codes (i.e., coded 1 or -1, not 1 or 0), so that the beta coefficients would contrast the relevant group directly with all others.

Control variables. This analysis was concerned with the antecedents of perceived managerial discretion. The aim was not to measure or predict objective discretion. However, it seemed plausible that objective discretion might influence a manager's perceived discretion, so several related variables were included as

controls. Prior research has found that different industries and national employment structures offer varying levels of objective discretion (Dobbin & Boychuk, 1999; Hambrick & Abrahamson, 1995), so controls were included for nation, scientific discipline, and the type of organization in which the unit was embedded (e.g., commercial, university, etc.).

Extra-organizational influence. This was measured by the manager's rating of how much extra-organizational stakeholders affected the unit's work. Each manager rated the influence of external parties on the unit's nine aspects of R&D work (i.e., those listed in Table 3.1). A confirmatory factor analysis of these nine ratings revealed the same two-factor structure as for managerial discretion. That is, managers used the same dimensions of processes and resources when thinking about extra-organizational influence. As such, each unit had two scores for extra-organizational influence: a rating of how much external parties influenced the unit's work processes, and a rating of how much external parties influenced the unit's resources.

Senior management influence. This was measured similarly to extra-organizational influence. Each manager reported how much influence his or her superiors had on the unit in the nine work areas. Confirmatory factor analysis again revealed the two-dimension structure of processes and resources, so two scores were extracted: senior management influence on unit work processes and senior management influence on unit resources.

Size. The standard measure was used: number of employees. The total number of people on the payroll was used for organization size, and the number of scientists and technicians supervised by the manager represented unit size.

Functional uniqueness. The estimate of functional uniqueness was based on the presence of similar research units in the larger organization. A categorical variable was constructed to indicate whether there were no functionally similar units (40%), one or two functionally similar units (36%), or three or more functionally similar units (24%) within the organization.

Resource availability. A nine-item scale was used. Managers assessed the adequacy of resources available to their unit in terms of workspace, scientific

equipment, office equipment, administrative assistance, technical services, library facilities, information services, budget, and human resources. The responses to these items had adequate reliability (Cronbach's $\alpha = 0.76$), so they were averaged to yield a single score for resource availability in the unit.

Formal planning. This was measured by an item asking managers to rate how much they used various planning methods in their unit. The prompt was: "Formal planning of the research (e.g., by means of opportunity and constraint analysis, environmental analysis, intuitive forecasting methods, dynamic system modeling, relevance matrix, risk analysis, probability, etc.)." Responses were (1) very rarely, (2) seldom, (3) sometimes, (4) often, and (5) usually. There was no clear distinction made between the frequency and extent of planning, so it was presumed that this question assessed aspects of both.

Supportive climate. In a research unit, this involves member attitudes that are conducive to scientific research and effective performance of work tasks. A climate scale was created from three ratings given by scientists. In each unit, scientists were asked to what extent (1) "There is generally a very innovative spirit and sense of pioneering in the unit," (2) "There is an atmosphere of great dedication to work in the unit," and (3) "There is a very high degree of co-operation in the unit." These three items were selected as best representing a supportive R&D climate, because they evaluated how well scientists worked together, their devotion to their work, and their focus on R&D goals. These questions had acceptable reliability (Cronbach's $\alpha = 0.75$), so the aggregate mean for each item was used to produce an overall score for supportive climate in the unit.

Climate congruence. A measure of how much members agree in their perception of the climate was required. A rating was created from scientists' responses on the supportive climate scale. Following the practice in climate research (e.g., Schmidt & Hunter, 1989), standard deviations (SD) were used. If every scientist in the unit reported an identical assessment, it would imply highly congruent perceptions and produce a small SD. In this analysis, the largest standard deviation from each unit's three responses to the climate questions was

used (the three SD were highly correlated, all $p < 0.01$). Since SD indicates disagreement, the scores were reversed to yield a measure of agreement or congruence.

Personal power. Two operationalizations were used. The primary measure used the manager's tenure as head of the unit. As in previous research (Perrone et al., 2003), it was assumed that greater tenure facilitates the creation of more connections, more time to have established trust, greater familiarity with the idiosyncrasies of that particular organization, and also provides the manager the benefits of familiarity (Fiske, 1998). However, tenure could fail to reflect some managers' personal power. A powerful and experienced manager in charge of an important new unit could have power beyond that suggested by tenure. Therefore, the number of projects active in the unit was used as potential additional measure of power. The size or importance of projects would have been a preferable measure, but this information was not available. Number of projects was used as proxy, on the assumption that more projects would generally indicate greater importance and power for the manager.

Goal alignment. Using a 5-point scale that ranged from "loosely connected" to "closely related," managers responded to the following prompt: "The scientific objectives of the research work performed by the unit are . . ." This item assessed whether managers felt there was synchronization among the various goals they pursued, or whether those goals were potentially at odds.

Managerial age. Managers reported their year of birth in the original survey, but these were grouped in nine age ranges to protect respondent anonymity. Thus age "1" indicated 30 years or younger, age "2" was 31-35 years, and so on to age "9" which was 66 years and older. The analysis described here treated this measure as an ordinal variable, rather than converting it to a series of categories, since the extreme values were relatively rare (2.7% age 1 and 3.8% age 9).

Job dependence. This was based on managers' reports. They used a 5-point scale ranging from (1) "little chance" to (5) "few difficulties" to indicate the likelihood of their finding a similar or better position should they leave the unit. It

was assumed that if they saw little possibility of finding another position, they would feel more dependent on their current one. This measure also benefits from focusing on the unit, so that it applies both to moves within the organization and to changes of organization.

Expertise. There were two components. Formal knowledge was measured through education. Each manager reported how many years of full-time equivalent education s/he had completed. Practical experience was measured as the number of years of R&D experience the manager had, as a measure of on the job learning about tacit aspects of the work.

Results

Descriptive statistics for all variables are given in Table 3.2. The final column of the table reports the rate of missing information for each variable. Several variables were transformed to correct for skewed distributions; these transformations are noted in the table.

Table 3.3 presents the results of regressing both process discretion (Model 1) and resource discretion (Model 2) on the control and predictor variables. Diagnostic analysis of these models revealed no significant deviations from statistical assumptions (i.e., constant variance, normal distribution, linear relationships, and no collinearity or high influence cases). It must be noted that the hypotheses were stated in causal terms, consistent with the theoretical mechanisms they embody; however, the cross-sectional data analyzed here cannot confirm causality. Results are therefore described only as consistent or inconsistent with the predicted causal effect.

Structural antecedents. Five of the six structural antecedents were significant predictors in at least one model. H2 received conditional support in both models. Managers perceived less discretion, both in processes and in resources, when extra-organizational influence was high. This is consistent with H2, but only applied to extra-organizational influence on the unit's work processes; extra-organizational influence on resources showed no relationship with managerial discretion. Senior management influence had a more varied relationship with discretion. Consistent with H3, any sort of senior management

Table 3.2: Descriptive Statistics

Variable	Mean	S.D.	1	2	3	4	5	6	7	8
1. Process discretion	0.06	1.05								
2. Resource discretion	0.01	1.13	-.12							
3. Extra-organizational influence: process	0.00	1.21	-.17	.00						
4. Extra-organizational influence: resources	0.00	1.14	.07	-.14	-.09					
5. Senior management influence: process	0.00	1.14	-.16	-.13	.35	-.07				
6. Senior management influence: resources	0.00	1.13	.05	-.24	-.01	.11	-.15			
7. Inertia (unit size) [2]	10.22	10.52	-.05	.17	.02	.04	-.10	-.01		
8. Inertia (organization size) [1]	2380	5872	-.01	.08	-.12	-.04	-.18	-.08	.10	
9. Resource availability	3.29	0.70	.01	.18	-.04	-.17	.09	-.02	-.03	-.04
10. Formal planning	3.23	1.52	-.01	-.07	.01	.11	.07	.08	.07	-.19
11. Supportive climate	3.75	0.73	.04	.04	-.06	-.01	.02	-.01	-.12	-.04
12. Climate congruence	0.59	0.48	-.04	.14	-.09	-.03	-.20	-.11	.22	.22
13. Goal alignment	4.20	1.06	.09	-.03	-.04	.07	.03	.04	-.03	-.06
14. Personal power (tenure) [1]	8.24	6.53	-.02	.15	-.03	.04	-.15	-.07	.20	.03
15. Personal power (# of projects) [2]	4.19	3.86	-.02	.07	-.07	-.02	-.01	.02	.28	.16
16. Age	4.93	1.95	-.03	.11	-.05	.09	-.14	-.14	.18	-.00
17. Job dependence	2.67	1.32	-.02	-.07	-.07	.04	-.02	.05	-.04	-.09
18. Expertise: Formal (education) [1]	19.88	3.46	.10	.05	-.07	.06	-.19	-.04	.01	.17
19. Expertise: Practical (yrs R&D experience) [2]	18.82	9.62	.08	.13	-.12	.15	-.22	-.14	.25	.01

N = 800

Correlations greater than the following values are significant at the corresponding level:

0.12 $p < 0.001$
0.09 $p < 0.01$
0.07 $p < 0.05$
0.06 $p < 0.10$

[1] variable log transformed
[2] variable square-root transformed

(Table continues on next page)

Table 3.2: Descriptive Statistics

Variable	9	10	11	12	13	14	15	16	17	18	% miss
1. Process discretion											5.9
2. Resource discretion											17.2
3. Extra-organizational influence: process											10.5
4. Extra-organizational influence: resources											18.9
5. Senior management influence: process											9.3
6. Senior management influence: resources											17.8
7. Inertia (unit size) [2]											2.1
8. Inertia (organization size) [1]											7.0
9. Resource availability											11.9
10. Formal planning	-.12										17.5
11. Supportive climate	.06	-.03									9.3
12. Climate congruence	.00	-.09	-.22								9.3
13. Goal alignment	.01	.10	.04	-.09							1.9
14. Personal power (tenure) [1]	-.00	.04	-.12	.05	-.02						1.0
15. Personal power (# of projects) [2]	.03	.06	-.02	.14	-.12	.15					4.3
16. Age	-.01	.15	-.13	.07	-.03	.49	.08				0.2
17. Job dependence	.05	-.04	.02	-.08	-.05	.05	-.04	.10			6.5
18. Expertise: Formal (education) [1]	-.10	-.01	.01	.13	-.06	.04	-.01	.07	-.12		0.8
19. Expertise: Practical (yr R&D experience) [2]	-.08	.14	-.10	.14	-.01	.51	.12	.79	.07	.10	0.4

N = 800

Correlations greater than the following values are significant at the corresponding level:

0.12 $p < 0.001$
0.09 $p < 0.01$
0.07 $p < 0.05$
0.06 $p < 0.10$

[1] variable log transformed
[2] variable square-root transformed

Table 3.3: Regression Models for Perceived Managerial Discretion

Variable	Model 1 Process Discretion	Model 2 Resource Discretion
Intercept	17.06 ****	17.61 ****
Nation: Austria	0.44	0.88 **
Nation: Finland	0.52	0.42
Nation: Sweden	1.08	1.51 **
Nation: Poland	-0.03	-0.19
Nation: Belgium	-0.16	0.68
Science: Life Sciences	-0.08	0.76 **
Science: Agriculture	-0.47	1.59 ****
Science: Technology	-0.02	0.47
Science: Medical Sciences	0.28	0.12
Org. Type: University-affiliated	0.84	0.60
Org. Type: Public Service	-0.68	-0.16
Org. Type: Commercial	-1.63 ***	0.49
Org. Type: Federal or State	0.22	0.96 *
Extra-organizational influence: process	-0.96 ****	-0.39 **
Extra-organizational influence: resources	0.15	0.16
Senior management influence: process	-0.29	-1.34 ****
Senior management influence: resources	0.71 **	-0.77 ***
Inertia (unit size) [1]	-0.73 **	1.24 ****
Inertia (organization size) [2]	-0.18	-0.20
Functional uniqueness: 1 or 2 similar units	-0.74 **	-0.01
Functional uniqueness: 3+ similar units	-0.66 *	-0.18
Resource availability	-0.24	1.43 ****
Formal planning	-0.07	-0.13
Supportive climate	0.17	0.29
Climate congruence	1.01	-0.63
Personal power (tenure as manager) [2]	-0.01	0.55 *
Personal power (no. of projects in unit) [1]	0.27	-0.08
Goal alignment	0.64 **	0.11
Age	-0.58 **	-0.02
Job Dependence	-0.10	-0.32 *
Expertise: Formal knowledge (education) [2]	4.14 **	0.67
Expertise: Practical experience (years R&D experience) [1]	1.11 ***	0.24
R^2	0.16	0.24
	$F_{(33,1944)} = 85.49$ ****	$F_{(33,1685)} = 100.35$ ****

N = 800

Reference categories: Hungary, Chemistry, University, no similar units

[1] variable square-root transformed [2] variable log transformed

* p < .10 ** p < .05 *** p < .01 **** p < .001

influence was linked to lower managerial discretion over resources. However, senior management influence on unit resources was associated with greater process discretion. This is opposite the predicted relationship, but makes intuitive sense. Having a patron at higher levels of the organization, someone who intercedes on one's behalf when resources are allocated, could allow for more options in how one does the work. With regard to inertia (H4), only unit size was important. Organization size showed no systematic relationship with either dimension of discretion. Unit size had the predicted association with process discretion; managers of larger units perceived themselves to have less freedom in work processes. However, this relationship was reversed for resource discretion. Managers of larger units reported having more control over unit resources. Again, this reversal of the prediction seems plausible. Larger units presumably attract more resources, and could thus give their managers more sense of discretion. Functional uniqueness revealed no relationship with resource discretion, and a somewhat equivocal one with process discretion. H5 was supported in that managers of unique units reported more (process) discretion, but the results did not clearly distinguish between H5a and H5b. The coefficient for three or more similar units was negative, but only marginally significant. If one regards the marginal effect as non-zero, then the simple functional uniqueness argument was supported (H5a), indicating the most process discretion was perceived when managing a functionally unique unit. In contrast, a strict interpretation would discount the marginal effect, and conclude that the presence of three or more similar units was associated with just as much process discretion as managing a unique unit (supporting H5b). H6 was conditionally supported. Having greater resources available was associated with greater resource discretion, but had no link to process discretion. H7 received no support; formal planning showed no link with either dimension of discretion.

Interpersonal antecedents. The four interpersonal antecedents were poor predictors of discretion. Climate failed to show any relationship with perceived discretion. Neither supportive climate (H8) nor climate congruence (H9) were linked to either dimension of discretion. The relationship between

resource discretion and personal power (as tenure; H10) had the predicted sign, but failed to reach traditional significance. Tenure showed no relationship with process discretion, and the alternate measure of personal power (number of projects) was not linked to either dimension of discretion. The interpersonal prediction about the effect of goal alignment (H11a) was refuted, with the evidence supporting the individual interpretation instead (H11b, discussed below).

Individual antecedents. Three of the four individual antecedents were significant predictors of perceived discretion. Goal alignment had a positive association with process discretion, suggesting that the individual benefit of well-aligned goals was more important than the potential to offset competing goals (supporting H11b; refuting H11a). H12 was conditionally supported; older managers perceived less process discretion, though age showed no link to resource discretion. The support for the effect of job dependence (H13) was marginal. The association between resource discretion and job dependence had the predicted negative sign, but failed to reach traditional significance. There was no association between job dependence and process discretion. Expertise had the predicted relationship with process discretion (H14). Both formal knowledge and practical experience were linked to greater perceived process discretion. Expertise showed no link to resource discretion.

Control variables. Several control variables were significant predictors, primarily of resource discretion. While it is beyond the scope of this paper to explain each control variable, the fact that national and disciplinary differences seemed more important to resource discretion was consistent with the other results. As discussed below, the antecedents of resource discretion were predominantly structural, so it seems plausible that the structural differences embodied in national and scientific research structures would also be important. At the same time, the fact that most control variables were non-significant provides indirect evidence for the appropriateness of comparing research units from different contexts. It suggests that the work of R&D units is more similar than not, regardless of where it is conducted.

Table 3.4 presents a qualitative summary of the hypotheses and results.

Discussion

Research has shown the wide-ranging consequences of discretion in organizations. However, far less attention has been paid to discretion's complex nature and antecedents, particularly among managers. While work has studied discretion's industry-level antecedents, there has been little testing of organizational and individual-level antecedents. Similarly, little attention has been directed to how individuals perceive discretion. These are consequential gaps in current theory, to which this paper responded by studying the nature and antecedents of managerial perceptions of discretion.

The findings presented here raise four important issues for understanding discretion in organized behavior. The first is confirmation of the prevalent intuition that managers perceive their discretion as multidimensional, and the corollary finding that each dimension of discretion has different antecedents. This has fundamental implications for the definition and measurement of discretion. This is particularly well illustrated by the observed relationships between senior management influence and perceived discretion. Treating discretion as a homogeneous construct, theory predicted that the involvement of superiors would reduce discretion. However, this prediction was only conditionally supported. It seems to be true that senior management involvement may reduce the manager's perceived control over unit resources, but the same involvement may be perceived as increasing control over work processes. As an illustration, imagine an assistant professor attempting to equip a research laboratory. If the Dean of Research chose to be particularly active in equipment decisions, the professor may have somewhat less control over which items were purchased, but may receive more total funding, and thus have more options available in conducting research.

Although these results make intuitive sense, they could have been missed if the analysis presented here had used a uni-dimensional measure of discretion. That is, if one combined the two coefficients for senior management influence in

Table 3.4: Qualitative Summary of Hypotheses and Results

Antecedent	Hypothesized relation	Observed relation:	
		Process Discretion	Resource Discretion
Structural antecedents			
H2: Extra-organizational influence on unit	Negative	Negative	Negative
H3: Senior management influence on unit	Negative	Positive	Negative
H4: Inertia (unit size)	Negative	Negative	Positive
H5: Functional uniqueness	Negative or U-shaped	Negative* or U-shaped*	
H6: Resource availability	Positive		Positive
H7: Formal planning	Negative		
Interpersonal Antecedents			
H8: Supportive climate	Positive		
H9: Climate congruence	Negative		
H10: Personal power	Positive		Positive*
H11a: Goal alignment	Negative		
Individual Antecedents			
H11b: Goal alignment	Positive	Positive	
H12: Age	Negative	Negative	
H13: Job Dependence	Negative		Negative*
H14: Expertise	Positive	Positive	

Marked relationships were significant ($p < 0.05$), unless otherwise stated.
* Relationship only marginally significant ($p < 0.10$)

Model 1 with the same two coefficients in Model 2 to yield a single result, the coefficient would be negative. This would have fit with the original prediction, but would have been a misleading simplification. Discretion can be better understood by recognizing its multidimensional nature. Theoretical predictions will be more precise if they specify the relevant dimension of discretion, which suggests an important next step in research: to describe the dimensions of discretion. While process discretion and resource discretion offer a preliminary typology, there are surely other dimensions, ones that will further clarify the dynamics of discretion.

The second issue raised by the findings concerns the relative importance of different causal mechanisms. It is striking that five of the six structural antecedents were significant predictors, as were three of the four individual antecedents, while none of the interpersonal antecedents showed a relationship with discretion. These findings suggest that interpersonal factors are not important sources of perceived managerial discretion, which is a surprising conclusion, given that prior research has suggested managers can increase their discretion through interpersonal mechanisms (Carpenter & Golden, 1997).

It may be true that interpersonal antecedents are irrelevant to perceived discretion, but there are also two other possible explanations of these results. The first is that the lack of importance is an artifact of using science-based R&D units, since scientists share a long, deeply embedded tradition of denying the importance of any social considerations in their work; scientists prefer to think that they are guided exclusively by objective facts (Knorr Cetina, 1999; Latour, 1996). Alternatively, the lack of interpersonal effects may result from using cross-sectional data. Perhaps there is a role for managers to use interpersonal factors to shape the structural antecedents (Feldman, 2004). In other words, interpersonal factors may be antecedents of the antecedents. These competing interpretations stress the need for further research, particularly in different work contexts and with longitudinal data.

The third issue raised by the results is closely related, and concerns the differing contributions of structural and individual antecedents. While both types of antecedents predicted process discretion, only structural antecedents were

linked to resource discretion. A likely explanation for this difference concerns how one exercises each dimension of discretion. Resource discretion, involving hiring, firing, facility use, and purchasing, would use formalized processes. There is likely to be official documentation involved in the exercise of resource discretion. In contrast, process discretion may be exercised less formally. Unit meetings and one-on-one conferences are more likely venues to allocate work or chose methods. Given this, it is not surprising that structural factors dominate in resource discretion. In a sense, resource discretion is the freedom to choose which structural routine will be implemented. It is a matter of choosing the outcome and then using the existing process to reach it. Exercising process discretion may allow freedom in both ends and means, and hence increase the influence of individual differences. This implies that a process-oriented approach, focusing on how managers exercise discretion, is an important avenue for future investigation.

The final implication of these results is the most ambitious: they suggest that discretion may be amenable to a unified, multilevel theory (Rousseau, 1985). A multilevel theory is one that generalizes causal mechanisms across levels, with the same basic explanations applying to organizations, groups, and individuals (e.g., Staw et al., 1981). The results in this paper show similarities with other findings that suggest such a theory is possible for discretion. For example, this study showed how size at the unit level had effects comparable to those of size at the organization level (Baum, 1996). Likewise, transferring Hambrick and Finkelstein's (1987) explanation of how industry structure influences organization-level discretion to the unit level was successful. In each case, the basic mechanism (inertia or competition) appears to be the same at both the organization and unit level. Stated differently, whether one looks at organizations embedded in industries or at units embedded in organizations, at least some antecedents of discretion seem to behave similarly. This is an exciting possibility, as the development of a single theory that simultaneously explains discretion at multiple levels would represent a significant theoretical advance. Further investigation of the multilevel applicability of theoretical mechanisms is certainly

warranted.

In summary, this paper reveals that discretion is more complex than existing treatments indicate. The results demonstrate that managers perceive their discretion as multidimensional, and that each dimension of discretion has different antecedents. The results also suggest that structural and individual factors are more important than interpersonal ones in understanding managers' perceived discretion. In sum, the findings presented here show the need to use a multidimensional conceptualization of managerial discretion. Theory should reflect the complexities of this phenomenon that is so central to modern organizing.

Chapter 4: Clarifying the Dimensional Structure of Discretion

Discretion, as freedom of action or control over how one does their work, is a fundamental aspect of organizational behavior, with importance for both the individual and the organization. For individuals, psychologists have identified control as a fundamental human need; all people desire some measure of control (Depret & Fiske, 1993). For organizations, discretion arises from the need to act in situations that are ambiguous or equivocal (Hambrick & Finkelstein, 1987), and it is these situations that shape organizational structures and rewards (March & Simon, 1958; Thompson, 1967; Williamson, 1994). Consistent with this fundamental importance, discretion has been shown to influence a vast range of outcomes, including corporate social performance (Aragon-Correa et al., 2004), strategic attention (Abrahamson & Hambrick, 1997), strategic persistence (Finkelstein & Hambrick, 1990), fairness (Hendrickson & Harrison, 1998), affirmative action (Weisman, 1994), knowledge creation (Oh, 2002), power (Carpenter & Golden, 1997), compensation (Finkelstein & Boyd, 1998), interpersonal trust (Perrone et al., 2003), creativity (Shalley, 1991), innovation (Nemeth & Staw, 1989), safety behavior (Zohar & Luria, 2005), job satisfaction (Dwyer & Ganster, 1991), motivation (Spector, 1987), stress (Bond & Bunce, 2001), well-being (Ganster, 1989), burnout (Glass et al., 1993), and physical health (Karasek, 1990).

Despite the many studies demonstrating the importance of discretion there is as yet no coherent, unifying "discretion theory." One reason for the lack of a unifying theory is that many studies have used the construct of discretion as a tool for understanding some other phenomenon (e.g., CEO dominance in Haleblian & Finkelstein, 1993 or role-breadth in Morgeson et al., 2005). Moreover, research projects that were primarily concerned with discretion have

often remained isolated from one another. This has produced a number of partial or strictly delimited theories about aspects of discretion, but no overarching framework to integrate them. Taken as a whole, research on discretion exhibits pockets of local clarity, but global uncertainty. For example, while previous research has examined the consequences of "general control" (Dwyer & Ganster, 1991) and of "decision authority" (Karasek et al., 1985), it has recently been shown that these two constructs overlap at least partially (Smith et al., 1997). This raises questions about how findings concerning general control relate to those of decision authority, and vice versa. In the absence of a theory to integrate individual studies, there are no clear answers.

A unifying theory of discretion would offer several benefits. Most obviously, a comprehensive theory of discretion would improve understanding of the phenomenon itself, clarifying issues such as the relationship between general control and decision authority, as well as allowing better explanations and predictions. In addition, a theory of discretion also has the potential to advance organizational theory more generally (Hambrick & Finkelstein, 1987). Given the number of organizational outcomes and processes in which discretion plays a role, better understanding discretion would benefit theories of these other organizational phenomena. For example, in a recent synthesis of research on motivation and commitment, Meyer and colleagues (2004) identified discretion as a key missing variable. By including discretion in their model of the relationship between motivation and employee commitment, they were able to resolve longstanding ambiguities and advance theory about both motivation and commitment. As this example shows, the benefits of a theory of discretion are potentially extensive.

In response, this paper takes an initial step toward a coherent, integrated theory of discretion. The aim of this project was to contribute to a foundation for future theory and research by clarifying the dimensions of discretion. This paper did not examine the antecedents or consequences of discretion, but focused exclusively on clarifying discretion's multidimensional structure. Research has identified many different dimensions of discretion, but most of these have never

been considered together. This paper brought them together, integrating isolated findings to create an overarching description of the phenomenon. The goal was to use the literature to derive a multidimensional conceptualization of discretion, one that encompassed all of the previously isolated research and created a basis for future investigation.

Background

A recent review of the job design literature suggested that discretion in one's work was the single most studied work characteristic (Morgeson & Humphrey, 2006). The literature is certainly extensive. Under the labels of discretion, autonomy, and work control, one finds a vast array of constructs, definitions, and models. Unfortunately, this considerable body of evidence is currently in a state of some conceptual and methodological disorder. This disorder can be traced to two sources: balkanization and uncertain dimensionality.

Balkanization

There are three separate and isolated research traditions that study aspects of discretion. The first is the autonomy literature, which arose from investigations of the motivational consequences of different job features (Hackman & Lawler, 1971; Hackman & Oldham, 1975). The second tradition began from the recognition that there is far more to a job than is ever explicitly specified (Katz, 1964), and developed into the organizational citizenship literature which examines the antecedents and consequences of employees' discretionary extra-role behavior (Smith et al., 1983; Organ, 1988). The third research stream proposed the construct of executive discretion to explain why senior organizational leaders sometimes had profound effects on their organizations and yet seemed powerless at other times (Hambrick & Finkelstein, 1987). While the specific details in each tradition vary, the substantive concerns of each have more in common than not. For the sake of clarity, I use "freedom" here to refer to the actual phenomenon of interest, and use "autonomy," "citizenship," and "discretion" to refer to the specific research traditions. I return to the issue of terminology later in the paper to explain my ultimate use of the term discretion to

encompass all three literatures.

Despite their common interest in understanding freedom in organizations, there has been little interaction among the autonomy, citizenship, and discretion research traditions. It appears that the primary reasons for this balkanization in the literature are differences in emphasis and research subjects. Discretion research has focused almost entirely on senior levels of management and objective measurements of freedom. In contrast, most of the autonomy and citizenship work has involved lower level staff and self-report (perceived) measures of freedom. Despite these similarities in research subjects, however, there has also been relatively little contact between autonomy and citizenship research because these traditions are framed as studying in-role versus extra-role behavior, respectively. As a result, the three research traditions have developed largely independent of each other.

This isolation is unfortunate. Opportunities to inform and advance each others' work have been missed. Theory based on the much larger empirical foundation of the combined results will be far better informed than it could be when based on only a subset of the available data. Moreover, the differences that separate these research traditions can be used as powerful tools for theoretical insight, rather than sources of division. There is extensive evidence that studying phenomena in different contexts can offer important insights into the general processes at work (O'Connor, 2000; Orlikowski, 2003; Sutton & Hargadon, 1996). Given this, and the fundamental similarity that each tradition is studying freedom at work, there is significant benefit to be had from integrating autonomy, citizenship, and discretion research.

However, to support the claim that these three literatures should be integrated, the extra-role distinction must be addressed. The behaviors subsumed under organizational citizenship have often been described as a distinct category of action, entirely separate from normal or in-role task behavior (e.g, MacKenzie et al., 1991; Morrison & Phelps, 1999; Motowidlo et al., 1997). Nonetheless, accumulating evidence suggests that the in-role/extra-role distinction is of questionable value. Organ's (1988) foundational definition of

citizenship stressed its discretionary nature (p. 4). Moreover, he stated that citizenship behavior was probably best understood along a continuum, and that the binary comparison of citizenship to non-citizenship behavior was only a simplifying convenience. This implies that rather than extra-role versus in-role behavior, there are simply behaviors in which individuals have varying degrees of discretion. Consistent with this view, research has shown that individuals engage in task revision and role broadening to intentionally modify their in-role behaviors (Morgeson et al., 2005; Staw & Boettger, 1990), calling into question the distinction between in- and extra-role behavior. Even more important, there is growing evidence that both managers and staff often make little distinction between citizenship and "non-citizenship" behaviors (Podsakoff et al., 2000; Tepper et al., 2001). As such, the in-role/extra-role distinction was abandoned in this analysis, and the focus was simply on discretion.

Uncertain Dimensionality

In each stream, and across the three, there is unanimous agreement about the definition of freedom (i.e., autonomy, citizenship, discretion) at the most fundamental level. This is the consensus uniting the many synonyms used, such as discretion, latitude of action, autonomy, control, freedom, and independence. In all cases, the focus is on how much freedom individuals have in their work (e.g., Abrahamson & Hambrick, 1997; Campion, 1988; Dwyer & Ganster, 1991; Finkelstein & Hambrick, 1990; Karasek, 1990; Landsbergis, 1988; Morgeson & Humphrey, 2006; Spreitzer, 1995; Tetrick & LaRocco, 1987; Wilkinson & van Zwanenberg, 1994). As a concrete example, consider a manager who is required to double sales in one year. S/he presumably has little choice about the target level of sales; it is given by organizational superiors. However, in the absence of other stipulations, the manager is free to decide how to increase sales (e.g., a sales promotion, increased productivity, or working longer hours). Thus the manager has discretion over the means of achieving the goal, but not in the selection of the goal itself. All of the research being integrated here is consistent to this level of detail.

However, once one moves beyond this simple summary, disagreements

arise. For example, the observation that the sales manager can choose the method but not the goal implies that his or her freedom is multidimensional. S/he has more control over means than ends, so discretion must have at least two dimensions. However, many measures of discretion have not included multidimensionality. For example, autonomy was initially conceived as uni-dimensional (Hackman & Oldham, 1975), though subsequent research has suggested it is multidimensional (Breaugh & Becker, 1987; Fried, 1991). However, there is no consensus about the specifics of those multiple dimensions (e.g., Smith et al., 1997). Citizenship research has followed the same general pattern, moving from simple (Smith et al., 1983) to more complex dimensional structures (Podsakoff et al., 1990), with ongoing debate about the appropriate dimensionality (Organ, 1997; Organ & Paine, 1999). Research in executive discretion has yet to move beyond a uni-dimensional approach, but there are indications that it could follow the same path (e.g., Carpenter & Golden, 1997).

Lack of agreement about the dimensionality of individual freedom at work is problematic. It leads to disagreement about how to measure the phenomenon, and by implication, disagreement on the precise definition of the key construct. The ability to compare studies and generalize knowledge is threatened by this state of affairs, as researchers claiming to study the same phenomenon have used potentially incompatible operationalizations. In fact, the situation is bad enough that it has been explicitly recognized as impeding progress in all three research traditions (Hambrick & Abrahamson, 1995; Podsakoff et al., 2000; Smith et al., 1997). The emerging consensus seems to be that discretion is multidimensional, and that failure to determine the nature of that dimensionality threatens the utility of the construct.

Proposed Solution

Thus far, this paper has highlighted four interrelated points: first, discretion plays a central role in organizational behavior; second, there is no coherent theory of discretion; third, research findings about discretion are isolated in three disparate literatures; and fourth, theoretical progress is currently blocked by disagreement about the dimensional structure and measurement of discretion.

Together, these four points highlight the need to clarify discretion's dimensional structure. Addressing this need was the basis of this paper.

Identifying the dimensions of discretion promises numerous benefits. The most obvious is for future operationalizations, as it would allow researchers to clearly focus on the dimensions most relevant to their aims. Delineating the dimensions of discretion may also clarify anomalous results in existing research. For example, if one dimension of discretion has a different antecedent than another, seemingly conflicting findings may simply reflect the fact that different dimensions have been measured. (This point is developed more concretely in the Discussion section.) Moreover, identifying the relationships among dimensions creates the potential for comprehensive theory and integration. For example, civic virtue (Podsakoff & MacKenzie, 1994) and work methods autonomy (Morgeson & Humphrey, 2006) are two dimensions of discretion that have been previously identified, but not considered together. Until the relationship between them is clarified, it is difficult to unite findings about these phenomena, despite both being aspects of discretion. Clarifying the dimensional structure of discretion will promote integration of the three disparate research streams, provide a means to clarify existing findings, and support the design of more precise research in the future.

Given these potential benefits, this paper sought to derive a dimensional structure for discretion by combining the findings from autonomy, citizenship, and discretion research. This paper integrated the many previously identified dimensions of discretion into a single, multidimensional structure. However, since the aim was to encompass three previously distinct research traditions, the issue of terminology should be addressed. This paper makes primary use of the term "discretion." Discretion was selected because its common language meaning best represents that of the construct under consideration. Having discretion is having a choice. It is behavioral freedom in being able to choose among alternate courses of action. Discretion was chosen over control because, strictly speaking, control is a larger construct. In addition to being able to decide about one's actions (discretion), control also includes issues of predictability, efficacy, and

interdependence (Smith et al., 1997). Similarly, the term autonomy implies an absence of interdependence that is not inherently a part of discretion (Breaugh, 1985). For these reasons, discretion was adopted as the term to refer to individual choice about work, as studied by all three of the relevant research traditions.

Method

A four-stage process was used to derive discretion's dimensional structure from prior research. For the purposes of this paper, "dimension" refers to an analytic category with two features. First, a dimension describes a domain or sphere of work where discretion can be perceived and exercised. Second, the domain described by the dimension is meaningfully distinguishable from other domains. For example, Wall and colleagues (1995) identified two dimensions of discretion: timing control and method control (see survey items in Appendix 1). The pattern in their respondents' answers indicated that the workers saw the timing of work and the methods of work as distinct aspects of their job, and that their discretion over one was potentially different from their discretion over the other. A dimension can thus be thought of as a useful level of aggregation. The workers in Wall and colleagues' (1995) study distinguished between timing and method, but did not distinguish among the individual items for each dimension. For example, their responses indicated that their discretion about when to start a piece of work and when to finish it were so closely related as to not be meaningfully distinct. Thus, two dimensions were derived from the ten items used in that survey.

The method used here to derive a dimensional structure for discretion combined aspects of traditional literature review, qualitative meta-synthesis, and thematic analysis of secondary data (Heaton, 2004; Sandelowski & Barroso, 2006). Classical meta-analysis was inappropriate because the relationships of interest (i.e., among dimensions of discretion) were rarely part of the studies reviewed. Other quantitative approaches to secondary analysis were similarly excluded, given the vast array of operationalizations and the fact that most of the dimensions under consideration had never been measured simultaneously.

However, the method used for this paper can be summarized by approximate analogy to familiar statistical techniques. Stage one, identifying previous dimensions, was like collecting survey data. Stage two, integrating previous dimensions, was like an exploratory factor analysis seeking a structure that would account for the patterns observed in the data. Stage three, identifying managerial behaviors, was a sort of second round of data collection, and stage four, integrating managerial behaviors, was like a confirmatory factor analysis, testing and refining the previous EFA results. Each of these four stages is described below.

Stage One: Identifying Previous Dimensions

The analysis began by identifying potential dimensions of discretion based on previous empirical studies. Dimensions proposed on purely theoretical grounds without empirical corroboration were excluded. Studies using exact replications of measures were also excluded (e.g., Abrahamson & Hambrick, 1997; Karasek et al., 1982), though different operationalizations of the same construct were included. For example, three different measures of altruism were identified and included, each with similar though not identical items. Studies where discretion was assumed (e.g., Hambrick et al., 1993) or manipulated (e.g., Shalley, 1991) were excluded. Finally, measures that failed to receive empirical support were also excluded (e.g., Barnett & Brennan's 1995 operationalization of "decision authority" failed to achieve traditional reliability standards, and they were unable to distinguish the construct in a subsequent factor analysis). Appendix 1 lists the 45 dimensions of discretion, and their associated measures, that had been previously identified in the literature.

Stage Two: Integrating Previous Dimensions

Very different measures have been used to operationalize discretion, and in some cases, identical items have been used in scales purporting to measure different dimensions. Discretion has been operationalized as uni-dimensional, with a handful of dimensions, or with as many as 15 different aspects of work. However, when examined together, the dimensions in Appendix 1 clearly did not represent 45 distinct domains of work; an integration of previous results was

required.

This integration was achieved by treating each previous dimension and its scale as a case for use in a template analysis. Template analysis is a qualitative research technique for creating a hierarchical ordering of thematic codes (King, 1998). In simple terms, this involved an iterative grouping exercise that is best illustrated by example.

Barnett and Brennan (1995) identified one relevant dimension of discretion: schedule control. (The criteria of relevance are discussed after this example). As the dimension label and the items measuring it suggest, this aspect of discretion concerns control over the timing of work. *Scheduling discretion* was thus tentatively adopted as a potential dimension of discretion. The next "case" was then considered, being Breaugh's (1985) work scheduling autonomy. The items in this scale served to confirm and enrich the emerging dimension of scheduling discretion. There was clear consistency between these two scales, though they were not identical. Considering Breaugh's (1985) scale to be another instance of scheduling discretion clarified the dimension's nature, by showing that work sequencing, in addition to work timing, should be included. This process continued iteratively through each of the dimensions and measures in Appendix 1. In some cases, new dimensions were added. For example, Breaugh (1985) had shown work criteria autonomy to be a distinct dimension from scheduling, so a second dimension was tentatively adopted. In this way, each measure served to expand or refine dimensions. This iterative aspect of template analysis uses the grounded theory technique of constant comparison, allowing each new case to inform and modify the arrangement of all cases (Glaser & Strauss, 1967).

One important pattern that was immediately obvious, and which motivated the use of template analysis, was the variance in level of measurement specificity. For example, one can compare schedule control (Barnett & Brennan, 1995) to general control (Dwyer & Ganster, 1991) and see that the former is implicitly subsumed by the latter. The only way to resolve such relationships was to presume that discretion had a hierarchical dimensional structure. This was

consistent with the fundamental idea of a dimension being a useful level of aggregation. Depending on one's frame of reference, more or less aggregation may be appropriate. To make an analogy to location, individuals can describe themselves as being in a particular country, in a specific city, or on a given street. Each of these can be ordered in terms of hierarchical inclusiveness (e.g., everyone on the street is in the city, but not vice versa). The pattern of dimensions for discretion in previous studies suggested a similar structure. The assumption of a hierarchical structure is also consistent with the high cross-loadings found among dimensions in previous research (MacKenzie et al., 1991; Podsakoff et al., 1997), since these overlaps imply some structured relationship among the dimensions of discretion.

As pointed out above, only relevant dimensions and items were used in the template analysis. Dimensions and individual items that focused on aspects of control or autonomy outside discretion were excluded. For example, Dwyer and Ganster (1991) intended to measure control, in the broadest sense. In addition to items about discretion (e.g., choosing among tasks), their scale also included items other than discretion (e.g., ability to predict things at work, even if they cannot be controlled). Items outside discretion were excluded from the template analysis. This included issues such as level of interdependence (Sims et al., 1976), the importance of non-routine problem solving (Dobbin & Boychuk, 1999), work variety (Karasek, 1990), required skill level (Landsbergis, 1988), opportunities for learning (Karasek, 1979), task difficulty (Barnett & Brennan, 1995), and the frequency of errors (Farh et al., 1997). Many of the excluded issues involve control and predictability, and the important managerial function that Mintzberg (1971) called disturbance handling, but they are distinct from discretion as freedom of action in doing one's work.

The emerging template was successively revised as each new case was considered. The result was a preliminary taxonomy or hierarchically ordered structure for the dimensions of discretion. This taxonomy reflected the patterns of data in all of the studies reviewed.

Stage Three: Identifying Managerial Behaviors

The third step in the analysis was to collect a sample of specific managerial behaviors from secondary reports. This may seem a somewhat unconventional part of a research synthesis, but findings in the citizenship literature indicated its importance. Organizational citizenship research has devoted considerable effort to developing theory-based operationalizations, and in doing so has identified a potential disconnect between theory and practice concerning the dimensional structure of discretion. Theory suggested that there should be five distinct dimensions of citizenship behavior (Organ, 1988), and research was able to distinguish these five (Podsakoff et al., 1990). However, subsequent work suggested that, in practice, organization members rarely made such fine distinctions, and tended to blur some of the dimensional boundaries (Podsakoff & MacKenzie, 1994). As a result, it seemed prudent to impose some sort of practical check on the emerging dimensional structure of discretion in this paper, to prevent abstruse theorizing. The decision was made to examine whether the derived dimensional structure could encompass actual managerial behavior. In other words, before the dimensions were finalized, their correspondence to the practical concerns of managers was assessed.

Managers were selected as the test population, and more specifically, only those managers who described their work in terms of both personal tasks and supervisory tasks. Since this analysis integrated the autonomy and citizenship research, conducted primarily with workers, and executive discretion research, conducted with senior executives, it was judged that working managers represented an appropriate compromise. The managers were like workers, in having their own productive tasks to complete, but they were also like senior executives, in having subordinates and responsibility for directing them. It was assumed that at least some of what is true of senior executive discretion should also be true for lower level managers, and likewise for workers and managers.

Interviews with working managers were taken from an existing collection. *Gig* (Bowe et al., 2000) presents more than 100 interviews that originally appeared in a weekly column called "Work." The book's editors describe their

process as "sitting down with people, asking them what they did and how they felt about it, and tape-recording the conversations" (Bowe et al., 2000, p. xii). The book consists of the apparently unedited transcripts of those conversations, as the editors' stated goal was to present the "unscripted voice of the individual" (Bowe et al., 2000, p. xii). Their sample was one of convenience, and the editors recognized that no general conclusions could be based on the interviews. However, these limitations were unimportant for the purposes of the research described in this paper, as noted below.

Fourteen of the interviews were selected for use in this analysis, as they were the only ones in which interview informants explicitly mentioned both personal tasks and supervisory tasks. A summary of the 14 informants is given in Appendix 2. In addition to meeting the minimum criterion of mentioning both personal and supervisory work, these specific interviews offered several advantages. For one, seven of the informants had organizational superiors, and seven did not. This offered the possibility of contrasting between "senior" and "middle" levels of management. In addition, the use of secondary data, where the original study had nothing to do with discretion, completely eliminated the possibility of biasing influence from this study's objectives. Moreover, the obvious limitations of this sample were not relevant to this study's purposes. The 14 informants are in no way representative of job frequencies, industries, or any other work characteristic. In addition, the fact that these individuals volunteered to talk on tape implies that idiosyncratic personality differences may have biased their commentary. Also, there were likely social desirability and impression management effects on what was said. Happily, none of these drawbacks were pertinent to this paper. The interviews were not meant to be a representative sample, but only to provide a diverse range of possible managerial behavior to compare with the emerging dimensional structure.

Each of the interviews was examined for specific work behaviors. Any time the informant mentioned a specific personal action or interaction, the mention was flagged as an instance of managerial work behavior. For example, the town manager mentioned writing job descriptions for her staff and the construction

foreman described teaching all new crew members how to use a Skilsaw. Each informant mentioned between 14 and 49 behaviors, for a cumulative total of 386 managerial work behaviors.

Stage Four: Integrating Managerial Behaviors

The final stage in the analysis was refining the dimensional structure of discretion to reflect the managerial behaviors identified. This consisted of another round of template analysis. The taxonomy produced in stage two was used to code each managerial behavior. For example, the food business owner described setting his workers' hours, and this was coded as an instance of the scheduling discretion dimension. The coding was once again iterative, and in fact involved a partial return to stage two. Whenever a managerial behavior was not adequately represented by a dimension in the coding template, the template was revised. This necessarily required revisiting all of the items previously coded. Table 4.1 presents counts of the managerial work behaviors coded.

The final result combined previous research findings with practical concerns raised by managers. The 14 interviews seemed a reasonably broad sampling of positions, industries, and settings. No single informant mentioned every dimension and no dimension was raised by every informant, giving some sign of diversity in the sample. Nonetheless, these behaviors were only a sample, rather than the universe of managerial actions. As such, it would have been mistaken to let the behaviors counter previous empirical results. So, for example, method discretion and scheduling discretion were retained as distinct dimensions due to previous research findings (Barnett & Brennan, 1995; Breaugh, 1985; Morgeson & Humphrey, 2006; Wall et al., 1995), despite the absence of a method-scheduling distinction in the interviews. In fact, some informants implicitly denied the distinction. For example, the construction foreman reported difficulties with his boss about safety and timing. The foreman used the safest method for any given task, but his boss would have preferred a faster, less safe, approach. This would seem to contradict the independence of method and scheduling. However, given the assumed hierarchical structure of discretion, the fact that some managers conflated method and scheduling

Table 4.1: Counts of Managerial Work Behaviors

	Internal Discretion							External Discretion				
	Task			Relational				Input		Output		Buffer
	Method	Schedule	Effort	Support	Monitor	Reward	interpersonal	Material	Staff	Goal	Civic Virtue	
Owner (web bus.)	1	2	1	2	1		8	10	4		1	3
Owner (cleaning bus.)	4		4	1		1		3	1			3
Owner (food bus.)	1	2	1			3	6	1	1	1		
Owner (casting bus.)	1	2	1		1	1	1		2	1	4	
CEO (web bus.)	1		1		1	1	1	4	3	3		4
CEO (insurance)	1	2	3	1	1	1	1		1	4	2	5
Film Producer	3	2	5		1			6		3		
Town Manager	9	3	4	1	7	2	7	5	1	2		8
General (air force)	2	2	3	2	5		4	7	1	2	2	4
Director (political fund)	2		3	3	5	7	7	2		1	1	2
Director (HR)	3	1	4	4			3		9		7	1
Foreman (construction)	4	4	6	2	2	4	6	1	4		1	2
Supervisor (telemarketing)				9	2	3	8	3	2			1
Coach (basketball)	2	3	3	1	1	4	3	1	7		3	5

seemed insufficient grounds to deny the considerable research evidence available on the matter.

Results

The final result of the analysis was a hierarchically ordered, four-level dimensional structure for discretion, ranging from a unitary notion of general discretion to increasingly finer distinctions about the dimensions in which discretion can be exercised. Table 4.2 presents the dimensions, which are summarized below.

Table 4.2: Hierarchical Dimensional Structure of Discretion

General Discretion	1. Internal Discretion	1.1 Task Discretion	1.1.1 Method Discretion
			1.1.2 Scheduling Discretion
			1.1.3 Effort Discretion
		1.2 Relational Discretion	1.2.1 Support Discretion
			1.2.2 Monitoring Discretion
			1.2.3 Reward Discretion
			1.2.4 Interpersonal Discretion
	2. External Discretion	2.1 Input Discretion	2.1.1 Materials Discretion
			2.1.2 Staffing Discretion
		2.2 Output Discretion	2.2.1 Goal Discretion
			2.2.2 Civic Virtue Discretion
		2.3 Buffering Discretion	

General Discretion

The most common means of measuring discretion has been with a single, uni-dimensional measure meant to encompass all aspects of the individual's work (e.g., Finkelstein & Boyd, 1998; Hackman & Lawler, 1971; Karasek, 1979; Morgeson et al., 2005; Parker et al., 2006; Spreitzer, 1995). This approach has shown success, with researchers detecting anticipated relationships with various antecedents and consequences of discretion. However, there has been criticism of this approach, and reviews suggest that sub-dimensions of the larger construct have distinct relationships with antecedents and consequences, and so need to

distinguished (e.g., Fried, 1991).

Internal versus External Discretion

The most fundamental sub-division of general discretion concerned the individual's control over internal versus external phenomena. For a manager, this is the difference between activities within his or her unit and those outside it. For a CEO, the "unit" is the organization, and for a staff member it is his or her work duties. The distinction may be most easily thought of in terms of formal organizational authority, which is likely an important antecedent of internal discretion, yet often irrelevant to external discretion. The web business owner provided a concrete example. She had great discretion over matters within her organization. She set the schedules, assigned work, determined the staff evaluation criteria, and set the general tone of the atmosphere. In contrast, she felt little control over the environment in which her business operated. For example, she viewed herself as competing with similar firms for quality staff. She set a number of internal policies to make her organization more attractive to staff, but recognized that potential workers' decisions would also be influenced by her competitors' policies, which were outside her control. Thus her discretion to have the staff she preferred was not as great as her discretion over internal matters such as scheduling.

1. Internal Discretion

1.1 Task Discretion versus 1.2 Relational Discretion. Internal discretion had two broad sub-dimensions, primarily distinguished by formal task orientation and interaction. Task discretion involved behaviors directly and formally involved in completing the productive work of the unit. Thus, the air force general developing plans to accomplish his assigned missions and the food business owner determining his staff's work hours were examples of task discretion. In contrast, relational discretion involved direct interpersonal contact, and was more likely to support subsequent task activity, rather than contributing directly to production. This included behaviors such as the town manager's creation of an employee award program and the telemarketing supervisor's efforts to foster optimism in his callers.

1.1.1 Method Discretion. This dimension of discretion referred to freedom in determining how work was actually done. It included a range of issues, such as choosing among methods (Dwyer & Ganster, 1991) and planning work (Morgeson & Humphrey, 2006). The construction foreman's decisions about task assignment, such as giving the "crummiest jobs" to the newest members of the work crew are a clear example (Bowe et al., 2000, p. 33).

1.1.2 Scheduling Discretion. Although choosing how (method) might seem to imply schedules and sequences of action, empirical evidence showed that these issues are distinct at least some of the time in individuals' minds (Breaugh, 1985; Morgeson & Humphrey, 2006; Wall et al., 1995). Thus being able to determine the scheduling of work (Moorman & Blakely, 1995), the pace of work (Tetrick & LaRocco, 1987), and the order of activities (Morgeson & Humphrey, 2006) represented a distinct dimension of discretion. An example is given by the food business owner's freedom to determine the hours his employees worked.

1.1.3 Effort Discretion. The actual effort one devotes to their work is a straightforward area of discretion, though it has received little attention outside the citizenship literature (though see Dwyer & Ganster, 1991; Parker et al., 2006). This dimension encompassed the constructs of conscientiousness (Podsakoff et al., 1990) and generalized compliance (Smith et al., 1983). It addressed individuals' discretion about actually doing what is expected of them and how much genuine effort they gave. Thirteen of the 14 interviewees mentioned the long, hard hours they worked.

1.2.1 Support Discretion. Because most of the research about assisting others in their work was conducted in the citizenship tradition with staff workers, the phrasing of measures implies altruistic motives (e.g., Farh et al., 1997; Moorman & Blakely, 1995; Podsakoff et al., 1990; Smith et al., 1983). However, for the purposes of this analysis, the motive for an action was ancillary. The citizenship results clearly demonstrated that individuals can have discretion about helping others, including whether, when, how, and in what ways to provide help. In addition to direct help with tasks, this dimension also included broader

issues such as providing motivation or encouragement (Podsakoff & MacKenzie, 1994), so the more general label of "support" was adopted, rather than "helping." Training was included as a component of this dimension, as it is intended to support the trainee's subsequent performance. Therefore, both the town manager's giving of "a lot of atta boys " to relief workers (Bowe et al., 2000, p. 592) and the insurance CEO's efforts to develop the skills of his executive team were examples of support discretion.

1.2.2 Monitoring Discretion. The only mention of monitoring in the existing measures was a single item in one scale, concerning how much the individual helped "to monitor your team's overall performance" (Parker et al., 2006). This was perhaps not surprising, given the previous focus on non-supervisory staff. Nonetheless, "monitor" is one of the ten central roles of managers according to Mintzberg's (Mintzberg, 1973) description, and more recent examinations have affirmed the continued importance of monitoring behaviors (Friedman et al., 1992; Kurke & Aldrich, 1983; Tengblad, 2006). Monitoring subordinates also figured prominently in the interview behaviors, including issues such as watching for signs of burnout, following up on problems with commanders, and performance reviews.

1.2.3 Reward Discretion. As with monitoring, the only explicit mention of discretion over rewards or punishment was in the measure developed by Parker and colleagues (2006). Again, this presumably reflects the previous focus on staff workers. While disciplining others may not be important enough to be meaningfully distinct for line workers (as in Parker et al., 2006), it was clearly an area in which the interviewed managers had distinct and varying degrees of discretion. The telemarketing supervisor had little discretion over rewards, as he was given guidelines about what behaviors to censure and how, whereas the casting director mentioned the range of outlandish behavior she tolerated without taking disciplinary action.

1.2.4 Interpersonal Discretion. This was a broad dimension encompassing various aspects of the individual's personal attitude and interpersonal behavior. This appeared variously in existing scales as

sportsmanship, courtesy, and interpersonal harmony (Farh et al., 1997; Podsakoff et al., 1990). However, the logic for placing an item in one of these scales rather than another was not always clear, and evidence suggests that individuals sometimes fail to distinguish among such constructs (MacKenzie et al., 1991, 1993; Podsakoff & MacKenzie, 1994; Podsakoff et al., 1997). They were therefore combined in this analysis, and labeled interpersonal discretion because the freedom exercised revolved around issues of interpersonal style. Examples included the telemarketing supervisor's decision to ring a bell and cheer when one of his subordinates made a sale, the cleaning business owner's efforts to be culturally sensitive, and the political fund manager trying to understand and respond to the emotional priorities of his staff.

2. External Discretion

2.1 Input Discretion versus 2.2 Output Discretion. Mintzberg (1971) noted that one of the defining characteristics of managerial work was serving as the link between the organization or unit and its external environment. This function was reflected in the dimensions of external discretion, which included control over what comes into the unit from outside (input discretion) and what goes out of the unit into the environment (output discretion).

2.1.1 Materials Discretion. This dimension concerned control over the materials with which work was conducted. It encompassed all necessary work inputs, including information (Dwyer & Ganster, 1991), tools (Frese et al., 1996; Semmer, 1984), and budgets (Parker et al., 2006), as well as the ability to modify the local working environment (Dwyer & Ganster, 1991). Examples included the high school basketball coach's control over alumni spending in support of his team and the film producer's choices about which story rights to purchase for future filming.

2.1.2 Staffing Discretion. This dimension was essentially the same as materials discretion, except it concerned the human resources available, rather than material ones. This dimension included all aspects of hiring and firing staff, as the two together determine who is available for the unit's work (Parker et al., 2006; Podsakoff & MacKenzie, 1994). The most frequent mentions in the

interviews concerned recruiting techniques (e.g., the HR director's decision to waive many standard hiring practices such as reference checking) and judgments of termination (e.g., the cleaning business owner's decisions to fire those who did not respond quickly enough to his requests).

2.2.1 Goal Discretion. Where method discretion was control over the means of achieving some given end, goal discretion was control over the end itself. Goal discretion was the ability to decide what one was trying to achieve in formal production or task-oriented work. This included the desired output and the criteria by which it was evaluated. Goal discretion appeared regularly in the existing scales, though given the usually low hierarchical level of analysis, it was often framed as influence, rather than outright choice (e.g., Breaugh, 1985; Langfred, 2000; Tetrick & LaRocco, 1987). Interview examples included the film producer's editorial freedom to decide what constitutes a good movie and the web content CEO's choice of which pilots to develop.

2.2.2 Civic Virtue Discretion. The name for this dimension was retained from the citizenship measure that defined it, because the construct has shown repeated empirical success and the label aptly conveyed the content of the dimension (MacKenzie et al., 1991, 1993, 1999; Podsakoff & MacKenzie, 1994; Podsakoff et al., 1990). This dimension consisted of voluntary actions taken on behalf of the organization. Civic virtue discretion concerns effort expended for the organization's health and advancement. In existing scales, this included things as simple as attending non-mandatory meetings (Podsakoff et al., 1990) and volunteering (Smith et al., 1983) to more active advocacy, such as defending the organization's reputation (Farh et al., 1997) or encouraging friends and family to use its products (Moorman & Blakely, 1995). The interviews had a similar range of behaviors, including the air force general's decision to structure to his family life in support of his work and the HR director's decision to spend the night in the ER with an injured worker.

2.3 Buffering Discretion. The final sub-dimension of external discretion was something of a catch-all category, because it had received relatively little attention in prior research on discretion. Although the manager's role as a

figurehead and environmental-mediator figures prominently in treatments of managerial work (Mintzberg, 1971; Stewart, 1982; Wilkinson & van Zwanenberg, 1994), most existing research on the dimensions of discretion did not address managers, and so neglected this issue. However, the dimension was clearly suggested by a number of behaviors in the interviews. The air force general discussed representing his unit at meetings in Washington. The town manager described how she served as the scapegoat when unpopular decisions were taken. The web business owner mentioned serving as a buffer and liaison between her staff and clients. In all, 38 behaviors were mentioned that had two things in common: they clearly involved discretion over interactions with the external environment, but they just as clearly were not instances of input or output discretion. Almost all of these behaviors combined elements of being a figurehead (i.e., symbolically representing a larger whole), a communicator, and a protector of those within the unit or organization. Buffering discretion was adopted as a preliminary label for this dimension, pending further investigation.

Discussion

As others have observed (Podsakoff et al., 2000; Van Dyne & LePine, 1998), research on discretion has devoted far more attention to issues of substantive validity than to issues of construct validity (Schwab, 1980). In other words, more is known about the consequences of discretion than is known about discretion itself. This creates a potentially unstable foundation for theorizing, despite the demonstrated importance of the phenomenon. As a result, there is no coherent theory of discretion. This paper sought to move toward such a theory, by integrating previously isolated research to clearly define the dimensional structure of discretion.

This led to the derivation of a four-level, hierarchically inclusive dimensional structure for discretion. The all-encompassing notion of general discretion at work can be decomposed into internal and external components of discretion. Each of these can then be reduced to another more specific level, consisting of the task, relational, input, and output domains of discretion. At the finest level of specificity, discretion at work consists of twelve distinct dimensions:

discretion over methods, scheduling, effort, support, monitoring, rewards, interpersonal style, materials, staffing, goals, civic virtue, and buffering behavior. Each of these dimensions represents a distinct domain for the exercise of discretion.

Clarifying the dimensional structure of discretion offers numerous benefits to theory and research. The most obvious and most important is the guide it offers for creating operationalizations in future study (Hambrick & Abrahamson, 1995; Podsakoff et al., 2000; Smith et al., 1997). For example, Smith and colleagues (1983) reported the failure of one survey item to load as expected on their altruism and generalized compliance dimensions. They dropped it from the analysis. This anomaly was clarified several years later when subsequent work showed that the item was associated with another, distinct dimension of discretion (Podsakoff et al., 1990). Had the first authors been aware of the other dimensions, they would not have been surprised by the loading failure, and in fact would have written items more precisely tailored to the aspects of discretion involved in their project. Knowing the full dimensionality of discretion will improve future research by allowing the creation of better instruments and also of more precise hypotheses, as researchers will be able to specify their focus more clearly.

The example of the seemingly anomalous survey item also suggests another benefit of specifying the dimensional structure of discretion. It can provide the insight to understand previous results that seemed mysterious or confusing. For example, consider the repeated failure to detect the predicted relationship between demand instability and executive discretion (Finkelstein & Boyd, 1998; Hambrick & Abrahamson, 1995). Given the multidimensional nature of discretion, the observed non-relation may be an artifact of measurement, rather than a failure of theory. The hypothesized effect of demand instability is two-fold: it will reduce the clarity of means-ends linkages and it will increase the complexity of conducting routine operations, creating greater demands on attention and information processing capacity (Finkelstein & Boyd, 1998; Hambrick & Abrahamson, 1995). The first effect suggests that input and output

discretion should be increased by demand instability, as the CEO can more easily justify a range of production capacities, staffing levels, and pricing schedules. In contrast, if the increased complexity has any effect on discretion, it would likely be to reduce internal discretion, because overwhelmed CEOs will have fewer cognitive resources to apply to planning and supervision. Considered in this light, it is not surprising that demand instability showed no consistent link with general discretion. If one assumes that demand instability increases input and output discretion, while having either a negative or null effect on buffering, work process, and supervisory discretion, one would expect a null relationship with a uni-dimensional scale that aggregates these dimensions. A reexamination of the effect of demand instability that is sensitive to the distinctions among dimensions of discretion would provide both a better test of the underlying theory and potentially more informative results.

The dimensional structure derived here also demonstrates the potential for success and benefit in combining the research traditions of autonomy, citizenship, and executive discretion. The results of this first effort at integration were encouraging. Ninety percent of the real-world managerial behaviors in the interview sample were accounted for by previously identified dimensions of discretion. These dimensions were spread across three discrete research traditions, but when taken together they offered fairly comprehensive coverage of discretion's dimensions. This suggests that the three research traditions can be usefully combined, and that doing so will provide most of the foundation for an overarching theory of discretion.

The dimensional structure identified here also points to a number of specific directions for future development and research. There is the clear need to develop and validate effective measures for each dimension, and to confirm their hierarchical relations. Moreover, patterns observed in the data used in this analysis suggest that there may also be other relationships among the dimensions, and these bear investigation.

One example is an inter-dimensional relationship implied by a pattern in the interview data. Because the sample, both of informants and of behaviors,

was non-representative, no firm conclusions can be drawn from behavioral frequencies, but one pattern does seem to be suggestive of a trade-off within the dimension of output discretion. Goal discretion was mentioned more often by those informants who did not have an organizational superior (e.g., CEO, business owner). Moreover, when those with superiors did mention goal discretion, it was described in terms of issue selling rather outright choice (Ashford et al., 1998). For example, the air force general mentioned watching for "hot spots" of potential trouble (Bowe et al., 2000, p.570). He described his role as identifying such hot spots to his superior, who would choose the appropriate response. The general was issue selling, in the sense that he directed his superior's attention to particular areas, but final decisions were out of the general's control. As such, the general had some goal discretion, but it was not as great as that exercised by the food business owner who described choosing which products to make and where to market them. In general, those with organizational superiors were less likely to mention goal discretion at all, and when they did, the discretion was almost always of an issue-selling variety. In contrast, informants with organizational superiors mentioned twice as many total instances of civic virtue, compared to those without superiors. This pattern of apparent trade-off between civic virtue and goal discretion could imply that as a manager increases his or her goal discretion, the meaningfulness of civic virtue behavior wanes. This is easiest to see at the extreme. Recall that civic virtue behaviors concern voluntary actions to benefit the organization (MacKenzie et al., 1991). Imagine the owner and manager of a sole proprietorship; his or her primary task is the success of the business, so any action taken for the good of the organization is likely to be construed as simply part of normal work, rather than any sort of civic virtue. It may be that the civic virtue sub-dimension becomes increasingly less meaningful with greater goal discretion.

Since the research using the civic virtue construct has been at lower hierarchical levels, this possibility has not yet been tested, This fact reaffirms this paper's call to integrate the three disparate literatures of discretion. The potential inverse relationship between goal discretion and civic virtue discretion provides

one example of a testable hypothesis derived from comparing across the literatures. It implies that there may be little benefit in measuring the civic virtue discretion of CEOs or the goal discretion of line workers. It may, however, still be possible to compare these positions meaningfully on the basis of the more inclusive dimension of output discretion.

This discussion raises the general issue of the best way to study discretion. While it is beyond the scope of this paper to give precise guidelines, it appears that a variety of approaches may be needed. For example, most civic virtue data has been collected from third-party report, because of the strong social desirability bias likely in self-reports about such matters. In contrast, for most knowledge work, with its long durations, non-observable cognitive activity, and specialist information, self-report may be the only practical source of credible data about method discretion. Future investigation will be required to determine the best sources of data for different dimensions of discretion.

A related methodological matter is determining the appropriate level of aggregation to use in a given study. The most useful level of the hierarchy of discretion will presumably vary with the research aim. However, having a defined dimensional structure will contribute to clarity in this regard. All previous studies of discretion have already confronted the issue of choosing a level of aggregation, but to date the decisions have remained implicit. Explanations were not given as to why a particular level was selected. Having a defined hierarchical dimensional structure will allow such decisions to be explicit and better informed. It will also contribute to more cogent discussion of the boundary conditions associated with study at a particular level of aggregation. This, in turn, will contribute to the development of a unified discretion theory, something which is sorely needed, given the organizational importance of discretion. Defining the dimensional structure of discretion is an important move toward foundation for a potentially central theory in organizational behavior.

Chapter 5: Conclusion

> We are like dwarfs standing on the shoulders of giants, so that we can see more than they, and things at a greater distance, not by virtue of any sharpness of sight on our part, or any physical distinction, but because we are carried high and raised up by their giant size.
>
> – Bernard of Chartres

My fundamental goal in this dissertation was to clarify the nature of managerial discretion in a way that would advance the field toward a general theory of discretion in organizations. When I began this work, our field's knowledge of discretion was disordered. There were only a series of findings, delimited theories, and ad hoc relationships, and these were spread across three distinct literatures with little history of interaction. Frankly, we did not even know what we knew about discretion, because so much of the existing work had never been drawn together. There was no comprehensive theory for understanding discretion, even though it seems to be one of the central phenomena of organized behavior.

In this dissertation, I have not created a general theory of discretion, or even a theory of managerial discretion. There is far more work to be done in that regard. Instead, I have gathered, integrated, and refined what was already known, to facilitate future development of a general theory. As the three papers show, there was in fact quite a bit already known about discretion. Combining findings from different traditions, perspectives, contexts, and organizational levels allowed me to describe managerial discretion with considerable precision. This dissertation thus served the role of integration: integrating previously disparate research traditions; integrating knowledge about discretion at three levels of organizational hierarchy; integrating a series of previously isolated propositions;

integrating the possibilities of theory with the practical demands of practice; and integrating the many potential dimensions of discretion into a single structure.

In doing so, this dissertation makes several broad contributions. The individual and specific contributions of each paper are discussed therein, and so will not be repeated here. However, there are three more general contributions that emerge when these papers are considered together. These are discussed here.

The first contribution is a call for theoretical integration in the study of discretion. Each of my papers involved a combination of perspectives previously treated as distinct. Paper one showed the need to use both ecology theory and strategic choice theory to understand the consequences of managerial discretion. Paper two united a series of isolated propositions, and showed how they could be combined under a more general framework for understanding managerial discretion's antecedents. Paper three showed the insight available from integrating research from the job control, executive discretion, and organizational citizenship research traditions. In each case, combining theories provided a more powerful perspective for understanding discretion. For example, papers one and two showed that managerial discretion must be understood through a combination of structural and individual elements, a combination that spans traditional theoretical divisions. My dissertation demonstrates that theoretical integration is both possible and useful, and I hope that it will be carried forward, so that, as an example, executive discretion researchers will build on the work of citizenship researchers, and vice versa.

The second contribution is a demonstration and affirmation of the power of organizational research. The potential unique contribution of organization science is to explicitly study the role of organizing itself. My dissertation did so by recognizing the importance of hierarchical level in understanding behavior and outcomes. The three papers showed that one's place within an organizational hierarchy was crucial to understanding the dynamics of discretion. The fundamental dimensions, antecedents, and consequences of discretion appear to be universal, but their specific meanings are conditioned by one's place in the

organization. This conditioning may be as straightforward as the variable effect of organization size on discretion at different hierarchical levels, or as far reaching as the potentially antagonistic relationship between goal discretion and civic virtue.

The third contribution is closely related, and concerns the tantalizing hints in my findings about the possibility of a multi-level theory of discretion. Paper one demonstrated the applicability of organization theories to intra-organizational units. While the transfer was not always perfect, there was enough similarity to suggest that findings about discretion at the organizational or unit level may also be applicable to the other level. Consistent with this, paper two revealed several other parallel relationships between organizational and unit-level discretion. Combined with paper three's successful integration of findings from various organizational levels, these findings suggest that the basic nature of discretion is common at all levels of analysis. This remains a tentative hypothesis, but the evidence presented here is both suggestive and exciting. Moreover, it argues strongly for the need to develop a general theory of discretion in organizations.

Taken together, these three papers represent my effort to advance toward a single, comprehensive theory of discretion. They unite previously disparate research, incorporating the findings of each tradition. As such, it is my hope that these papers can serve as a bridge among previously disparate traditions, and thereby speed the development of discretion theory.

Appendices

Appendix 1: Existing Measures of Discretion

Source	Construct	Measurement
Barnett & Brennan, 1995	Schedule Control (self-report)	Being able to set your own work schedule Having hours that fit your needs Your job being flexible enough that you can respond to non-work situations
Breaugh, 1985	Work Scheduling Autonomy (self-report)	I have control over the scheduling of my work I have some control over the sequencing of my work activities (when I do what) My job is such that I can decide when to do particular work activities
Breaugh, 1985	Work Criteria Autonomy (self-report)	My job allows me to modify the normal way we are evaluated so that I can emphasize some aspects of my job and play down others I am able to modify what my job objectives are (what I man supposed to accomplish) I have some control over what I am supposed to accomplish (what my supervisor sees as my job objectives)
Breaugh, 1985	Work Method Autonomy (self-report)	I am allowed to decide how to go about getting my job done (the methods to use) I am able to choose the way to go about my job (the procedures to utilize) I am free to choose the method(s) to use in carrying out my work
Campion, 1988	Autonomy & Participation (self-report)	Note: 2 items in 18-item scale of job's motivational characteristics A: The job allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making P: The job allows participation in work-related decision making
Carpenter & Golden, 1997	Perceived Managerial Discretion (self-report)	Degree of discretion over 15 simulation-specific organizational issues
Dobbin & Boychuk, 1999	Job Autonomy (trained coder rating of incumbent description)	Extent of involvement in designing/planing final output and/or importance of non-routine problem-solving in work

Source	Construct	Measurement
Dwyer & Ganster, 1991	General Control (self-report)	How much control do you have over the variety of methods you use in completing your work? How much can you choose among a variety of tasks or projects to do? How much control do you personally have over the quality of your work? How much can you generally predict the amount of work you will have to do on any given day? How much control do you personally have over how much work you get done? How much control do you have over how quickly or slowly you have to work? How much control do you have over the scheduling and duration of your rest breaks? How much control do you have over when you come to work and leave? How much control do you have over when you take vacations or days off? How much are you able to predict what the results of decisions you make on the job will be? How much are you able to decorate, rearrange, or personalize your work area? How much can you control the physical conditions of your work station (lighting, temperature)? How much control do you have over how you do your work? How much can you control when and how much you interact with others at work? How much influence do you have over the policies and procedures in your work unit? How much control do you have over the sources of information you need to do your job? How much are things that affect you at work predictable, even if you can't directly control them? How much control do you have over the amount of resources (tools, material) you get? How much can you control the number of times you are interrupted while at work? How much control do you have over the amount you earn at your job? How much control do you have over how your work is evaluated? In general, how much overall control do you have over work and work-related matters?

Source	Construct	Measurement
Farh, et al., 1997	Altruism toward Colleagues (manager rating of subordinate)	Willing to assist new colleagues to adjust to the work environment Willing to help colleagues solve work-related problems Willing to cover work assignments for colleagues when needed Willing to coordinate and communicate with colleagues
Farh, et al., 1997	Conscientiousness (manager rating of subordinate)	Complies with company rules and procedures even when nobody watches and no evidence can be traced Takes one's job seriously and rarely makes mistakes Does not mind taking on new or challenging assignments Tries hard to self-study to increase the quality of work outputs Often arrives early and starts to work immediately
Farh, et al., 1997	Interpersonal Harmony (manager rating of subordinate)	~ Uses illicit tactics to seek personal influence and gain with harmful effect on interpersonal harmony in the organization ~ Uses position power to pursue selfish personal gain ~ Takes credits, avoids blames, and fights fiercely for personal gain ~ Often speaks ill of the supervisor or colleagues behind their backs
Farh, et al., 1997	Identification with the Company (manager rating of subordinate)	Willing to stand up to protect the reputation of the company Eager to tell outsiders good news about the company and clarify their misunderstandings Makes constructive suggestions that can improve operation of the company Actively attends company meetings
Farh, et al., 1997	Protecting Company Resources (manager rating of subordinate)	~ Conducts personal business on company time (e.g., trading stocks, shopping, going to barber shops) ~ Uses company resources to do personal business (e.g., company phones, copy machines, computers, and cars) ~ Views sick leave as a benefit and makes excuse for taking sick leave

Source	Construct	Measurement
Finkelstein & Boyd, 1998	Managerial Discretion (firm-level archival data)	Market growth R&D intensity Advertising intensity ~ Capital intensity Industry concentration ~ Regulation
Hackman & Lawler, 1971	Autonomy (self-report)	How much are you left on your own to do your own work? The opportunity for independent thought and action The freedom to do pretty much what I want on my job
Hambrick & Abrahamson 1995	Environmental Discretion (expert analysis)	Overall degree to which top managers in each industry have executive discretion, or 'latitude of action'
Karasek 1979	Decision Latitude (self-report)	High skill level required Required to learn new things Non-repetitious work Requires creativity Freedom as to how to work Allows a lot of decisions Assist in one's own decision Have say over what happens
Karasek 1990	Task Control or Decision Latitude (self-report)	Level of control over: Variety in work Decisions on planning and conduct of daily work Future possibilities for skill development
Landsbergis, 1988 (Karasek, et al., 1985)	Decision Latitude (self-report)	My job requires that I learn new things ~ My job involves a lot of repetitive work My job requires me to be creative My job allows me to make a lot of decisions on my own My job requires a high level of skill ~ On my job, I have very little freedom to decide how I work I get to do a variety of different things on my job I have a lot of say about what happens on my job I have an opportunity to develop my own special abilities
Langfred, 2000	Autonomy (self-report)	Control over pace of work Authority in determining tasks to be performed ~ Number of written rules and procedures pertaining to job Authority in determining rules and procedures for own work

Source	Construct	Measurement
Moorman & Blakely, 1995	Loyal Boosterism (self-report)	Defends the organization when other employees criticize it Encourages friends and family to utilize organization products Defends the organization when outsiders criticize it Shows pride when representing the organization in public Actively promotes the organization's products and services to potential users
Moorman & Blakely, 1995	Individual Initiative (self-report)	For issues that may have serious consequences, expresses opinions honestly even when others may disagree Often motivates others to express their ideas and opinions Encourages others to try new and more effective ways of doing their job Encourages hesitant or quiet co-workers to voice their opinions when they otherwise might not speak-up Frequently communicates to co-workers suggestions on how the group can improve
Moorman & Blakely, 1995	Interpersonal Helping (self-report)	Goes out of his/her way to help co-workers with work-related problems Voluntarily helps new employees settle into the job Frequently adjusts his/her work schedule to accommodate other employees' requests for time-off Always goes out of the way to make newer employees feel welcome in the work group Shows genuine concern and courtesy toward co-workers, even under the most trying business or personal situations
Morgeson, et al., 2005	Job Autonomy (self-report)	I have significant autonomy in determining how I do my job I can decide on my own how to go about doing my work I have considerable opportunity for independence and freedom in how I do my job
Morgeson & Humphrey, 2006	Work Scheduling Autonomy (self-report)	The job allows me to make my own decisions about how to schedule my work The job allows me to decide on the order in which things are done on the job The job allows me to plan how I do my work

Source	Construct	Measurement
Morgeson & Humphrey, 2006	Decision Making Autonomy (self-report)	The job gives me a chance to use my personal initiative or judgment in carrying out the work The job allows me to make a lot of decisions on my own The job provides me with significant autonomy in making decisions
Morgeson & Humphrey, 2006	Work Methods Autonomy (self-report)	The job allows me to make decisions about what methods I use to complete my work The job gives me considerable opportunity for independence and freedom in how I do the work The job allows me to decide on my own how to go about my work
Morrison & Phelps, 1999	Taking Charge (coworker report)	This person often . . . Tries to adopt improved procedures for doing his or her job Tries to change how his or her job is executed in order to be more effective Tries to bring about improved procedures for the work unit or department Tries to institute new work methods that are more effective for the company Tries to change organizational rules or policies that are nonproductive or counterproductive Makes constructive suggestions for improving how things operate within the organization Tries to correct a faulty procedure or practice Tries to eliminate redundant or unnecessary procedures Tries to implement solutions to pressing organizational problems Tries to introduce new structures, technologies, or approaches to improve efficiency
Parker, et al., 2006	Job Autonomy (self-report)	Help to decide how much work your team will do Help to allocate jobs among team members Get involved in the selection of new team members Arrange cover for people Get involved in improvement teams Help to monitor your team's overall performance Train other people Get involved in the discipline of other team members Help to manage the budget for your team

Source	Construct	Measurement
Podsakoff & Mackenzie, 1994	Helping (manager rating of subordinate)	Willingly gives of his or her time to help other agents who have work-related problems Is willing to take time out of his or her own busy schedule to help with recruiting or training new agents "Touches base" with others before initiating actions that might affect them Takes steps to try to prevent problems with other agents and/or other personnel in the agency Encourages other agents when they are down Acts as a "peacemaker" when others in the agency have disagreements Is a stabilizing influence in the agency when dissension occurs
Podsakoff & Mackenzie, 1994	Civic Virtue (manager rating of subordinate)	Attends functions that are not required but help the agency/company image Attends training/information sessions that agents are encouraged but not required to attend Attends and actively participates in agency meetings
Podsakoff & Mackenzie, 1994	Sportsmanship (manager rating of subordinate)	~ Consumes a lot of time complaining about trivial matters ~ Always finds fault with what the agency/company is doing ~ Tends to make "mountains out of molehills" (makes problems bigger than they are) ~ Always focuses on what is wrong with his or her situation rather than the positive side of it
Podsakoff, et al., 1990	Civic Virtue (immediate supervisor report)	Attends meetings that are not mandatory, but are considered important Attends functions that are not required but help the company image Keeps abreast of changes in the organization Reads and keeps up with organization announcements, memos, and so on
Podsakoff, et al., 1990	Sportsmanship (immediate supervisor report)	~ Consumes a lot of time complaining about trivial matters ~ Always focuses on what's wrong, rather than the positive side ~ Tends to make "mountains out of molehills" ~ Always finds fault with what the organization is doing ~ Is the classic "squeaky wheel" that always needs greasing

Source	Construct	Measurement
Podsakoff, et al., 1990	Altruism (immediate supervisor report)	Helps others who have been absent Helps others who have heavy workloads Helps orient new people even though it is not required Willingly helps others who have work related problems Is always ready to lend a helping hand to those around him/her
Podsakoff, et al., 1990	Courtesy (immediate supervisor report)	Takes steps to prevent problems with other workers Is mindful of how his/her behavior affects other people's jobs Does not abuse the rights of others Tries to avoid creating problems for coworkers Considers the impact of his/her actions on coworkers
Podsakoff, et al., 1990	Conscientiousness (immediate supervisor report)	Attendance at work is above the norm Does not take extra breaks Obeys company rules and regulations even when no one is watching Is one of my most conscientious employees Believes in giving an honest day's work for an honest day's pay
Semmer, 1984 (as reported in Frese, et al., 1996)	Control at Work (self-report)	If you look at your job as a whole: How many decisions does it allow you to make? Can you determine how you do your work? Can you plan and arrange your work on your own (e.g., calculate which material/tools you need)? How much can you participate in decisions of your superior (e.g., the superior asks you for your opinion and asks for suggestions)?
Sims, et al., 1976	Autonomy (self-report)	How much are you left on your own to do your own work? To what extent are you able to do your job independently of others? ~ To what extent do you complete work that has been started by another employee? The freedom to do pretty much what I want on my job The opportunity for independent thought and action

Source	Construct	Measurement
Smith, et al., 1983	Generalized Compliance (self-report)	Punctuality ~ Takes undeserved breaks Attendance at work is above the norm Gives advance notice if unable to come to work ~ Great deal of time spent with personal phone conversations Does not take unnecessary time off work Does not take extra breaks Does not spend time in idle conversation
Smith, et al., 1983	Altruism (self-report)	Helps others who have been absent Volunteers for things that are not required Orients new people even though it is not required Helps others who have heavy work loads Assists supervisor with his or her work Makes innovative suggestions to improve department
Spreitzer, 1995	Self-Determination (self-report)	I have significant autonomy in determining how I do my job I can decide on my own how to go about doing my work I have considerable opportunity for independence and freedom in how I do my job
Tetrick & LaRocco, 1987	Control (self-report)	Have influence over the things that affect you on the job Have input in deciding what tasks or parts of tasks you will do Have the opportunity to take part in making job-related decisions that affect you Set your own work deadlines Job allows you the opportunity for independent thought and action Control the pace and scheduling of your work
Wall, et al., 1995	Timing Control (self-report)	Decide on the order in which you do things Decide when to start a piece of work Decide when to finish a piece of work Set your own pace of work
Wall, et al., 1995	Method Control (self-report)	Control how much you produce Vary how you do your work Plan your own work Control the quality of what you produce Decide how to go about getting your job done Choose the methods to use in carrying out your work

~ indicates reverse-scored item

Appendix 2: Summary of Interview Informants

Each informants' work and title is summarized in the terms used by that informant.

Internet Business Owner: Maggie, co-owner and operator of website providing interactive, live content to clients

Cleaning Business Owner: Neal Smither, president and owner of Crime Scene Cleaners

Food Business Owner: David Eng, co-owner and operator of Fong On Tofu Factory

Casting Business Owner: Lisa Pirriolli, owner of business providing auditions and casts for movies

Web Content CEO: Jaime Levy, chief executive officer or Electronic Hollywood

Insurance CEO: Robert Devlin, chairman and chief executive officer of American General Corporation

Film Producer: Jerry Bruckheimer

Town Manager: Jennifer Daily, town manager of Cumberland, IN [hired by mayor and town council]

Air Force General: Patrick Kenneth Gamble, commander of Pacific Air Forces in the United States Air Force

Political Fund Manager: Tom, regional finance director for unnamed presidential candidate's campaign

HR Director: Sandy Wilkens, director of human resources for unnamed slaughterhouse plant

Construction Foreman: Scott Nichols, foreman of residential home construction company

Telemarketing Supervisor: Jason Groth, trainer and supervisor at Dial-America Marketing, Inc.

Basketball Coach: James R., head varsity basketball coach of unnamed Catholic high school in Pennsylvania

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