CHAPTER 13

WORK MATTERS: JOB DESIGN IN CLASSIC AND CONTEMPORARY PERSPECTIVES

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"We are nothing more than glorified clerks." The bank tellers at a multibillion dollar corporation in the Southwest United States were dissatisfied with their jobs. They described their tasks as boring, and felt micromanaged by supervisors when making minor decisions (Griffin, 1991). In an effort to improve the situation, managers decided to intervene by redesigning the bank tellers' jobs. To reduce boredom, managers added new tasks to the jobs, providing tellers with greater variety and opportunities to use a broader range of skills. Along with their original tasks of cashing checks and accepting deposits and loan payments, tellers were now trained to handle commercial and travelers' checks and post transactions in an online computer terminal. To reduce micromanagement, managers provided tellers with more autonomy. Managers also delegated decision-making responsibilities: Instead of requiring tellers to obtain supervisors' signatures to credit deposits and approve withdrawals over \$100, they gave tellers the authority to post checks immediately and approve their own withdrawals when the customer's account had sufficient funds. Managers also provided feedback on transactions and errors, giving tellers increased ability to monitor their own work processes. Finally, managers modified transaction receipts to include the name and contact information for the teller who handled the transaction. This allowed customers to contact tellers directly to ask questions or report errors, enabling tellers to take responsibility for their own customers.

These efforts to redesign and enrich the tellers' jobs produced lasting effects on their attitudes and behaviors (Griffin, 1991). Six months later, the tellers were more satisfied with their jobs and more committed to the company, whereas tellers at a comparison bank whose jobs were not enriched achieved no increases in satisfaction or commitment. The effects on performance were more remarkable. Griffin asked supervisors to evaluate tellers' performance in terms of both quality and quantity. After a period of adaptation, tellers whose jobs were enriched were rated by supervisors as displaying significantly better performance, with the effects lasting at least 4 years. This study demonstrated that enriching jobs to provide variety, feedback, and autonomy can improve attitudes and performance. (See Vol. 3, chap. 3, this handbook.)

"This may not be a great place to study motivation, well, because there isn't any. Then again, we could use some help." The managers of a call center in the Midwest United States were facing annual staff turnover exceeding 400%: Over the course of each 3-month cycle, the entire staff quit. The hiring and training costs resulted in performance challenges: The call center employed fundraisers to solicit alumni donations to a large public university, and the total funds raised were falling below expectations. A team of organizational psychologists entered the call center hoping to use principles of job redesign to increase caller motivation and performance (Grant, Campbell, Chen, Cottone, Lapedis, & Lee, 2007). Their initial

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diagnosis was that the callers might benefit from a job enrichment process similar to what the bank tellers encountered. Noticing that the callers were required to make repetitive calls using standardized scripts, the researchers proposed to redesign callers' jobs to provide greater variety. With a forlorn grin, the manager replied, "Variety is not an option. This job only involves one task: calling as many alumni as possible to convince them to give their hard-earned money to their alma mater."

The researchers returned to the drawing board and continued interviewing, surveying, and observing the callers. They soon discovered that callers reported being in the dark about how the alumni donations were used. The majority of the funds raised were funneled directly into scholarships for students to attend the university. The researchers proposed to enrich the callers' jobs by placing them in contact with scholarship recipients who had benefited from the funds raised, which was expected to increase task significance by providing a vivid illustration of the impact of callers' jobs on others (Grant, 2007). The researchers recruited scholarship recipients to help the callers understand how their efforts made a difference in scholarship students' lives. The researchers then designed a series of field experiments and quasiexperiments in which they connected the callers to scholarship recipients through face-to-face meetings or written letters. They measured the callers' weekly persistence (calls made and minutes on the phone) and performance (pledges obtained and donation money raised) before and after the interventions. In the first experiment, the researchers were surprised to discover that a full month after the interventions, callers who had contact with scholarship recipients had increased dramatically in their persistence and performance. Relative to baseline levels prior to the intervention, the average caller was spending more than twice as many minutes on the phone-and raising more than twice as much money-per week (Grant et al., 2007). Subsequent experiments replicated these effects with different samples of callers, different scholarship recipients, different measures of persistence and performance, and both managersupervised and researcher-supervised interventions (Grant, 2008a). In one version of the intervention,

hearing a story from one scholarship recipient led to fivefold increases in the amount of donation money that callers raised per week (Grant, 2008b). Similar effects emerged with newcomers to the job: When callers were connected to their impact on scholarship recipients during training, they secured nearly twice as many pledges as a control group in their very first week on the job (Grant, 2008a). Across all of these experiments, callers in pure control and alternative treatment groups did not change significantly on any of the performance measures. These findings highlight the motivating power of enriching jobs to connect employees to the people who benefit from their work.

JOB DESIGN

Researchers originally defined job design as the set of opportunities and constraints structured into assigned tasks and responsibilities that affect how an employee accomplishes and experiences work (Hackman & Oldham, 1980). Today, job design is defined more broadly as encapsulating the processes and outcomes of how work is structured, organized, experienced, and enacted (Morgeson & Humphrey, 2008; Parker & Wall, 1998). (See also Vol. 2, chap. 1, this handbook.) This broader definition opens the door to include dynamic, emergent roles and changes in work from project to project, as opposed to merely emphasizing static job descriptions composed of fixed tasks assigned from above (llgen & Hollenbeck, 1991; Parker, Wall, & Cordery, 2001; Wrzesniewski & Dutton, 2001). We will return to these definitional issues throughout the chapter.

Job design has played a central role in the history of research in applied psychology and organizational behavior, and it continues to be a key topic for several reasons. First, in past and recent decades, job design has been one of only a handful of organizational theories rated as simultaneously high in validity, importance, and usefulness (Miner, 1984, 2003). As illustrated by our opening stories, job design theory and research has enabled applied psychologists, organizational scholars, and practitioners to describe, diagnose, and resolve important practical problems in organizations. Second, because it is a fundamental component of the execution and experience of work, job design is as old as work itself. Job design exerts a foundational influence on the actions and experiences of employees in every type of work, occupation, and organization.

Third, job design is an actionable feature of organizational contexts. Managers typically have more influence and control over job design than they do over culture, structure, relationships, technology, and people themselves (Hackman & Oldham, 1980). As such, most managers are responsible for making decisions about how to design jobs for employees (Mintzberg, 1973). Job design therefore commands what some have described as an organization's most valuable and scarce resource: the time and attention of managers (Dutton & Ashford, 1993). Depending on how managers make decisions about job design, it can be a liability or a potential source of competitive advantage for organizations (Pfeffer, 1994). Unfortunately, however, many managers often use simplified work as the default approach to designing jobs (Campion & Stevens, 1991).

Fourth, job design is receiving a resurgence of attention as dramatic changes in domestic and international landscapes of work have created new types of jobs, particularly in service and knowledge/creative sectors (Elsbach & Hargadon, 2006; Grant & Parker, 2009; Parker et al., 2001; Rousseau & Fried, 2001). These changes have spawned rapid increases in autonomy, professionalization, and service customization, providing employees with growing amounts of latitude and discretion to alter their own job designs. As organizations flatten, employees have opportunities to craft their jobs (Wrzesniewski & Dutton, 2001), expand their roles (Parker, Wall, & Jackson, 1997), revise their tasks (Staw & Boettger, 1990), and negotiate new roles and idiosyncratic deals (Ilgen & Hollenbeck, 1991; Rousseau, Ho, & Greenberg, 2006). Moreover, technological advances have increasingly made information available that is conducive to autonomy and empowerment (Sinha & Van de Ven, 2005). Integrating these final two points suggests that job design is especially important in theory and practice because-unlike more intractable factors such as culture and structureboth managers and employees have the opportunity to change job designs on a regular basis.

WHERE HAVE WE BEEN? A SELECTIVE HISTORY OF JOB DESIGN RESEARCH FROM PAST TO PRESENT

Having highlighted the importance of job design in scholarship and practice, we now provide a selective overview of the major theoretical perspectives and empirical findings in the job design literature. Our review includes economic perspectives on the division of labor, the human relations movement and the emergence of job enrichment, the job characteristics model, the social information processing perspective, sociotechnical systems theory, interdisciplinary frameworks, and models of job demands. For further details, we refer the reader to several excellent reviews of the job design literature (e.g., Fried, Levi, & Laurence, 2008; Griffin, 1987; Morgeson & Campion, 2003; Morgeson & Humphrey, 2008; Oldham, 1996; Parker & Ohly, 2008; Parker & Wall, 1998; Wall & Martin, 1987).

Economic Theories of Division of Labor

Job design theory and research has its roots in economic perspectives on the division of labor (Babbage, 1835; Smith, 1776). Economists such as Smith and Babbage proposed that productivity could be increased if jobs were broken down into simple tasks. The premise behind this thinking was that division of labor and simplification would allow employees to develop specialized skills and efficient techniques for completing tasks, as well as to eliminate distractions and reduce time wasted while switching tasks (Morgeson & Campion, 2003). In the beginning of the 20th century, proponents of "scientific management" sought to test and apply this logic. For example, Taylor (1911) conducted time and motion studies in an effort to systematize efficient division of labor by managers.

Human Relations Movement

Although researchers continue to debate about whether Taylor's motives were benevolent, malevolent, or indifferent toward employees (Wagner-Tsukamoto, 2007), scientific management sparked a reactionary movement. Researchers began to observe that attempts to achieve efficiency were pursued at

the expense of employee satisfaction and motivation. To address these problems, the human relations movement was born. Advocates of this movement were deeply concerned about the well-being, satisfaction, and motivation of employees. They launched the classic Hawthorne studies to improve environmental conditions, such as lighting, in ways that they expected to be conducive to both comfort and productivity (Mayo, 1933, 1945; Roethlisberger & Dickson, 1939). They learned that taking an interest in employees' opinions, rather than the lighting conditions themselves, appeared to drive productivity increases. They then investigated the effects of other changes to employees' job designs and schedules, such as varying break intervals, working hours, and vacations. As productivity continued to increase, the researchers came to recognize the importance of employees' attitudes in shaping their behavior (Hsueh, 2002). They began to interview employees to understand their feelings about their jobs, supervision, and working conditions.

This focus on jobs-and the supervision and working conditions that affect how employees carry out their jobs-paved the way for a full-blown research agenda on the design of jobs to satisfy and fulfill employees' basic motives and psychological needs. While Likert (1961, 1967) emphasized the importance of participative management, McGregor (1960) distinguished between two theories that leaders and managers can hold. "Theory X" leaders believe that employees are inherently lazy: They dislike work and responsibility and will avoid it if possible, preferring to follow rather than lead. When designing jobs, Theory X leaders micromanage employees, restricting their autonomy and freedom. "Theory Y" leaders, on the other hand, believe that work can be as naturally enjoyable as play or rest, and that doing a good job can be a source of satisfaction in and of itself. Theory Y leaders therefore believe that if employees are given freedom, they will be self-motivated and ambitious, seek responsibility, exercise self-control and selfdirection, and pursue goals that benefit themselves and the organization. When designing jobs, Theory Y leaders advocate empowerment and participative

management, giving employees considerable autonomy and freedom in their work.

Both Likert and McGregor emphasized the potential value of reducing managerial control in designing jobs to provide employees with freedom to fulfill their psychological needs. Their perspectives dovetailed with the work of Herzberg and colleagues, who introduced the notion of job enrichment to applied psychology and organizational behavior. These authors proposed motivator-hygiene theory, which argues that job satisfaction and dissatisfaction are distinct states caused by different forces (Herzberg, 1966; Herzberg, Mausner, & Snyderman, 1967). According to this theory, satisfaction is caused by "motivators" intrinsic to the nature and content of a job: opportunities to achieve, receive recognition, perform interesting work, be responsible, grow, and advance. Dissatisfaction, on the other hand, arises not from the job itself but rather from "hygiene" factors related to the context of the job: policy and administration, supervision, interpersonal relations, working conditions, salary, status, and security.

Job Design and Enrichment

Subsequent research challenged the validity of distinguishing between motivators and hygiene factors and between satisfaction and dissatisfaction, revealing that the two-factor theory is method bound and has little empirical support for predicting satisfaction (Ambrose & Kulik, 1999; Locke & Henne, 1986). However, the thrust of Herzberg's contribution is conveyed by a reflection from Terkel (1972): "Most of us have jobs that are too small for our spirit. Jobs are not big enough for people" (p. 29). Herzberg's work proved influential in drawing researchers' attention to the potential for jobs to be redesigned, enlarged, and enriched to increase motivation and satisfaction.1 Building on this notion, Turner and Lawrence (1965) sought to develop a more systematic classification of the task attributes that influence employees' attitudes and behaviors. Informed by the works of Herzberg, as well as others focusing on job enlargement, task attributes, and the interaction of technology, people, and work (e.g., Trist & Bamforth,

¹ Job enlargement refers to adding requirements at the same level to expand the scope of the job, while job enrichment refers to adding higher-level responsibilities to increase intrinsic motivation (e.g., Campion & McClelland, 1993; Hackman & Oldham, 1980; Herzberg, 1966).

1951; Walker & Guest, 1952), Turner and Lawrence (1965) argued that "workers' response to task attributes could and should become a more important factor in job design" (p. 2). They raised the possibility that jobs could be described from behavioral (what behaviors need to be enacted for the work to be completed), technical (physical and mechanical operations to be performed), organizational (function of the job in combining with other jobs to achieve the organization's goals), social (the social desirability and status of the work), and personal (expected career progression) perspectives.

Focusing primarily on the behavioral perspective, Turner and Lawrence introduced six multidimensional task attributes that could be required to varying degrees by the intrinsic nature of the work itself: variety, autonomy, required interaction, optional interaction on and off the job, required knowledge and skill, and responsibility. They also examined several additional "associated task attributes" that are part of the job but not essential to its performance: task identity, pay, working conditions, cycle time, level of mechanization, and capital investment.² With a sample of 470 employees in 47 different jobs, Turner and Lawrence measured these task attributes and provided an initial examination of their relationships with job satisfaction and attendance. They found that the requisite task attributes predicted higher satisfaction and attendance only among employees from factories in small towns, but not in urban settings, suggesting that cultural backgrounds may shape employees' task preferences.

Job Characteristics Model

Setting the stage for contemporary perspectives on job design, Hackman and Lawler (1971) sought to investigate the influence of job characteristics on attitudes and behaviors. They developed a conceptual framework with roots in Turner and Lawrence's (1965) work, as well as in classic formulations of expectancy theory (Porter & Lawler, 1968; Vroom, 1964). The framework specified that four core job dimensions of variety, autonomy, task identity, and feedback would be associated with higher motivation, job satisfaction, and performance, as well as lower absenteeism for employees with strong "higher order needs" for accomplishment and personal growth. Using data from telephone company employees, Hackman and Lawler found general support for these hypotheses. This paper laid the groundwork for the development of a framework that has fueled three decades of research and remains the dominant model of job design today: the job characteristics model (JCM; Hackman & Oldham, 1975, 1976, 1980; for a reflection on how the model developed, see Oldham & Hackman, 2005).

The JCM focuses on five core job characteristics: task significance, task identity, skill variety, autonomy, and job feedback. Task significance is the extent to which the job provides opportunities to have a positive impact on the well-being of other people; task identity is the extent to which the job allows individuals to complete a whole, identifiable, visible piece of work from start to finish; skill variety is the extent to which the job involves a wide range of capabilities and talents; autonomy is the extent to which the job provides freedom and discretion in how and when to do the work; and feedback is the extent to which the job itself provides clear, direct information about performance effectiveness. Hackman and Oldham (1975, 1976) argued that these five core job characteristics are objective properties of the structure of employees' assigned tasks that influence their job perceptions.

They proposed that the five core job characteristics lead to three *critical psychological states*: experienced meaningfulness, responsibility, and knowledge of results. More specifically, they predicted that task significance, task identity, and skill variety would contribute in an additive or compensatory fashion to experienced meaningfulness: When these characteristics were present, employees would perceive their work as more worthwhile and valuable. They further predicted that autonomy would lead employees to experience greater personal responsibility or ownership over their work, and that job feedback would lead employees to experience greater knowledge of results, or awareness of effectiveness. Hackman and Oldham (1976) proposed that the

²Rarely mentioned is that Turner and Lawrence (1965) developed four additional task attributes that they eliminated from their classification due to measurement difficulties: requisite interdependence, strategic position (the extent to which a job was strategic to the overall work process), direction of interaction (initiated vs. received), and variety of jobs in the working area.

core job characteristics could be combined, when grouped according to the critical psychological states, to create a score for the motivating potential of a job. The *motivating potential of a job* was defined as the product of (a) autonomy, (b) job feedback, and (c) the average of task significance, task identity, and skill variety (the meaningfulness-related dimensions), such that the motivating potential of a job = autonomy × job feedback × 1/3(task significance + task identity + skill variety).

Hackman and Oldham (1976) argued that the critical psychological states would mediate the positive association between the core job characteristics and the outcomes of internal work motivation, performance quality, job and growth satisfaction, and low absenteeism and turnover. They further proposed, in line with Hackman and Lawler's (1971) arguments, that these relationships would be moderated by employees' growth need strength at two stages in the model.³ First, the stronger the employees' growth needs, the more likely the core job characteristics would be to cultivate the critical psychological states. Second, the stronger the employees' growth needs, the more likely the critical psychological states would be to shape the motivation, attitude, and behavior and performance outcomes. These moderating hypotheses were again based on the logic of expectancy theory (Vroom, 1964; Porter & Lawler, 1968). Employees with strong growth needs would be more dependent on enriched job characteristics to experience meaningfulness, responsibility, and knowledge of results, as well as more dependent on the critical psychological states to experience enhanced motivation and more positive attitudes and display higher performance quality and fewer withdrawal behaviors.

Researchers have conducted several hundred studies to test the JCM and its central propositions. The majority of studies have relied on cross-sectional designs, using self-reports, observer-reports, or occupational title classifications to evaluate job characteristics and self-reports, observer reports, or objective behavioral measures to assess motivation, satisfaction, performance, and withdrawal behaviors. Metaanalyses provide general support for the hypotheses that the core job characteristics are associated with favorable attitudinal and behavioral reactions, as mediated by the critical psychological states (Fried, 1991; Fried & Ferris, 1987; Humphrey, Nahrgang, & Morgeson, 2007; Johns et al., 1992). Generally speaking, these meta-analyses have revealed stronger relationships of job characteristics with psychological-attitudinal outcomes than with behavior and performance outcomes. For example, Humphrey et al. (2007) reported mean correlations (p, corrected for unreliability) for the five core job characteristics (autonomy, skill variety, task identity, task significance, and job feedback) of .41, .55, and .39 with job satisfaction, growth satisfaction, and internal work motivation, respectively. They found a weaker relationship between the job characteristics and absenteeism, with corrected correlations of -.15 for autonomy, -.09 for task identity, and -.10 for job feedback. The only one of the five motivational characteristics that was significantly correlated with objective performance was autonomy (p = .17). On the other hand, research testing the moderating role of growth need strength has returned mixed results. While some studies have found support, others have not (Johns et al., 1992; Tiegs, Tetrick, & Fried, 1992). It is not yet clear whether these conflicting findings are an artifact of range restriction and other measurement limitations or whether they are due to the theoretical possibility that growth need strength may be more relevant to some outcomes than others (Fried & Ferris, 1987; Johns et al., 1992; Loher, Noe, Moeller, & Fitzgerald, 1985; Spector, 1985).

Researchers have also extended the JCM by examining the distinction between enriched tasks and enriched jobs. Wong and Campion (1991) argued that although researchers have defined a job as a group of tasks designed for one employee to complete (Griffin, 1987), the JCM is ambiguous about whether the five core job characteristics are motivating at the level of individual tasks or at the aggregate level of the job itself. On one hand, several of the job charac-

³ Researchers expanded the model to include two additional classes of moderators: individual knowledge and skill and context satisfaction (Hackman & Oldham, 1980; Oldham, Hackman, & Pearce, 1976). They proposed that the core job characteristics would be more likely to cultivate critical psychological states and favorable psychological and behavioral reactions when individuals were capable of performing their jobs and when they were satisfied with their supervisors, coworkers, compensation, and job security. These two categories of moderators have received little theoretical and empirical attention (Johns, Xie, & Fang, 1992).

teristics are labeled as features of tasks (task identity, task significance). On the other hand, the characteristics are defined and measured as features of jobs. To resolve these issues, Wong and Campion (1991) developed a mediational model proposing that tasklevel characteristics influence job-level characteristics, which in turn influence attitudinal reactions. Their data provided only partial support for the role of job characteristics in mediating the association between task characteristics and attitudinal outcomes. Subsequent research by Taber and Alliger (1995) shed light on these mixed results by revealing that employees use different psychological processes to evaluate their tasks versus their more global jobs, and that because tasks and jobs are defined externally, they may not fully capture employees' own task and job perceptions (see also Dierdorff & Morgeson, 2007; Ilgen & Hollenbeck, 1991; Morrison, 1994). These findings suggest that although focusing on the job level may be the most parsimonious way to understand employees' work experiences and behaviors, we can deepen our knowledge by incorporating more molecular, personalized units of work such as tasks, roles, duties, activities, and projects.

In spite of-or perhaps more accurately in response to-its popularity, the JCM has attracted criticism from a number of theoretical and empirical perspectives (e.g., Roberts & Glick, 1981). Researchers have debated about whether jobs have objective characteristics (Griffin, 1987; Morgeson & Campion, 2003; Oldham, 1996), as well as whether the five core job characteristics are distinct properties of jobs, can be subsumed by a smaller set of characteristics, or can even be reduced to a single characteristic of job complexity (e.g., Taber & Taylor, 1990), although more recent work has revealed that the characteristics are distinct (Edwards, Scully, & Brtek, 2000). Researchers have found that eliminating negatively worded items in scales can improve the factor structure, but not necessarily the predictive validity, of the measures of job characteristics in Hackman and Oldham's (1975) Job Diagnostic Survey (Cordery & Sevastos, 1993; Kulik, Oldham, & Langner, 1988). However, these methodological critiques have tended to focus more heavily on the instruments used to test the JCM than on the core premises of the JCM itself. More recently, researchers have begun to devote

greater attention to extending the JCM conceptually to include a broader range of job characteristics, outcomes, mediators, moderators, and antecedents (e.g., Grant & Parker, 2009; Morgeson & Humphrey, 2006; Parker et al., 2001).

Social Information Processing Perspective

The foundational assumptions of the JCM were challenged by Salancik and Pfeffer (1978), who offered the social information processing perspective as an alternative. Salancik and Pfeffer argued that employees' job perceptions and attitudes derive not from objective structural properties of the work itself, but rather from how the work is socially constructed by cues from coworkers, supervisors, customers, family members, and other sources, as well as by their own past behaviors and experiences (for reviews, see Blau & Katerberg, 1982; Griffin, 1987; Wall & Martin, 1987; Zalesny & Ford, 1990). Salancik and Pfeffer proposed that social cues can affect employees' job perceptions and attitudes through four different pathways. First, through a direct pathway, social cues can serve as a form of social influence, such that overt statements from other people about a job affect employees' perceptions and attitudes. Second, through an attentional pathway, social cues can make particular aspects of a job salient, shaping the dimensions on which employees assess their perceptions and attitudes. Third, through an interpretation pathway, social cues can provide frames for assessing ambiguous job properties, shaping the interpretations that employees make of their jobs. Fourth, through a learning pathway, social cues can provide information about what needs or values are important, shaping employees' judgments about what they want in a job.

Research has provided mixed support for the social information processing perspective (Zalesny & Ford, 1990). Some field studies have shown that social comparisons are related to employees' attitudinal and behavioral reactions to job design, with employees who perceive inequity displaying less favorable responses (Oldham, Kulik, Ambrose, Stepina, & Brand, 1986; see also Oldham, Kulik, Stepina, & Ambrose, 1986). The majority of investigations of the effects of social cues on perceptions and performance have taken the form of short-term laboratory experiments, which have generally shown that positive social cues about a job result in more favorable task perceptions (Griffin, Bateman, Wayne, & Head, 1987; Thomas & Griffin, 1983; Zalesny & Ford, 1990). However, laboratory experiments have displayed inconclusive results for the effects of social cues on performance. Some experiments have shown that positive social cues can increase performance and productivity (e.g., White & Mitchell, 1979; White, Mitchell, & Bell, 1977), whereas others have returned null effects on behavior (e.g., Kilduff & Regan, 1988; Shaw & Weekley, 1981).

Moreover, field experiments have called into question whether social cues can have lasting effects on the job perceptions and performance of employees in work organizations. For example, Jex and Spector (1989) conducted two field experiments directly applying social cues manipulations used in the laboratory, and found no changes in job perceptions and attitudes. Griffin (1983) conducted a field experiment in which he trained supervisors to provide positive social cues to manufacturing employees about specific task characteristics; the results indicated that social information affected task perceptions, but not productivity. Griffin's (1983, 1987) theoretical and empirical integrations of job design and social information processing perspectives suggest that social cues can have effects on attitudes and behaviors, but these effects are generally weaker than those of job design itself. Thus, whereas social information processing theorists argued that scholars and practitioners should pay less attention to objective job characteristics than to social cues, research points to the opposite conclusion, accentuating the value of considering how jobs are objectively designed and structured. However, researchers continue to debate whether we should study objective job characteristics or individual perceptions of job characteristics (for reviews, see Morgeson & Campion, 2003; Oldham, 1996; Parker & Wall, 1998).

Sociotechnical Systems Theory

Sociotechnical systems theory, developed primarily at the Tavistock Institute in the United Kingdom, is closely linked to job design theory and research (Rousseau, 1977). A core premise of sociotechnical systems theory is that individual and organizational effectiveness depend on the joint optimization of human and mechanical-technological components of organizations (Trist, 1981; Trist & Bamforth, 1951). Sociotechnical systems theory proposes that creating autonomous workgroups can help to accomplish such optimization. Providing groups with the autonomy to manage their own work processes is believed to facilitate communication and problem solving, thereby enhancing productivity and well-being.

Researchers have conducted numerous experiments to apply and test principles of sociotechnical systems theory (for reviews, see Pasmore, Francis, Haldeman, & Shani, 1982; Parker & Wall, 1998; see also Cummings, 1986). For example, in a longitudinal quasi-experiment, Wall, Kemp, Jackson, and Clegg (1986) found that the introduction of autonomous workgroups in a manufacturing company produced mixed effects. At the individual level, autonomous workgroups achieved lasting increases in intrinsic job satisfaction and fleeting increases in extrinsic job satisfaction but did not influence individual work motivation or performance. At the organizational level, autonomous workgroups enhanced productivity by eliminating unnecessary managerial positions but also increased voluntary labor turnover. In the past 2 decades, sociotechnical systems theory has seen few empirical tests and conceptual developments, in large part because the core propositions lack specificity (Parker & Wall, 1998; Parker et al., 2001). However, the theory continues to provide a meta-theoretical perspective that informs ongoing job design research, especially that which is related to autonomous workgroups.

Interdisciplinary Models of Job Design

As of the 1980s, research on job design in industrial and organizational (I/O) psychology and organizational behavior was dominated by Hackman and Oldham's motivational perspective. To broaden the job design literature and integrate it with principles from other disciplines, Campion and colleagues introduced an interdisciplinary perspective that theoretically integrates four different approaches to job design (Campion, 1988; Campion & Thayer, 1985; for a review, see Campion, Mumford, Morgeson, & Nahrgang, 2005). The motivational perspective emphasizes JCM principles such as variety, autonomy, task identity and feedback. The motivational approach to job design offers benefits of motivation, satisfaction, and retention, but often involves enhanced training costs and stress. The mechanistic perspective, rooted in industrial engineering, emphasizes economic and scientific management principles such as specialization, simplification, and repetition. The mechanistic approach to job design offers benefits for efficiency and staffing and training, but tends to produce lower levels of motivation and satisfaction. The perceptual-motor perspective, rooted in human factors and cognitive psychology, emphasizes the principle of reducing information processing requirements (e.g., by operating and monitoring technology rather than performing tasks manually). The perceptual-motor approach to job design offers the benefits of reducing errors, accidents, and mental overload but tends to result in boredom and decreased motivation and satisfaction. Finally, the biological perspective, rooted in biology and medicine, emphasizes principles of physical comfort. The biological approach to job design offers benefits for health, stress, and fatigue, but it tends to involve considerable financial resources and low levels of physical activity.

To examine the benefits and costs of these four general approaches to job design, Campion and McClelland (1991, 1993) conducted longitudinal quasi-experiments with clerical employees and managers in a financial services organization. Their initial results suggested that when jobs were enlarged by adding tasks and combining jobs, motivational principles improved, whereas mechanistic principles declined. The enlarged jobs were generally associated with higher satisfaction, lower boredom, greater probability of detecting errors, and improved customer service but required more training, higher skills, and higher compensation (Campion & McClelland, 1991).

A follow-up study 2 years later suggested that the benefits and costs of job redesign changed over time as a function of how the redesign was conducted (Campion & McClelland, 1993). Enlarging jobs by adding tasks and combining jobs was increasingly costly over time: Employees were less satisfied and efficient, experienced greater overload, made more errors, and provided poorer customer service. However, the organization had used a second approach to job redesign. For some jobs, instead of enlarging them by adding more low-level tasks, they enriched them by adding higher-level responsibilities for understanding procedures and rules for the organization's products. When jobs were enriched in this fashion, the majority of the effects were beneficial over time: Employees were more satisfied, experienced less overload, made fewer errors, and provided better customer service. These findings supported the original arguments by Herzberg (1966) and Hackman and Oldham (1980) that organizations and their employees may achieve greater benefits from job enrichment than job enlargement.4

In subsequent research, Morgeson and Campion (2002) sought to address the trade-off between satisfaction and efficiency that frequently emerged between motivational and mechanistic approaches to job design. They proposed that jobs could be designed to be both satisfying and efficient by focusing on task clusters, "the smallest collection of logically related tasks that are normally performed by a single person such that they form a whole or natural work process" (Morgeson & Campion, 2002, p. 593). By increasing specialization, employees can work on clusters of tasks that allow for both skill utilization and efficiency. This idea was informed by the research of Edwards, Scully, and Brtek (1999, 2000), who showed that each of the four interdisciplinary approaches to job design is multidimensional. Their analyses revealed that the negative relationship between motivational and mechanistic job design was primarily due to the common trade-off between skill usage and simplicity: As one increases, the other tends to decrease. However, some forms of specialization enhance skill requirements without reducing complexity, making it possible to increase specialization in ways that are both mechanistically and motivationally sound. In a longitudinal quasi-experiment in a pharmaceutical company, Morgeson and Campion found support for the hypothesis that trade-offs between motivational

⁴ Campion and McClelland (1993) also found that job enlargement tends to lead to poorer biological designs, reducing physical comfort. Although the biological perspective has received less attention in job design research, it deserves further attention in light of its potential to improve physical health and protect against stress.

and mechanistic approaches can be avoided by enhancing specialization in task clusters. Employees whose jobs were redesigned in this fashion displayed increased satisfaction without increasing training costs or perceptions of simplicity.

The interdisciplinary perspective has been generative in introducing new job characteristics and outcomes that had not previously been documented in psychological and organizational research on job design, especially from the standpoints of ergonomics, human factors, and industrial engineering. Researchers now recognize the importance of considering mechanistic, perceptual-motor, and biological perspectives, as well as traditional motivational perspectives, on job design. In addition, the interdisciplinary perspective has provided scholars and practitioners with new tools for diagnosing, planning, implementing, and evaluating job redesign interventions.

Job Demands-Control-Support and Job Demands-Resources Models

Although it is not always included in reviews of the job design literature, another perspective on job design was developed by Karasek and colleagues (Karasek, 1979; Karasek & Theorell, 1990; for a review, see Vol. 3, chap. 13, this handbook). These authors were interested in understanding and reducing the deleterious effects of job demands on stress, strain, burnout, and physical illnesses such as heart disease. They proposed that providing greater job control to employees could buffer against these detrimental effects of job demands. Enhanced job control, or decision latitude, was hypothesized to allow employees to develop a sense of mastery and learn to cope with their job demands (e.g., Sonnentag & Zijlstra, 2006; Theorell & Karasek, 1996). Discovering that social support also helped to buffer against job demands, researchers expanded the model into the job demands-control-support model (Karasek & Theorell, 1990) and explored the possibility that control and support are interchangeable (e.g., Van Yperen & Hagedoorn, 2003).

Researchers have discovered mixed evidence for the predicted two-way (demand-control and demandsupport) and three-way (demand-control-support) interactions (van der Doef & Maes, 1999). In light of this mixed evidence, European researchers have recently proposed a job demands-resources model that focuses on independent effects of job demands and resources on different aspects of burnout (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Job demands-characteristics that require effortare proposed to contribute to the emotional exhaustion dimension of burnout. Job resourcescharacteristics that facilitate goal achievement, demand reduction, or personal growth-reduce disengagement or depersonalization (Bakker & Demerouti, 2007; Halbesleben & Buckley, 2004). Together, the job demands-control-support and job demands-resources models encourage job design researchers to study additional job characteristics and consider their implications for occupational health outcomes such as stress, strain, burnout, and illness.

WHERE ARE WE NOW? CONTEMPORARY PERSPECTIVES ON JOB DESIGN

Now that we have traced the history of job design research, we turn to contemporary perspectives that have emerged in recent years and are continuing to receive attention. These contemporary perspectives can be divided into two general categories: (a) new job characteristics and (b) new moderators, mediators, and outcomes of job design. These developments are directed toward overcoming the narrow focus of the JCM on only five job characteristics, three psychological mechanisms, and four outcomes of motivation, satisfaction, performance, and withdrawal behaviors (Parker et al., 2001). Figure 13.1 provides a summary model to integrate both the classic and contemporary perspectives that we discuss in the chapter.

New Job Characteristics: Including the Physical, Knowledge, and Social

Morgeson and colleagues have developed an integrative typology and Work Design Questionnaire that divides job characteristics into four broad categories: task, physical, knowledge, and social (Humphrey et al., 2007; Morgeson & Humphrey, 2006). The task characteristics focus on the five JCM characteristics of



FIGURE 13.1. An integrative model of job design.

autonomy, variety, task significance, task identity, and job feedback.⁵ The physical, knowledge, and social characteristics build on the efforts of several teams of researchers to broaden the scope of job design research beyond a relatively narrow focus on the characteristics of the tasks that employees perform.

Physical Characteristics of Jobs. One of the earliest extensions expanded job design research beyond a restricted emphasis on the tasks that employees perform toward a consideration of the physical contexts in which they work. This choice was supported by a multidimensional scaling study by Stone and Gueutal (1985), who found that physical demands are one of the three core dimensions along which individuals perceive jobs. Two years earlier, Oldham and Rotchford (1983) introduced a typology of office characteristics specifying that physical environments in which employees perform their jobs vary in terms of openness, office density, workspace density, accessibility, and darkness. In a study of university employees, they found that these office characteristics were related to satisfaction and discretionary behavior through employees' interpersonal, job, and environmental experiences. Subsequent research has underscored the performance and well-being costs of crowding via high spatial density, low interpersonal distance, or a lack of physical enclosures such as partitions-especially if employees work in simple jobs, have poor stimulus-screening skills (Fried, 1990; Oldham, Kulik, & Stepina, 1991), or have high privacy needs (Oldham, 1988). Thus, physical characteristics of jobs can refer to both the physical features of tasks as well as the broader

⁵ In the Morgeson and Humphrey (2006) typology and questionnaire, autonomy is divided into three dimensions (decision making, scheduling, and work methods), and variety is divided into two types (task variety, a task characteristic, and skill variety, a knowledge characteristic).

physical environments in which employees perform their tasks.

Other studies have demonstrated that employees adapt more favorably to high-density physical environments when they spent their childhoods in dense residential environments (Zhou, Oldham, & Cummings, 1998), that employees with low selfefficacy or external loci of health control are more responsive to physical conditions (May, Schwoerer, Reed, & Potter, 1997), and that the physical context of job design influences not only employees' reactions but customers' reactions as well (Conlon, Van Dyne, Milner, & Ng, 2004). Researchers have also begun to study physical danger (Jermier, Gaines, & McIntosh, 1989), physical taint (Ashforth & Kreiner, 1999), and noise as other physical characteristics along which jobs vary. With respect to noise, some researchers have identified music as a source of relaxation in simple jobs (Oldham, Cummings, Mischel, Schmidtke, & Zhou, 1995), whereas others have discovered that ambient noise is a source of job dissatisfaction, stress, high blood pressure, and absenteeism in complex jobs (Fried, Melamed, & Ben-David, 2002; Melamed, Fried, & Froom, 2001).

Although this emerging literature on the physical context of job design is reminiscent of the early Hawthorne studies on environmental conditions, these studies have provided new insights into the important impact that physical characteristics of jobs can have on psychological, behavioral, and health outcomes. Researchers have developed questionnaires to capture the physical context of job design, which includes dimensions such as ergonomics, physical demands, work conditions, and equipment use (Morgeson & Humphrey, 2006), and environmental design, facilities, workload and activity levels, equipment and tools, and health and safety (Carlopio, 1996). Field experiments and quasi-experiments conducted by Oldham and colleagues (Oldham, 1988; Oldham et al., 1995) and May and colleagues (May, Reed, Schwoerer, & Potter, 2004; May & Schwoerer, 1994) have helped to strengthen causal inferences and illuminate factors that moderate individuals' reactions to the physical context of jobs. Moreover, in a recent meta-analysis, Humphrey et al. (2007) found that after controlling for task, knowledge, and social

characteristics, physical job characteristics explained 16% incremental variance in stress and 4% incremental variance in job satisfaction. As such, scholars now agree that to gain a complete understanding of job design, we need to study the physical environment as well as the task environment (Fried, Slowik, Ben-David, & Tiegs, 2001; May, Oldham, & Rathert, 2005; Morgeson & Humphrey, 2006).

Knowledge characteristics of jobs. Researchers have also called attention to the fact that jobs vary in terms of the knowledge that they require employees to acquire, retain, and utilize. This focus on knowledge characteristics was spearheaded primarily by the efforts of Campion and colleagues (e.g., Campion, 1988) and Wall and colleagues (e.g., Wall, Jackson, & Mullarkey, 1995). Morgeson and Humphrey (2006) synthesized research on five knowledge characteristics of jobs: complexity, information processing, problem solving, skill variety, and specialization. They found that knowledge characteristics predict job satisfaction, and unlike task characteristics, knowledge characteristics are related to training and compensation requirements.

Complexity, which describes the difficulty versus simplicity of a job, was one of the first knowledge characteristics to receive attention in the literature (Campion, 1988; Edwards et al., 2000). Information processing is a related knowledge characteristic that captures the extent to which a job requires employees to pay attention to events, monitor data, and actively use cognitive abilities for sense-making and decisionmaking purposes (Jackson, Wall, Martin, & Davids, 1993; Martin & Wall, 1989). Problem solving, a third knowledge characteristic, focuses on the degree to which the job involves generating ideas, implementing solutions, and diagnosing and resolving errors (Wall, Corbert, Martin, Clegg, & Jackson, 1990), activities which are especially common in jobs with high creativity requirements (Morgeson & Humphrey, 2006; Unsworth, Wall, & Carter, 2005). Skill variety, a fourth knowledge characteristic, is drawn directly from Hackman and Oldham's (1976) conceptualization of the breadth of capabilities needed to carry out the work. Specialization, a fifth knowledge characteristic, differs from skill variety in

that it captures the depth, rather than breadth, of skills required to perform the work (Campion, 1988; Edwards et al., 2000; Morgeson & Humphrey, 2006).

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Research on knowledge characteristics has challenged scholars to recognize that jobs vary in their learning and skill requirements as well as in their motivational opportunities and physical conditions. As hinted previously, knowledge characteristics often present trade-offs between simplicity and skill usage, and thus between efficiency and satisfaction (Morgeson & Campion, 2002; Morgeson & Humphrey, 2006). For example, research suggests that jobs high in complexity and information processing involve considerable mental demands and challenges, and can thus serve as sources of both stress and satisfaction (e.g., Xie & Johns, 1995; see also Little, 1989). Researchers have only begun to study the conditions under which these trade-offs can be minimized or even eliminated (Morgeson & Campion, 2002; see also Drach-Zahavy, 2004).

Social characteristics of jobs. Researchers have also begun to call attention to the social characteristics along which jobs vary-the interpersonal connections, interactions, and relationships that are embedded in assigned responsibilities (Grant, 2007; Morgeson & Humphrey, 2006). Although early research on job design included interpersonal components of jobs such as social structure (Trist & Bamforth, 1951), requisite interdependence, required and optional interaction, and received versus initiated directions of interaction (Turner & Lawrence, 1965), and dealing with others, feedback from others, and friendship opportunities (Hackman & Lawler, 1971; Hackman & Oldham, 1976), as noted earlier, these social characteristics disappeared from subsequent research (Grant, 2007; Grant et al., 2007; Latham & Pinder, 2005; Morgeson & Campion, 2003).6 This is surprising given that Stone and Gueutal (1985) identified service to the public, a social characteristic, as one of the three core dimensions on which individuals perceive jobs. Recently, we have witnessed a resurgence of attention to the social context of job design. Morgeson and Humphrey (2006) considered jobs as varying in terms of four social characteristics: social support, interdependence, interaction outside the organization, and feedback from others.

Morgeson and Humphrey's view of social support is based on the aforementioned research by Karasek and colleagues, which highlights that jobs differ in the degree to which they allow employees to receive assistance from supervisors and coworkers (Karasek, 1979; Karasek & Theorell, 1990), as well as early conceptualizations of friendship opportunities (Hackman & Lawler, 1971; Sims, Szilagyi, & Keller, 1976). Interdependence emphasizes the extent to which employees rely on each other to complete work, and can be divided into two types: initiated interdependence, where employees pass their work along to others, and received interdependence, where others' work is passed along to employees (Kiggundu, 1981, 1983; Morgeson & Humphrey, 2006). Interaction outside the organization describes the extent to which the job enables employees to communicate and interrelate with people external to the organization's boundaries, such as clients, customers, or suppliers (Morgeson & Humphrey, 2006). Finally, feedback from others captures the extent to which employees receive information from other people about their performance (Hackman & Lawler, 1971; Hackman & Oldham, 1980; Morgeson & Humphrey, 2006). These social characteristics of jobs appear to play an important role in employees' attitudes and experiences. In a meta-analysis, Humphrey et al. (2007) found that all four social characteristics were associated with job satisfaction (mean p = .36). Moreover, they found that even after controlling for task and knowledge characteristics, these four social characteristics explained incremental variance of 17% in job satisfaction, 18% in role ambiguity and conflict, 40% in organizational commitment, 24% in turnover intentions, and 9% in subjective performance. Together, they found that task, knowledge, physical, and social characteristics explained 55% of the variance in job satisfaction, 54% in role ambiguity, 38% in stress, and 23% in burnout.

⁶Social characteristics of jobs are distinct from the social cues discussed in Salancik and Pfeffer's (1978) social information processing perspective. Whereas Salancik and Pfeffer focused on social cues that are independent of the objective structure of the job itself, social characteristics capture the connections, interactions, and relationships that are structured into the job. For further explanation, see Grant (2008a).

A different view of the social characteristics of jobs is offered by Grant and colleagues. These researchers have focused on the design of jobs to fuel prosocial, rather than intrinsic, motivation: to motivate employees to care about protecting and promoting the wellbeing of beneficiaries (Grant, 2007, 2008c). These researchers have proposed that when jobs are high in both task significance and contact with beneficiaries, employees will experience higher perceptions of impact on beneficiaries and affective commitments to beneficiaries. These experiences will trigger prosocial motivation, which will drive employees to display additional effort, persistence, and helping behavior. These predictions have been tested in a series of recent studies.

For instance, Grant et al. (2007) found significant effects of contact with beneficiaries on persistence that were (a) mediated by higher levels of perceived impact on and affective commitment to beneficiaries and (b) moderated by task significance, which strengthened the effect of contact with beneficiaries on persistence. Grant (2008a) expanded on this research by examining new mechanisms and boundary conditions of the performance effects of task significance. Noting that previous research had yet to establish a causal impact of task significance on job performance, Grant (2008a) sought to shed new light on this relationship, as well as its relational mediators and individual moderators. Whereas past research had treated task significance as a characteristic of the work itself that enables employees to experience their tasks as more meaningful (Hackman & Oldham, 1976; Morgeson & Humphrey, 2006), Grant (2007) proposed that task significance is also a relational job characteristic because it connects employees to the impact of their actions on other people. Grant (2008a) drew on this notion to propose that task significance increases job performance by strengthening employees' perceptions of impact on beneficiaries, as well as by enabling employees to feel valued and appreciated by beneficiaries.

To test these mechanisms and investigate their boundary conditions, Grant (2008a) conducted three field experiments. In the first experiment, he found that task significance cues increased the performance of fundraisers, relative to two control groups and their own baselines. In the second experiment, he found that task significance cues increased the job dedication and helping behavior of lifeguards, relative to a control group and their own baselines. These effects were mediated by lifeguards' heightened perceptions of impact on and appreciation from the guests in their pool. In the third experiment, he found that task significance cues led new fundraising callers to raise more pledges in their first week on the job than callers in a control group. He further found that these effects were independently moderated by individual differences in conscientiousness and prosocial values. Task significance had stronger performance effects for employees with low levels of conscientiousness, whose effort is more dependent on external signals, and employees with prosocial values, who are more concerned about doing work that protects and promotes the welfare of others. These experiments highlight the causal impact that task significance can have on job performance and introduce new relational mediators and individual moderators of these effects.

A third perspective on social characteristics of jobs has been presented by researchers studying "necessary evils"-that is, tasks that require employees to harm others in the interest of a perceived greater good (Molinsky & Margolis, 2005). These researchers have offered an innovative theoretical perspective on how task structures affect the emotional drama of performing work that simultaneously does good and harm, as well as employees' efforts to express compassion and sensitivity to the victims harmed by their efforts. Such tasks are especially common in the daily lives of health care professionals performing painful medical procedures, attorneys and judges determining the fates of accused criminals, and managers performing downsizings. Molinsky and Margolis proposed that necessarily evils vary in terms of task dimensions (complexity and frequency), agency dimensions (causality, task identity, legitimacy), and impact dimensions (magnitude and salience of harm, ratio of harm to benefit). One of the more fascinating issues raised by a focus on necessary evils is that some task designs may make the harm easier to deliver but undermine the employee's motivation to express compassion and cause moral disengagement (Bandura, 1999) by shielding the employee from the harm being done. For example, Molinsky

and Margolis (2005) suggest that complex or fragmented tasks involve less emotional drama but also invite less compassion and moral awareness. On the other hand, exposing employees directly to the victims and giving them responsibility for the entire process of harmdoing may facilitate expressions of compassion and protect moral sensibilities, but it tends to place severe emotional burdens on employees. Recently, researchers have begun to empirically investigate the conditions under which employees engage psychologically to express compassion while performing necessary evils (Margolis & Molinsky, 2008), as well as how the experience of doing good offsets the job dissatisfaction and burnout costs of the experience of doing harm (Grant & Campbell, 2007).

Together, the studies highlighted above have challenged Hackman and Oldham's (1976) findings about the weak predictive validity of dealing with others and friendship opportunities,⁷ corroborating earlier intuitions about the importance of social characteristics of jobs (Hackman & Lawler, 1971; Trist & Bamforth, 1951; Turner & Lawrence, 1965). The research programs advanced by Morgeson and colleagues, Grant and colleagues, and Molinsky and Margolis have accentuated the significant impact that social job characteristics can have on employees' experiences, attitudes, behaviors, and performance. However, researchers have yet to explore how each social characteristic interacts with task, physical, and knowledge characteristics, and we see this as a promising opportunity for future research. In addition, there are other job characteristics that do not fit neatly into these four categories, and we cover them in a subsequent section on directions for future research.

New Moderators, Mediators, and Outcomes: Uncertainty, Proactivity, Dynamism, and Creativity

As researchers have broadened job design theories to include task, physical, knowledge, and social characteristics, they have also presented new perspectives on the boundaries, processes and outcomes of job design. These developments move beyond the traditional focus on motivational processes and satisfaction, performance, and withdrawal outcomes, and they can be classified into four major categories: uncertainty, proactivity, dynamism, and creativity.

Uncertainty. Scholars have pointed out that the majority of job design research has failed to attend to uncertainty, a contextual variable that plays a central role in psychological and organizational research (Johns, 2006). Wall and Jackson (1995) noted that conflicting evidence for the effects of job control might be resolved by incorporating uncertainty as a moderator, proposing a contingency perspective suggesting that job control is most likely to achieve beneficial outcomes when uncertainty is high. As Wright and Cordery (1999) summarized:

Although both sociotechnical systems and job characteristics theorists stress job control as a primary causal factor influencing performance and job attitudes . . . neither explicitly predicts that the strength of these relationships will vary with the degree of contextual uncertainty

... According to the contingency view, job redesign may fail to lead to improvements in performance simply because there are no system control benefits to be had from transferring decision-making control from supervisors to employees in simple, stable, and predictable operating environments. Conversely, job redesign programs may well succeed because they increase job control to suit the level of uncertainty at the job level or, alternatively, because they increase both uncertainty and job control simultaneously, such as through changes to workflow and technology. (p. 456)

In an empirical study of production operators in a wastewater treatment company, Wright and Cordery (1999) found evidence that the association between job control and attitudinal outcomes was moderated by production uncertainty. More specifically, when

⁷ Future research is needed to explain why Hackman and Oldham (1976) returned weak results. Their findings may have been due to methodological artifacts such as range restriction and unreliable measures, attention to a limited range of social characteristics, or increases in the importance of social characteristics over time.

production uncertainty was low, job control was negatively associated with satisfaction and intrinsic motivation, but when production uncertainty was high, job control was positively associated with satisfaction and intrinsic motivation. These findings suggest that job control is most likely to offer psychological benefits to employees when they work in environments characterized by high levels of uncertainty, helping to position uncertainty as a key variable in job design theory and research.

Proactivity. A number of researchers have challenged the assumption that jobs are static objects designed by managers. Ilgen and Hollenbeck (1991) recommended that we move away from our focus on jobs and toward an emphasis on roles, which capture both the formal and more informal, emergent attributes of work that are not always included in job descriptions. On the basis of an excellent synthesis of the largely separate literatures on job design and roles, Ilgen and Hollenbeck argued that jobs are created by managers, who identify a set of required task elements for employees to perform. However, as employees enact their jobs, they become aware of additional elements that need to be incorporated in order to perform them effectively in context. Ilgen and Hollenbeck defined the role as the combination of the formal, assigned and informal, emergent task elements. They pointed out that employees often take initiative to incorporate new task elements into their roles and negotiate altered roles with supervisors (see also Graen, 1976).

Other researchers have elaborated on Ilgen and Hollenbeck's ideas to capture the ways in which employees' responsibilities change over time. (See also Vol. 2, chap. 19, this handbook.) Researchers have increasingly recognized that rather than passively reacting to the jobs that managers assign to them, employees proactively take initiative to alter their own roles and jobs (Frese & Fay, 2001). This general viewpoint has been expressed by a number of different scholars (for reviews, see Grant & Ashford, 2008; Grant & Parker, 2009). For example, Staw and Boettger (1990) introduced the concept of task revision to capture how employees proactively improve flawed task structures, and Black and Ashford (1995) studied how new employees change their own roles to "make jobs fit" during the adjustment process.

Similarly, Parker, Wall, and Jackson (1997) asserted that as organizational structures flatten, employees are given increased autonomy and latitude to change their own jobs. They collected data suggesting that modern manufacturing and production practices result in enhanced autonomy, which gives employees the freedom to expand their own roles. As the authors summarize, "Autonomy allows hands-on learning in which people have the opportunity to interact with the environment and become more involved in, and more knowledgeable about, the wider production process. This experience might then lead to broader ownership of problems and a more proactive view of performance" (Parker et al., 1997, p. 923). Thus, Parker and colleagues identified learning as a new mechanism through which autonomy enhances job performance (see also Frese, Kring, Soose, & Zempell, 1996; Langfred & Moye, 2004; Liden, Wayne, & Sparrowe, 2000; Wall, Jackson, & Davids, 1992).

In subsequent research, Parker and colleagues have sought to investigate the psychological processes through which autonomy facilitates role expansion and thereby more proactive behaviors. They have argued that proactive behaviors emerge when autonomy cultivates a psychological state of role-breadth self-efficacy (RBSE), or feeling capable of taking on a broader, more proactive set of responsibilities (e.g., Parker, 2000, 2007). For example, Parker, Williams, and Turner (2006) found that individuals with higher levels of RBSE were more likely to be proactive in implementing ideas and solving problems, and Griffin, Neal, and Parker (2007) found that RBSE predicted proactive behaviors directed toward one's task, one's team, and one's broader organization. In a series of studies, Parker and colleagues have found that autonomy and control are important facilitators of RBSE. Across two field studies, Parker (1998) found that autonomy can contribute to the development of RBSE by signaling to employees that they are capable of handling larger responsibilities, a finding replicated by Morgeson, Delaney-Klinger, and Hemingway (2005). In another field study, Parker and Sprigg (1999) discovered that job control and job demands interact to predict higher levels of RBSE

only for employees with proactive personalities, who are motivated and able to take advantage of job control to cope with and learn from their job demands. Reinforcing the importance of autonomy for promoting RBSE, Axtell and Parker (2003) conducted a longitudinal study revealing that enlarging jobs without increasing autonomy was associated with decreases in RBSE, and Parker (2003) found in a longitudinal quasi-experiment that the introduction of lean production practices reduced RBSE by undermining employees' perceptions of autonomy, skill utilization, and participation in decision making. Together, these studies underscore the value of considering knowledge, skill development, and learning mechanismsnot only motivational mechanisms-as mediators of the effects of job characteristics on employees' attitudes, behaviors, and well-being (see also Holman & Wall, 2002).

Building on this emphasis on proactivity, researchers have begun to examine the role of job design in shaping whether roles can be formalized or must emerge more proactively. Griffin et al. (2007) proposed that as interdependence rises, role performance depends on contributions to the broader team and organization rather than to individual tasks, and as uncertainty rises, role performance depends on adaptive and proactive behaviors rather than merely completing tasks proficiently. Their theoretical model highlights the importance of interdependence and uncertainty in encouraging employees to take on more proactive, emergent roles as opposed to merely carrying out formalized jobs (see also Dierdorff & Morgeson, 2007).

This focus on proactivity also appears in Wrzesniewski and Dutton's (2001) theoretical model of job crafting. Wrzesniewski and Dutton developed the concept of job crafting to describe the process through which employees proactively alter the boundaries of their own tasks and relationships. They proposed that employees can change physical task boundaries by altering the number or type of tasks that they complete, cognitive task boundaries by reframing their views of their tasks, and relational boundaries by altering with whom and how they interact and communicate at work. They described how employees are motivated to engage in job crafting by desires for control, work meaning, positive identities, and interpersonal connections, and how the effect of these motives on job crafting depends on perceived opportunities for crafting, job features, and individual work and motivational orientations. They further suggested that by crafting their jobs, employees are able to change the meaning of their work and their identities at work. For example, they described how a group of hospital cleaners crafted their jobs by actively caring for patients and their families, even though this was not part of their job descriptions.

A focus on job crafting suggests that employees are active architects, not merely passive recipients, of jobs. The job crafting concept has been generative in integrating different views of how employees proactively take initiative to alter their own jobs, roles, and tasks, and in inviting a broader consideration of the ways in which they do so and the work meaning and identity functions that it serves. In a more recent conceptual paper, Rousseau et al. (2006) suggested that job crafting may even occur prior to accepting a job. They proposed that employees often negotiate idiosyncratic deals, or "i-deals," in which supervisors agree to unique job expectations or employment arrangements that differ from those given to other employees performing the same job.8 Combining these different perspectives, it is now clear that employees play a proactive role in shaping their own job designs.

Dynamism. A recent advancement in job design theory was offered by Clegg and Spencer (2007). These authors criticized prior research for its static focus on fixed job designs, building on the proactivity research cited previously to propose a more flexible view that culminates in a "circular and dynamic" model of the job design process. They proposed that when employees perform effectively, supervisors interpret this performance as a sign of competence and develop higher levels of trust in employees. In addition, employees themselves interpret this performance as a sign of

⁸Moreover, researchers have suggested that job crafting can involve negotiation with peers as well as supervisors (e.g., Fried, Levi, & Laurence, 2007). For example, Langfred (2007) suggested that when trust among team members is reduced due to conflict, team members are less willing to grant work autonomy to other team members. In contrast, when trust is high, team members are willing to allow and facilitate job crafting.

competence and develop higher levels of trust in themselves. These enhanced levels of interpersonal and intrapersonal trust lead to role expansion, which can be initiated by supervisors or by employees themselves through job crafting. Role expansion enhances employees' motivation and opportunity to learn and develop new knowledge, thereby fueling higher performance, and the cycle begins again.

The logic of the model also applies in reverse to poor performance. Supervisors and employees themselves interpret poor performance as a signal of incompetence, which reduces interpersonal and intrapersonal trust and leads to role constriction, through smaller assignments and less autonomy from supervisors or through employees' own efforts to craft simpler jobs. This constricted role decreases employees' motivations and opportunities to learn, decreasing performance, and the cycle repeats itself.

Clegg and Spencer's (2007) model presents several promising contributions to our understanding of job design. First, rather than treating job design solely as a predictor variable and performance as an outcome variable, they conceptualized both variables as predictors and outcomes that are dynamically interrelated. Second, by incorporating job crafting and other forms of proactivity, they moved beyond static perspectives by highlighting the flexibility and malleability of job design. Third, they integrated knowledge and motivational mechanisms through which role expansion and autonomy may facilitate performance.

Despite these strengths, there are theoretical and methodological challenges that merit attention in further conceptual and empirical work. For example, Clegg and Spencer (2007) wisely noted that the model assumes that performance triggers self-fueling spirals or "deviation-amplifying loops" (Weick, 1979; see also Lindsley, Brass, & Thomas, 1995), but virtuous or vicious cycles are unlikely to continue into perpetuity. For example, at very high or low levels of performance, employees may reach "performance ceilings" or "performance floors" in which it is no longer possible for performance to continue escalating in positive or negative directions. Moreover, poor performance in and of itself may motivate supervisors to provide employees with further training and motivate employees themselves to proactively seek out

feedback and learning opportunities (e.g., Ashford, Blatt, & VandeWalle, 2003; Kluger & DeNisi, 1996). We hope to see researchers incorporate new mediators and moderators that explain how Clegg and Spencer's virtuous and vicious cycles are counteracted. Nevertheless, we applaud the development of a dynamic, cyclical, reciprocal model that prompts researchers to examine the multiple causal pathways through which job designs, roles, and performance interrelate. To test their model, multiwave longitudinal studies will be critical (e.g., Frese, Garst, & Fay, 2007), and we are especially enthusiastic about the prospects for cross-lagged designs that can adjudicate questions about temporal order by facilitating comparisons of reciprocal relationships. We also hope to see researchers conduct growth modeling and nonlinear analyses to begin to explore the spirals proposed by Clegg and Spencer.

Creativity and workday cycles. Job design researchers have also begun to consider creativity as an outcome. (See also chap. 9, this volume.) Oldham and Cummings (1996), for example, found that employees working in enriched jobs (i.e., high scores on the JCM attributes) were rated as more creative, produced more patents, and offered more suggestions. Enriched jobs were stronger predictors of several of these creativityrelevant outcomes when employees had creative personalities or supportive or noncontrolling supervision. Elsbach and Hargadon (2006) extended our understanding of job design and creativity by introducing a framework of "workday design" for knowledge workers. They asserted that many knowledge workers are chronically overloaded, facing daily demands and obstacles that undermine their creativity. They proposed that the creativity of knowledge workers can be enhanced by identifying and regularly scheduling simple, easily mastered tasks that involve low cognitive difficulty and low performance pressure (see also Ohly, Sonnentag, & Pluntke, 2006). They suggested that daily doses of "legitimate and scheduled mindless work" may enhance employees' cognitive capacity, feelings of psychological safety, and positive affect, and that these psychological states will in turn fuel creativity.

Elsbach and Hargadon's (2006) framework offers at least three noteworthy contributions to job design

theory and research. First, they shifted our unit of analysis by suggesting that researchers should focus on designing workdays rather than jobs or tasks; this draws our attention to the importance of considering how tasks are sequenced throughout the course of a day, an issue long neglected in job design research. Second, consistent with the predictions and findings presented by Xie and Johns (1995), Elsbach and Hargadon challenged the long-held assumption that reduced variety and complexity undermine motivation: When employees work in very complex, high-pressure knowledge jobs, tasks that would traditionally be described as dull and monotonous may provide a welcome break. Third, they offered new ideas for managing commonly observed tradeoffs in job design research (see Morgeson & Campion, 2002): By alternating complex, challenging tasks with routine, mindless tasks, employees may achieve a balance of pressure and relaxation that is conducive to high creativity and relatively low stress.

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Summary. These perspectives on uncertainty, proactivity, dynamism, and creativity break new ground in job design theory and research. Research on uncertainty has helped us understand how the effects of job control are contingent on organizational and industrial contexts. Research on proactivity has helped us understand how employees take initiative to shape their own job designs. Research on dynamism has illuminated how such initiative results in spirals of changes in job characteristics, relationships, and performance over time. Research on creativity has helped us understand how tasks can be sequenced within workdays to stimulate original, flexible thinking. Together, these viewpoints have expanded the scope of moderators, mediators, and outcomes beyond those traditionally considered in job design research.

WHERE ARE WE GOING? FUTURE DIRECTIONS

Now that we have covered the past and the present of job design theory and research, we turn our focus to the future. Our emphasis in this section is on unanswered questions and further directions that merit attention in ongoing conceptual and empirical inquiry. We focus on two key themes: taking context seriously and unanswered questions.

Taking Context Seriously

To paraphrase Bob Dylan, "Jobs, they are a-changin'." Recent changes in the nature of work present both opportunities and challenges for job design research. A number of scholars have pointed out that the job design literature has largely neglected the dramatic changes in work contexts and job environments that have occurred over the past few decades (e.g., Johns, 2006; Holman, Clegg, & Waterson, 2002; Parker et al., 2001; Rousseau & Fried, 2001). We see several valuable steps that researchers can take to incorporate these contextual changes: continue studying new social and knowledge characteristics of jobs, consider temporal characteristics of jobs, and explore more macroscopic environmental variables as antecedents of job design and moderators of its effects.

New social characteristics of jobs. Social characteristics of jobs are changing at a rapid pace. As we shift from a manufacturing economy to a service economy, and we continue to see increases in task interdependence and the use of teams, employees' jobs may be more embedded in and interconnected to interpersonal relationships than ever before (e.g., Grant, 2007; Parker et al., 2001). The time is ripe for researchers to examine new social characteristics of jobs, revisit forgotten characteristics, or consider dimensions that have received little attention in prior research. For example, Turner and Lawrence (1965) suggested that jobs vary in their social desirability and status. Although social status and stigma have been central themes in research on dirty work (e.g., Ashforth & Kreiner, 1999), job design researchers have scarcely taken notice of these important variables. As a second example, Turner and Lawrence (1965) originally defined task identity as the extent to which a job involved work that was clearly differentiated as a unique and visible assignment. Similarly, Ariely, Kamenica, and Prelec (2008) found that having one's products destroyed by others-seeing one's written work put through a paper shredder or watching the experimenter disassemble a machine that one has built-may threaten meaning by

challenging individuals' beliefs that the work will last as a whole, identifiable product that is visible to others. These ideas and findings suggest that task identity may be a social characteristic of jobs, in that task identity is higher in jobs that are more distinct from those of others and permanently observable to others. Turner and Lawrence also identified responsibility as a potential job characteristic that encompasses the probability of serious error, the ambiguity of remedial action (the clarity of the solution), and the time span of discretion (the delay needed to detect mistakes). All of these dimensions of responsibility may be social characteristics-not only task characteristics-in that they have implications for the harm that employees may do to others as a result of making errors.

As a third example, friendship opportunities may become less prevalent as a social job characteristic. The advent of virtual work, global operations, temporary project work, and independent contracting may reduce opportunities for social interactions and interpersonal relations (Shamir & Salamon, 1985), as well as for building trust and strong ties. Therefore, both employers and employees are facing challenges in developing meaningful interpersonal relationships on the job. In response to these challenges, the phenomenon of "coworking" has emerged, whereby independent workers in different jobs work in a common space for a sense of community (Fost, 2008). This new form of working is ripe for theoretical and empirical attention.

As a final example, researchers have begun to consider the social features of virtual work, with evidence suggesting that empowerment may be particularly important in virtual teams with little face-to-face interaction (Kirkman, Rosen, Tesluk, & Gibson, 2004). In addition, in the service industry, for example, as technology improves, we expect increases in the opportunity for virtual interaction between the service employees and their customers, regardless of geographical location. These increased opportunities for visual contact with beneficiaries are expected to enhance employees' experience of task significance (Grant, 2007). Along these lines, we hope to see further research on new and forgotten social job characteristics.

Knowledge characteristics of jobs may be expanding and changing at similar rates. Recent years have brought continued increases in the scope and importance of knowledge work, significant growth in globalization and global operations, greater employee involvement in job design and greater autonomy for job crafting, and the enhanced use of continued information technology and flexible work methods, ranging from virtual teams to teleworking (e.g., Elsbach & Hargadon, 2006; Parker et al., 2001; Rousseau & Fried, 2001; Sinha & Van de Ven, 2005). Many of these changes are associated with increased unpredictability and uncertainty. As such, researchers have recommended that we devote greater attention to the design of knowledge and creative jobs and their creative requirements (Elsbach & Hargadon, 2006; Unsworth et al., 2005), as well as the design of the knowledge-intensive jobs held by executives (Hambrick, Finkelstein, & Mooney, 2005) and white-collar employees and managers (Xie & Johns, 1995). Shamir (1992) has even called for a "nonorganizational work psychology" that focuses on the dynamics of working from home, which are especially salient for employees performing virtual work. Along these lines, we expect to see researchers continue to uncover new knowledge characteristics of jobs and explore how their effects are contingent on moderators at the job, individual, and organizational levels.

New knowledge characteristics of jobs.

Changing knowledge characteristics of jobs may affect task characteristics as well. Autonomy is particularly important in knowledge work (e.g., Janz & Prasarnphanich, 2003), and knowledge workers are increasingly being given freedom not only in terms of "when to do" and "how to do" (Hackman & Oldham, 1980), but also in terms of "what to do," "with whom to do," and "from where to do" (e.g., Breaugh & Becker, 1987; Morgeson & Humphrey, 2006). In knowledge-based organizations, such as high-tech startups, the premium placed on innovation often leaves employees with discretion about what specific goals and tasks to pursue (Fried et al., 2008). Further, flexibility in work locations may have both benefits and costs for knowledge workers. On the one hand, increased location autonomy increases control over

job performance; on the other hand, being able to work from home or away from work in nonstandardized hours may increase role overload and burnout (Fried et al., 2008). We clearly need more research on the effects of knowledge characteristics on task characteristics and outcomes in changing work environments.

As another example of knowledge characteristics influencing task characteristics, the growing use of technology to provide electronic performance feedback and monitoring may lead to cognitive overload, burnout, reduced control and lower performance (Kluger & DeNisi, 1996; Parker et al., 2001). As technology progresses, we expect ongoing advances in opportunities for immediate and timely feedback, which may exacerbate the problem of excessive feedback. How can organizations design knowledge characteristics of jobs to create an optimal level of timely and detailed feedback? Finally, in addition to knowledge characteristics, there is a need to develop a theoretical conceptualization of skill and ability characteristics, which will capture what employees are trained and able to do, as opposed to simply what they know.

Temporal job characteristics. We also hope to see researchers investigate whether Morgeson and Humphrey's (2006) four categories of task, physical, knowledge, and social characteristics comprehensively capture the full set of categories that should be used to describe jobs. Temporal job characteristics—job features that influence the time horizons on which employees complete work-may be one category worth adding, especially as technological advances continue to fuel faster performance and cycle times. Such variables as time pressure (Elsbach & Hargadon, 2006) and work cycles, time-toaccomplishment, and required delay of gratification (Fried, Grant, Levi, Hadani, & Slowik, 2007) may qualify as temporal job characteristics. Existing temporal perspectives have focused on dynamic relationships among task and knowledge characteristics (Clegg & Spencer, 2007; Mathieu, Hofmann, & Farr, 1993) but have not yet fully captured temporal characteristics themselves.

New macroscopic environmental variables and cultural differences. The nature of the workforce itself is changing considerably, with more women, greater ethnic diversity, more educated employees, altered psychological contracts between employers and employees (Fried et al., 2008), and an aging population (e.g., Kanfer & Ackerman, 2004). These contextual changes give rise to new questions about the design, experience, and effects of jobs. Although the majority of job design models have been rooted in psychological frameworks focusing on individual motivation, satisfaction, and performance, researchers have offered hints that job designs are also embedded in national cultures, institutional fields, organizational structures, and emerging technologies (e.g., Brass, 1981; Dean & Snell, 1991; Oldham & Hackman, 1981; Parker et al., 2001; Robert, Probst, Martocchio, Drasgow, & Lawler, 2000; Spreitzer, 1996). For example, Robert et al. (2000) reported a negative relationship between empowerment and job satisfaction in India, which appears to be attributable to the lack of fit between empowering employees to make their own decisions and the Indian cultural values of power distance, which emphasize hierarchy and status. Similarly, Roe, Zinovieva, Dienes, and Ten Horn (2000) found a weaker relationship between autonomy and the JCM critical psychological states in Bulgaria and Hungary than in the Netherlands, which is characterized by a more individualistic culture (see also Gelfand, Erez, & Aycan, 2007).

Furthermore, in a sample of more than 100,000 employees from 49 countries, Huang and Van De Vliert (2003) found that enriched job characteristics are related more strongly to job satisfaction in countries characterized by high wealth, high individualism, strong governmental social welfare programs, and low power distance. Finally, researchers have proposed that job design may have stronger effects in cultures characterized by high power distance, where employees are more likely to conform to supervisors' expectations (Leung, 2001), and found that helping coworkers is more likely to be viewed as part of one's job in collectivistic than individualistic cultures (Perlow & Weeks, 2002). These studies support the notion that the effect of job characteristics on individual reactions will be affected by the national culture in which the organization is embedded. Although the findings on job characteristics in the context of culture are promising, we need more theoretical development and systematic research on the effect of particular job characteristics on specific outcome variables in different cultures and macroscopic contexts. Of particular value will be investigations of how autonomy and control unfold in different cultures. Some researchers have argued that autonomy is a universal psychological need across cultures that can be differentiated from individualism and independence: Autonomy involves choice, whereas individualism and independence involve separation from other people (Chirkov, Ryan, Kim, & Kaplan, 2003). Other researchers, however, have argued that autonomy is still more important in individualistic than collectivistic cultures (Chua & Iyengar, 2006). Further studies are needed to resolve this debate.

Unanswered Questions

Job design researchers have only begun to scratch the surface of several important areas of inquiry. Next, we call attention to unanswered questions about the role of individual differences and job design, job design as a decision-making process, interactions among job characteristics, curvilinear effects, units of analysis, and multidimensionality of characteristics.

Individual differences and job design. We believe it is time for researchers to move beyond growth need strength as the primary individual difference moderator of reactions to job characteristics. Although the five-factor model has been the dominant taxonomy of personality for nearly 2 decades (e.g., Barrick & Mount, 1991), surprisingly little research has investigated whether the Big Five personality traits of extraversion, neuroticism, conscientiousness, agreeableness, and openness moderate individuals' attitudinal and behavioral reactions to job characteristics. There is evidence, however, that individual differences in conscientiousness and prosocial values moderate the effects of task significance on performance, with employees low in conscientiousness and high in prosocial values responding most favorably (Grant, 2008a). There is also evidence that

positive affectivity moderates the effect of objective task enrichment on task perceptions, with employees high rather than low in positive affectivity responding more favorably to moderately enriched tasks (Fortunato & Stone-Romero, 2001), and that psychologically flexible employees respond more favorably to enhanced job control (Bond, Flaxman, & Bunce, 2008).

We hope to see attention to a broader range of individual differences as moderators. In addition to the Big Five, researchers may investigate the moderating roles of knowledge, skills, and abilities (Morgeson & Humphrey, 2008) and orientations toward work as a job versus career versus calling (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). With respect to work orientations, we may be witnessing a rise of job orientations as free time and leisure activities have increased substantially in the past few decades (e.g., Hunnicutt, 1988; Snir & Harpaz, 2002). Some have even argued that this increase in the importance of leisure time signifies a decrease in work importance (for a review, see Snir & Harpaz, 2002). According to compensation models, employees who experience deprivation at work will compensate in their choice of non-work activities (e.g., Kohn & Schooler, 1982; Snir & Harpaz, 2002; Wilensky, 1960; cf. Judge, Bono, & Locke, 2000). This suggests that employees who lack enriched jobs will seek out enrichment in other life domains, and employees who lack enriched nonwork lives may seek out enriched jobs. These reactions, however, may depend on employees' work orientations, with calling-oriented employees seeking out greater involvement and identity engagement in work and job-oriented employees preferring to invest their time, energy, and identities in nonwork activities.

Researchers may also attend to the impact of gender differences on job design, returning to classic research on orientations toward people versus things and data versus ideas (Fine, 1955; Lippa, 1998; Little, 1972; Morgeson & Campion, 2003; Rousseau, 1982), as well as to debates about whether gender differences are due to evolutionary and biogenetic sources (Buss, 1995) or social roles, expectations, and stereotypes (Eagly & Wood, 1999). With respect to gender, the past few decades have witnessed significant increases in working women and dual-career families (e.g., Parker et al., 2001). This, in turn, has increased the potential for work-family conflict (Oldham, 1996; Parker et al., 2001). Such conflict, unless being carefully managed, can adversely affect employees' abilities to function in demanding work environments (Fried et al., 2008). We clearly need more research on the effect of dual-career issues on employees' reactions to job design, and on what organizational policies and choices can enable dual-career employees to successfully manage high job demands without creating work-family conflict. Finally, research is also needed on the roles that individual values (Grant, 2008a), interests (Holland, 1996), and knowledge, skills, and abilities (Morgeson et al., 2005) play in moderating reactions to job design. Vocational psychology may offer particularly useful contributions in this area (Gustafson & Mumford, 1995).

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Job design as a decision-making process. At present, we know little about how managers make decisions about jobs (Campion & Stevens, 1991). From a sociological perspective, managers' decisions may be influenced by institutional norms and mimicry of similar firms (Meyer & Rowan, 1977), as well as the fads and fashions that take the popular press by storm (Abrahamson, 1996). From a psychological perspective, managers may use heuristics to guide decisions about how to design jobs (Heath, Larrick, & Klayman, 1998). For example, research on the false consensus bias suggests that managers may rely on their own preferences and personalities to infer their employees' preferences (Marks & Miller, 1987; Ross, Greene, & House, 1977). Similarly, as noted earlier, researchers have shown that many decision makers systematically underestimate the importance of enriched job characteristics in motivating employee performance, relying instead on work simplification principles (Campion & Stevens, 1991) and extrinsic rewards (Heath, 1999).

Along these lines, recent research has suggested that job perceptions are a mechanism through which transformational leaders may inspire higher task performance and citizenship behavior. More specifically, researchers have found that perceptions of jobs as motivating and meaningful mediate the associations of transformational leadership with the outcomes of task performance and citizenship behavior (Piccolo & Colquitt, 2006; Purvanova, Bono, & Dzieweczynski, 2006). Additionally, the concept of evocation offered by Buss (1987) implies that managers may base job design decisions in part on the personality traits of employees. Managers may offer task significance and autonomy to conscientious employees, high interpersonal contact to agreeable extraverts, and jobs with strong creative requirements to open-minded employees. Once managers have made these decisions, how do they implement them? For instance, when seeking to enhance an employee's task significance, do managers share inspiring stories, implement contact with beneficiaries, provide more autonomy and support for job crafting, or even delegate their own significant tasks to employees? Although sparse research has attended to the processes through which managers make and implement job design decisions, we believe that this is a fruitful avenue that could spawn an entire literature. From a different angle, the field would also benefit from research on the political and social processes that affect job crafting when leaders, structures, and climates are not supportive of job changes initiated by individual employees.

Interactions among job characteristics. Researchers have largely neglected efforts to systematically investigate how multiple job characteristics interact to influence attitudes and performance (Dodd & Ganster, 1996). Hackman and Oldham (1976, 1980) proposed that autonomy would enhance the motivational effects of meaningrelated job characteristics such as task significance and task identity, such that task significance and task identity would produce more favorable effects on attitudes and performance when employees had autonomy. This synergistic effect has received little support (Dodd & Ganster, 1996; Oldham & Hackman, 2005). Perhaps it is time for researchers to abandon the synergistic hypothesis in favor of a compensatory hypothesis. For example, high-reliability organizations (HROs), such as air traffic control systems and nuclear power plants, place high priority on preventing errors (Hofmann & Stetzer, 1998; Weick & Roberts,

1993; Zohar & Luria, 2003). The expected growth of these organizations is consistent with the projected increase in importance of public safety and security needs, as well as the increased complexity of technology and its impact on society. HROs often use restrictive rules and procedures to reduce individual error (Weick, Sutcliffe, & Obstfeld, 1999). The potential motivational costs of this lack of autonomy may be offset by the high levels of task significance inherent in the mission of protecting public safety and human well-being. We hope that researchers will examine whether high task significance compensates for low autonomy in HROs, and explore other new patterns of interactions between job characteristics (see also Morgeson, Johnson, Campion, Medsker, & Mumford, 2006).

On a related note, researchers have paid little attention to possible interactions between job feedback and interpersonal feedback. It may be the case that when one source of feedback is lacking, the other source of feedback may serve a compensatory function. For example, knowledge workers responsible for abstract ideas and ambiguous projects are unlikely to receive direct feedback from the job itself, which may increase their reliance on interpersonal feedback. The direction of the interactive effects may depend on contextual factors. For instance, knowledge workers responsible for well-structured tasks-such as fixing bugs in computer programs—may be able to use feedback from the task itself regardless of feedback from other people. There is a need to develop a more systematic theoretical integration between the constructs of job feedback and interpersonal feedback.

Curvilinear effects of job characteristics. The majority of job design theory and research has focused on linear, monotonic associations between job characteristics and attitudinal and behavioral outcomes. However, several studies have revealed curvilinear relationships between several job characteristics and outcomes. Much like vitamins, in high doses, "enriched" job characteristics may actually have detrimental effects (Warr, 2007). For instance, Xie and Johns (1995) found a U-shaped relationship between objective ratings of job complexity and self-reports of emotional exhaustion. Similar costs of highly complex or enlarged jobs have been noted by other researchers (e.g., Campion & McClelland, 1993; Elsbach & Hargadon, 2006). Social psychologists have even begun to identify boundaries on autonomy, returning evidence that high levels of choice can lead to dissatisfaction, regret, and indecision (Chua & Iyengar, 2006; Schwartz, 2000). Such effects may be explained by theories of personenvironment fit, which suggest that job characteristics are most likely to engender negative effects when they are supplied at levels that exceed employees' preferences and abilities (e.g., Cable & Edwards, 2004; Ostroff & Judge, 2007). We hope to see researchers answer calls from Warr (2007) to address these types of curvilinear effects and explain their mechanisms and boundary conditions.

Units of analysis for understanding the structures of work. Which work structures should we choose as our units of analysis? Should we retain a focus on jobs and tasks, shift to an emphasis on roles, or consider "middle-range" (Weick, 1974) or intermediate units? Such intermediate units may include activities or duties (Morgeson & Campion, 2002), projects (Grant, Little, & Phillips, 2006; Weick, 1999, 2003), and workdays (Elsbach & Hargadon, 2006). Researchers have yet to achieve consensus on the meaning and potential utility of these more molecular versus more global conceptualizations of work structures.

Multidimensionality of job characteristics. Multidimensionality is an issue that warrants greater consideration in ongoing research. Researchers have increasingly recognized that specific job characteristics are multifaceted. For example, researchers have identified autonomy as varying in terms of decision making, scheduling, and methods dimensions (Breaugh, 1985; Morgeson & Humphrey, 2006; Wall et al., 1992), task significance as varying in terms of magnitude, scope, frequency, focus, beneficiary, and wellbeing domain dimensions (Grant, 2007), and interpersonal contact as varying in terms of duration, frequency, intensity or depth, directness or proximity, and breadth (Cordes & Dougherty, 1993; Grant, 2007). It is puzzling that other job characteristics have not been seen as multidimensional when related literatures have highlighted multiple facets.

For instance, psychologists and sociologists typically differentiate between emotional and instrumental forms of social support (e.g., Carver, Scheier, & Weintraub, 1989; House, 1981), or between more specific forms such as relieving emotional distress, giving advice, teaching skills, and providing material aid (e.g., Duffy, Ganster, & Pagon, 2002). Similarly, although job feedback and interpersonal feedback are seen by job design researchers as unidimensional characteristics (Hackman & Oldham, 1980; Morgeson & Humphrey, 2006), the feedback literature suggests that feedback can vary in terms of sign/ valence (positive vs. negative), focus of attention (learning, motivation, meta-task), and medium (verbal vs. written), specificity, credibility, and timeliness (Kluger & DeNisi, 1996), and the performance monitoring literature suggests that feedback can also vary in terms of purpose and perceived intensity (Holman, Chissick, & Totterdell, 2002). As a third example, although many job design researchers focus on the initiated versus received dimension of task interdependence (Kiggundu, 1981, 1983; Morgeson & Humphrey, 2006), researchers have highlighted a number of other dimensions of interdependence. Wong and Campion (1991) divided interdependence into three broad dimensions, each with multiple facets: task inputs (materials or supplies, information, product or service), task processes (input-output relationship, method, scheduling, supervision, sequencing, time sharing, support service, tools), and task outputs (goal, performance, quality). Others have distinguished between means or task interdependence and resource interdependence (Johnson & Johnson, 1999; Wageman, 1995) and pooled versus sequential versus reciprocal interdependence (Thompson, 1967). From a pragmatic standpoint, whether researchers study single or multiple dimensions of job characteristics may involve trade-offs between respondent burden and potential redundancy with comprehensiveness. From a theoretical standpoint, however, we believe that our understanding of job design can be enhanced by considering the multiple dimensions along which key job characteristics

may vary. The more dimensions that we can generate, the more opportunities we can identify for redesigning jobs.

HOW SHOULD WE GET THERE? THEORY-BUILDING AND METHODS IN RESEARCH AND PRACTICE

Thus far, we have focused our attention primarily on past, present, and possible future theoretical perspectives and empirical findings. In this section, we consider the different theory-building and methodological approaches that have been used in the past, and may help to advance the future, of job design research.

Theory-Building Approaches

Researchers have taken different approaches to building job design theories. Some researchers have adopted a theory-focused approach (Weick, 1992), generating conceptual models with the goal of contributing to knowledge by filling gaps or resolving tensions in the literature. For example, Campion and Thayer (1985) developed their perspective on interdisciplinary job design to compare, reconcile, and synthesize different approaches recommended in organizational psychology, industrial engineering, physiology and ergonomics, and cognitive psychology. Similarly, Clegg and Spencer's (2007) dynamic model of job design was guided by the observation that job design theorists had not yet integrated key insights that challenged several assumptions of the dominant existing models. In contrast, other researchers have adopted a problem-focused approach (Lawrence, 1992), recognizing problems or challenges in the field and then generating theories to solve these problems. For instance, Wrzesniewski and Dutton (2001) noticed that hospital cleaners were taking initiative to alter their tasks and relationships in ways that were not part of their job descriptions. They developed their theoretical perspective on job crafting to describe and explain these behaviors. Likewise, Grant and colleagues noticed in field research that many employees were doing jobs high in task significance but were left disconnected from seeing their impact on beneficiaries. This observation fueled the theoretical development and empirical test

of a model of relational job design that could describe, explain, and resolve this problem (Grant, 2007, 2008a; Grant et al., 2007).

We see value in both theory-focused and problemfocused approaches to building job design theory. However, we expect that new theoretical perspectives on job design will be increasingly problem driven. Since no theory of social behavior can be simultaneously simple, general, and accurate (Thorngate, 1976), it is unlikely that any single theoretical model will be able to capture all of the important dimensions, antecedents, consequences, mechanisms, and boundary conditions of job design. Instead, we anticipate that researchers will generate novel "middlerange theories" (Weick, 1974) to describe, explain, and resolve job design challenges that emerge in practice. Such problem-driven approaches will require researchers to pay close attention to context (Johns, 2006) to capture the organizational, occupational, social, environmental, and technological opportunities and constraints that affect how jobs are designed, enacted, and experienced.

Methodological Approaches

The job design literature is an exemplar in I/O psychology and organizational behavior research for its methodological diversity. In many cases, job design researchers have followed advice from methodologists to allow their research questions to guide their choices of methods (McGrath, 1981), which results in excellent fit between the theoretical question being posed and the suitability of the method for addressing it. When seeking to inductively identify the dimensions along which incumbents perceive job characteristics, researchers have used multidimensional scaling methods (e.g., Stone & Gueutal, 1985). When seeking to test complex models with multiple antecedent, mediating, moderating, and outcome variables, researchers have used surveys of broad cross-sections of jobs (e.g., Hackman & Oldham, 1976). When seeking to cumulate knowledge, researchers have used meta-analyses to draw broad conclusions about relationships among dimensions of job characteristics (Fried, 1991; Taber & Taylor, 1990) and between these dimensions and work related outcomes (Fried & Ferris, 1987; Morgeson & Humphrey, 2006). When seeking to determine how

job characteristics influence intraindividual changes in daily well-being, researchers have used experiencesampling studies to capture micro-level experiences (Sonnentag & Zijlstra, 2006; Totterdell, Wood, & Wall, 2006). When seeking to address questions of causality and internal validity that are difficult to control in the field, researchers have used laboratory experiments (e.g., Dodd & Ganster, 1996; Grant et al., 2007; Griffin et al., 1987; White & Mitchell, 1979). When seeking to achieve both internal and external validity, researchers have used field experiments and quasi-experiments, randomly assigning different groups of employees to controlled manipulation and treatment conditions (e.g., Grant, 2008a) or capitalizing on naturally occurring interventions that allow for the comparison of nonequivalent treatment groups (e.g., Campion & McClelland, 1991, 1993; Griffin, 1991; Lieberman, 1956; Morgeson & Campion, 2002; Morgeson et al., 2006; Oldham et al., 1995; Parker, 2003; Wall et al., 1986).

However, our assessment is that the job design literature features too many cross-sectional or singlemethod, single-source survey studies in which it is difficult to rule out alternative explanations such as reverse causality, omitted variables, and selection threats. Such studies hamper not only the conclusions drawn by individual authors, but also the ability of the broader community of scholars to draw generalizable conclusions from meta-analyses: "garbage in, garbage out." As is true in many areas of applied psychology and organizational behavior, the strongest study designs also tend to be the most invasive and time-sensitive designs. However, we believe that in the coming years, the job design literature is most likely to be advanced by four types of studies: field experiments and quasi-experiments, longitudinal survey and experience-sampling studies, qualitative studies, and multimethod and multisource designs. Next, we elaborate on the potential contributions of each methodological approach.

Field experiments and quasi-experiments: Combining internal and external validity and supporting job redesign. Many researchers see field experiments and quasi-experiments as the gold standard for studying job design and redesign. Such experiments allow researchers to support causal inferences by ruling out alternative explanations, and also facilitate generalizability to the field settings that we are ultimately studying. Furthermore, these experiments make it possible for researchers to achieve applied goals of diagnosing, implementing, and evaluating job redesign interventions. As highlighted in our two introductory vignettes, in studying job redesign, researchers typically begin by conducting interviews with managers and observations or surveys of employees. These interviews and surveys make it possible to identify job characteristics that may be constraining and undermining outcomes such as satisfaction, motivation, performance, initiative, and health, as well as job changes that might help to enhance and enable these outcomes. Researchers then collect pretest data on perceptions of job characteristics, the outcomes of interest, and the mediators and moderators expected to carry and bound the effects of an intervention. Interventions are then designed and implemented by researchers or practitioners, dividing employees into different treatment and control groups, and researchers follow up with measures of perceived job characteristics, outcome variables, and mediators to examine and evaluate the effects of the intervention on each group. In this process, researchers can contribute to theory by achieving high levels of both internal and external validity, and also contribute to practice by helping to diagnose, implement, and evaluate job redesign interventions (for further advice, see Grant & Wall, 2009).

Longitudinal survey and experience-sampling studies: Supporting internal and external validity when experiments are not possible or not ethical. The job design literature also features surprisingly few longitudinal studies. Most of the longitudinal studies in this literature take the form of long-term evaluations of the effects of field experiments and quasi-experiments (e.g., Campion & McClelland, 1993; Griffin, 1991; Lieberman, 1956; Morgeson & Campion, 2002; Morgeson et al., 2006; Parker, 2003; Wall et al., 1986). When it is not possible or ethical for researchers to conduct experiments, we recommend more longitudinal survey and experiencesampling studies. Such studies allow for much stronger causal inferences than cross-sectional studies while maintaining greater fidelity to external validity than lab experiments allow. Experience-sampling studies may also help researchers capture daily and weekly effects of task-level experiences (e.g., Sonnentag & Zijlstra, 2006; Totterdell et al., 2006).

Qualitative studies: Identifying new job characteristics and mechanisms. In addition, we hope to see more qualitative studies in the job design literature. Job design researchers, being trained primarily in I/O psychology and organizational behavior, have predominantly used quantitative methods to deductively test hypotheses. However, Barley and Kunda (2001) called for more detailed, in-depth studies of work to enrich our understanding of how work is changing in its methods and meaning. Accordingly, we believe that qualitative methods will help researchers to inductively build theory about new job characteristics and mechanisms. For example, qualitative studies have facilitated the discovery of the importance of informal social interaction in job experiences (Roy, 1959), the phenomenon of job crafting (Wrzesniewski & Dutton, 2001), and new explanations for how job control facilitates performance (Wall et al., 1992). Along these lines, although they have received little attention in the job design literature, organizational scholars have recently conducted a number of qualitative studies that have implications for issues of interest to job design researchers. For example, researchers have investigated the work conditions that enable psychological engagement (Kahn, 1990), the strategies that managers use to help employees doing "dirty work" cope with and counter occupational stigma (Ashforth, Kreiner, Clark, & Fugate, 2007), how medical residents resolve work-identity violations when they find that their actions do not match their identities (Pratt, Rockmann, & Kaufmann, 2006), and how managers, doctors, police officers, and addiction counselors express compassion when their tasks require them to harm others in the interest of a greater good (Margolis & Molinsky, 2008). We need more qualitative

research of this kind, using a combination of case study, interview, and observational-ethnographic methods, to identify new job characteristics and fresh mechanisms through which these job characteristics may influence employees' attitudes and behaviors.

Multimethod, multisource designs: Triangulating results. Historically, the Job Diagnostic Survey (Hackman & Oldham, 1975, 1980) and the Job Characteristics Inventory (Sims et al., 1976) have been the two most popular scales for measuring job design (for a comparison, see Fried, 1991). Recently, Morgeson and Humphrey (2006) developed the more comprehensive Work Design Questionnaire to allow researchers to measure a much broader set of task, knowledge, physical, and social characteristics of work. These scales rely primarily on Likert-type scales in which respondents indicate the extent of agreement versus disagreement with statements about a job. Most often, respondents are providing self-reports on their own jobs, but some researchers have supplemented these self-reports with ratings from observers such as coworkers, supervisors, and spouses, as well as with independent job classification data from the Dictionary of Occupational Titles or the O*NET (e.g., Morgeson & Humphrey, 2006; Xie & Johns, 1995). Ideally, rather than relying primarily on a single approach, researchers will use multiple methods and sources to strengthen their findings and interpretations. Incorporating sophisticated research designs that combine quantitative and qualitative data, field and laboratory studies, and measures of psychological, behavioral and physiological outcomes obviously requires substantial investments of time, resources, and energy. However, as Campbell and Fiske (1959) articulated, the internal and external validity of our conclusions is ultimately dependent on our ability to triangulate results across different methods and sources of data.

CONCLUSION

Job design is a topic that continues to fascinate (and sometimes frustrate) both scholars and practitioners. Given its theoretical and practical importance, we are confident that research on job design will continue to flourish in the coming decades and centuries. We hope that in addition to dutifully testing existing theories, researchers will keep their eyes open to new phenomena that help us gain a deeper understanding of job design. As Einstein once quipped, "If we knew what we were doing, it wouldn't be called research, would it?"

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