The Milieu of Managerial Work: An Integrative Framework Linking Work Context to Role Requirements

Erich C. Dierdorff and Robert S. Rubin
DePaul University

Frederick P. Morgeson
Michigan State University

Theoretical and empirical efforts focusing on the interplay between work context and managerial role requirements have been conspicuously absent in the scholarly literature. This paucity exists despite over 60 years of research concerning the requirements of managerial work and with the rather universal recognition that work context meaningfully shapes organizational behavior. The authors developed a theoretical model linking different types of role requirements to different forms of work context. They empirically tested this framework with a nationally representative sample of 8,633 incumbents spanning 52 managerial occupations. Findings from hierarchical linear modeling analyses demonstrated that discrete forms of context (task, social, and physical) exert significant and predictable effects on managerial role requirements.

Keywords: context, competencies, leadership, job analysis, occupation

Of the hundreds of distinct organizational work roles, few have received as much scholarly attention as that of the managerial role. A considerable amount of research has sought to delineate what managers do and how they can influence organizational functioning (e.g., Campbell, Dunnette, Lawler, & Weick, 1970; Kotter, 1982; Mintzberg, 1973; Shetty, 1982). With its early roots in Fayol's (1916) classic managerial activities of planning, commanding, coordinating, and controlling, the overarching goal in much of this research has been to develop comprehensive taxonomies of managerial behavior or otherwise define what activities are required by all managers. Though fruitful, this extant research has largely ignored the influence of work context on the adoption of managerial roles, where work context can be thought of as the "situational opportunities and constraints that affect the occurrence and meaning of organizational behavior" (Johns, 2006, p. 387). There have been two exceptions to this general tendency. First, some scholars have studied managers in situ by interviewing or observing them as they go about their day-to-day activities (e.g., Kotter, 1982; Mintzberg, 1973; Sayles, 1964). Second, other scholars have been interested in how organizational factors can influence managerial behavior (e.g., Osborn & Hunt, 1975; Stewart,

1982). Despite this implicit recognition, there have been very few empirical examinations of how different aspects of work context shape managerial behavior (see Hammer & Turk, 1987, for an exception).

This lack of research is unfortunate, as scholars over the past 25 years have increasingly highlighted the important part work context plays in shaping organizational behavior and have lamented the dearth of empirical research on context (Johns, 2001; Mowday & Sutton, 1993; Schneider, 1983). For example, Cappelli and Sherer (1991) pointed out that when studying organizational behavior "it is impossible to explore [behavioral] uniqueness without an explicit consideration of context" (p. 97). More recently, Johns (2006) reached a similar conclusion by noting that most of the attention in organizational research is directed toward "the shining figure at the expense of the murky ground [which] is perhaps understandable, but it is also dysfunctional" (p. 404). Managerial work is certainly not insulated from effects of the "murky ground." Indeed, managerial work roles occur in diverse work contexts, and context can exert a profound influence on what work role requirements are more or less important (Dierdorff & Morgeson, 2007; Johns, 2006). Therefore, theory and research on managerial work stands to benefit greatly from a systematic and explicit examination of managerial work roles and their relationships to features of the work context.

Toward this end, we have developed an integrative meso-level framework (House, Rousseau, & Thomas-Hunt, 1995) that links features of the work context to individual role enactment. Thus, our study answers calls for organizational research to "weave context more systematically into its traditional areas of research" (Mowday & Sutton, 1993, p. 225). To accomplish this purpose, we build on Johns's (2006) recent categorical model of work context to empirically examine how managerial roles vary depending on the context within which these roles are enacted. We also draw from historical literature outlining the broad categories of required managerial work. This choice allows for more parsimonious theory building regarding the links between categories of work context

and categories of managerial role requirements. In this sense, our approach is a process-based theoretical perspective (Maguire, 1983) in which we examine mechanisms of influences between taxonomic models (i.e., managerial requirements and work context). Such an approach is theoretically important because it attempts to explicate the intermediate steps by which categories of variables are interrelated (Hattrup & Jackson, 1996), as well as characterizing both person-centric and contextual factors in "mutually relevant and comparative forms" (Chatman, 1989, p. 337). We begin with a description of what comprises and shapes work roles in general and managerial work roles in particular. Next, we discuss ways to conceptualize context based on recent work by Johns (2006) and others. Finally, we develop hypotheses for the important effects of work context on different managerial role requirements.

Managerial Work Role Requirements

According to organizational role theory, a role subsumes expectations regarding the various obligations that are associated with a particular position (Biddle & Thomas, 1966; Gross, Mason, & McEachern, 1958; D. Katz & Kahn, 1978). Thus, work roles are generally defined in terms of responsibilities and requirements associated with enacting specific jobs (Ilgen & Hollenbeck, 1991). These responsibilities and requirements include role activities and role holder attributes such that they refer to "specific acts, things that the person should do or avoid doing . . . [and] to personal characteristics or style" (D. Katz & Kahn, 1978, p. 190). Therefore, work role requirements encompass more than just the *activities* incumbents must perform as part of their roles, but also extend to relevant *attributes* that are requisite to role enactment, such as different knowledge, skills, abilities, and traits of the role holders themselves (Dierdorff & Rubin, 2007). Of importance, similarities in work role requirements also enable individual work roles to be meaningfully combined in occupational groupings that share a common overall goal or purpose (Dierdorff & Morgeson, 2007). In this sense, managerial work roles entail the various attribute and activity requirements associated with enacting specific managerial occupations (e.g., financial managers, construction managers, human resource managers, etc.).

Descriptions of managerial work role requirements have a long history and have primarily focused on deriving the assortment of behaviors or functions that coincide with managerial work. Although disparate in method (e.g., critical incidents, standardized job analysis instruments) and sample (e.g., military, executives, first-line supervisors), a review of this literature suggests that there are three general categories of managerial work role requirements. First, *conceptual* requirements span knowledge, skills, characteristics, and behaviors associated with cognitive processes, such as collecting and processing information (Harvey, 1991), planning (Hemphill, 1959), and learning (Lau & Pavett, 1980; Mintzberg, 1973). Second, *interpersonal* requirements reflect interacting, influencing, and leading others (Borman & Brush, 1993; Harvey, 1991; R. L. Katz, 1974). Third, *technical/administrative* requirements include aspects of managerial work dealing with the traditional functions of business (R. L. Katz, 1974; Tett, Guterman, Bleier, & Murphy, 2000), such as operations, accounting, and coordinating administrative activities (Mahoney, 1961; Pavett & Lau, 1983; Stogdill, Wherry, & Jaynes, 1953). With some varia-

tion in nomenclature, comprehensive reviews have corroborated these general requirement categories (Bass, 1990; Harvey, 1991; Hunt, 1991; R. L. Katz, 1970, 1974; G. C. Thornton & Byham, 1982; Yukl, 1987). Table 1 presents select examples of these three requirement categories from studies spanning 5 decades.

Clearly, the three broad categories appear to underlie the enactment of all managerial roles. Yet, managerial work takes place in diverse contexts that are likely to shape the manner in which managerial roles are enacted. In fact, one of the central tenets of organizational role theory is the fundamental interplay between individual factors and contextual influences on role enactment (Biddle, 1986; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; R. Thornton & Nardi, 1975). D. Katz and Kahn (1978) explained this interrelationship by stating that role enactment "does not occur in isolation; it is itself shaped by additional or contextual factors" (p. 195). Thus, managerial roles are subject to a variety of diverse demands, constraints, and opportunities (Stewart, 1982). A complete understanding of managerial roles, therefore, requires a consideration of contextual influences.

Placing Managerial Work Roles in Context

In his recent review, Johns (2006) put forth a categorical model of context that can be used to inform inquiry about such influences on managerial roles. Specifically, he conceptualized context in two ways. First, an *omnibus* approach to context entails a broad consideration of environmental influences and "refers to an entity that comprises many features or particulars" (Johns, 2006, p. 391). Accordingly, Johns noted that omnibus context effects operate in an undifferentiated manner by providing information about the broad essential elements of a given context. Thus, researchers studying a given phenomenon are likely to derive different results when the omnibus context (e.g., society, organization, culture) is altered. When a researcher specifies top-down effects for societal elements, for instance, he or she is using an omnibus approach to context. Similarly, omnibus context is explored when one cares to know whether the results of a study would yield similar findings if the participants worked under one particular organizational structure rather than another.

Broad omnibus context effects can be subjected to finer grained analysis in which more precise contextual features of are examined. Johns (2006) described *discrete* context, which refers to "specific situational variables that influence behavior directly or moderate relationships between variables" (Johns, 2006, p. 393). Three particular dimensions of discrete context have been put forward as having important influences on organizational behavior: task, social, and physical context (Hattrup & Jackson, 1996; Johns, 2006; Mowday & Sutton, 1993). Briefly, discrete *task context* encompasses contextual features that are informational in nature, discrete *social context* refers to contextual aspects that are interpersonal in nature, and discrete *physical context* comprises contextual elements of the material or built environment (Hattrup & Jackson, 1996; Johns, 2006; Strong, Jeanneret, McPhail, Blakey, & D'Egidio, 1999).

Omnibus Context and Managerial Role Requirements

Although occupations have been long recognized as central forces in modern life (Durkheim, 1964), contemporary organiza-

Table 1
Categories and Examples From 5 Decades of Managerial Work Role Requirement Research

Study	Conceptual	Interpersonal	Technical/administrative
Flanagan (1951)	Planning and directing action	Supervising personnel	Handling administrative detail, accepting organizational responsibility, accepting personal responsibility
Stogdill et al. (1953)	Methods planning, high-level policymaking	Managing personnel services	Administrative coordinating
Prien (1963)	Coordinating and administrating personnel, organizing work, planning and preparing	Supervising employees, maintaining employee contact and communication, handling union–management relations	Supervising and handling administration of manufacturing process
Katzell et al. (1968)	Long-range planning	Staffing, shared responsibility, individual responsibility	Budgeting, technical consulting, operational concerns, professional concerns, controlling, technical activity, administrative activity
Dowell & Wexley (1978)	Organizing work of subordinates, work planning and scheduling	Working with subordinates	Maintaining efficient/quality production, maintaining safe/clean work areas, maintaining equipment and machinery, compiling records and reports
Morse & Wagner (1978)	Organizing and coordinating, information handling, strategic problem solving	Providing growth and development, motivating and handling conflict	Managing the organization's environment and resources
Luthans & Lockwood (1984)	Planning and coordinating,	Motivating and reinforcing, interacting with outsiders, managing conflict	Processing paperwork, monitoring and controlling performance
Yukl (1989)	Planning, problem solving, clarifying roles and objectives	Supporting, networking, managing conflict and team building, motivating, recognizing and rewarding, informing	Monitoring operations and environment
Borman & Brush (1993)	Planning and organizing, decision making, problem solving, collecting and interpreting data	Guiding, directing, motivating subordinates, maintaining good working relationships	Monitoring and controlling resources, handling administration and paper work
Tett et al. (2000)	Decision making, strategic planning, problem awareness	Maintaining person orientation, developing self and others, communicating, motivating	Having occupational acumen and expertise, monitoring, having a concern for safety

tional theory and research generally have not incorporated the study of occupations (Trice, 1993). Barley and Tolbert (1991) highlighted this disregard by concluding that organizational researchers have ignored occupation as a contextual influence, "even though the interplay between occupation and organization clearly constitutes a central dynamic in the work lives of individuals" (p. 3). Further, along with division of labor and structures of organizations, the structure of occupations is a fundamental aspect of the modern social organization of work (Abbott, 1989).

Sociologists have generally viewed occupations as *conscious social groups* (Abbott, 1989) that can be delineated by their distinctive sets of tasks and the control over how those tasks are performed (Trice, 1993). Researchers from the work analysis literature, following an industrial–organizational psychology tradition, have defined occupations as groupings of work roles that span multiple organizations but share common purposes and common requirements of incumbents (Dierdorff & Morgeson, 2007). In other words, an occupation can be viewed as a "group of jobs, found at more than one establishment, in which a common set of tasks are performed or are related in terms of similar objectives, methodologies, materials, products, worker actions, or worker characteristics" (U.S. Department of Labor, 1991, p. 2-1). Combining these perspectives, occupations are collections of work roles with similar goals that require the performance of distinctive

activities as well as the application of specialized skills or knowledge to accomplish these goals. As such, an occupation is an entity that exists at a level above individual incumbents or positions within an organization (Dierdorff & Ellington, 2008), in part because numerous individuals and related work roles reside within a particular occupation.

Not only do occupations reflect groupings of similar work roles, but they also reflect distinctly different contexts within which work roles are enacted. For example, occupations have been described as creating "an interacting system, an ecology" (Abbott, 1988, p. 33). This has led scholars to describe occupations as having their own cultural features, which have effects on work life that are at least as potent as the effects typically attributed to organizational cultures (Trice, 1993). Thus, occupations are a particularly useful way to index omnibus context because they delineate boundaries of larger environmental configurations consisting of more specific situational stimuli. Thus, knowing an individual's occupation can permit reasonable inferences about the context in which the individual works (Johns, 2006). Additionally, as a higher level phenomenon, occupational context exerts a top-down effect on individual role enactment (see Kozlowski & Klein, 2000). Thus, the contexts of occupations do not so much emerge from individual role enactment as they simply exist at higher levels and exert downward influences.

As discussed earlier, conceptual, interpersonal, and technical/administrative requirements appear to broadly underlie all managerial work. However, given the potential forces of occupation (omnibus context) in shaping work roles, these common managerial role requirements are likely to vary across different managerial occupations with regard to their relative significance to role enactment. This variance stems from the fact that, although managerial occupations share the broad requirements associated with managing, the unique omnibus contexts in which incumbents of different managerial occupations work make some of these shared requirements more or less important to role enactment. As an illustration, the relative importance of a role requirement such as managing technology would certainly be greater for the occupation of computer systems manger than for the occupation of hotel/lodging manager, although the requirement is shared by both types of managers. Consistent with the emphasis on contextual effects in both role theory and occupational theory, observed differences in the relative importance of work role requirements should be attributable to the managerial occupation under consideration and, thus, make evident the effects of omnibus context.

> *Hypothesis 1:* Omnibus context (occupation) accounts for variance in the importance of role requirements across different managerial work roles.

Discrete Context and Managerial Role Requirements

Although work context can be specifically delineated with discrete dimensions (e.g., task, social, and physical contexts), it is essential to recognize that these dimensions are by no means theoretically orthogonal. Rather, discrete dimensions of context make up a tension system or force field (Lewin, 1951) that impinges on behavior (Johns, 1991; Ross & Nisbett, 1991; Rousseau & Fried, 2001). In this sense, the task, social, and physical contexts shape role requirements regardless of whether they are conceptual, interpersonal, or technical/administrative. Yet, different contexts are also known to exert greater influence on some aspects of role performance when compared to other aspects (i.e., greater *press* in Murray, 1938, or *situation strength* in Mischel, 1977). Therefore, a given discrete context dimension is likely to be more or less relevant (Tett & Burnett, 2003) to a given category of managerial role requirements, which results in a larger or smaller contextual impact on that role requirement category. Following a meso-theoretical approach, our hypotheses described later emphasize those categories of managerial role requirements for which the influence of a particular discrete context dimension is most pronounced. This approach ensures that our level of theory and analysis are equivalent and promotes parsimony.

Task context. Discrete task context encompasses contextual features that are structural and informational in nature, including attributes such as the availability of information, degree of consensus among information cues, amount of behavioral or informational ambiguity and uncertainty, level of accountability, degree of structure in role demands, and the amount of autonomy (Hattrup & Jackson, 1996; Johns, 2006). A wealth of empirical evidence demonstrates that task context elements shape the structure, processes, and information used to perform work.

For example, autonomy promotes freedom and discretion in work scheduling, decision making, and choice of work processes

(Morgeson & Humphrey, 2006; Wall, Jackson, & Mullarkey, 1995). Lower levels of uncertainty, as in more routinized task contexts, are associated with less role innovation (Wrzesniewski & Dutton, 2001), increased informational regularity (Pentland & Rueter, 1994), and decreased role flexibility (Griffin, Neal, & Parker, 2007). In addition, task context variables affect perceptions and judgments about the work role itself, as well as role performance (Abramis, 1994; Dierdorff & Morgeson, 2007; Dierdorff & Rubin, 2007; Morgeson, Delaney-Klinger, & Hemingway, 2005; Tubre & Collins, 2000).

Discrete task context elements that shape how information is obtained and processed have consequences for fulfilling the conceptual requirements of managerial work, such as those related to decision making (Flanagan, 1954; Hunt, 1991), strategy (Hemphill, 1960; Katzell, Barrett, Vann, & Hogan, 1968), and planning (Flanagan, 1951; Luthans & Lockwood, 1984; Wofford, 1970). For example, task contexts with low autonomy can restrict or reduce individuals' decision-making capabilities (Spreitzer, 1995), whereas contexts high in uncertainty can amplify the need for information and the overall complexity of the decision-making process (Ellsberg, 1961).

Features of the task context that impact how work is structured have specific implications for technical/administrative requirements, such as those dealing with the coordination of administrative activities (Mahoney, 1961; Stogdill et al., 1953). In addition, informational facets of task context may hold rather potent ramifications for managerial role requirements that involve compiling financial reports and monitoring operations, production, and quality (Dowell & Wexley, 1978; Pavett & Lau, 1983; Tornow & Pinto, 1976). For instance, levels of accountability could very well shape the importance placed on such requirements, especially considering that they can affect how explicitly one's performance is visible to the organization.

From the earlier discussion, conceptual requirements of managerial work entail activities and attributes that pertain to decision making, strategy, idea generation, and analyzing information, all of which directly relate to managing structure and information within organizations. Similarly, technical/administrative requirements of managerial work also relate directly to managing structure and information, as these requirements encompass activities and attributes relating to coordination, compliance, and administrative control. Because discrete task context represents the structural and informational conditions under which managerial work must be enacted, such elements should exert stronger influences on managerial role requirements that are most relevant to these conditions. It is this increased relevance that we argue translates to more pronounced influences for discrete task context on conceptual and technical/administrative role requirements than on interpersonal role requirements.

> *Hypothesis 2A:* Task context accounts for more variance in the importance of conceptual managerial role requirements than interpersonal requirements.

> *Hypothesis 2B:* Task context accounts for more variance in the importance of technical/administrative managerial role requirements than interpersonal requirements.

Social context. Discrete social context refers to contextual aspects that are interpersonal in nature and includes attributes such as social density, norms, degree of interdependence, and interpersonal conflict (Evans, Johansson, & Carrere, 1994; Hattrup & Jackson, 1996; Johns, 2006; Kelly et al., 2003). Like all aspects of context, social context may press on individuals in slight or forceful ways (Johns, 2006). For example, both subtle social density (e.g., the mere presence of others) and forceful direct social influences (e.g., norms established by powerful authority figures) can have equally potent effects on behavior. Not surprisingly then, wide variations in social context are known to amplify the effective functioning of organizations (e.g., prevalence of citizenship) as well as undermine this functioning (e.g., extensive social loafing).

Forces within the discrete social context shape interpersonal exchanges and interactions that pervade role enactment. Elements of social context are also viewed as major aspects of one's work (Stone & Gueutal, 1985). With respect to managerial work, role requirements that involve human relations, such as interpersonal role requirements, should be the most significantly shaped by social context. Unlike technical/administrative and conceptual requirements where significant interaction with others may (e.g., strategic planning) or may not (e.g., processing paper work) be requisite, human interaction is a necessary condition to enact all interpersonal role requirements of managerial work; requirements that include leadership, motivation, counseling, conflict resolution, team building, and interpersonal communication (Borman & Brush, 1993; Hunt, 1991; R. L. Katz, 1974; Luthans & Lockwood, 1984; Prien, 1963).

For example, the prevalence of interpersonal conflict within the social context necessitates conflict management tactics and affects the manner with which individuals engage their social environment (De Dreu & Beersma, 2005; De Dreu & Weingart, 2003; Dierdorff & Ellington, 2008; Jehn, 1995, 1997). Similarly, the level of interdependence in the social context represents the connectedness among work roles (Griffin et al. 2007; Morgeson & Humphrey, 2006) and promotes reciprocal interaction with others, the sharing of information and workload, and boundary spanning activities to accomplish work goals (Katz-Navon & Erez, 2005; Kiggundu, 1981; Kozlowski, Gully, Nason, & Smith, 1999). Given the correspondence of such discrete social context elements to the nature of interpersonal role requirements, we argue a pronounced influence for discrete social context variables on interpersonal role requirements as compared to conceptual or technical/administrative role requirements.

> *Hypothesis 3:* Social context accounts for more variance in the importance of interpersonal managerial role requirements than conceptual and technical/administrative requirements.

Physical context. Discrete physical context comprises contextual elements of the material or built environment, including environmental conditions, such as acoustic (noise), visual (lighting and glare), temperature, humidity, and air quality, as well as hazardous work conditions, such as radiation, high places, and disease exposure (Hatch, 1987; Johns, 2006; Pfeffer, 1997; Strong et al., 1999). Such physical elements are generally discussed as ambient conditions, referring "to the atmosphere of a work environment, both literally and figuratively" (Sundstrom & Sundstrom,

1986, p. 7). As extensions of the built environment, facets of discrete physical context can be seen as inanimate features of the work context (Evans et al., 1994).

Although understudied in organizational behavior research (Pfeffer, 1997), the related fields of industrial engineering, human factors, and environmental psychology have long studied the effects of physical context on many forms of work behavior. An example of this historical focus is evident in the now classic Hawthorne studies, where change in ambient conditions was an empirical centerpiece (Roethlisberger & Dickson, 1939). Research evidence suggests that aspects of physical context have significant effects on a wide variety of outcomes, such as job satisfaction, affect, customer service, job performance, and learning (Baron, 1993; Bitner, 1990; Butler & Jones, 1979; Oldham & Rotchford, 1983; Springer, 1992; Sundstrom & Sundstrom, 1986). Considering these effects, Elsbach and Pratt (2008) recently concluded that "physical environments play a major role in facilitating and constraining organizational action" (p. 182).

Although physical context appears to have numerous influences on work behavior, some research indicates that such effects are influenced by levels of perceived control (Evans et al., 1994). This suggests that the impact of physical context may be stronger for role requirements that are related to managerial control. Such control-related role requirements primarily belong in the technical/administrative category (e.g., maintenance of equipment, monitoring operations and technology, and coordinating administrative activities). For example, physically hazardous work conditions frequently entail the use of specialized technology and equipment, creation of standardized operating procedures, administration of compliance policies, and adherence to safety regulations (Strong et al., 1999). Consistent with this logic, empirical evidence indicates that across jobs in general, ambient conditions are highly related to operational activities, technical skills, and technological knowledge (Hanson, Borman, Kubisiak, & Sager, 1999). Thus, the effects of physical context are likely to be most pronounced for role requirements that are technical/administrative in nature.

> *Hypothesis 4:* Physical context accounts for more variance in the importance of technical/administrative managerial role requirements than conceptual and interpersonal requirements.

Method

Database and Sample

Archival data from the U.S. Department of Labor's Occupational Information Network (O*NET) were used to conduct study analyses. O*NET is a comprehensive database of occupational information and replaces the 70-year-old *Dictionary of Occupational Titles* (Dye & Silver, 1999). The data contained within O*NET allow for a focus on areas that describe important characteristics of both workers and the work itself (M. D. Mumford & Peterson, 1999). Important to examining managerial work role requirements, O*NET provides a common language for describing occupations, which allows comparisons across different managerial occupations. O*NET data are representative of the national labor force and are collected with a staged sampling process. First, the broad business environment in which a target occupation resides is examined to determine the types of establishments that

employ occupational incumbents, the different sizes of such establishments, and how many individuals are employed in the target occupation within the U.S. labor market. Next, a random sample of establishments is identified and contacted to verify employment of occupational incumbents. Third, questionnaires are sent to random samples of incumbents within the selected establishments. All questionnaire items are rated with a 5-point importance scale (1 = *not important* to 5 = *extremely important*) and are presented with definitions to aid comprehension. To reduce the burden on respondents, items are organized into four questionnaires (see later description), and respondents are randomly assigned to one questionnaire. This random assignment is valuable because it creates independent samples across surveys and eliminates potential common source (respondent) bias.

The study's sample comprises 52 managerial occupations contained in O*NET. These occupations encompass all of the designated management-related occupations within O*NET. Data for these occupations were provided by incumbents no earlier than 2004. The total sample size was 8,633 incumbent managers. Table 2 lists these managerial occupations and their sample sizes. Data at the individual level for four work role requirement domains from the O*NET database, spanning both activities and attributes, were analyzed and are described next.

Measures: Work Role Requirements

Responsibilities. These behavioral requirements were collected from incumbents with a standardized 41-item O*NET questionnaire that assesses generalized work activities (Jeanneret, Borman, Kubisiak, & Hanson, 1999). Item examples include "getting information," "selling or influencing others," and "documenting or recording information." Each item is presented with a brief definition to facilitate respondent comprehension. Previous research (Childs, Peterson, & Mumford, 1999) has shown acceptable levels of reliability for items contained in this questionnaire: mean intraclass correlation coefficient, ICC(1, 30) = .92.

Knowledge. Knowledge requirements were collected from incumbents with a standardized 33-item O*NET questionnaire (Costanza, Fleishman, & Marshall-Mies, 1999). Items include "psychology," "sales and marketing," and "personnel and human resources." All items are presented with brief definitions. Prior research has shown acceptable levels of reliability, mean ICC(1, 30) = .95, for items contained in this questionnaire (Childs et al., 1999).

Skills. Skill requirements are collected from incumbents with a standardized 35-item O*NET questionnaire (M. D. Mumford, Peterson, & Childs, 1999). Item examples include "judgment and decision making," "time management," and "social perceptiveness." All skill items are presented with brief definitions. Research has indicated acceptable levels of reliability, mean ICC(1, 30) = .93, for the 35 skill items (Childs et al., 1999).

Traits. Trait role requirements are collected from incumbents with a standardized O*NET questionnaire that assesses 16 work-related traits (Borman, Kubisiak, & Schneider, 1999). Example items include "achievement/effort," "attention to detail," "social orientation," "dependability," and "adaptability/flexibility." Each work style is presented with a brief definition, and previous research suggests acceptable levels of reliability, mean ICC(1, 30) = .86, for items contained in this questionnaire (Childs et al., 1999).

Table 2
Managerial Occupations and Sample Sizes

Title	N
Chief executives	108
General and operations managers	164
Advertising and promotions managers	141
Marketing managers	73
Sales managers	94
Public relations managers	97
Administrative services managers	115
Computer and information systems managers	113
Financial managers, treasurers and controllers	171
Financial managers, branch or department	66
Human resources managers	98
Compensation and benefits managers	109
Training and development managers	82
Industrial production managers	80
Purchasing managers	85
Transportation managers	92
Storage and distribution managers	89
Nursery and greenhouse managers	97
Crop and livestock managers	116
Aquacultural managers	128
Construction managers	84
Education administrators, preschool/child care	87
Education administrators, elementary/secondary	556
Education administrators, postsecondary	766
Engineering managers	80
Food service managers	237
Funeral directors	359
Gaming managers	128
Lodging managers	81
Medical and health services managers	59
Natural sciences managers	96
Postmasters and mail superintendents	96
Property, real estate, and community association managers	73
Social and community service managers	127
First-line supervisors, correctional officers	127
First-line supervisors, police and detectives	106
First-line supervisors, food preparation and serving workers	297
First-line supervisors, housekeeping and janitorial workers	116
First-line supervisors, landscaping, lawn service, and groundskeeping workers	152
First-line supervisors, personal service workers	97
First-line supervisors, retail sales workers	78
First-line supervisors, nonretail sales workers	113
First-line supervisors, office and administrative support workers	570
First-line supervisors, agricultural crop and horticultural workers	118
First-line supervisors, animal husbandry and animal care workers	104
First-line supervisors, logging workers	90
First-line supervisors, aquacultural workers	109
First-line supervisors, construction trades and extraction workers	165
First-line supervisors, mechanics, installers, and repairers	426
First-line supervisors, production and operating workers	769
First-line supervisors, helpers, laborers, and material movers	164
First-line supervisors, transportation and material-moving machine and vehicle operators	85

Dimensionality of Managerial Work Role Requirements

Because there has been no published exploration of the O*NET factor structure for managerial occupations, it was necessary to first derive generic requirements of managerial work roles for

purposes of data reduction and to promote parsimony. To accomplish these purposes, principal component analysis (PCA) with varimax (orthogonal) rotation was conducted for each work role requirement domain (responsibilities, knowledge, skills, and traits). We conducted parallel analysis (Horn, 1965) in conjunction with each PCA to facilitate decisions regarding the number of factors to retain. Parallel analysis has been shown to be one of the most accurate methods to help determine the number of factors to retain in exploratory factor analysis (Hayton, Allen, & Scarpello, 2004; Zwick & Velicer, 1986). Briefly, parallel analysis randomly generates and analyzes n data sets (100 in the current study) with equal dimensions to the actual data. Eigenvalues from the actual data are then compared to those from the randomly generated data sets, and factors from the real data with eigenvalues greater than the corresponding eigenvalue from the random data are retained (see Hayton et al., 2004, for more details).

The parallel analysis of responsibility data suggested a six-factor solution, because the actual eigenvalue for seven factors was less than both the average eigenvalue and the 95th percentile eigenvalue. The pattern of factor loadings suggested a similar solution; thus, we concluded that behavior-based managerial work role requirements were best represented by six factors. From inspection of the highest loading items on each factor, we named the responsibility factors as follows: Managing Human Capital, Managing Logistics and Technology, Managing Decision-Making Processes, Managing Administration and Control, Managing Strategy and Innovation, and Managing the Task Environment.

The parallel analysis of knowledge data suggested a five-factor solution. However, the pattern of factor loadings from the PCA suggested a four-factor solution because only two items (knowledge of biology and knowledge of food production) displayed loadings greater than .40 on the fifth factor. Considering these results, we concluded that the most interpretable solution posited four factors, and subsequently we dropped the two items loading on the fifth factor. From inspection of the highest loading items, we named the knowledge-based factors as follows: Knowledge of Technology, Design, and Production; Knowledge of Human Behavior and Society; Knowledge of General Business Functions; and Knowledge of Media Communications and Delivery.

The parallel analysis of skill data indicated that four factors should be retained. PCA results similarly suggested a four-factor solution. From inspection of the highest loading items, we named the skill-based factors as follows: Interpersonal Skills, Operations and Technical Skills, Strategic and Systems Skills, and Cognitive Skills. These categories are consistent with other recent factor analyses of O*NET skills (T. V. Mumford, Campion, & Morgeson, 2007).

The final parallel analysis and PCA were conducted on trait data. The parallel analysis indicated a three-factor solution. However, results from the PCA suggested that a four-factor solution may be more interpretable (i.e., simple structure); thus, we retained four factors. Reviewing the item loadings for these factors, we named the following trait-based managerial work role requirements: Learning, Motivation, and Leadership; Interpersonal Orientation; Conscientiousness; and Generative Thinking (e.g., creative thinking).

Overall, the results for the PCA and parallel analyses produced 18 broad work role requirements central to enacting managerial roles. For illustrative purposes, Table 3 shows the 18 managerial work role requirements in relation to the three general requirement categories delineated by prior research. Of importance, these 18 distinct work role requirements can be viewed as the broad requirements underlying the enactment of all managerial work roles.

Measures: Discrete Context Variables

The three discrete context dimensions outlined in Johns's (2006) framework were also operationalized with O*NET data. Substantial efforts, including an extensive synthesis of the extant literature and reliability and validity examinations, were undertaken in the development of O*NET work context measures (Strong et al., 1999). All variables used to measure discrete context were aggre-

Table 3

Managerial Work Role Requirements by General Category

Conceptual	Interpersonal	Technical/administrative
	Responsibilities	
Managing decision-making processes	Managing human capital	Managing administration and control
Managing strategy and innovation	Managing the task environment	Managing logistics and technology
	Knowledge	
Knowledge of media communications and delivery	Knowledge of human behavior and society	Knowledge of general business functions
		Knowledge of technology, design, and production
	Skills	
Strategic and systems skills	Interpersonal skills	Operations and technical skills
Cognitive skills		
	Traits	
Generative thinking	Learning, motivation, and leadership	Conscientiousness
	Interpersonal orientation	

gated to the occupation level. ICC(2) values for these variables ranged from .72 to .91 (M = .80). ICC(1) values for these variables ranged from .04 to .22 (M = .14). All ICC(1) and ICC(2) values were significant (p < .01).

Task context. This dimension of discrete context was assessed with measures of (a) autonomy, (b) accountability, and (c) routinization. These measures are congruent with central attributes of the task context outlined by Johns (2006) and others (e.g., Hattrup & Jackson, 1996).

Autonomy was operationalized with two items: "How much freedom do you have to determine tasks, priorities, or goals?" and "How much freedom do you have to make decisions without supervision?" These items reflect the essential aspects of autonomy, which are the freedom to determine work methods and to make decisions. Both items used a 5-point scale (1 = *no freedom*, 3 = *little freedom*, 5 = *a lot of freedom*). The correlation between these two items was .81 (p < .01). Accountability was operationalized with two items: "How responsible are you for work outcomes and results of other workers?" and "How responsible are you for the health and safety of other workers?" Both items used a 5-point scale (1 = *no responsibility* to 5 = *very high responsibility*) and reflect the degree to which managers are answerable for others' work. The correlation between these two items was .70 (p < .01). Finally, routinization was operationalized with three items. The first item was "How automated is your current job?" and used a 5-point scale (1 = *not at all automated*, 3 = *moderately automated*, 5 = *completely automated*). Other items were "How important are continuous, repetitious physical activities (like key entry) or mental activities (like checking entries in a ledger)?" and "How important is being very exact?" These items used a 5-point importance scale. These items capture the essence of routinization, which relates to regularity, consistency, and standardization of behavior. Coefficient alpha was .72.

Social context. This dimension of discrete context was assessed with measures of (a) interdependence and (b) interpersonal conflict. Both of these measures represent salient features of the social context described by Johns (2006) and others (e.g., Evans et al., 1994).

Interdependence was operationalized with three items: "How important are interactions that require you to work with or contribute to a work group or team?" "How important are interactions that require you to deal with external customers (as in retail sales) or the public in general (as in police work)?" "How important are interactions that require you to coordinate or lead others in accomplishing work activities (not as a supervisor or team leader)?" These items used a 5-point importance scale and reflect the basic connectedness of a work role. Coefficient alpha was .79. Interpersonal conflict was operationalized with three items: "How often are conflict situations a part of your current job?" "Is dealing with unpleasant, angry, or discourteous people a part of your current job?" "Is dealing with violent or physically aggressive people a part of your current job?" These items used a 5-point frequency scale (1 = *never,* 3 = *once a month but not every week,* 5 = *every day*) and represent the level of conflict present in the social environment. Coefficient alpha was .85.

Physical context. This dimension of discrete context was assessed with measures of (a) extreme environmental conditions and (b) hazardous exposure. These measures reflect significant aspects of the physical context as described by Johns (2006) and Pfeffer (1997).

Extreme environmental conditions were operationalized with five items, with responses on a 5-point frequency scale (1 = *never,* 3 = *once a month but not every week,* 5 = *every day*). Examples include the following: "How often are you exposed to sounds and noise levels that are distracting and uncomfortable?" "How often are you exposed to extremely bright or inadequate lighting conditions?" "How often are you exposed to cramped work space that requires getting into awkward positions?" Coefficient alpha was .92. Hazardous exposure was operationalized with seven items, with responses on the same 5-point frequency scale. Item examples include the following: "How often does your current job require that you be exposed to radiation?" "How often does your current job require that you be exposed to diseases or infection?" "How often does your current job require that you be exposed to high places?" "How often does your current job require that you be exposed to hazardous equipment?" Coefficient alpha was .84.

Analytic Strategy

Because work context was operationalized at the occupational level, we used hierarchical linear modeling (HLM) to examine the effects of context on managerial role requirements. HLM allows one to simultaneously model both within- and between-group variance (Raudenbush & Bryk, 2002). Thus, using HLM, we were able to partition variance in the importance of different managerial role requirements into within- and between-occupation components. HLM was conducted in two stages with HLM 6 software (Raudenbush, Bryk, Cheong, & Congdon, 2004). The first stage estimated a null model to partition total variance in managerial work role requirements into within-occupation and between-occupation components (Hofmann, 1997). Here, significant between-occupation variance components would indicate effects of omnibus (occupational) context, thus testing Hypothesis 1. Given significant between-occupation variance, the second stage introduced Level 2 predictors (discrete context variables) in intercepts-as-outcomes models. These models offer evidence of whether discrete context variables account for between-occupation variance in managerial work role requirements (tests of Hypotheses 2–4).

Results

Table 4 provides the means, standard deviations, and zero-order correlations among the 18 managerial work role requirements. Individual-level correlations are shown above the diagonal, and occupational-level correlations are shown below. As one would expect, the magnitude of correlations tended be larger within role requirement domains. For example, average correlations within role requirement domains for the individual-level data ranged from .35 (knowledge requirements) to .57 (trait requirements), whereas the average correlations between different domains ranged from .08 (activity and skill requirements) to .10 (knowledge requirements). A similar pattern was evident for the occupational-level data as average correlations within domains ranged from .33 (activity and skill requirements) to .58 (trait requirements). However, the average correlations between different domains for the occupational-level data were higher than those for individual-level

Table 4

Means, Standard Deviations, and Correlations for Managerial Work Role Requirements

Work role requirements	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Responsibilities
1. MHC	3.64	0.29	—	.21	.58	.55	.65	.55	−.03	.12	.05	.06	.11	−.01	.06	.04	.08	.07	.01
2. MLT	2.48	0.55	−.08	—	.32	.16	.19	.12	.29	−.13	−.15	−.21	−.16	.28	−.05	−.05	−.10	−.12	−.11
3. MDP	3.73	0.26	.44	.20	—	.58	.61	.40	.04	.06	.03	.01	.07	.02	.04	.07	.06	.03	.01
4. MAC	3.30	0.30	.38	.21	.59	—	.66	.47	−.13	.08	.06	.10	.08	−.11	.03	.07	.09	.06	.05
5. MSI	3.38	0.35	.40	−.10	.57	.41	—	.51	−.07	.09	.08	.10	.09	−.07	.08	.11	.09	.05	.02
6. MTE	3.37	0.45	.41	−.47	.16	.18	.17	—	−.16	.14	.13	.11	.13	−.13	.02	.09	.05	.08	.04
Knowledge
7. KTDP	3.83	0.28	−.20	.57	.07	−.11	−.11	−.50	—	.15	.17	.19	−.13	.34	.07	.09	.02	−.08	−.03
8. KHBS	2.43	0.49	.51	−.41	.36	.32	.39	.48	−.34	—	.46	.65	.21	−.06	.08	.12	.28	.31	.19
9. KGBF	3.16	0.36	.13	−.51	.11	.15	.32	.56	−.44	.34	—	.49	.10	−.12	.03	.11	.32	.28	.23
10. KMCD	3.42	0.29	.29	−.42	.34	.41	.56	.41	−.24	.63	.41	—	.14	−.11	.08	.12	.26	.21	.20
Skills
11. INS	2.05	0.62	.50	−.39	.23	.18	.39	.49	−.55	.67	.38	.44	—	.22	.61	.45	.10	.13	.06
12. OPS	2.19	0.44	−.06	.62	.11	−.10	−.25	−.31	.68	−.20	−.46	−.35	−.25	—	.53	.28	−.04	−.08	−.06
13. SSS	3.29	0.35	.18	.03	.38	.02	.46	.10	.16	.29	.18	.21	.36	.44	—	.42	.06	.02	.01
14. CGS	2.22	0.31	−.12	−.16	.27	.13	.40	.02	.26	.22	.04	.38	.18	.19	.45	—	.07	.04	.06
Traits
15. LML	4.16	0.25	.50	−.43	.25	.03	.19	.51	−.22	.62	.45	.43	.43	−.03	.41	.02	—	.66	.61
16. IPO	4.11	0.32	.35	−.43	.25	.19	.14	.56	−.53	.59	.59	.32	.54	−.34	.07	−.19	.62	—	.58
17. CON	4.48	0.21	.31	−.40	.33	.35	.25	.59	−.36	.54	.51	.46	.30	−.28	.21	−.02	.58	.68	—
18. GNT	3.93	0.29	.05	−.35	.37	.19	.51	.27	−.10	.43	.51	.50	.25	−.18	.43	.33	.49	.49	.60

Note. Correlations below the diagonal are at the occupation level ($N = 52$); those greater than .35 are significant at $p < .01$; those greater than .29 are significant at $p < .05$. Correlations above the diagonal are at the individual level; those greater than .07 are significant at $p < .01$; those greater than .04 are significant at $p < .05$; MHC = managing human capital; MLT = managing logistics and technology; MDP = managing decision-making processes; MAC = managing administration and control; MSI = managing strategy and innovation; MTE = managing the task environment; KTDP = knowledge of technology, design, and production; KHBS = knowledge of human behavior and society; KGBF = knowledge of general business functions; KMCD = knowledge of media communications and delivery; INS = interpersonal skills; OPS = operations and technical skills; SSS = strategic and systems skills; CGS = cognitive skills; LML = learning, motivation, and leadership; IPO = interpersonal orientation; CON = conscientiousness; GNT = generative thinking.

data, ranging from .27 (skill requirements) to .37 (knowledge requirements). Although these latter results could have been due to increased reliability because of aggregation, they provide preliminary evidence of the impact of occupation type on managerial role requirements. More important, these results indicate that using a method such as HLM to test our hypotheses is necessary, precisely because HLM is sensitive to the hierarchical structure of our data.

Hypothesis 1 predicted that omnibus occupational context would account for significant variance in managerial role requirements. The first HLM stage estimated 18 null models partitioning the total variance in each requirement into within-occupation and between-occupation components. The partitioned data were individual-level factor-based scores on each requirement (i.e., incumbent scores on each work role requirement). Table 5 shows the results of these null models. Findings indicate significant variance ($p < .01$) exists between occupations for all 18 managerial role requirements. Table 5 also provides ICC(1) estimates (Bartko, 1976), which represent the proportion of variance that resides between occupations. The ICC(1) values indicate that 4% to 39% of the variance in importance of different work role requirements is due simply to the omnibus context (i.e., managerial occupation) in which individuals work. These results provide strong support for Hypothesis 1.

Given evidence of significant between-occupation variance in the importance of managerial role requirements, we next introduced discrete context variables as Level 2 predictors to account

for this variance (Hypotheses 2–4). For each managerial role requirement, three sets of HLM models were constructed in which variables for a given discrete context dimension (e.g., social context) served as Level 2 predictors of between-occupation variance in the focal role requirement. For example, the first set of HLM models posited the Level 2 predictors of accountability, autonomy, and routinization. In this set, 18 HLM models were conducted to assess whether discrete task context accounted for significant between-occupation variance in each of the 18 managerial role requirements. A total of 54 intercepts-as-outcomes models were conducted across all three discrete context dimensions and all 18 requirements. Results of these models are shown in Table 6. Most pertinent to Hypotheses 2 through 4 are the variance explained estimates. These estimates are the proportions of between-occupation variance explained by the discrete context predictors and are calculated by comparing the variability in occupation means from the null models and the conditional models with context predictors. It is important to note that these estimates are not equivalent to traditional R^2 values in ordinary least squares regression, which represent the proportion of total variance accounted for by a set of predictors (Singer, 1998). Instead, these estimates are often called *pseudo R^2* because they indicate proportions of the *explainable variance* (i.e., criterion variance due to groups) accounted for by the predictors (Snjiders & Bosker, 1999). Level 2 predictors were not centered; thus, we also tested models

Table 5
Omnibus Context Effects on Managerial Work Role Requirements

Work role requirement	T	σ^2	ICC(1)
Responsibilities			
Managing human capital	.059	.571	.094
Managing logistics and technology	.378	.612	.382
Managing decision-making processes	.019	.470	.039
Managing administration and control	.056	.560	.091
Managing strategy and innovation	.045	.697	.061
Managing the task environment	.110	.601	.155
Knowledge			
Knowledge of technology, design, and production	.339	.535	.387
Knowledge of human behavior and society	.144	.480	.230
Knowledge of general business functions	.065	.497	.115
Knowledge of media communications and delivery	.062	.374	.141
Skills			
Interpersonal skills	.045	.307	.128
Operations and technical skills	.215	.660	.246
Strategic and systems skills	.060	.660	.083
Cognitive skills	.047	.377	.112
Traits			
Learning, motivation, and leadership	.019	.333	.053
Interpersonal orientation	.049	.386	.112
Conscientiousness	.017	.320	.051
Generative thinking	.030	.520	.054

Note. All null model variance components were significant ($p < .001$). ICC(1) = intraclass correlation (Bartko, 1976).

with grand-mean centering to ensure the stability of our results. Results from these models were identical.

We used two approaches to test discrete context hypotheses. First, we tested for mean differences between pseudo R^2 values across different discrete context dimensions (e.g., conceptual vs. interpersonal). Second, we tested for differences between the average ICC(1) estimates from the null models and the average ICC estimates from the conditional models (for details regarding ICC difference tests, see Alsawalmeh & Feldt, 1992, and Donner & Zou, 2002). Here, conditional ICC estimates represent the correlations between pairs of role requirement scores within the same occupation after removing the effects of discrete task context (Raudenbush & Bryk, 2002).

Hypotheses 2A and 2B pertained to the impact of discrete task context on managerial role requirements. From Table 6, the average percentage of between-occupation variance explained by discrete task context was .13 (range = .02–.22) for conceptual requirements and .33 for technical/administrative requirements (range = .22–.44), whereas for interpersonal requirements, the average was .09 (range = .00–.20). The average variance explained estimates for discrete task context across various technical/administrative requirements were significantly higher than those for interpersonal requirements ($p < .01$). However, the average variance explained estimates for various conceptual requirements were not significantly different from those for interpersonal requirements ($p > .05$). Results from the ICC difference tests were similar to the findings for differences among the variance explained estimates in that, on average, the conditional and null ICC

estimates were not significantly different for conceptual and interpersonal requirements ($p > .05$) but were different for technical/administrative requirements ($p < .05$). In summary, these results did not support Hypothesis 2A, which posited discrete context to account for more variance in conceptual role requirements than interpersonal requirements. However, Hypothesis 2B was fully supported in that discrete task context accounted for more variance technical/administrative requirements than interpersonal requirements.

Hypothesis 3 related to the influence of discrete social context on managerial role requirements. Results shown in Table 6 indicate that the average variance explained by the discrete social context was .28 (range = .15–.35) for interpersonal requirements, whereas the average variance explained was .09 (range = .00–.24) for conceptual requirements and .18 (range = .13–.27) for technical/administrative requirements. The variance explained estimates for discrete social context across various interpersonal requirements were significantly higher than for technical/administrative and conceptual requirements ($p < .05$). Additionally, differences between the average null model ICC(1) values and the average conditional ICC values were significant for interpersonal requirements ($p < .05$). Overall, these findings support Hypothesis 3 because discrete social context accounted for more variance in interpersonal role requirements than conceptual and technical/administrative requirements.

Hypothesis 4 concerned the effects of discrete physical context on managerial role requirements. The average variance explained in conceptual requirements by physical context was .11 (range = .00–.19) and .08 for (range = .00–.22) interpersonal requirements. The average variance explained by discrete physical context for technical/administrative requirements was .36 (range = .16–.56). The variance explained estimates for discrete physical context across technical/administrative requirements were significantly higher than for conceptual and interpersonal requirements ($p < .05$), and differences between the average null model ICC(1) values and the average conditional ICC values were significant for technical/administrative requirements ($p < .05$). These results provide evidence to support Hypothesis 4 because discrete physical context accounted for the most variance in technical/administrative role requirements.

As noted earlier, the three discrete context dimensions are not theoretically orthogonal but, rather, may simultaneously impinge on managerial role requirements. To display such collective effects, we conducted 18 intercepts-as-outcomes models in which all three discrete context dimensions were entered simultaneously. Results showed the average variance explained collectively in conceptual requirements was .19 (range = .05–.26), .34 (range = .23–.51) for interpersonal requirements, and .63 (range = .35–.86) for technical/administrative requirements.

Discussion

For decades, scholars have been actively engaged in research to describe the managerial role. Although it seems obvious that context matters to managerial work, theoretical efforts describing the relationships between context and managerial work have remained absent. Compounding this theoretical paucity is the fact that few empirical examinations have been undertaken. To begin addressing these needs, we sought to explicate and test connections

Table 6
Discrete Context Effects on Managerial Work Role Requirements

Predictor	Conceptual								Interpersonal					Technical/administrative				
	MDP	MSI	KMCD	SSS	CGS	GNT	MHC	MTE	INS	KHBS	LML	IPO	MAC	MLT	OPS	KTDP	KGBF	CON
Task context																		
Accountability	.003	−.006*	−.004	−.003	−.006**	−.004*	.004	−.007	−.001	.002	−.003	.000	−.005	.021**	.013**	.009	−.009**	−.005**
Autonomy	−.001	.018*	.011	.020**	.015**	.010	.008	.025*	.012*	.013	.010	.010	.006	−.031	−.014	−.008	.013	.009*
Routinization	−.001	.001	.004	−.006	−.004	.001	−.003	−.002	−.001	−.004	.003	.002	.011*	−.030**	−.022**	−.025**	.010**	.006**
Variance explained	.02	.17	.06	.13	.18	.22	.08	.09	.05	.00	.20	.09	.28	.44	.32	.22	.28	.42
Social context																		
Interdependence	−.006**	.004	.009**	−.001	.002	.004	.001	.014**	.006**	.007*	.004**	.008**	.006*	−.034**	−.021**	−.020**	.013**	.003
Interpersonal conflict	.006**	−.001	−.002	−.003	−.006*	−.002	.008**	−.003	.003*	.006	.001	.001	.002	.008	.001	−.006	−.006	.001
Variance explained	.24	.01	.21	.00	.09	.00	.25	.34	.34	.15	.25	.35	.19	.21	.17	.27	.13	.13
Physical context																		
Extreme environment	.007	.001	−.002	−.004	−.007	−.003	.005	−.016**	−.002	−.010	.001	−.006	.009	.008	.003	.012	−.008*	.005
Hazardous conditions	−.003	−.009	−.008	.003	.007	−.003	−.005	.009	−.002	.009	−.006	.001	.020**	.037**	.028**	.015	−.009	.001
Variance explained	.19	.16	.15	.00	.01	.15	.00	.14	.08	.00	.22	.03	.22	.56	.46	.23	.50	.16

Note. Cell entries are Level 2 coefficients ($\gamma_{01} \ldots \gamma_{0n}$) representing fixed effects of context variables; Variance explained = proportion of between-occupation variance explained by model predictors. MDP = managing decision-making processes; MSI = managing strategy and innovation; KMCD = knowledge of media communications and delivery; SSS = strategic and systems skills; CGS = cognitive skills; GNT = generative thinking; MHC = managing human capital; MTE = managing the task environment; INS = interpersonal skills; KHBS = knowledge of human behavior and society; LML = learning, motivation, and leadership; IPO = interpersonal orientation; MAC = managing administration and control; MLT = managing logistics and technology; OPS = operations and delivery; KTDP = knowledge of technology, design, and production; KGBF = knowledge of general business functions; CON = conscientiousness.
$^*p < .05.$ $^{**}p < .01.$

between features of work context and requirements of managerial roles. Toward this end, we developed an integrative framework best described as an intertaxonomic process theory (see Hattrup & Jackson, 1996) by utilizing two categorical theories as input for the framework and testing the interrelating mechanisms between these two taxonomies.

It is important to recognize that the level at which we orient our framework and ensuing hypothesis testing has several implications. For example, the framework is a meso-level framework with regard to level of specificity, as seen in the hypotheses proffered between taxonomic classes (i.e., between role requirement categories and dimensions of context). This approach allows for more generalizable conclusions about the manner with which work context shapes managerial work roles. A meso-level approach also ensures that descriptions of work role factors and work contextual factors occur in mutually comparative forms (Chatman, 1989). Finally, the framework is flexible because other more molecular operationalizations of the work context or the role requirement categories can be inclusively modeled. For instance, other discrete social context variables (e.g., density, social support) could be fit into our framework.

It is also noteworthy that although some existing research has begun to partially operationalize Johns's (2006) model of work context (e.g., Dierdorff & Morgeson, 2007), our study represents the first empirical examination to fully assess this framework. That we found significant effects for both omnibus context and the three forms of discrete context offers rather promising evidence toward the viability of this model. Further, our results show that differential effects across dimensions of discrete context are systematic and can be meaningfully predicted.

Overall, our results provide additional verifying evidence that the requirements of managerial roles can be parsimoniously described as conceptual, interpersonal, and technical/administrative in nature. The fact that these three categories, taken from historical research spanning more than 50 years, are again replicated in the contemporary data analyzed in this study is corroborating evidence. This by no means suggests that the importance or salience of requirements in these categories has remained unchanged over the past several decades. Indeed, today's managers are likely inundated with more complex and increased amounts of information than managers of previous decades, conditions which, for example, could amplify the importance of conceptual requirements. Similarly, the degree with which contemporary managers must engage in boundary-spanning activities could increase the importance of interpersonal requirements. Regardless of changes in the salience of specific requirements, the categories of requirements that underlie the enactment of managerial roles appear rather stable.

In exploring the impact of omnibus context, we found that occupation accounts for significant variance in managerial role requirements. These results indicate that particular requirements can be more (or less) important depending on the broad context in which role enactment occurs. Moreover, these differences exist even though all of the role requirements are indeed requisite for enacting managerial work. Findings further indicate that role requirements in the technical/administrative category vary the most linked to omnibus context, mean ICC(1) = .24, followed by the interpersonal category, mean ICC(1) = .13, and the conceptual category, mean ICC(1) = .08. Such differences in effects linked to

omnibus context suggest that managerial requirements that are technical/administrative are likely to be the most occupation specific, whereas interpersonal and conceptual requirements are more universally important.

With regard to discrete context, our findings show that elements of the task, social, and physical contexts have meaningful relationships with managerial role requirements. Generally consistent with our predictions, we find that task context and physical context account for more variance in the importance of technical/administrative requirements, whereas social context accounts for more variance in the importance of interpersonal requirements. In a broad sense, this evidence affirms the value of examining discrete context by demonstrating that different forms of discrete context simultaneously shape various types of role requirements, or what Lewin (1951) described as contexts creating *tension systems* that influence individual action.

Implications for Research

The current study has a number of implications for research. First, despite long-standing calls for more research, especially studies that incorporate a broader variety of managerial roles (e.g., Campbell et al., 1970), only two major studies examining managerial role requirements have been published over the past 20 years (e.g., Borman & Brush, 1993; Tett et al., 2000). With an empirical investigation of a nationally representative sample of over 8,600 incumbents from 52 different managerial occupations, our study addresses these needs in terms of timeliness, scope, and breadth of managerial work. We found that 18 distinct work role requirements broadly capture the activities, knowledge, skills, and traits required to perform managerial occupations today. Although previous literature has produced a multitude of requirements (see Table 1), most of these studies focused solely on the behavioral requirements of managerial work. Thus, the current results extend this literature in an important way by identifying not only behavioral requirements (i.e., activities), but also personal attributes required of managerial incumbents themselves (i.e., knowledge, skills, and traits).

Second, our findings demonstrate the value gained from specifying context within organizational research. Although intuitively compelling, many researchers have been slow to incorporate context within their research domains (Cappelli & Sherer, 1991; Johns, 2001). Some of the failure to consider context can be attributed to the difficulties surrounding exactly how to delineate the major elements that comprise context (Griffin et al., 2007; Hattrup & Jackson, 1996). Yet, the current study shows that even small steps toward specifying context can result in high utility. For instance, at the very least, most researchers routinely collect data that would allow for explicit examination of broader omnibus context effects, using elements such as industry, culture, and region (Johns, 2006).

Third, our results portray occupation as an important contextual factor in relation to the requirements of managerial roles. For example, demarcating managerial occupations illuminated systematic differences that would otherwise go largely unnoticed. In a general sense, such evidence regarding the influence of occupation supports the notion that even the most undifferentiated approach to defining context can produce meaningful insights. Considering the results of this study with other recent work (e.g., Dierdorff &

Ellington, 2008), there is mounting empirical evidence for the argument that occupation is indeed a useful variable for studying context in organizational research. Further, the general neglect of occupations in organizational research (Trice, 1993) makes specifying occupational effects theoretically novel and important.

Implications for Practice

Examining the connections between work context and managerial work holds implications for practice as well. Most important, the present results demonstrate that it is critical to explore context as part of a thorough work analysis. Although describing work context has long been recognized as one purpose of work analysis, efforts in practice have typically focused on work and worker-related activities and attributes (Morgeson & Dierdorff, in press). Our results suggest that work analysts must delve into aspects of work context to paint a more complete picture of the work role. Indeed, the results here clearly show that managerial role requirements, although similar in nature, vary greatly in importance with the context in which they are enacted. This finding has at least two ramifications. First, thorough work analyses give rise to increased clarity in work role responsibilities. Such clarity has been linked to increased individual-level motivation, satisfaction, and effectiveness (Abramis, 1994; Jackson & Schuler, 1985). Second, an incomplete consideration of context within a work analysis has significant downstream effects because work analysis is the fundamental foundation for effective human resource systems (Brannick, Levine, & Morgeson, 2007; Dierdorff & Wilson, 2003; Morgeson & Campion, 1997).

Our results may also highlight the importance of context for recruitment and selection efforts as they relate to maximizing fit. Person–environment (P-E) fit is generally defined as "the compatibility between an individual and a particular work environment that occurs when their characteristics are well matched" (Kristof-Brown, Zimmerman, & Johnson, 2005, p. 281). In recruiting managers, P-E fit can thus be enhanced by including descriptions of context as part of realistic job previews and job advertisements, allowing candidates to make better assessments of the match. P-E fit can also be described with a *demands–abilities approach* that involves comparisons between the demands of the environment and the capabilities of the person (Kristof, 1996). In this light, our findings explicate under what circumstances the compatibility between work and worker requirements is likely to be maximized. Here, selection systems are likely to improve overall fit when designed to test not only for managerial candidates' activity-related capabilities but for capabilities as they relate to contextual demands (e.g., role requirements within a physically demanding environment).

Performance management systems might benefit from the explication of context as well. Here, our results suggest that evaluations of managers' performance should entail a consideration of contextual effects that impact role enactment. Indeed, some research has shown that context can account for greater proportions of variance in performance ratings than actual performance differences (e.g., Dierdorff & Surface, 2007). Even the broad consideration of omnibus context could matter greatly in understanding managerial performance. As an example, omnibus contexts, such as sales territories, would be relevant for criteria used to evaluate sales managers. Similarly, discrete contexts hold obvious implications for the ubiquitous practice of using a standard performance appraisal form for all managers. For instance, consider the differences in interpersonal requirements due to variation in the social contexts in which a public relations manager compared to an accounting manager in the same organization would enact their roles.

Boundary Conditions

Our study has several limitations that warrant specific mention. The incumbent managers in the sample were from an existing database of work role requirement information. Thus, our results are contingent on the extent to which these data are of sufficient quality. We believe the data are indeed of high quality, because they are derived from the nationally representative O*NET database. The work role requirements collected for the O*NET database are chosen on the basis of expansive and thorough theoretical development and preliminary validation, and they are surveyed with standardized methodology that incorporates multiple stages of stratified random sampling.

Our examinations relied on a general model of 18 work role requirements, one that is applicable across all managerial occupations. Some have noted that a generalist model may have practical limitations (e.g., Tett et al., 2000). Although it is true that generality may obscure a depiction of work role complexity, our study utilized O*NET data, which are taxonomic and create a common language permitting cross-occupational comparisons. These data characteristics were essential to our meso-level study, which necessarily entailed an examination of common role requirements across potentially dissimilar work contexts.

Although we were able to operationalize all three dimensions of discrete context with multiple measures, it is important to note that the variables used for each dimension are by no means exhaustive. Certainly, there are other aspects of the task, social, and physical context that could alternatively represent these dimensions. For instance, Johns (2006) described resources as an important facet of task context and described density and influence as meaningful facets of social context. Indeed, even after accounting for significant portions of between-occupation variance with the chosen variables, substantial variance still remained to be explained. Perhaps other operationalizations of discrete context could begin to account for this remaining variance.

The specific focus of our research was on the way in which work context shapes the requirements of managerial role enactment. This focus is a vital issue in its own right, because the extent to which individuals view various activities and attributes as important to enacting their work roles is central to how they ultimately perform those roles (Dierdorff & Rubin, 2007). However, future research that explicitly measures and tests more distal outcomes, such as satisfaction, organizational citizenship behavior, or job performance, is clearly needed.

In addition to being performed in different contexts, managerial roles also exist at different hierarchical levels within an organization. Unfortunately, we could not explore the potential effects of hierarchical level because such data are not included in the O*NET database. Some evidence suggests that managerial level could shape some managerial role requirements, such as leadership skills (T. V. Mumford et al., 2007). Thus, this remains an area in need of additional empirical treatment.

Temporal influences or dynamism of role requirements and work context could not be directly assessed in the current study because of the nature of the archival data. Nonetheless, the stability seen in three categories of managerial role requirements suggests that such changes would most likely impact the importance of various role requirements rather than the types of requirements themselves. Further, broader changes in the world of work (e.g., increased complexity) are likely to amplify the work context effects found in this study. Such likelihoods have very real implications for the way future research on managerial work is conducted. For instance, organizational researchers may need to more continually examine how requirements and work contexts are becoming more or less salient to enacting managerial roles over time.

Finally, both our theory and our empirical tests focused exclusively on elements of the occupational context. As such, we did not explore other potentially important contextual aspects that might shape managerial roles. For example, past research has shown that factors such as national culture may influence the role requirements of managerial work (Shin, Morgeson, & Campion, 2007). In addition, the specific industry within which one works has also been shown to impact the amount of discretion in managerial roles (Hambrick & Abrahamson, 1995). Such contextual effects could be examined in future research to extend the understanding of managerial role enactment. Researchers would be well advised to use methods that account for the multilevel nature of these contextual factors, as was done in this study.

Future Research

Given our findings detailing differences in the importance of managerial role requirements because of work context, future research could examine precisely how context impacts various predictors of managerial success. Interactional psychology researchers have long argued the joint influences of person and context on work behavior (Block & Block, 1981; Pervin, 1989; Terborg, 1981), with some suggesting that a better understanding of work context can lead to increased precision in predicting job effectiveness (Murphy & Cleveland, 1995). As Hattrup and Jackson (1996) concluded, incorporating both person and contextual features can result in "higher predictive validities between person and/or situation causes and criterion responses" (p. 521). Our framework and results can help point to potential areas to begin this research, as well as to theoretically classify demonstrated effects. For example, from a general perspective, researchers interested in predicting interpersonal effectiveness across managers could include traditional person-centric variables (e.g., extraversion) and could emphasize elements of the social context found to shape such interpersonal role requirements (e.g., interdependence). In this sense, our framework and results could aid the identification of relevant predictors (Tett & Burnett, 2003) through a combined consideration of role requirements and work context.

Our framework holds implications for examining issues of P-E fit in relation to managerial roles. Such an approach certainly encompasses both work role requirements and work context features, especially when P-E fit is conceptualized from a *molar P-E perspective* (see Edwards, Cable, Williamson, Lambert, & Shipp, 2006). With respect to managerial roles, our framework provides future researchers with a parsimonious model organizing both individual characteristics and work environment characteristics. Moreover, results from this study depict the processes by which these characteristics are connected by demonstrating that particular forms of work contexts (e.g., social contexts) place significantly more press on certain types of managerial role requirements (e.g., interpersonal requirements). Such findings should assist future researchers wanting to explore finer grained analyses of specific forms of context.

Finally, the convergence of our study's findings with those from historical research quite clearly indicates that a comprehensive understanding of the requirements of managerial work has been reached. Even with the introduction of more expansive requirements, such as knowledge, skills and traits, the activities and attributes necessary for enacting managerial roles can be succinctly summarized as conceptual, interpersonal, and technical/administrative in nature. Our conclusion is that the next chapter of research examining managerial roles must now turn its attention to contextual influences. Of interest, this is not the first call for incorporating context into research on managerial work (see Osborn & Hunt, 1975). Nonetheless, such focus is critical for deepening the understanding of managerial work, as well as for building more effective systems to select, develop, and educate individuals for these vital organizational roles. Our hope is that our framework linking common dimensions of discrete context to categories of managerial role requirements, and the associated empirical support from our investigations, will be a catalyst for such an endeavor. In this sense, we hope research continues to further examine the vast milieu in which contemporary managerial work occurs.

References

Abbott, A. (1988). *The system of professions: An essay on the division of expert labor.* Chicago: University of Chicago Press.

Abbott, A. (1989). The new occupational structure: What are the questions? *Work and Occupations, 16,* 273–291.

Abramis, D. J. (1994). Work role ambiguity, job satisfaction, and job performance: Meta-analyses and review. *Psychological Reports, 75,* 1411–1433.

Alsawalmeh, Y. M., & Feldt, L. S. (1992). Test of the hypothesis that the intraclass reliability coefficient is the same for two measurement procedures. *Applied Psychological Measurement, 16,* 195–205.

Barley, S. R., & Tolbert, P. S. (1991). Introduction: At the intersection of organizations and occupations. In P. Tolbert & S. R. Barley (Eds.), *Research in the sociology of organizations* (Vol. 8, pp. 1–13). New York: JAI Press.

Baron, R. A. (1993). Affect and organizational behavior: When and why feeling good (or bad) matters. In J. K. Murnighan (Ed.), *Social psychology in organizations: Advances in theory and research* (pp. 63–88). Englewood Cliffs, NJ: Prentice Hall.

Bartko, J. J. (1976). On various intraclass correlation reliability coefficients. *Psychological Bulletin, 83,* 762–765.

Bass, B. M. (1990). *Bass & Stogdill's handbook of leadership: Theory, research, and managerial applications.* New York: Free Press.

Biddle, B. J. (1986). Recent developments in role theory. *Annual Review of Sociology, 12,* 67–92.

Biddle, B. J., & Thomas, E. J. (1966). *Role theory: Concepts and research.* New York: Wiley.

Bitner, M. J. (1990). Evaluating service encounters: The effects of physical surroundings and employee responses. *Journal of Marketing, 54,* 69–82.

Block, J., & Block, J. H. (1981). Studying situational dimensions: A grand perspective and some limited empiricism. In D. Magnusson (Ed.),

Toward a psychology of situations: An interactional perspective (pp. 85–103). Hillsdale, NJ: Erlbaum.

Borman, W. C., & Brush, D. H. (1993). More progress toward a taxonomy of managerial performance requirements. *Human Performance, 6,* 1–21.

Borman, W. C., Kubisiak, U. C., & Schneider, R. J. (1999). Work styles. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 213–226). Washington, DC: American Psychological Association.

Brannick, M. T., Levine, E. L., & Morgeson, F. P. (2007). *Job analysis: Methods, research, and applications for human resource management* (2nd ed.). Thousand Oaks, CA: Sage.

Butler, M. C., & Jones, A. P. (1979). Perceived leader behavior, individual characteristics, and injury occurrence in hazardous work environments. *Journal of Applied Psychology, 64,* 299–304.

Campbell, J. P., Dunnette, M. D., Lawler, E. E., & Weick, K. E. (1970). *Managerial behavior, performance, and effectiveness.* New York: McGraw-Hill.

Cappelli, P., & Sherer, P. D. (1991). The missing role of context in OB: The need for a meso-level approach. *Research in organizational behavior, 13,* 55–110.

Chatman, J. A. (1989). Improving interactional organizational research: A model of person–organization fit. *Academy of Management Review, 14,* 333–349.

Childs, R. A., Peterson, N. G., & Mumford, M. D. (1999). Occupational descriptor covariates: Potential sources of variance in O*NET ratings. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 237–246). Washington, DC: American Psychological Association.

Costanza, D. P., Fleishman, E. A., & Marshall-Mies, J. C. (1999). Knowledges. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 71–90). Washington, DC: American Psychological Association.

De Dreu, C. K. W., & Beersma, B. (2005). Conflict in organizations: Beyond effectiveness and performance. *European Journal of Work and Organizational Psychology, 14,* 105–117.

De Dreu, C. K. W., & Weingart, L. R. (2003). Task versus relationship conflict and team effectiveness: A meta-analysis. *Journal of Applied Psychology, 88,* 741–749.

Dierdorff, E. C., & Ellington, J. K. (2008). It's the nature of work: Examining behavior-based sources of work–family conflict across occupations. *Journal of Applied Psychology, 93,* 883–892.

Dierdorff, E. C., & Morgeson, F. P. (2007). Consensus in work role requirements: The influence of discrete occupational context on role expectations. *Journal of Applied Psychology, 92,* 1228–1241.

Dierdorff, E. C., & Rubin, R. S. (2007). Carelessness and discriminability of work role requirement judgments: Influences of role ambiguity and cognitive complexity. *Personnel Psychology, 60,* 597–625.

Dierdorff, E. C., & Surface, E. A. (2007). Placing peer ratings in context: Systematic influences beyond ratee performance. *Personnel Psychology, 60,* 93–126.

Dierdorff, E. C., & Wilson, M. A. (2003). A meta-analysis of job analysis reliability. *Journal of Applied Psychology, 88,* 635–646.

Donner, A., & Zou, G. (2002). Testing the equality of dependent intraclass correlation coefficients. *Journal of the Royal Statistical Society: Series D (The Statistician), 51,* 367–379.

Dowell, B. E., & Wexley, K. N. (1978). Development of a work behavior taxonomy for first-line supervisors. *Journal of Applied Psychology, 63,* 563–572.

Durkheim, E. (1964). *The division of labor in society.* New York: Free Press.

Dye, D., & Silver, M. (1999). The origins of O*NET. In N. G. Peterson,

M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 9–19). Washington, DC: American Psychological Association.

Edwards, J. R., Cable, D. M., Williamson, I. O., Lambert, L. S., & Shipp, A. J. (2006). The phenomenology of fit: Linking the person and environment to the subjective experience of person–environment fit. *Journal of Applied Psychology, 91,* 802–827.

Ellsberg, D. (1961). Risk, ambiguity, and the savage axioms. *Quarterly Journal of Economics, 75,* 643–669.

Elsbach, K. D., & Pratt, M. G. (2008). The physical environment in organizations. In J. P. Walsh & A. P. Brief (Eds.), *The Academy of Management annals* (Vol. 1, pp. 181–224). New York: Erlbaum.

Evans, G. W., Johansson, G., & Carrere, S. (1994). Psychological factors and the physical environment: Inter-relations in the workplace. In C. N. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 9, pp. 1–29). Chichester, England: Wiley.

Fayol, H. (1916). *Administration industrielle et generale* [Industrial and general administration]. Paris: Dunod.

Flanagan, J. C. (1951). Defining the requirements of the executive's job. *Personnel Psychology, 28,* 28–35.

Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin, 51,* 327–349.

Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal, 50,* 327–347.

Gross, N., Mason, W. S., & McEachern, A. W. (1958). *Explorations in role analysis: Studies of the school superintendency role.* New York: Wiley.

Hambrick, D. C., & Abrahamson, E. (1995). Assessing managerial discretion across industries: A multimethod approach. *Academy of Management Journal, 38,* 1427–1441.

Hammer, T. H., & Turk, J. M. (1987). Organizational determinants of leader behavior and authority. *Journal of Applied Psychology, 72,* 674–682.

Hanson, M. A., Borman, W. C., Kubisiak, U. C., & Sager, C. E. (1999). Cross-domain analysis results. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 247–258). Washington, DC: American Psychological Association.

Harvey, R. J. (1991). Job analysis. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., pp. 71–164). Palo Alto, CA: Consulting Psychologists Press.

Hatch, M. J. (1987). Physical barriers, task characteristics, and interaction activity in research and development firms. *Administrative Science Quarterly, 32,* 387–399.

Hattrup, K., & Jackson, S. E. (1996). Learning about individual differences by taking situations seriously. In K. R. Murphy (Ed.), *Individual differences and behavior in organizations* (pp. 507–547). San Francisco: Jossey-Bass.

Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods, 7,* 191–205.

Hemphill, J. K. (1959). Job descriptions for executives. *Harvard Business Review, 37,* 55–67.

Hemphill, J. K. (1960). *Dimensions of executive positions.* Columbus: Ohio State University, Bureau of Business Research.

Hofmann, D. A. (1997). An overview of the logic and rationale of hierarchical linear models. *Journal of Management, 23,* 723–744.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 32,* 179–185.

House, R., Rousseau, D. M., & Thomas-Hunt, M. (1995). The meso paradigm: A framework for the integration of micro and macro organizational behavior. In B. M. Staw & L. L. Cummings (Eds.), *Research in*

organizational behavior (Vol. 17, pp. 71–114). Greenwich, CT: JAI Press.

Hunt, J. G. (1991). *Leadership: A new synthesis.* New York: Sage.

Ilgen, D. R., & Hollenbeck, J. R. (1991). The structure of work: Job design and roles. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 165–207). Palo Alto, CA: Consulting Psychologists Press.

Jackson, S. E., & Schuler, R. S. (1985). A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behavior and Human Decision Processes, 36,* 16–78.

Jeanneret, P. R., Borman, W. C., Kubisiak, U. C., & Hanson, M. A. (1999). Generalized work activities. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 105–125). Washington, DC: American Psychological Association.

Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly, 40,* 256–282.

Jehn, K. A. (1997). A qualitative analysis of conflict types and dimensions in organizational groups. *Administrative Science Quarterly, 42,* 530–557.

Johns, G. (1991). Substantative and methodological constraints on behavior and attitudes in organizational research. *Organizational Behavior and Human Decision Processes, 49,* 80–104.

Johns, G. (2001). In praise of context. *Journal of Organizational Behavior, 22,* 31–42.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review, 31,* 386–408.

Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D., & Rosenthal, R. A. (1964). *Organizational stress: Studies in role conflict and ambiguity.* New York: Wiley.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (2nd ed.). New York: Wiley.

Katz, R. L. (1970). *Cases and concepts in corporate policy.* Englewood Cliffs, NJ: Prentice Hall.

Katz, R. L. (1974). Skills of an effective administrator. *Harvard Business Review, 52,* 90–102.

Katzell, R. A., Barrett, R. S., Vann, D. H., & Hogan, J. M. (1968). Organizational correlates of executive roles. *Journal of Applied Psychology, 52,* 22–28.

Katz-Navon, T. Y., & Erez, M. S. (2005). When collective- and self-efficacy affect team performance: The role of task interdependence. *Small Group Research, 36,* 437–465.

Kelly, H. H., Holmes, J. G., Kerr, N. L., Reis, H. T., Rusbelt, C. E., & Van Lange, P. A. M. (2003). *An atlas of interpersonal situations.* Cambridge, England: Cambridge University Press.

Kiggundu, M. N. (1981). Task interdependence and the theory of job design. *Academy of Management Review, 6,* 499–508.

Kotter, J. (1982). What effective general managers really do. *Harvard Business Review, 60,* 157–169.

Kozlowski, S. W. J., Gully, S. M., Nason, E. R., & Smith, E. M. (1999). Developing adaptive teams: A theory of compilation and performance across levels and time. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development* (pp. 240–292). San Francisco: Jossey-Bass.

Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In S. W. J. Kozlowski & K. J. Klein (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3–90). San Francisco: Jossey-Bass.

Kristof, A. L. (1996). Person–organization fit: An integrative review of its conceptualization, measurement, and implications. *Personnel Psychology, 49,* 1–49.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005).

Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology, 58,* 281–342.

Lau, A. W., & Pavett, C. M. (1980). The nature of managerial work: A comparison of public- and private-sector managers. *Group & Organization Studies, 5,* 453–466.

Lewin, K. (1951). *Field theory in social science: Selected theoretical papers.* (D. Cartwright, Ed.). New York: Harper & Row.

Luthans, F., & Lockwood, D. L. (1984). Toward an observation system for measuring leader behavior in natural settings. In J. D. Hunt, D. Hosking, C. Schreishiem, & R. Stewart (Eds.), *Leaders and managers: International perspectives on managerial behavior and leadership* (pp. 117–141). New York: Pergamon.

Maguire, W. J. (1983). A contextual theory of knowledge: Its implications for innovation and reform in psychological research. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 16, pp. 1–47). New York: Academic Press.

Mahoney, T. A. (1961). *Building the executive team.* Englewood Cliffs, NJ: Prentice Hall.

Mintzberg, H. (1973). *The nature of managerial work.* New York: Harper & Row.

Mischel, W. (1977). The interaction of person and situation. In D. Magnusson & N. Endler (Eds.), *Personality at the crossroads: Current issues in interactional psychology* (pp. 333–352). Hillsdale, NJ: Erlbaum.

Morgeson, F. P., & Campion, M. A. (1997). Social and cognitive sources of potential inaccuracy in job analysis. *Journal of Applied Psychology, 82,* 627–655.

Morgeson, F. P., Delaney-Klinger, K. D., & Hemingway, M. A. (2005). The importance of job autonomy, cognitive ability, and job-related skill for predicting role breadth and job performance. *Journal of Applied Psychology, 90,* 399–406.

Morgeson, F. P., & Dierdorff, E. C. (in press). Job and work analysis: From technique to theory. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology.* Washington, DC: American Psychological Association.

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology, 91,* 1321–1339.

Morse, J. J., & Wagner, F. R. (1978). Measuring the process of managerial effectiveness. *Academy of Management Journal, 21,* 23–35.

Mowday, R. T., & Sutton, R. I. (1993). Organizational behavior: Linking individuals and groups to organizational contexts. *Annual Review of Psychology, 44,* 195–229.

Mumford, M. D., & Peterson, N. G. (1999). The O*NET content model: Structural considerations in designing jobs. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 21–30). Washington, DC: American Psychological Association.

Mumford, M. D., Peterson, N. G., & Childs, R. A. (1999). Basic and cross-functional skills. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 49–69). Washington, DC: American Psychological Association.

Mumford, T. V., Campion, M. A., & Morgeson, F. P. (2007). The leadership skills strataplex: Leadership skill requirements across organizational levels. *Leadership Quarterly, 18,* 154–166.

Murphy, K. R., & Cleveland, J. N. (1995). *Performance appraisal: An organizational perspective.* Boston: Allyn & Bacon.

Murray, H. (1938). *Explorations in personality.* New York: Oxford University Press.

Oldham, G. R., & Rotchford, N. L. (1983). Relationships between office

characteristics and employee reactions: A study of the physical environment. *Administrative Science Quarterly, 28,* 542–556.

Osborn, R. N., & Hunt, J. G. (1975). An adaptive–reactive theory of leadership: The role of macro variables in leadership research. In J. G. Hunt & L. L. Larson (Eds.), *Leadership frontiers* (pp. 27–44). Kent, OH: Kent State University Press.

Pavett, C. M., & Lau, A. W. (1983). Managerial work: The influence of hierarchical level and functional specialty. *Academy of Management Journal, 26,* 170–178.

Pentland, B. T., & Rueter, H. H. (1994). Organizational routines as grammars of action. *Administrative Science Quarterly, 39,* 484–510.

Pervin, L. A. (1989). Persons, situations, interactions: The history of a controversy and discussion of theoretical models. *Academy of Management Review, 14,* 350–360.

Pfeffer, J. (1997). *New directions for organization theory: Problems and prospects.* New York: Oxford University Press.

Prien, E. P. (1963). Development of a supervisor description questionnaire. *Journal of Applied Psychology, 47,* 10–14.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Newbury Park, CA: Sage.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. (2004). *HLM 6: Hierarchical linear and nonlinear modeling.* Lincolnwood, IL: Scientific Software International.

Roethlisberger, F. J., & Dickson, W. J. (1939). *Management and the worker.* Cambridge, MA: Harvard University Press.

Ross, L., & Nisbett, R. E. (1991). *The person and the situation: Perspectives of social psychology.* New York: McGraw Hill.

Rousseau, D. M., & Fried, Y. (2001). Location, location, location: Contextualizing organizational research. *Journal of Organizational Behavior, 22,* 1–13.

Sayles, L. (1964). *Managerial behavior: Administration in complex organizations.* New York: McGraw-Hill.

Schneider, B. (1983). Interactional psychology and organizational behavior. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 5, pp. 1–31). Greenwich, CT: JAI Press.

Shetty, Y. K. (1982). Management's role in declining productivity. *California Management Review, 25,* 33–47.

Shin, S. J., Morgeson, F. P., & Campion, M. A. (2007). What you do depends on where you are: Understanding how domestic and expatriate work requirements depend upon the cultural context. *Journal of International Business Studies, 38,* 64–83.

Singer, J. D. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics, 23,* 323–355.

Snjiders, T., & Bosker, R. (1999). *Multilevel analysis.* London: Sage.

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal, 38,* 1442–1465.

Springer, T. J. (1992). Does ergonomics make good business sense? *Facilities Design and Management, 11,* 46–49.

Stewart, R. (1982). A model for understanding managerial jobs and behavior. *Academy of Management Review, 7,* 7–13.

Stogdill, R. M., Wherry, R. J., & Jaynes, W. E. (1953). *A factorial study of navy officer performance.* Columbus: Ohio State University.

Stone, E. F., & Gueutal, H. G. (1985). An empirical derivation of the dimensions along which characteristics of jobs are perceived. *Academy of Management Journal, 28,* 376–396.

Strong, M. H., Jeanneret, P. R., McPhail, S. M., Blakey, B. R., & D'Egidio, E. L. (1999). Work context: Taxonomy and measurement of the work environment. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O*NET* (pp. 127–146). Washington, DC: American Psychological Association.

Sundstrom, E. D., & Sundstrom, M. G. (1986). *Work places: The psychology of the physical environment in offices and factories.* New York. Cambridge University Press.

Terborg, J. R. (1981). Interactional psychology and research on human behavior in organizations. *Academy of Management Review, 6,* 569–576.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology, 88,* 500–517.

Tett, R. P., Guterman, H. A., Bleier, A., & Murphy, P. J. (2000). Development and content validation of a "hyperdimensional" taxonomy of managerial competence. *Human Performance, 13,* 205–251.

Thornton, G. C., III, & Byham, W. C. (1982). *Assessment centers and managerial performance.* New York: Academic Press.

Thornton, R., & Nardi, R. M. (1975). The dynamics of role acquisition. *American Journal of Sociology, 80,* 870–885.

Tornow, W. W., & Pinto, P. R. (1976). The development of a managerial job taxonomy: A system for describing, classifying, and evaluating executive positions. *Journal of Applied Psychology, 61,* 410–418.

Trice, H. M. (1993). *Occupational subcultures in the workplace.* Ithaca, NY: ILR Press.

Tubre, T. C., & Collins, J. M. (2000). Jackson and Schuler (1985) revisited: A meta-analysis of the relationships between role ambiguity, role conflict, and job performance. *Journal of Management, 26,* 155–169.

U.S. Department of Labor. (1991). *Revised handbook for analyzing jobs.* Washington, DC: U.S. Government Printing Office.

Wall, T. D., Jackson, P. R., & Mullarkey, S. (1995). Further evidence on some new measures of job control, cognitive demand, and production responsibility. *Journal of Organizational Behavior, 16,* 431–455.

Wofford, J. C. (1970). Factor analysis of managerial behavior variables. *Journal of Applied Psychology, 54,* 169–173.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review, 26,* 179–201.

Yukl, G. A. (1987, August). *A new taxonomy for integrating diverse perspectives on managerial behavior.* Paper presented at the annual meeting of the American Psychological Association, New York.

Yukl, G. A. (1989). Managerial leadership: A review of theory and research. *Journal of Management, 15,* 251–289.

Zwick, W. R., & Velicer, W. F. (1986). Factors influencing five rules for determining the number of components to retain. *Psychological Bulletin, 99,* 432–442.