CHAPTER 7

Personnel Selection and Employee Performance

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A detailed treatment of the area of personnel selection in a single chapter is even less possible now than it was when the first *Handbook* was published 10 years ago. One of our goals is to build on our 2003 model (Schmitt, Cortina, Ingerick, & Weichmann, 2003) by integrating into it the variables, processes, and issues that have received a good deal of attention over the past 10 years. A second goal is to integrate the variables, processes, and issues that we believe will receive attention over the next 10 years. Among the topics that we emphasize in this chapter are knowledge and skill predictors of contextual performance, personality predictors of performance, predictors of team performance, intraindividual variability, faking in personality assessment, implicit measurement, fairness, motivation, counterproductive work behaviors, withdrawal, citizenship, diversity, workplace safety, innovation, customer service, and expatriate/cross-cultural issues.

PERFORMANCE MODEL

Our model begins with the notion that there are two major individual difference determinants of performance: "can do" and "will do" factors. This notion underlies most of the history of industrial/organizational psychology, if not psychology in general. In the performance domain itself, this distinction is often referred to as the difference between maximal (can do) and typical (will do) performance. "Can do" factors include what has been referred to as "g" (general cognitive capacity) and lower order abilities (e.g., spatial perception, math and verbal abilities, reasoning, etc.). Also included in the "can do" category are physical abilities (e.g., manual dexterity, strength, coordination, stamina). The Fleishman taxonomy of physical ability and his measures of these abilities (Fleishman & Reilly, 1992) have dominated this area of research within the personnel selection arena (J. C. Hogan, 1991). Another "can do" characteristic is the experience an individual brings to a job. While not an ability in the traditional sense, the experience that an individual brings to a job situation certainly contributes to her or his competent handling of that situation. Accordingly, job experience has played a central role in various theories of job performance (Borman, White, Pulakos, & Oppler, 1991; Campbell, McCloy, Oppler, & Sager, 1993; Schmidt, Hunter, & Outerbridge, 1986).

The "will do" factor in our model is represented by personality and integrity. In the past 2 decades, the interest in personality determinants of performance is obvious to anyone reading the journals publishing personnel selection

research. Renewal of interest began with the meta-analysis published by Barrick and Mount (1991), establishing conscientiousness as a valid predictor of performance across job situations and establishing other of the Big Five dimensions as valid predictors in some circumstances. Many industrial–organizational (I-O) researchers (e.g., J. C. Hogan & Roberts, 1996; Hough, 1998) believe that the Big Five do not represent an all-inclusive taxonomy of personality. For example, constructs such as need for achievement are found to be particularly predictive of performance. In many jobs, a sense of integrity has been found to be relevant to our understanding of counterproductive behavior (Ones, Viswesvaran, & Schmidt, 1993). In any case, conscientiousness, need for achievement, and integrity are all motivational in nature and therefore belong among the "will do" factors.

Finally, it is important to note that "can do" and "will do" factors are often thought to interact to determine performance. That is, one must be both able and motivated to perform well, and if either of these characteristics is low or absent, performance will be inadequate. For a variety of reasons discussed later in this chapter, such interactive hypotheses often are not supported. In any event, we have ample evidence of the importance of both factors in the determination of performance.

The "can do" and "will do" variables are thought to lead to declarative knowledge (knowledge about facts and things), procedural knowledge or skill (knowing how to do something as well as what to do), and motivation, with the latter being a combination of three choices: what to do, how much energy to expend on the activity, and how long to continue expending energy. Viewing these three variables as mediators of the individual difference–performance relationship is consistent with the Campbell et al. (1993) theory.

Performance is behavior that is a direct function of declarative and procedural knowledge and motivation. Our notions about performance include the major performance dimensions specified by Campbell et al. (1993), but we have grouped them into task proficiency, contextual behavior, and adaptive performance. The distinction between task proficiency and contextual behavior is consistent with work that indicates that these two major dimensions of work behavior are conceptually and empirically distinct (Borman & Motowidlo, 1993; 1997; Motowidlo, Borman, & Schmit, 1997). Task proficiency involves behaviors that contribute to the technical core of the organization. By contrast, contextual work behavior supports the environment in which the technical core must function, rather than the technical core itself. A final performance dimension, adaptive performance, can be defined as the proficiency with which employees self-manage novel work experiences (London & Mone, 1999). Adaptive performance is considered separately because it appears to be an important part of job performance that doesn't fit neatly into either task or contextual performance (Pulakos, Arad, Donovan, & Plamondon, 2000).

Individual job performance and performance aggregated over individuals has a variety of outcomes both individual and organizational. The introduction of the notion that performance can be aggregated and that outcomes include organizational-level variables as well as individual variables means that our research must consider levels-of-analysis issues (Klein & Kozlowski, 2000). A significant body of such literature has been generated in the past 2 decades (see Schneider, Smith, & Sipe, 2000, for a review). Some of the variables in the last column of Figure 7.1 can be conceptualized and measured both at the individual and organizational levels. Such is the case for productivity measures. Customer satisfaction is almost always an aggregated or organizational-level variable, though there might be cases in which organizational members serve a single client and an individual level of analysis without aggregation could be conducted. Withdrawal and counterproductive behaviors could be treated as individual or organizational. Litigation and social responsibility measures are likely to be organizational.

One of the most intriguing avenues of research over the past 10 years has involved the within-person level of analysis. That is, variables that had traditionally been conceptualized and examined at the between-person level (e.g., job attitudes, contextual performance) are increasingly studied at the within-person level (e.g., Judge, Scott, & Ilies, 2006; Yeo & Neal, 2004). Just as new truths have been discovered as we have broadened our view to the group level, so have new truths been discovered as we have focused our view on the within-person level.

Figure 7.1 represents some familiar ideas and variables. For example, the individual difference constructs mentioned have been studied by psychologists for most of the past century, as has the construct of job performance (Austin & Villanova, 1992). Distinctions between knowledge components, performance dimensions, and organizational-level indices of performance are notions that are relatively underresearched in the personnel selection literature. Indeed, it is only in the past 15 years that selection models clearly reflect such distinctions (e.g., Hough & Oswald, 2000). This figure and our preceding discussion of it represent an outline of the issues we address in this chapter.

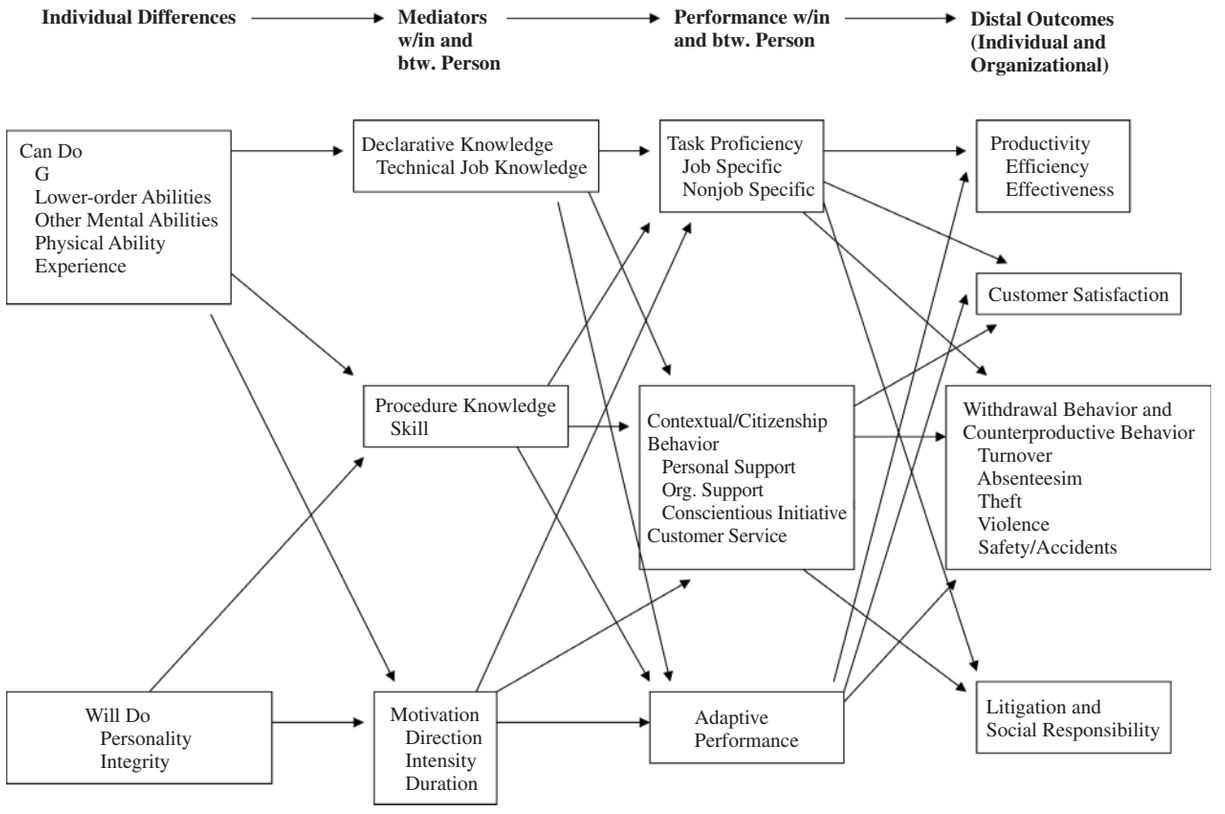

Figure 7.1 A model of personnel selection

THEORIES OF JOB PERFORMANCE AND JOB ANALYSIS

Figure 7.1 is presented as a general model of job performance. This model has grown in important ways from the model that was presented 10 years ago. First, research has shown that many of the variables that had been conceptualized and studied at the between-person level are now conceptualized at the within-person level (e.g., Dalal, Lam, Weiss, Welch, & Hulin, 2009; Judge, Scott, & Ilies, 2006). Second, our conceptualization of contextual performance has become far more complex (e.g., Bolino, 1999; Bolino & Turnley, 2005). Third, linkages between knowledge and various proximal and distal outcomes have been discovered (e.g., Bergman, Donovan, Drasgow, Overton, & Henning, 2008). Fourth, the role of cognitive ability as self-regulatory mechanism at work has been outlined (Dilchert, Ones, Davis, & Rostow, 2007).

Models of job performance in specific work situations may involve only portions of Figure 7.1, and they will almost always include more detail about the nature of the can do and will do aspects of the job (often referred to as knowledge, skill, ability, and other characteristics [KSAOs]) and the performance domains relevant to the job under consideration. Such models are constructed based on reviews of the literature, the experience of the industrial/organizational psychologist, and a formal job analysis. A job analysis involves the specification of the work behaviors required of job incumbents and hypotheses about the KSAOs required to competently perform those work behaviors. The work involved in a thorough job analysis is time consuming and expensive and is described well in a variety of sources (Goldstein, Zedeck, & Schneider, 1993; Schmitt & Chan, 1998). A detailed job analysis may be necessary when litigation is a possibility (Varca & Pattison, 1993) or when one is trying to document that selection procedures constitute a representative sample of the domain of work behavior (i.e., they are content valid). However, aspects of these detailed analyses may be unnecessary if the researcher can abstract from previous analyses the basic structure of work and its attendant KSAO requirements. This abstraction is one of the basic components of science, that is, parsimony. The most significant development in job analysis in the past 20 years

is the development of such an abstraction by the U.S. Department of Labor in the form of the Occupational Information Network (O*NET).

O*NET represents an extremely rich source of accumulated information about a broad range of jobs. It provides lists of job tasks and related KSAs (categorized as broad occupational requirements, worker requirements, and worker characteristics) as well as the level and importance of the KSAs required for most major jobs in our economy. In addition, experience, educational, and licensing/certification requirements as well as occupational characteristics are specified for most jobs. As such, much of the work involved in forming a basic model of performance on these jobs can be done by consulting this computerized database. The need for extensive new job analyses in specific situations has thus been reduced. As was noted in the 2001 version of this chapter, updating of this database is essential. Traditional employment arrangements have been changed as a function of outsourcing, use of temporary employees, and the creation of individual career paths (Hall, 1996). One important research effort might involve the documentation of such changes and the implications for various aspects of the content model underlying the O*NET.

THE NATURE OF PERFORMANCE

Until 20 or 25 years ago, I-O psychology had a tendency to focus on predictors of performance to the exclusion of performance itself. This was in spite of numerous pleas to attend better to the "criterion problem" (Campbell, 1990; Dunnette, 1963; Wallace, 1965). Appreciation of the need to better understand the performance side of the equation *prior* to consideration of the predictor side has increased, thanks in part to some influential sources (Austin & Villanova, 1992; Binning & Barrett, 1989; Campbell, 1990). Consistent with this concern regarding the nature of performance and much recent research, we discuss the differences between task and contextual performance. We also discuss adaptive performance and other possible candidates for the list of performance dimensions.

Why Focus on the Task/Contextual Performance Distinction?

Although this distinction was relatively new 10 years ago, aspects of it have received much attention since. In one way or another, a good deal of recent research has focused on the distinction between organizational citizenship behaviors (OCBs) targeting individuals (OCB-I) and OCBs targeting the organization (OCB-O; McNeely & Meglino, 1994). Other research has focused on the flip side of contextual performance (e.g., counterproductive work behaviors, workplace deviance, workplace incivility). Finally, just as Motowidlo and Van Scotter (1994) found that behaviors classified as contextual are predicted by different variables than are behaviors classified as task related, so has more recent research shown that these more specific categories have different nomological networks (LePine, Erez, & Johnson, 2002).

Why Include Adaptive Performance?

Adaptive performance has also received a great deal of attention since the last edition of this volume (e.g., Dorsey, Cortina, & Luchman, 2010). Although the task/contextual distinction describes well the day-to-day activities in most job settings, there exists an overarching concern about the dynamic nature of today's workplace and the attributes needed to negotiate the fluctuations associated with it (Bridges, 1994; Ilgen & Pulakos, 1999). That is, both task-related and contextual requirements may change on a regular basis, and the successful employee may be the one who identifies these changes and possesses the KSAOs necessary to modify behavior accordingly. Without some consideration of adaptive performance, some theoreticians and researchers believe that any model of performance becomes too static to represent the vagaries and exigencies of the modern workplace (Pearlman & Barney, 1999). Indeed, empirical research has borne this out (e.g., organizational adaptiveness/learning orientation; Baker & Sinkula, 1999).

Task Performance

Every definition of job performance includes the notion of task performance or proficiency. For Katz & Kahn (1978), these are role-prescribed behaviors. For Campbell (1990), these are core tasks. For Borman & Motowidlo (1993), these are the tasks that involve or maintain the "technical core." We focus on the approach suggested by Borman and Motowidlo (1993). Task-related behaviors contribute to the technical core of the organization. Additionally, although they tend to be role-prescribed (as in Campbell's notion of job-specific task proficiency) and built into the formal reward structure, this isn't necessarily so.

The term *technical core* is used here a bit loosely. The technical core, as defined by Borman and Motowidlo (1993), involves the transformation of raw materials

(machine parts, stitches, unenlightened students) into organizational products (machines, closed wounds, less unenlightened students). As can be seen from these examples, the term *raw materials* is not restricted to pig iron and rolls of fabric. Raw materials are those that are to be manipulated in some fashion to become whatever it is that the organization in question produces, and any behaviors that contribute, either directly or indirectly, to the manipulation process are labeled *task related.* As another example, the technical core of managerial jobs may involve the need to manage employee attitudes through conflict resolution or efforts to motivate. The complication that arises is that a given task might represent the technical core for one job but not for another.

Task-related behaviors are typically predicted well by ability and experience-related individual differences (Hunter & Hunter, 1984; Schmidt, Hunter, Outerbridge, & Goff, 1988), and less well by dispositional sorts of variables (Cortina, Goldstein, Payne, Davison, & Gilliland, 2000). Task-related behaviors also have been shown to relate to scores from structured interviews (McDaniel, Whetzel, Schmidt, & Maurer, 1994), biodata forms (Rothstein, Schmidt, Erwin, Owens, & Sparks, 1990), and a variety of other types of predictors. In the latter cases, the predictability would likely result from the fact that these predictors index ability or experience.

In the previous iteration of this chapter, we pointed out that our field had focused most of its attention on task-related performance. This is clearly no longer the case. Our field has come to the realization that the "changing world of work" is not just an empty catchphrase and that most jobs are composed of more than task-related behaviors. As a result, the overwhelming majority of selection-related research published in the last 10 years has focused not on task performance as an outcome, but rather outcomes such as counterproductive work behaviors (e.g., Dalal, 2005), workplace aggression (Douglas & Martinko, 2001), citizenship (Payne & Webber, 2006), proactive behavior (Parker, Williams, & Turner, 2006), compliance (Den Hartog, De Hoogh, & Keegan, 2007), and initiative (De Dreu & Nauta, 2009). As we report later in the chapter, this shift has brought with it a shift in the types of predictors on which we focus our attention.

Citizenship Behavior and Contextual Performance

Citizenship behavior and contextual performance are defined as behaviors that support the environment in which the technical core functions, rather than the technical core itself (e.g., Borman & Motowidlo, 1993; Organ, 1997). Citizenship or contextual behaviors differ from task-related behaviors in that citizenship behaviors are more likely to be constant across jobs, whereas task-related behaviors vary. Examples of citizenship behaviors are persisting with enthusiasm and extra effort, volunteering to carry out activities that are not part of one's formal job, and following organizational rules and procedures even when personally inconvenient. Although citizenship behaviors are less likely to be role-prescribed and thus built into a formal reward structure than task-related behaviors, citizenship behaviors are nevertheless crucial to organizational functioning.

Perhaps the most important research in the past decade on citizenship has attempted to more precisely and accurately define the citizenship domain and refine citizenship theory to better represent its conceptual structure. Theoretical reviews of the citizenship construct generally agree that citizenship is behavior that facilitates the implementation of an organization's technical core tasks. However, theorists disagree on the extent to which citizenship is discretionary and nonrewarded (see LePine et al., 2002, for a discussion). Moreover, theoretical and empirical investigations of the citizenship construct suggest that although citizenship appears to be a higher order factor, it can be broken down into lower order dimensions. Some researchers have distinguished between citizenship directed at the organization and citizenship directed at individual employees (Hoffman, Blair, Meriac, & Woehr, 2007; LePine et al., 2002). Others have distinguished between job dedication and interpersonal facilitation (Van Scotter and Motowidlo, 1996). Borman & Penner (2001) created the most precise conceptualization to date by breaking citizenship into three categories: Personal Support, Organizational Support, and Conscientious Initiative. Each of these was, in turn, broken into three to four dimensions. For example, Personal Support is broken down into Helping, Cooperating, Showing Courtesy and Consideration for Others, and Motivating.

As was mentioned earlier, research has considered the extent to which citizenship behaviors are actually appraised as "work performance" and therefore rewarded (e.g., LePine et al., 2002). Recent research demonstrates quite clearly that citizenship behaviors are, in fact, rewarded as the results of several studies converge on the idea that citizenship contributes—in some cases substantially—to overall performance evaluations (Rotundo & Sackett, 2002; Whiting, Podsakoff, & Pierce, 2008), especially when work tasks are interdependent in nature (Bachrach, Powell, Bendoly, & Richey, 2006). Moreover, recent research finds that citizenship behavior

contributes to multiple indexes of organizational performance such as customer satisfaction (Payne & Webber, 2006), costs, turnover, and productivity (Podsakoff, Whiting, Podsakoff, & Blume, 2009). Interestingly, a recent study also suggests that demonstrating citizenship behavior in a selection interview is related to numerous positive employee outcomes such as ratings of competency, higher level job placement, and higher salary recommendations (Podsakoff, Whiting, Podsakoff, & Mishra, 2011). Citizenship is therefore highly valued and valuable behavior.

Research outlining the antecedents of citizenship behavior also has increased in the past decade. In recent years, citizenship is increasingly being conceptualized as a "resource" in a social exchange relationship. Thus, when an employee is provided with something that is valued by the employee (e.g., monetary reward, public appreciation), the employee may reciprocate with citizenship behavior in order to show his or her appreciation (e.g., Cropanzano & Mitchell, 2005). Research consistent with the social exchange perspective finds, for example, that citizenship is related to relationship quality (Porath & Erez, 2007; Settoon & Mossholder, 2002), psychological contract type (i.e., relational vs. economic) and breach (Hui, Lee, & Rousseau, 2004; Zhao, Wayne, Glibkowski, & Bravo, 2007), leadership style and procedural justice climate (Den Hartog et al., 2007; Ehrhart, 2004), as well as friendship ties in a social network (Bowler & Brass, 2006). The social exchange perspective on citizenship then provides evidence that citizenship can be increased in the workplace by fostering a collegial environment conducive to positive social exchange relationships.

In addition to the social exchange perspective, a large amount of research on citizenship takes a personological approach. For example, research from the personological perspective shows that dispositions emphasizing dutifulness (e.g., Moon, Kamdar, Mayer, & Takeuchi, 2008) are important antecedents of citizenship. Citizenship behaviors also tend to be performed more often by employees endorsing an "other-centered" or prosocial orientation. Indeed, multiple studies find converging evidence that prosocial motives predict citizenship toward other employees and the organization (De Dreu & Nauta, 2009; Grant, 2008; Joireman, Kamdar, Daniels, & Duell, 2006; Parker et al., 2006; Rioux & Penner, 2001). Important to both the social exchange and personological perspective is theory suggesting that citizenship behavior is the direct result of positive affect or attitudes toward another person or entity (e.g., Lee & Allen, 2002)—hence, affect and attitudes mediate the relationship between dispositional and social exchange predictors and citizenship. Research supportive of the affect/attitudes-as-mediator perspective has been found in recent studies demonstrating that the effects of the conscientiousness and agreeableness traits of the Big Five on citizenship behaviors are mediated by job satisfaction (Ilies, Fulmer, Spitzmuller, & Johnson, 2009). Because both social exchange and dispositional perspectives on citizenship imply affective and cognitive mediating mechanisms, evaluating the extent to which specific affective and cognitive constructs do, in fact, mediate established relationships seems an important future direction for citizenship research.

Whereas the majority of research in the citizenship domain has focused on social exchange and dispositional antecedents to citizenship, recent research suggests that citizenship behaviors arise for reasons other than reciprocation and prosocial motives. One particularly fruitful direction has begun to investigate the role of impression management in citizenship behavior (cf. Bolino, 1999). Initial evidence suggested that, in addition to prosocial motives, impression management motives are an important contributor to citizenship behavior (Rioux & Penner, 2001). More recently, prosocial and impression management motives have been found to interact with one another to produce the highest levels of citizenship (Grant & Mayer, 2009). Another notable finding within this stream of research is that the effects of citizenship on performance appraisals depend on characteristics of the employee being rated. Specifically, employees exhibiting low negative affect and strong prosocial motives exhibit the strongest relationship between their citizenship behavior and performance appraisal ratings—hence, ingratiation or impression management may not lead to more favorable performance appraisals (Grant, Parker, & Collins, 2009; Halbesleben, Bowler, Bolino, & Turnley, 2010).

A second fruitful direction for citizenship research involves the extent to which a given citizenship behavior is equally effective across individuals. That is, citizenship from more able employees may be more useful than citizenship from less able employees. Several researchers have then suggested that specific knowledges and skills meaningfully contribute to effective citizenship behavior (e.g., Dudley & Cortina, 2008). Empirical research in the customer service domain does suggest that understanding the customer and being aware of strategies for dealing with customer needs is related to citizenship (Bettencourt, Gwinner, & Meuter, 2001).

Although our understanding of citizenship behavior continues to improve, it should be noted that much of the research on citizenship tends to be insular, focusing on

social exchange *or* dispositions—but rarely both simultaneously. Moreover, given the potential importance of the impression management and knowledge and skills perspectives, it seems important, going forward, to attempt to integrate each into a single theory of citizenship. Research on self-regulation could be a mechanism through which each perspective can be integrated. To illustrate, consider that impression management requires cognitive effort and results in depletion of self-regulatory resources (Vohs, Baumeister, & Ciarocco, 2005), and that learning (i.e., knowledge acquisition, for example, about customer needs) requires cognitive effort (e.g., Zimmerman & Moylan, 2009). Additionally, research finds that some individuals are dispositionally superior with regard to self-regulation (e.g., Steel, 2007) and that self-regulation has important effects on social relationships (Finkel & Fitzsimons, 2011; Fitzsimons & Finkel, 2011). Hence, investigations focusing on the role of self-regulation in citizenship behavior could potentially integrate our understanding of the knowledge, impression management, dispositional, and social exchange sources of citizenship—as well as inform our understanding of each perspective for personnel selection.

Adaptive Performance

Many, perhaps most, of today's jobs require versatility and tolerance for ambiguity in addition to whatever is required for the individual tasks that they involve. In the seminal work on the topic, Pulakos et al. (2000) developed an eight-factor taxonomy of adaptive performance:

1. Handling emergencies or crisis situations.
2. Handling work stress.
3. Solving problems creatively.
4. Dealing with uncertain and unpredictable work situations.
5. Learning work tasks, technologies, and procedures.
6. Demonstrating interpersonal adaptability.
7. Demonstrating cultural adaptability.
8. Demonstrating physically oriented adaptability.

It should be noted that these dimensions aren't suggestive of the technical core for most jobs. Neither do they appear to be redundant with either the job dedication or interpersonal facilitation aspects of contextual performance (although there is sure to be some overlap). Thus, the suggestion that such behaviors be added to any conceptualization of job performance is not unfounded.

In the past 10 years, research has begun to specify the precise nature of adaptive performance as well as the nomological net in which adaptive performance exists. In the 2003 version of this chapter, we had speculated with regard to various possibilities. First, cognitive ability might predict some aspects of adaptive performance but not others. Recently, Lang and Bliese (2009) distinguished between transition adaptation (an immediate loss of performance following a change) and reacquisition adaptation (relearning a changed task over time). They found that general mental ability was negatively related to transition adaptation and found no evidence for a relationship between general mental ability and reacquisition adaptation. We next speculated that dispositional variables might play an important role in the prediction of adaptive performance. In his work on teams, LePine has shown that cognitive ability and personality composition of teams influences both team adaptation and postchange performance (LePine, 2003), as do goal orientation and goal difficulty (LePine, 2005). Oreg et al. (2008) showed evidence of dispositional resistance to change across 17 different countries. We also suggested that adaptive performance may be particularly modifiable as a function of training/situational differences. Zaccaro and his colleagues have shown that adaptation skills can be trained (Ely, Zaccaro, & Conjar, 2009; Nelson, Zaccaro, & Herman, 2010). Ely (2009) showed that skills relative to adaptive transfer can also be trained. Finally, Stewart and Nandkeolyar (2006) showed that sales personnel who were higher in conscientiousness and lower in openness to experience were more successful in coping with a fluctuating opportunity environment than were those low in conscientiousness or high in openness (cf. Griffin, Neal, & Parker, 2007).

Little is known about the degree to which adaptive performance influences overall performance ratings, the rewards that go with them, or organizational effectiveness. Just as the importance of citizenship was demonstrated by linking it to performance evaluations, so would the importance of adaptive performance be so demonstrated. There are also other individual difference variables, such as behavioral flexibility and emotional stability, that merit investigation as predictors.

Summary

We have discussed three aspects of job performance: task-related performance, citizenship/contextual performance, and adaptive performance. Each should provide a unique contribution to the prediction of organizational effectiveness. For example, the employees in a given organization may be exceptional with regard to the technical core of the organization, but if they fail to cooperate with one

another, or if they are unwilling to expend extra effort at crucial times, organizational effectiveness will suffer. Likewise, high task-related performance without adaptive performance may result in stagnation over time, or in an inability to cope with changing circumstances, thus leading to deterioration of organizational effectiveness in the long term. It seems reasonable to posit that only when all three aspects of performance are emphasized is effectiveness optimized. Finally, and most important for selection research, these different performance dimensions have different individual difference determinants.

PROXIMAL ANTECEDENTS OF PERFORMANCE: DECLARATIVE KNOWLEDGE, PROCEDURAL KNOWLEDGE AND SKILLS, AND MOTIVATION

Campbell and colleagues (Campbell, 1990, 1999; Campbell et al., 1993) identified three proximal determinants of job performance: (a) declarative knowledge; (b) procedural knowledge and skills; and (c) motivation. Consistent with the model formulated by Campbell and colleagues, we propose that these variables mediate the effects of more distal "can do" (i.e., abilities) and "will do" (i.e., dispositional traits) individual differences on performance. In the past 10 years, research has identified new knowledge, new skills, and new motivation mechanisms that transmit the effects of abilities and traits. Research has also shown how these factors combine with each other and with environmental variables to influence outcomes. Finally, research has shown that previously unknown linkages exist between some mediating variables and some outcomes (e.g., skills and citizenship). In this section, we (a) define declarative knowledge, procedural knowledge and skills, and motivation; (b) discuss how these variables may influence different dimensions of performance (task, contextual, and adaptive performance); and (c) review the measurement of these variables, including new approaches to their assessment.

Defining Declarative Knowledge, Procedural Knowledge and Skills, and Motivation

Declarative knowledge is knowledge about facts and things (Campbell, 1990). As noted by Campbell (1990), examples of declarative knowledge include knowledge of facts, principles, goals, and self. In the context of Campbell and colleagues' model of performance, declarative knowledge consists of knowledge of performance-relevant tasks and behaviors. Similar to cognitive ability, declarative knowledge can be conceived as a hierarchical arrangement of knowledge at differing levels of specificity. For example, declarative knowledge can be decomposed by occupation/job, by performance dimension (i.e., Motowidlo et al., 1997), by task, and so on, as is typically done in a job analysis. Additionally, the amount of declarative knowledge one possesses is different from the manner in which that knowledge is organized in memory (i.e., mental models/knowledge structures; Dorsey, Campbell, Foster, & Miles, 1999). Declarative knowledge is therefore best viewed as a multifaceted construct, reflecting both the amount and structure of one's knowledge.

Recent research has examined hitherto unfamiliar knowledges (at least to I-O) and their role in performance. For example, Dudley and Cortina (2008) suggested that knowledges such as strategy richness were relevant for personal support behaviors. Recent research has also examined the structure of knowledge and how it related to outcomes. For example, Schuelke et al. (2009) found that knowledge structure coherence influences skill-based performance. Day, Arthur, and Gettman (2001) found that skill acquisition was related to knowledge structure.

Procedural knowledge and skills consist of the knowledge and skills necessary to perform various activities (Campbell, 1990). Procedural knowledge and skills are differentiated from declarative knowledge in that procedural knowledge and skills pertain to the *processes* underlying relevant performance behaviors (i.e., how to do things). Procedural knowledge and skills are not limited to cognitive processes, as they can include psychomotor, physical, self-management, and interpersonal processes as well (Campbell, 1990). In short, procedural knowledge and skills will reflect the task domain from which they are acquired and (subsequently) applied.

As defined by Sternberg and colleagues (Sternberg, Wagner, Williams, & Horvath, 1995), tacit knowledge, a component of practical intelligence (Sternberg et al., 2000), is similar to Campbell's conceptualization of procedural knowledge and skills. However, tacit knowledge differs from Campbell's definition in that it is closely tied to a given work context and is acquired through an individual's personal experiences (i.e., self-learning), rather than through formal training or education. Hence, tacit knowledge reflects more an individual's aptitude than his or her level of achievement (Borman, Hanson, & Hedge, 1997).

Skills new to I-O psychology have also received attention in the past 10 years. Harris, Kacmar, Zivnuska, and Shaw (2007); Treadway, Ferris, Duke, Adams, and

Thatcher (2007); and Harris, Andrews, and Kacmar (2007) have linked political skills to various individual outcomes. Dudley and Cortina (2008) posited that perspective-taking skills and social perception skills predict courtesy and motivating behaviors.

Motivation is the combined effect of (a) the choice to expend effort, (b) the choice of level of effort to expend, and (c) the choice to persist in the expenditure of that level of effort (Campbell, 1990). Whereas Campbell's definition is widely used, theorists still have not settled on what motivation is (see Kanfer, Chen, & Pritchard, 2008, for a discussion). In spite of a lack of consensus among researchers, theoretical models of motivation in I-O psychology such as Kanfer & Heggestad's (1997, 1999; also see Kanfer et al., 2008) have received support (Kanfer & Ackerman, 2000). Such models define motivation as including both distal processes such as goal-setting (Klein, Austin, & Cooper, 2008) and proximal processes such as self-regulation (Diefendorff & Lord, 2008)—all of which change over time and are dependent on the context in which goal pursuit and self-regulation occur (Kanfer et al., 2008). Research in the past decade has been extremely productive in terms of increasing our understanding of motivation. For example, research during the past decade has fundamentally changed the field's conceptualization of constructs like self-efficacy (Vancouver & Kendall, 2006; Vancouver, More, & Yoder, 2008), investigated the role of motivation in separating maximal versus typical performance (Kirk & Brown, 2003; Klehe & Anderson, 2007), and made advances in understanding *how* personality relates to performance (Barrick, Stewart, & Piotrowski, 2002; Erez & Judge, 2001; Judge & Ilies, 2002).

Of the advances in the science of motivation in recent years, three issues stand out as particularly important. First, several theorists have attempted to model motivated behavior using computational models. For example, control theory (Carver & Scheier, 1998) has been effectively used in several studies to accurately model the behavior of employees (Vancouver, Putka, & Scherbaum, 2005; Vancouver, Tamanini, & Yoder, 2010). Given the increasing focus on within-person processes in motivation (e.g., Ilies & Judge, 2005), using computational modeling to assist in our understanding of the complex, dynamic nature of human work behavior seems to be a very promising direction for motivation research. Second, recent research has begun to operationalize and measure a construct central to motivation: subjective effort (Yeo & Neal, 2008). Importantly, research on subjective effort has confirmed earlier conjecture regarding the role of personality traits such as conscientiousness in work performance. Specifically, conscientiousness is related to consistently high subjective effort expenditure, irrespective of a task's difficulty, thereby confirming the idea that conscientious individuals are both "hardworking" and "dutiful" (Yeo & Neal, 2008). Finally, and perhaps most importantly, recent work has made important advances integrating theories of motivation. In constructing *temporal motivation theory*, Steel and König (2006) pull together the most effective elements of theory from economics (e.g., hyperbolic discounting, cumulative prospect theory), personality (e.g., needs theory), and organizational psychology (e.g., expectancy theory) to construct a mathematical model that can explain perhaps one of the most iconic motivational phenomena in behavioral science: procrastination. Taken together with other advances, a general trend in the field is an increasing focus on within-person dynamics. Motivation is not static; therefore, to effectively understand motivation, we need to account for within-person variation in motivation (Kanfer, 2009).

ANTECEDENTS AND OUTCOMES OF DECLARATIVE KNOWLEDGE, PROCEDURAL KNOWLEDGE AND SKILLS, AND MOTIVATION

Within the Campbell and colleagues' model (Campbell, 1990, 1999; Campbell et al., 1993), the components (or dimensions) of performance are a joint function of individual differences in declarative knowledge, procedural knowledge and skills, and motivation. This section briefly reviews support for these hypothesized linkages.

Declarative knowledge and procedural knowledge are determined by different ability constructs (Ackerman, 1987). These ability constructs can be classified into three categories: (a) general intelligence (i.e., cognitive ability); (b) perceptual speed; and (c) psychomotor abilities (Kanfer & Ackerman, 1989). To these constructs, some researchers might add practical intelligence, if it is not reflected in traditional measures of general intelligence. Practical intelligence may contribute to the acquisition of knowledge and skills (i.e., tacit knowledge) independent of general intelligence in a variety of performance contexts (see Sternberg et al., 2000), though this point is sharply disputed by others (Schmidt & Hunter, 1993). More data should be provided on the nature of practical intelligence and how it relates to both performance and measures of more traditional constructs.

In brief, research demonstrates that declarative knowledge is better predicted by cognitive ability, while procedural knowledge and skills more strongly reflect

perceptual speed and psychomotor abilities (Kanfer & Ackerman, 1989; McCloy, Campbell, & Cudeck, 1994). However, much of this research has been conducted within the context of skill acquisition involving very technical, cognitively demanding tasks, which may not generalize to other performance domains. Hence, there is a need to consider the type of knowledge and skill (i.e., technical, interpersonal, etc.), as the knowledge and skill in question will be differentially predicted by certain kinds of traits (Motowidlo et al., 1997). For example, dispositional traits will be more highly predictive of knowledge and skills involving interpersonal relationships or interacting with others (i.e., social skills), whereas cognitive ability might better predict technical knowledge and skills related to the tasks performed.

Motivation is related to stable, dispositional traits, such as conscientiousness (McCloy et al., 1994), achievement motivation (Kanfer & Heggestad, 1997; McCloy et al., 1994), emotional stability (Kanfer & Heggestad, 1997), and goal orientation (Ford, Smith, Weissbein, Gully, & Salas, 1998). Further, motivation encompasses more state-like or proximal motivational process variables such as task-specific self-efficacy and goal setting, which mediate the influence of distal dispositional traits on performance (Gellatly, 1996; Phillips & Gully, 1997). Predictors of self-efficacy are not limited to dispositional variables, as cognitive ability appears to be positively related to self-efficacy (Phillips & Gully, 1997). However, this relationship may not be causal, but due to overlapping variance that cognitive ability shares with some of the stable, dispositional traits (i.e., achievement motivation, locus of control) that contribute to efficacy perceptions. The latter argument is consistent with the work of Ackerman (Ackerman & Heggestad, 1997), demonstrating that cognitive, dispositional, and interest traits can be clustered into trait complexes consisting of a mixture of both cognitive and noncognitive traits.

Additionally, declarative knowledge, procedural knowledge and skills, and motivation can influence each other. For example, in the context of skill acquisition, declarative knowledge is considered a precursor to procedural knowledge and skills (Kanfer & Ackerman, 1989). However, experts' inability to verbalize the procedures behind successful task completion (i.e., Langer & Imber, 1979) would seem to contradict this point. Further, motivational processes can impact the acquisition (and hence the quality) of declarative knowledge and procedural knowledge and skills, by shifting limited cognitive resources away from skill acquisition and toward self-regulatory activities (Kanfer & Ackerman, 1989). There is evidence (i.e., DeShon, Brown, & Greenis, 1996), however, that self-regulatory activities may not demand major cognitive resources, and thereby be detrimental to skill acquisition. A possible explanation for this finding is that individual differences in motivational control skills ameliorate the deleterious effects of self-regulatory activities, such that individuals high on these skills are able to successfully minimize the negative influence of self-regulatory activities on performance, whereas individuals low on such skills cannot.

In terms of their influence on job performance, research has demonstrated that declarative knowledge, procedural knowledge and skills, and motivation are direct determinants of performance, and that they mediate the effects of distal traits, such as cognitive ability and dispositions (Borman et al., 1991; McCloy et al., 1994; Schmidt et al., 1986). The types of knowledge and skills (and motivation) that are most predictive of a certain dimension of performance will largely depend on the nature of the performance domain (Motowidlo et al., 1997). Indeed, research has borne this out in the past 10 years. For example, Dudley and Cortina (2008) suggested that the personal support dimension of citizenship can be predicted by a variety of knowledges and skills. Morgeson, Delaney-Klinger, and Hemingway (2005) found that role breadth is predicted by job-related skill. Bettencourt, Gwinner, and Meuter (2001) found that specific skills predict service-oriented citizenship. Harris et al. (2007) showed that political skill influences the effectiveness of impression management efforts.

As was mentioned earlier, research has also shown how knowledge, skill, and motivation combine with each other and with situational variables to influence outcomes. For example, Hochwarter, Witt, Treadway, and Ferris (2006) found that social skills interact with organizational support to influence performance. Treadway et al. (2007) and Haerem and Rau (2007) showed that expertise and task complexity combine to influence both performance and perceived task complexity. Taylor and Greve (2006) showed that knowledge combination and experience are relevant for the performance of innovative teams.

Although recent research has answered many questions regarding the role of knowledge, skill, and motivation in models of performance, many questions remain. For example, although Dudley and Cortina (2008) linked knowledge and skill to the personal support dimension of citizenship, they should also relate to the organizational support dimension. Regarding motivation, it is traditionally viewed as a moderator of the influence of ability determinants of performance. However, research tends not to find significant evidence for such an interaction

(Sackett, Gruys, & Ellingson, 1998). We speculated in 2003 that this could be due to the general confusion regarding the conceptualization of motivation. We also suggested that it could reflect the fact that many of these studies have used distal dispositional variables (i.e., conscientiousness) as an indicator of motivation, rather than more proximal motivational constructs, such as self-efficacy, goal-setting, or motivational skills. These possibilities remain unexplored, but given the increased depth of our understanding of motivational processes, it may be time to revisit this issue.

Measuring Declarative Knowledge, Procedural Knowledge and Skills, and Motivation

Traditional measurement strategies for assessing declarative knowledge, procedural knowledge and skills, and (to a lesser extent) motivation include job sample tests/simulations, situational judgment inventories, job knowledge tests, and structured interviews. Within the past decade, research involving these approaches has continued to yield information on their predictive relationship with performance (e.g., Barrick, Shaffer, & DeGrassi, 2009; Schmidt & Zimmerman, 2004), and subgroup differences compared to traditional cognitive ability tests (Roth, Bobko, McFarland, & Buster, 2008). Research has also attempted to match assessment techniques with constructs (e.g., Chapman & Zweig, 2005; Huffcutt, Conway, Roth, & Stone, 2001) and to identify the threats to validity that are peculiar to each (e.g., Lievens, Chasteen, Day, & Christiansen, 2006; Stewart, Dustin, Barrick, & Darnold, 2008).

Let us consider some of these assessment techniques more specifically. In general, job sample tests and job knowledge tests are more indicative of maximal than typical performance (Schmitt & Chan, 1998). Hence, test scores are not likely to reflect an individual's motivation (Sackett, Zedeck, & Fogli, 1988). Dudley and Cortina (2008) describe several scenario-based knowledge measures that are common outside of I-O but rare within I-O. For example, constructs such as Strategy Richness (i.e., knowledge of the different strategies that one might employ in dealing with a particular problem) and Interpersonal Construct Knowledge (i.e., knowledge of the attitudes and preferences of another person) can be measured via open-ended responses to written scenarios. Skills such as Means–End Knowledge (i.e., skill in implementing strategies) can be measured in a similar fashion.

Unlike knowledge and skills, interviews appear to reflect both "can do" and "will do" determinants of performance. Huffcutt, Roth, and McDaniel (1996) validated a construct-oriented approach to the development of situational judgment tests that may serve as a model for future research assessing the construct validity of structured interviews. In a later section, we describe efforts and obstacles for validation of interview-based measures. For the moment, it is sufficient to point out that Roth et al. (2008) showed that interviews are affected by interviewing skills and that interviews can be used to measure various job-relevant skills.

Situational judgment tests (SJTs) fall into a similar category. As is the case with interviews, researchers have asked whether SJTs are a method of measurement or a construct (Schmitt & Chan, 2006). Recent research suggests the SJT is a method of measurement and not a construct itself (e.g., Christian, Edwards, & Bradley, 2010; McDaniel, Hartman, Whetzel, & Grubb, 2007). Of interest here is the fact that SJTs have been used to measure procedural knowledge (Motowidlo & Beier, 2010) and team role knowledge (Mumford, Van Iddekinge, Moregeson, & Campion, 2008).

Mental models/knowledge structures and cognitive task/verbal protocol analysis represent two "nontraditional" approaches to measuring declarative knowledge and procedural knowledge and skills. Mental models/knowledge structures represent an organized set of domain-level knowledge that can be activated to describe, predict, and explain behavior (Marshall, 1993). Within I-O, mental models/knowledge structures have been applied to the study of teams and training outcomes (see Kraiger & Wenzel, 1997; Langan-Fox, Code, & Langfield-Smith, 2000). More recent work has tied individual knowledge structures to individual level outcomes (Day et al., 2001; Schuelke et al., 2009).

Mental models/knowledge structures have also been used as measures of training effectiveness (Kraiger, Ford, & Salas, 1993). Of interest to the Campbell et al. (1993) model, there is evidence that training interventions lead to changes in trainees' knowledge structures, and that more highly developed knowledge structures are positively related to posttraining task performance (Dorsey et al., 1999; Kraiger et al., 1993). Further, knowledge structure assessments are weakly to moderately correlated with traditional declarative knowledge tests (Dorsey et al., 1999). Rather than being an alternative measure of declarative knowledge, these findings suggest that knowledge structure assessments actually measure aspects of an individual's knowledge, such as organization, different from traditional declarative knowledge tests (Kraiger et al., 1993). This unique variance might reflect higher levels of knowledge acquisition, such as expertise (Kraiger et al.,

1993), and could add incremental validity to the prediction of task performance. As evidenced by the lack of convergent validity between different approaches to measuring knowledge structures (Dorsey et al., 1999), more research is needed in differentiating between the method and content of knowledge structure assessments (Kraiger et al., 1993).

An extension of traditional task analysis techniques, cognitive task analysis (CTA) yields information about the knowledge, thought processes, and goal structures that underlie observable performance (Chipman, Schraagen, & Shalin, 2000). CTA emphasizes the multidimensional nature of job performance and job expertise, by making explicit the knowledge/cognitive requirements of effective performance (DuBois & Shalin, 2000). As such, CTA holds promise for advancing theoretical understanding of job expertise and knowledge, as well as (more practically) the development of job knowledge and work sample tests (DuBois & Shalin, 1995, 2000). For a recent treatment of CTA and its application to work contexts, including team-based environments, see Schraagen, Chipman, and Shalin (2000).

Verbal protocol analysis (VPA) methods are based on the proposition that verbal protocols are observable behaviors of cognitive processes (Ericsson & Simon, 1993). VPA methods are one set of techniques, in addition to structured interviews and critical incidents, for assessing cognitive processes employed during decision making and task performance. Within I-O, VPA has been applied to the investigation of cognitive processes in performance appraisals (Martin & Klimoski, 1990), problem solving and strategy formation (Ball, Langholtz, Auble, & Sopchak, 1998), questionnaire responding (Barber & Wesson, 1998), and applicant job search decisions (Barber & Roehling, 1993). For an overview of VPA methods and their validity, see Ericsson & Simon (1993).

These nontraditional measurement strategies have yet to be widely applied in personnel selection research. However, they reflect a shift away from the behavioral emphasis on which traditional predictor and criterion measurement approaches (and not coincidentally, the theories/models they support) have been almost exclusively based. As such, these approaches hold promise for furthering our understanding of the nature of job performance and its determinants (Campbell et al., 1993; Schmitt & Chan, 1998).

Summary

The purpose of this section was to discuss and review research related to the three proximal determinants (declarative and procedural knowledge and motivation) of job performance proposed by Campbell and colleagues (Campbell, 1990, 1999; Campbell et al., 1993). In the 2001 edition, we suggested that future research more fully delineate the nature and set of construct(s) associated with "motivation." We are encouraged by the fact that a good deal of this research has in fact been conducted. We also called for more research investigating *how* individual differences on these determinants combine to jointly influence the different dimensions of performance, which has not been explicitly specified, even within the Campbell et al. (1993) model. The way in which these determinants combine (i.e., additive, compensatory, etc.) to predict performance and the weights associated with each of the determinants (e.g., Murphy & Shiarella, 1997) raises both theoretical and practical considerations, not the least of which is the validity of selection decisions. Although some such research has been conducted (e.g., Judge & Ilies, 2002; Yeo & Neal, 2008), more is needed. In particular, more research is needed that links the different facets and processes of motivation to knowledge and skills, stable individual differences, and outcomes.

INDIVIDUAL DIFFERENCE CORRELATES OF KNOWLEDGE, MOTIVATION, AND PERFORMANCE

We pointed out 10 years ago that relatively little validation work had considered knowledge and motivation explicitly as mediators of KSAO–performance relationships and that most such research had simply assessed the KSAO–performance relationship directly or ignored the distinction between individual differences and mediators. The past 10 years has seen an increase in research on mediation vis-à-vis selection processes. Next, we review both the older and the newer work.

Cognitive Ability

Schmidt & Hunter (1998) reconfirmed the finding that cognitive ability measures are among the most valid predictors of job performance across all job situations. Nevertheless, these measures continue to generate sizable subgroup differences (Neisser et al., 1996). Partly in response to these differences, as well as new research findings, and because of a belief that cognitive ability or intelligence has been too narrowly defined, new theories of intelligence have been formulated and investigated.

Hierarchical models of intelligence (Spearman, 1927) posit the existence of a single general factor *g* collectively defined by different specific ability factors. A contemporary hierarchical model is described by Carroll (1993). Citing the results of a large number of factor-analytic studies, Carroll describes three levels of specificity. At the most general level is *g;* the second level consists of seven broad abilities: fluid intelligence, crystallized intelligence, auditory perception, memory ability, retrieval ability, visual perception, and cognitive speediness; and each of these broad abilities can be further subdivided into more specific abilities. Murphy (1996) has argued that hierarchical models suggest that general versus specific ability constructs can be used for different purposes. The single general factor may be all that is needed if we want only a parsimonious prediction of performance. Ree, Earles, and Teachout (1994) have demonstrated that specific abilities that are relatively independent of *g* provide no incremental predictive contribution when related to job-relevant criteria. However, if the researcher wants to understand and explain performance, then the ability to link specific abilities at the lower levels of a theory of intelligence to performance helps describe the nature and content of the tasks performed by the individual.

Three other theories of intelligence have received attention in the broader psychological literature. Naglieri and Das (1997) have presented a neuropsychological theory of intelligence that posits there are three major functional areas of intelligence: planning, attention, and simultaneous or successive information processing. This model is reflected in tests such as the Naglieri nonverbal ability tests (see Naglieri, 2003, for a description). Given the interest in information processing in some areas of I-O psychology, it is somewhat surprising that this theory and the authors' operationalizations of these concepts have gained no attention in the personnel selection area.

Gardner (1999) posits a number of intelligences including the traditional linguistic, spatial, and mathematical dimensions but also interpersonal and intrapersonal dimensions as well, claiming that different dimensions have been important to different cultures at different points in time. Gardner's interpersonal and intrapersonal dimensions also seem similar to some aspects of emotional intelligence (Mayer, Salovey, & Caruso, 2000), another concept that has been discussed by those who seek to broaden the concept of intelligence beyond the traditional verbal and mathematical components (see Law, Wong, & Song, 2004, for a more recent example of empirical work on emotional intelligence). Gardner's dimensions of intelligence include more than what we usually identify as intelligence, but not many personnel selection researchers would deny the importance of many of his dimensions (e.g., interpersonal) in job performance.

Sternberg (2000) divides intelligence into three major areas. The componential part of intelligence is comprised of problem-solving abilities; the contextual component involves an understanding of how to modify or adapt to a situation or select a new environment; and the experiential component relates to the manner in which individuals can use their past experience in problem solving. Perhaps Sternberg's greatest influence on personnel selection is his notion of practical intelligence (R. K. Wagner, 2000), which appears central to most situational judgment measures that have become a popular and useful selection tool (Clevenger, Pereira, Wiechmann, Schmitt, & Harvey, 2001). The construct(s) measured by situational judgment measures is not clear. Some (Schmit, Motowidlo, DeGroot, Cross, & Kiker, 1996) have argued that they are measures of job knowledge related to the way interpersonal or administrative situations are handled in a given organizational context. With the exception of the SJT, these alternative views of intelligence have had minimal impact on personnel selection.

Although criterion-related validation work involving cognitive ability used to be quite common in our field, there has been relatively little work published in the past 10 years that focuses specifically on cognitive ability as an individual selection tool. One reason for this may be that we feel there is little more to learn about cognitive ability, although the proliferation of alternative theories of cognitive ability would suggest otherwise. Another reason is that our focus has shifted from individual task performance to other outcomes as we suggested earlier. This shift in focus seems to have led to a shift away from "can do" factors and toward "will do" factors such as personality and attitudes.

The work that does examine outcomes of cognitive ability makes novel connections. For example, Dilchert et al. (2007) linked cognitive ability to counterproductive work behaviors. Instead, research has focused on the role that cognitive ability plays within larger systems. For example, Morgeson et al. (2005) showed how cognitive ability combined with job characteristics and skill to influence role breadth and performance. Yeo and Neal (2004) examined the influence of ability and other stable characteristics on the relationship between effort and performance.

Much of the research on the predictive power of cognitive ability has focused not on individuals but on teams. Edwards, Day, Arthur, and Bell (2006) considered role

of ability composition of a team in determining team performance. Similarly, LePine (2003, 2005) examined the effects of ability composition (and personality composition) on adaptive performance at the team level. DeChurch and Mesmer-Magnus (2010) considered cognitive underpinnings broadly defined as they related to team functioning.

Research has also delved deeper into discrimination issues as they relate to cognitive ability. For example, Brown and Day (2006) examined the role of stereotype threat. Arthur, Edwards, and Barrett (2002) and Edwards and Arthur (2007) evaluated strategies for reducing subgroup differences on achievement/ability tests.

In sum, general cognitive ability measures are valid predictors of supervisory ratings (usually overall performance or a summed composite of dimensional ratings), and although the ubiquity of this conclusion is not quite what it used to be, the general statement still holds true for the most part. Whether additional cognitive factors provide incremental validity is, in part, a function of how broadly or narrowly one defines cognitive ability and job performance. Efforts have been made to minimize subgroup differences in personnel selection measures such as cognitive ability measures (Bobko, Roth, & Potosky, 1999; Sackett, Schmitt, Kabin, & Ellingson, 2001), but it seems that a more promising line of research involves the identification of alternative combinations of predictors that influence task performance and of alternative weightings of outcomes in the prediction of organizational effectiveness.

Physical Ability

Most of what we know about physical ability derives from the work of Fleishman and his associates (Fleishman & Reilly, 1992) and J. C. Hogan (1991). Hogan provides data indicating that measures of physical ability are valid in a wide variety of contexts, but that there are large mean differences in physical ability measures across gender groups and that validity within gender groups is often near zero. These results, along with concerns regarding Americans with Disabilities Act (ADA) requirements, have dampened enthusiasm for the use of physical ability measures. The procedure described by Good, Maisel, and Kriska (1998) to set the cutoff score for the use of a visual acuity test might be helpful in providing defensible means of using physical ability tests. Psychomotor ability, which implies the use of a combination of cognitive, sensory, and muscular activity, has not been widely studied in the selection context usually because of the difficulty of developing appropriate instrumentation. Ackerman and Cianciolo (1999) provide an innovative computerized touch panel to measure psychomotor abilities. They provide initial evidence of the construct and criterion-related validity of these measures and discuss the challenge associated with the development of dynamic versus static versions of this test.

Experience

Experience in a job like the one for which an applicant is being considered should be a reasonable proxy for both the "can do" and "will do" factors believed to be important for job success, and Rynes, Orlitzky, and Bretz (1997) present evidence that employers evaluate experienced hires versus inexperienced college graduates more favorably on a wide variety of dimensions. Most previous studies have operationalized experience as years in a job, position, or organization (see McDaniel, Schmidt, & Hunter, 1988, for a meta-analysis of the validity data). Quinones, Ford, and Teachout (1995) maintained that the mediocre results for the validity of job experience variables are due to the fact that experience is often measured inappropriately. In the framework they provided, experience is measured at three different levels of specificity (task, job, and organization) and in three different modes (type, amount, and time). Job tenure is only one of the resulting nine types; we have very little data on the other eight types. In a performance model, it is important to specify the nature of the work experience and how it relates to some potential aspect of the job performance domain. Tesluk and Jacobs (1998) provide an elaboration of this idea about experience that should generate additional research on experience–performance relationships that will enhance the utility of job experience measures. That said, very little recent research has examined the explanatory power of experience, and that which has (e.g., Taylor & Greve, 2006) has focused on task or job tenure.

Motivational and Noncognitive Traits

The 1990s gave rise to a new interest in the use of personality and motivational characteristics in personnel selection beginning with the meta-analysis by Barrick and Mount (1991), which indicated that personality traits, especially measures of conscientiousness, are valid predictors of job success. A second major factor stimulating further work on personality has been the contention of personality theorists that the myriad available personality measures and constructs can be reduced to the Big Five: Conscientiousness, Neuroticism, Extraversion,

Agreeableness, and Openness to Experience (Digman, 1990). Subsequent reviews of the personality literature in personnel selection (J. C. Hogan & Roberts, 1996; Hough, 1998) have indicated that the Big Five may be too broad; that is, that significant increments in understanding can be achieved by considering additional narrower personality characteristics. Some empirical research supports this contention. Frei and McDaniel (1998) and Mabon (1998) provide support for a customer service orientation measure, as does the research by Hogan and colleagues (R. Hogan & Hogan, 1995). Siebert, Crant, and Kraimer (1999) provide evidence of the importance of a proactive personality in predicting career success, and Judge, Erez, and Bono (1998) point to the importance of a positive self-concept in predicting job performance. R. Hogan and Shelton (1998) present evidence for the importance of self-presentation and social skill in job success and argue for seven personality dimensions. One factor that seems to be common to several of these studies was similar to achievement motivation, which Conway (2000) also found to be an important factor in managerial success.

Several other studies of the use of personality measures should be noted. Tett, Jackson, Rothstein, and Reddon (1999) present evidence that attention to the hypothesized direction of the relationship between personality and performance criteria provide significantly larger estimates of the validity of personality. Sackett et al. (1998) did not find evidence for an interaction between personality and ability in the prediction of performance. This notion has a long history and is reflected in our model of performance (see Figure 7.1). Barrick, Stewart, Neubert, and Mount (1998) found that aggregated team member personality constructs were related to team performance. Dudley, Orvis, Lebiecki, and Cortina (2006) found that different facets of conscientiousness predict different dimensions of performance, and that they do so over and above global conscientiousness. Finally, increased concern and attention to the measurement of contextual performance as described above will likely increase the predictive utility of personality measures (Hogan, Rybicki, Motowidlo, & Borman, 1998).

Concerns regarding "faking good" still plague the usefulness of personality measures in selection. Our field, however, does not yet have a clear consensus on the effects, or even the prevalence, of faking behavior during personality testing. Whereas some evidence suggests that faking has significant effects on criterion-related validity (Komar, Brown, Komar, & Robie, 2008)—a concern that extends to employment interviews (Levashina & Campion, 2007)—other evidence suggests faking is not common in "real-world" situations (Ellingson, Sackett, & Connelly, 2007; J. Hogan, Barrett, & Hogan, 2007) and thus is not likely to be a problem. To the extent that there are individual differences in faking, different people will get selected if the best scores on personality measures are used to make decisions (Ellingson, Sackett, & Hough, 1999; Viswesvaran & Ones, 1999)—however, the effects of using cut scores as opposed to top-down selection have more nuanced implications for who actually gets hired (Berry & Sackett, 2009).

In the past 10 years, several different methods have been proposed to control faking and the effects of faking on predictor validity. One approach to reducing faking suggests that "contextualizing" personality (i.e., making items specific to "work") could be an effective approach to reducing the effects of faking on criterion-related validity (Bing, Whanger, Davison, & VanHook, 2004). Other approaches to reduction of faking suggest that using personality in a "select-out" fashion (i.e., using personality to identify and remove the least qualified rather than to retain the most qualified) does not unduly affect mean-level performance (Mueller-Hanson, Heggestad, & Thornton, 2003). Moreover, research suggests that simply removing suspected fakers, identified using "faking scales" or similar mechanisms, from consideration does not affect mean performance and thus is a viable strategy for organizations to reduce faking (Schmitt & Oswald, 2006).

Much research during the past 10 years has attempted to bypass the faking problem by using "implicit" measures of personality. For example, James's conditional reasoning (James, 1998) method has been found to resist faking and has strong criterion-related validity (James et al., 2005; LeBreton, Barksdale, Robin, & James, 2007). Such measures also appear to interact with "explicit" measures to predict different profiles of aggressive individuals on a variety of outcomes (Bing et al., 2007). This is consistent with the interactive hypothesis proposed by Winter, John, Stewart, Klohnen, and Duncan (1998).

Another promising approach to the implicit measurement of personality is based on responses to SJTs. In the SJT approach, a respondent's personality is inferred from the distribution of his or her responses. For instance, highly conscientious individuals have more extreme responses when evaluating behaviors indicative of high and low levels of conscientiousness, whereas less conscientious individuals have much more moderate evaluations of the same set of behaviors. Based, then, on the difference between evaluations of high- and low-conscientiousness behaviors, researchers can infer the level of conscientiousness of the respondent (Motowidlo, Hooper, &

Jackson, 2006a, 2006b). Much like James's conditional reasoning, the SJT approach has shown impressive criterion-related validity (Motowidlo et al., 2006a) and convergent validity with explicit measures of personality (Motowidlo et al., 2006b).

There also has been continued interest in forced-choice methods as a defense against faking. Allen, Cheng, Putka, Hunter, and White (2010) used a very large sample of U.S. Army soldiers to show that their forced-choice measure of personality predicted performance and retention variables over and above cognitive ability.

Biodata, or scored versions of background experiences, hobbies, or preferences, probably represent alternative sources of information about motivation and personality. Early versions of these measures were scored application blanks; current versions of many biodata instruments are indistinguishable in format, and sometimes content, from many personality instruments (Mumford & Stokes, 1992). Nevertheless, research suggests that biodata measures have incremental validity over that afforded by measures of the Big Five personality constructs (McManus & Kelly, 1999; Mount, Witt, & Barrick, 2000). Another issue central to the study and use of biodata has been the organizational specificity of biodata scoring keys. Given the variability in content, scoring key development, and uses of biodata, it is perhaps not surprising that this research has failed to produce much that is generalizable other than the fact that biodata appear to be valid predictors of a variety of performance criteria (Schmidt & Hunter, 1998). However, Rothstein et al. (1990) showed that developing scoring keys using experts and responses from individuals in multiple organizations resulted in a scoring key whose validity generalized to multiple organizations. Also, Carlson, Scullen, Schmidt, Rothstein, and Erwin (1999) demonstrated the generalizability of the validity of a key developed in 1 organization to 24 other organizations. They attributed their success to the development of a common and valid criterion across organizations, large sample sizes, and the use of theory in developing items. The latter focus on the development of rational scoring keys or constructs has continued to receive a great deal of research attention (Mumford & Stokes, 1992; special issue of *Human Resource Management Review* [Summer, 1999]).

One concern that some (e.g., Pace & Schoenfeldt, 1977) have expressed about biodata is the potential for differences in racial or ethnic groups who approach various life and work experiences from a different cultural perspective. Schmitt and Pulakos (1998) reported differential response patterns across racial groups especially for items related to the manner in which members of different subgroups reported interacting with other people.

As with personality, there is also concern about faking in biodata measures. Schmitt et al. (2003) showed that elaboration can reduce socially desirable responding in biodata items. Ployhart, Weekley, Holtz, and Kemp (2003) found no evidence that faking was more of an issue for Web-based as opposed to paper-and-pencil biodata delivery. Overall, however, relatively little research has been done on biodata in the past 10 years.

METHODS OF MEASUREMENT

Aside from developments in the constructs measured, the past several years have seen significant changes in the methods used to measure those constructs. These changes have resulted from technology and from increased concern about the reactions of examinees as well as for concerns related to measurement and validity.

Technological Changes

Ten years ago, we reported that Web-based assessments were becoming common and that technology allowed the simulation of complex jobs (e.g., Hanson, Borman, Mogilka, Manning, & Hedge, 1999). Some of the advantages of computer-based testing are obvious, for example, standardization, ease of administration and scoring, and opportunity for increased realism in the development of test stimuli. Computer technology has been used to measure attributes that don't necessarily lend themselves to computerization (e.g., Ackerman & Cianciolo, 1999; see Drasgow & Olson-Buchanan, 1999, for other examples). The liabilities of computerized assessments have also been described (Drasgow & Olson-Buchanan, 1999; McBride, 1998). Foremost among these liabilities are the cost and complexities of development, and in the case of Web-based testing, the security of the test materials and the examinees' responses.

Relatively little has been done in this area in the past 10 years, much of it appearing in a special issue of the *International Journal of Selection and Assessment* in 2003. The work that has been done has focused primarily on applicant reactions. Weichmann and Ryan (2003) examined reactions of applicants to selection technology and found that experience with computers influences scores on computerized tests. Anderson (2003) provided a framework for understanding reactions. Others have examined online personality testing (e.g., Landers, Sackett, & Tuzinski,

2011) and the use of social networking sites (e.g., Kluemper & Rosen, 2009). Thus, although the use of technology for selection purposes has grown, research on the topic is sparse. Not surprisingly, familiarity with computers is a factor, but presumably it is a diminishing one. Perhaps it is more true of this area than any other that more research is needed.

Interviews

Interviews remain a widely used selection method in modern organizations, receiving a great deal of research attention for most of the past century (R. Wagner, 1949). In recent years, research on the employment interview has expanded beyond evaluating whether the employment interview has criterion-related validity (e.g., McDaniel et al., 1994) toward a more nuanced understanding of what the interview measures (Huffcutt et al., 2001; Posthuma, Morgeson, & Campion, 2002) and of the factors that affect interview validity (Maurer, 2002; Middendorf & Macan, 2002). For example, research has revealed that the employment interview is susceptible to contextual and motivational effects. To be specific, multiple studies document that the employment interview is affected by impression management and faking behavior (Barrick et al., 2009; Ellis, West, Ryan, & DeShon, 2002; Levashina & Campion, 2006, 2007). Recent research on impression formation from social psychology (e.g., Uleman, Adil Saribay, & Gonzalez, 2008) also bears on the employment interview as seemingly innocuous social skills such as giving a "firm" handshake (Stewart, Dustin, Barrick, & Darnold, 2008) and rapport building (Barrick, Swider, & Stewart, 2010) affect interview ratings as well as internship or job offers. Conversely, anxiety experienced during interviewing has been found to negatively impact both scores on the interview (McCarthy & Goffin, 2004) and interview validity (Schmit & Ryan, 1992).

Recent research has also uncovered numerous methods to *increase* interview validity. For example, research finds that the use of behaviorally anchored scales in an interview increases rater accuracy and between-rater agreement (Maurer, 2002). Additionally, note-taking during the employment interview—even if only related to key points—has been found to increase accuracy of information recall and has important implications for legal defensibility of interviews (Middendorf & Macan, 2002). Finally, recent research suggests that interviewees can be "coached." That is, interviewees can receive training in interview strategies and provide interviewing practice to improve interview performance (Maurer & Solamon, 2006; Maurer, Solamon, Andrews, & Troxtel, 2001). Importantly, interview coaching been shown to increase the reliability and validity of the interview (Maurer, Solamon, & Lippstreu, 2008). In combination with recent research suggesting that self-efficacy for interviewing leads to improved interview outcomes (Tay, Ang, & Van Dyne, 2006), coaching interventions could be an effective way in which to improve interview scores for low scoring individuals and groups.

In recent years, perhaps the most important advances made in the employment interview have to do with understanding the constructs measured by the employment interview. Research shows, for example, that the interview has a personality component (e.g., agreeableness and neuroticism) regardless of its target attributes. Interviews also have interview skill and person–organization fit components as well as a cognitive ability and job skills components (Huffcutt, Conway, Roth, & Stone, 2001). Other research suggests that relationships uncovered between cognitive ability and interviews may be overstated (Berry, Sackett, & Landers, 2007). Recent research has also uncovered reasons why managers use structured versus unstructured interviews. For example, norms and attitudes toward interviewing tend to favor unstructured interviews (van der Zee, Bakker, & Bakker, 2002). Moreover, interviewers tend to resent interview structure as it reduces rapport with interviewees and perceived usefulness of the interview for recruiting (Chapman & Zweig, 2005). However, interviewers do like increased question sophistication provided by structured interviews (Chapman & Zweig, 2005). It's worth noting that a recent study suggests that the distinction between structured and unstructured interviews—in terms of criterion-related validity—is quantitative and not a qualitative difference. That is, to the extent that interview structure increases validity through improving interview internal consistency reliability, increasing the number of interviews can increase the validity of unstructured interviews to near that of structured interviews (Schmidt & Zimmerman, 2004). That said, if one compares the predictive power of unstructured versus structured interviews, there is no contest. An unstructured interview is almost entirely useless as a prediction tool, while a structured interview is one of the most powerful selection tools available (Cortina et al., 2000).

Although typically used as a selection tool by researchers, research also suggests that the usefulness of the employment interview extends beyond simply assessing applicant attributes such as social skills or personality. A growing body of research finds that the employment interview could also be quite useful as a recruitment tool

(e.g., Hakel, 1989; Rynes, 1989). Although our field has recognized that the interview has implications for recruitment for some time, relatively little research has been conducted on the employment interview as a recruitment tool. To date, research has found that interviews that have a "recruitment focus" convey more information about the hiring organization to applicants, especially to less cognitively able and more anxious applicants—yet, persistence of applicants through the application process was higher for interviews with a dual "selection and recruitment" focus (Barber, Hollenbeck, Tower, & Phillips, 1994).

Other research supports the idea that although recruitment-oriented interviews provide more information to the applicant, interviews that focus on both recruitment and selection result in slightly higher job acceptance intentions (Stevens, 1998). Intriguingly, research suggests that aspects of the interview associated with good psychometric properties (i.e., interview structure) tend to also produce perceptions of the interviewer as "cold" (Kohn & Dipboye, 1998). Clearly, more research is needed in terms of outlining how and when selection-oriented, selection and recruitment-oriented, and recruitment-oriented interviews are best. Moreover, research investigating optimal trade-offs between psychometric properties and positive applicant perceptions could be useful for balancing an organization's overall human resource strategy between both selection and recruitment functions.

Assessment Centers

Research on assessment centers has uncovered some interesting things about the functioning of assessors and the implications of this functioning. Several authors (e.g., Haaland & Christiansen, 2002; Lievens et al., 2006) have used trait activation theory to explain assessor behavior.

Others have suggested new conclusions to old patterns in assessment center data. Several papers (e.g., Lance, Foster, Gentry, & Thoreson, 2004; Lance, Lambert, Gewin, Lievens, & Conway, 2004; Lievens, 2002; Lievens & Conway, 2001) suggested that the traditional assumption that exercise variance (as opposed to assessee variance) is due merely to assessor error is misguided. They suggest instead that exercise variance shows real consistency of assessees across exercises. For example, the fact that an assessee scores high on all traits in a leaderless group discussion doesn't necessarily mean that assessments reflect halo. Instead, they may simply reflect that the assessee is good at leaderless group discussions. Of course, as Lance, Foster, et al. (2004) point out, halo is still a problem because of the tendency of raters to form initial global impressions and for those impressions to drive specific ratings. Nevertheless, there appears to be more to exercise variance than halo.

The next step seems to be to understand what we are to do with exercise variance. That is, what do we conclude about a person who shows virtuous attributes in one situation but not in another? Are we to place them in leaderless group discussions but keep them away from in-baskets? We need to know more about the predictive validity of exercise scores. Presumably, research on job sample tests would help in this regard.

Situational Judgment Tests

An increasingly active area of selection research focuses on the situational judgment test (e.g., Motowidlo, Dunnette, & Carter, 1990). Indeed, research in this area has spawned an edited book (Weekley & Ployhart, 2006), several meta-analytic studies (Clevenger et al., 2001; McDaniel et al., 2007), and numerous primary studies. An important finding related to SJTs is that they generally provide incremental validity over and above relevant KSAO predictors in the prediction of job performance, tend to fare better than other selection instruments in terms of score equivalence across Web versus paper-and-pencil forms (Ployhart et al., 2003), and also tend to maintain their criterion-related validity under diverse response instructions during high-stakes testing (Lievens, Sackett, & Buyse, 2009; McDaniel, Hartman, Whetzel, & Grubb, 2007).

As was mentioned previously, an important issue that faces SJT research is to identify whether SJTs are a method of measurement or a construct (Schmitt & Chan, 2006). The issue of whether SJTs measure or are a construct is important for understanding the role of SJTs in the selection process (Arthur & Villado, 2008). Research bearing on the topic suggests the SJT is a method of measurement and not a construct itself (e.g., Christian, Edwards, & Bradley, 2010; McDaniel et al., 2007). Indeed, the idea that SJTs are methods that *measure* constructs is implicit in research using SJTs to measure constructs such as implicit personality (Motowidlo, Hooper, & Jackson, 2006a), personal initiative (Bledow & Frese, 2009), procedural knowledge (Motowidlo & Beier, 2010), and team role knowledge (Mumford, Van Iddekinge, Morgeson, & Campion, 2008). Importantly, SJT research suggests that not only are SJTs effective for measuring a host of constructs, but that SJT measures tend to produce small subgroup differences (de Meijer, Born, van Zielst, & van der Molen, 2010; Weekley, Ployhart, & Harold, 2003),

possibly owing to SJTs' measuring aspects of personality (Whetzel, McDaniel, & Nguyen, 2008).

Although the SJT is an increasingly important and promising method of selection, researchers note that our understanding of exactly what SJTs are remains underdeveloped (Ployhart, 2006). Further understanding the cognitive processes that underlie situational judgment could provide clues as to how and why SJTs obtain incremental validity in predicting performance (Clevenger et al., 2001; O'Connell, Hartman, McDaniel, Grubb, & Lawrence, 2007) in spite of measuring many "traditional" constructs used in selection research (Christian et al., 2010; McDaniel et al., 2007).

Neuroimaging

One fascinating line of research that has come into its own over the past 10 years has been the use of neuroimaging for purposes of psychological measurement (see Adis & Thompson, in press, for a review). For example, Takeuchi et al. (2010) used structural magnetic resonance imaging (sMRI) to link creativity as measured by a divergent thinking task to gray matter volume in the dorsolateral prefrontal cortex. DeYoung and colleagues (DeYoung & Gray, 2009; DeYoung et al., 2010) have used sMRI to link personality attributes to brain structure. For example, they showed that gray matter density in areas of the brain associated with reward sensitivity (e.g., the nucleus accumbens) was associated with trait extraversion while density in areas associated with sensitivity to threat (e.g., anterior cortex) was associated with trait neuroticism.

Functional MRI (fMRI), which focuses on brain activity rather than volume, has been also been used in various ways that would be of interest to our field. For example, leadership research might be influenced by the findings that occipital lobe activity has been linked to mental imagery and complex problem solving (Christensen & Schunn, 2009) while orbitofrontal activity, which is associated with planning (Wallis, 2007), might be related to strategy formation (Adis & Thompson, in press).

Other techniques, such as computed tomography (CT) scans and electroencephalogram (EEG) have been used to study individual and social characteristics and behavior. In short, given the amount of time, energy, and journal space that we as a field have devoted to problems such as intentional distortion, self-deception, and rater bias, it makes a lot of sense for us to turn to the biological bases of the characteristics that drive workplace behavior. We hope to see more research of this kind in the future.

Cross-Cultural Research

With the increased globalization of our economy, two research and practice issues have attracted the attention of those interested in personnel selection. The first issue involves the selection and success of individuals assigned to company facilities located in other countries. There is still relatively little empirical literature on expatriate selection (see Black, Mendenhall, & Oddou, 1991; Ronen, 1989), but that literature points to three skills: self-skills that relate to the individual's own capacity to maintain his or her mental health and well-being; relationship skills, referring to the person's ability to develop successful interactions with persons in the host country; and perception skills that relate to the expatriate's ability to perceive and evaluate the behavior of people in the host country. This is consistent with the findings of Shaffer, Harrison, Gregersen, Black, and Ferzandi (2006), who showed the importance of factors such as cultural flexibility and people orientation. The technical competence of the individual to perform his or her assigned duties may also play some role. Other variables such as previous experience with other cultures may be a factor, but the person's non–work life and family adjustment are probably much more important (Takeuchi, Wang, & Marinova, 2005). The importance of the latter concerns was established in a study of expatriate withdrawal by Shaffer and Harrison (1998).

The second cross-cultural issue that has received some attention is the appropriateness of translations of assessment devices for use with people who do not speak or write English (e.g., Budgell, Raju, & Quartetti, 1995). Most of the research on the adequacy of translations has involved the use of measures of job attitudes (Ryan, Horvath, Ployhart, Schmitt, & Slade, 2000). This relatively small body of literature indicates that some ideas and/or test items are very difficult, if not impossible, to translate with the same psychological meaning, even when very thorough back-translation techniques are used. Even when these instruments can be translated reasonably well, it is important to consider the host country's own practices with respect to selection (Levy-Leboyer, 1994). Clearly, there is a great need for more understanding of the applicability of our personnel selection practices in other cultures. Efforts such as those represented by the work of Schmit, Kihm, and Robie (2000), in which the researchers set out to develop an instrument that could be used globally, should become more frequent and will provide useful models for research and practice in international selection.

Reactions to Selection Procedures

Selection procedures not only serve as a tool for increasing the performance of employees, but are increasingly recognized as serving a communicative function. Specifically, selection procedures are interpreted by applicants as communicating an organization's culture, values, and mission to applicants, which can thereby affect an organization's reputation (e.g., Schmitt & Chan, 1999). For example, organizations that implement drug screening procedures are perceived as being more "fair" in testing employees when applicants perceive legitimate job safety concerns surrounding drug use and are perceived to be more attractive when treatment policies are voluntary rather than mandatory (Paronto, Truxillo, Bauer, & Leo, 2002; Truxillo, Bauer, Campion & Paronto, 2002). Note, however, that research still suggests that applicants are more concerned about the favorability of the outcomes of the selection process than they are about the selection process itself (e.g., Bauer, Maertz, Dolen, & Campion, 1998; Gilliland, 1994).

The predominant theoretical orientation of selection procedure reaction research is organizational justice theory (Gilliland, 1993), which has informed interventions to improve applicant reactions (Truxillo, Bauer, Campion, & Paronto, 2002) and has been demonstrated to be an effective method to improve applicant test-taking motivation (Truxillo, Bodner, Bertolino, Bauer, & Yonce, 2009). Recent research suggests, however, that perceptions of selection fairness depend on the technology used to implement the procedure. For example, interviews are viewed as more fair, and the organization using them as more attractive, in the case that an interview is face-to-face rather than over the telephone or a videoconferencing program. Similarly, applicants who are less familiar with computers, when using an online selection system, report more concerns about privacy and show stronger negative relationships between procedural justice with test-taking motivation and intentions to accept a job if offered, than when experiencing an "in-person" selection procedure (Bauer, Erdogan, Liden, & Wayne, 2006).

We note, however, that Ryan and Ployhart's (2000; see also Hausknecht, Day & Thomas, 2004) recommendations are still as relevant today as they were 10 years ago in that selection reaction research should pay greater attention to outcomes other than organization perceptions or intentions measures, focus more on individual difference antecedents of test reactions, afford greater attention to the role of social information in the selection context, and provide more theoretical emphasis in areas other than justice theory. Whereas progress based on Ryan and Ployhart's suggestions has been made (e.g., Chapman & Webster, 2006; Hausknecht et al., 2004; Herriot, 2004; Nikolaou & Judge, 2007), applicant reaction theory remains relatively underdeveloped. Toward this end, Chan and Schmitt (2004) have recently made several suggestions for building applicant reaction theory by focusing on understanding the selection reaction construct, and focusing on changing reactions over time and on the outcomes of applicant reactions (e.g., application process withdrawal, poorer job performance, low job satisfaction), which could inform practice.

On a practical level, Schmitt and Chan (1999) have suggested that actual and perceived job relatedness of selection procedures should be maximized. Thus, the use, development, and validation of selection procedures should be explained to the applicants; staff interacting with applicants should be trained to treat applicants with respect and courtesy; and applicants should be provided with timely, detailed feedback and suggestions for remedial action, if possible, to support an applicant's self-efficacy. Moreover, organizational personnel should ensure that applicants understand the selection process, applicants are informed as to when outcome decisions will be made, and that the entire process be conducted consistently across applicants and in accordance with what applicants are told will occur. Building on Schmitt and Chan's recommendations, Hausknecht et al. (2004) have found other aspects of the selection procedure that are linked to applicant reactions. Specifically, Hausknecht et al. suggest that the job relatedness, face validity, and outcome favorability of the selection procedure predict the most favorable reactions. In terms of selection tools, resumes, work samples, and references were perceived to be the most favorable. Finally, and most important, applicant reactions were found to be linked to recommendation intentions (i.e., word-of-mouth advertising), acceptance of offer intentions, and organizational attraction, as well as test-taking anxiety.

METHODOLOGICAL ISSUES AND POTENTIAL MODERATED RELATIONSHIPS

Some of the issues related to methods and moderators have been covered in other sections of the chapter (e.g., job analysis). Other such issues remain, and it is these on which this section of the chapter focuses. Specifically, this section includes a discussion of validation, prediction over time, other moderators, and performance modeling.

Validation

Although the term *validity* is used in many different ways, validity is defined here as the degree to which evidence and theory support the interpretation of test scores for various proposed uses of the test (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 1999). Validation is therefore the compilation of evidence of inferential appropriateness. It is important to note that validity is not an attribute of a test, but is instead an attribute of the uses to which scores from a test are put. For example, cranial circumference scores from a good measuring tape may be perfectly appropriate for inferences about age in preadolescents, but they are likely inappropriate for inferences about one's capability to deal with complex problem-solving situations.

The situation in a selection context is often quite complicated because validation involves establishing the connection between a selection tool and the outcome of interest. This outcome may be some of the performance constructs discussed above or some of the distal outcomes in Figure 7.1 that are discussed later. This process can involve the validation of measures of "predictor constructs," measures of "criterion constructs," and/or measures of criterion constructs that may serve as predictors of some other outcome. Nevertheless, the inferences of primary interest in a selection context are those having to do with criteria, and validation involves the investigation of the appropriateness of those inferences regardless of whether they are based on "direct" measures (e.g., work samples) or "indirect" measures (e.g., cognitive ability).

Although we still speak of content, construct, and criterion-related validation (Binning & Barrett, 1989), it is now recognized that there aren't different types of validity, only different strategies for justifying inferences (Society for Industrial and Organizational Psychology [SIOP], 1987), and different inferences that might be justified (e.g., statistical conclusions vs. construct-related conclusions; Cook & Campbell, 1979). Validation involves theory development and testing, and any information about the test or job in question can contribute to a basis for conclusions regarding test scores (Binning & Barrett, 1989).

With these realizations has come an increased appreciation of the need to take a more complex view of job performance as described above (Campbell, 1990). This has, in turn, led to increased efforts to match particular predictors to particular aspects of performance. Examples of research showing differential relationships between different performance dimensions and different predictor constructs were provided earlier (e.g., Motowidlo & Van Scotter, 1994). Additional evidence suggesting a more complex view of validation comes in the form of studies focusing not on bivariate predictor-criterion relationships but on incremental validity. This is useful from a practical standpoint in that it allows an examination of contribution over and above existing selection procedures. Pulakos and Schmitt (1995) demonstrated the incremental validity of an experience-based interview over and above cognitive ability in predicting composite performance ratings. McManus and Kelly (1999) showed that four of the Big Five personality factors predicted contextual performance over and above a biodata instrument and that extraversion alone contributed to the prediction of task-related performance over and above the biodata instrument. Mount et al. (2000) found similarly encouraging results for the contribution of biodata scores beyond both personality and cognitive ability.

Consideration of incremental validity can also be useful from a theoretical perspective. Cortina et al. (2000) showed that structured interviews contributed to the prediction of performance over and above both cognitive ability and conscientiousness. In addition to the practical implications, these results refute suggestions that interviews are merely poor measures of cognitive ability or indirect measures of conscientiousness. Goffin, Rothstein, and Johnston (1996) showed similar results for assessment centers and personality. The incremental validity evidence from these studies informs not only practice, but also our understanding of commonly used selection tools.

Finally, although banding is discussed later in the chapter, it is worth mentioning here that the trend toward taking a more complex view has also spread to procedures for constructing equivalence bands around selection scores. Aguinis, Cortina, & Goldberg (1998) developed a banding procedure that takes into account not only predictor reliability, but also criterion reliability and criterion-related validity. Banding test scores usually involves the consideration of the unintended consequences of testing (Messick, 1998) or the explicit consideration that more than performance outcomes must be considered in test use. Taken as a whole, the evidence suggests that our field has taken a much-needed step in the direction of more complex characterizations of and models for predicting work behavior.

Prediction Over Time

The importance of time in models of performance prediction has been recognized for some time (Henry &

Hulin, 1987). Perhaps the most ubiquitous finding in longitudinal studies of performance prediction has been the superdiagonal or simplex pattern of correlations in which predictor-criterion relationships are highest at Time 1 and decrease steadily as the separation in time between the predictor and the criterion increases (Humphreys, 1960). Among the implications of such a pattern is that the rank order of job applicants would change over time such that the person most likely to perform well tomorrow may not be the person most likely to perform well next year.

Ackerman (1987) has suggested that deterioration is not uniform, but varies with the type of predictor and the consistency of the task on which performance is measured. For inconsistent tasks, higher order cognitive abilities continue to predict performance over time. For consistent tasks, the predictiveness of higher order cognitive abilities deteriorates substantially over time, while the importance of lower order abilities such as perceptual speed and psychomotor ability wax in importance.

Keil and Cortina (2001) showed that although deterioration occurred regardless of task consistency and type of ability, the deterioration was curvilinear, conforming to a cusp catastrophe model such as those found in the work of S. Guastello (Guastello & Guastello, 1998). Ployhart and Hakel (1998) showed that there were individual differences in performance changes over time, and that the latent growth parameters representing these changes were predicted by biodata scores.

One of the greatest advances of the past 10 years has been the application of *experience sampling methods* (ESM) to the study of organizational phenomena. Dimotakis, Ilies, and Judge (in press) state that ESM "aims to examine fluctuations in daily or episodic individual states, and to explain the antecedents and outcomes of these states." This is done through repeated measurement, and there are three categories of cues for an instance of measurement. Signal-based measurement requires participants to respond to cues that are sent on a random or semirandom schedule in order to obtain representative information about the participant's experiences generally. In an interval-contingent design, measurements are obtained either at fixed intervals or at predetermined parts of the day (e.g., upon arriving at work). In an event-contingent design, participants initiate measurement themselves whenever they have a particular type of experience. Dimotakis, Scott, and Koopman (in press) give the example of workplace incivility in which participants might respond to a questionnaire whenever they experience incivility.

These different approaches to ESM lend themselves to different sorts of questions. Signal-based measurement is appropriate where one requires a random sampling of experiences. For example, Ilies, Dimotakis, and Watson (2010) randomly signaled participants during the workday in order to measure ephemerae such as mood and blood pressure. Interval-contingent measurement is appropriate when there are specific points in time during which one wishes to collect information. For example, Sonnentag and Bayer (2005) used such an approach to examine psychological detachment from work and its correlates. Event-contingent measurement is appropriate when measurement must be triggered by specific events regardless of when they occur. Finally, it is possible to combine two or more of these approaches in a single design (e.g., Dimotakis et al., in press).

As a set, these approaches have forced us to reconsider many of the assumptions that underlie our research. Judge et al. (2006) showed that more than half of the variance in workplace deviance is within-person variance, and that this variance can be explained by within-person variability in state hostility, justice, and job satisfaction. Moreover, some of these within-person relationships were moderated by the between-person variable trait hostility. Similarly, Ilies, Scott, and Judge (2006) found that 29% of the variance in citizenship was within-person and that this variance could be explained by within-person variance in positive affect and job satisfaction. As with Judge et al. (2006), a cross-level interaction was also found such that the stable trait agreeableness moderated the effect of positive affect. These authors and many others have used ESM to show that variables that had been studied previously as between-person variables and described as such in the 2003 version of this chapter (e.g., deviance, citizenship) do, in fact, vary within persons and that this within-person variability can be explained with other within-person variables. In short, an employee may be a good citizen on one day and an organizational deviant on the next.

Other authors have used techniques that are similar to ESM in order to accomplish some of the same goals as ESM studies. Yeo and Neal (2006) showed that although within-person increases in task-specific efficacy were associated with decreases in performance, average (i.e., between-person) efficacy was positively related to performance. In an earlier study, Yeo and Neal (2004) showed that the effort–performance relationship increased with practice and that this effect was stronger for those with low-performance goal orientation. Moreover, the negative effects of performance orientation were stronger for those who were also high on learning orientation. Although one might reasonably object to the labeling of these studies as

ESM studies, they share with ESM studies the fact that they reveal the importance of considering within-person variability in constructs that had previously been studied between persons.

Moderators

There are, of course, many different potential moderators of the relationships among individual difference variables, mediators such as declarative knowledge and motivation, performance, and outcomes. We are also cognizant of the research that indicates that most predictors used by personnel selection specialists are valid in most contexts in which they are used (Schmidt & Hunter, 1998). However, validities do vary in practically significant ways. Our purpose here is merely to highlight a few variables that have accounted for such variability in recent research.

There has been a good deal of research in the past 10 years on interactions involving knowledge and skills. Witt and Ferris (2003) showed that social skill moderates the relationship between conscientiousness and performance ratings. Hochwarter et al. (2006) showed that the effect of organizational support on performance depends on political skill. Similarly, Treadway et al. (2007) showed that political skill moderates the relationship between ingratiation behavior and ratings of interpersonal facilitation. Dudley and Cortina (2008) posited that the relationship between knowledges/skills and personal support behaviors would be moderated by organizational norms.

There has also been research showing the moderating effects of personality. In the previous section, we mentioned several studies showing that personality moderates various Level 1 relationships. Using similar methodology (i.e., diary methods), Yang and Diefendorff (2009) showed that trait negative affectivity strengthened the within-person relationship between injustice and negative emotions. These authors also showed that agreeableness and conscientiousness weakened the relationship between negative emotions and counterproductive work behavior (CWB). In a between-person study, Chan (2006) showed that proactive personality moderated the relationship between situational judgment effectiveness and work outcomes.

We anticipate more research on moderators, particularly cross-level moderators of the sort often identified in ESM research (i.e., stable individual difference variable moderating relationships among within-person variables). We also hope to see more higher order (e.g., cross-level) interactions. Unfortunately, measurement error makes higher order interactions difficult to detect (Busemeyer & Jones, 1983). As our methods of measurement improve, however, it should be possible to uncover more and more of the complexity that must exist in workplace behavior.

Performance Models

Beginning with the work of Hunter (1986), personnel selection researchers have also proposed and tested a variety of increasingly complex performance models. These models include cognitive and noncognitive measures, mediators, and both contextual and task proficiency measures (e.g., Borman et al., 1991; Pulakos, Schmitt, & Chan, 1996). These models are similar to that depicted in Figure 7.1, and we suspect that there will be many more future attempts to test theories of job performance that include a broader array of individual difference and contextual variables. Testing these models usually requires the use of structural equation modeling and other multivariate techniques rather than correlation and regression analyses that have usually been the primary data-analytic tools in selection research.

Summary

In this section, we discussed topics relevant for validity and validation, prediction over time, and moderators of the relationships between the classes of variables included in our model. Obviously, this discussion was selective; there is a much larger body of such research. We are encouraged by the increased appreciation of the complexity of relationships among variables relevant for selection reflected in the consideration of multiple predictors, multiple and specific criteria, and the boundary conditions within which the relationships among them operate.

DISTAL OUTCOMES OF THE SELECTION PROCESS AND EMPLOYEE PERFORMANCE

In this section, we consider relatively distal outcomes associated with the "can do" and "will do" variables studied in personnel selection. In most cases, these outcomes are the result of an employee's behavior rather than the behavior itself, though we realize that, in some cases (e.g., withdrawal and counterproductive behavior), this distinction does not apply. Prediction of these distal outcomes using "can do" and "will do" measures has often proceeded without consideration of potential mediators.

Aspects of Productivity

Although the term *productivity* is used often, its definition has been far from consistent (Pritchard, 1992). Adding to

the confusion is the fact that productivity can be considered at a variety of levels of analysis. For example, Pritchard (1992) defines organizational productivity as how well an organization uses its resources to achieve its goals. Payne (2000) modified this definition in an attempt to define individual productivity as how well an individual uses available resources to contribute to organizational goals. Payne (2000) goes on to explain that productivity is a combination of efficiency (ratio of inputs to outputs) and effectiveness (amount and quality of output relative to some standard or expectation).

I-O psychologists tend to focus on effectiveness, although it is usually referred to as job performance (Pritchard, 1992) or perhaps as productivity. This confusion stems in large part from a lack of clear delineation among the concepts productivity, performance, efficiency, and effectiveness. Campbell, Dunnette, Lawler, and Weick (1970) provided a useful distinction between performance and effectiveness, but that distinction has been largely ignored. Payne (2000) provided a similar delineation at the individual level of analysis. First, effectiveness is distinguished from performance through consideration of the value associated with a given behavior. Specifically, effectiveness is a function of performance dimensions (i.e., value-free markers of behavior), value weights for those dimensions determined by the organization and its goals, and situational factors. Second, efficiency is the sum of input to (value-free) performance ratios plus situational factors. Third, productivity is efficiency plus effectiveness plus any additional situational factors that might be influential. Finally, organizational productivity is a function of the productivity of its individuals plus higher level situational factors.

Thus, in considering productivity as an outcome in a model of personnel selection, we must consider both efficiency and effectiveness. Clearly, those employees or components of an organization that produce more of the behaviors that are strongly tied to the goals of the organization will be more productive. Also, those employees or components that can produce those behaviors with less input (e.g., time, money, materials) will be more productive. Those individual, group, or organizational attributes that increase these behaviors or decrease the amount of input required to generate them will contribute to productivity.

Clearly, higher task-related, contextual, and adaptive performance will lead to higher effectiveness (all else equal), and therefore, higher productivity. This ignores, however, the weights attached to the different aspects of performance and the efficiency with which those aspects of performance are produced. With respect to efficiency, Payne (2000) examined a new construct called efficiency orientation (EO), which is defined as "the tendency to approach a task with the goal of obtaining the most out of the resources used" (p. 23). Those who tend to approach a task with the intention of maximizing output given a fixed amount of input, or of reducing input given a high level of output, are more likely to minimize input-to-output ratios, thus making them more efficient. This, in turn, results in higher individual productivity.

Innovation and Creativity

An organization's competitive advantage is increasingly dependent on the innovative products and services and delivery of those products and services provided by an organization (e.g., rare resources; Barney, 1991). Thus, understanding how to facilitate individual innovation and creativity is a strategic human resource objective. In part, research on creativity and innovation has taken a personological approach. That is, research evaluates the role of individual differences predictors of creativity and innovation. For example, innovation research finds that narrow facets of conscientiousness such as Duty increase and Achievement Striving decrease innovative behaviors that require *taking charge* or are related to functional organizational change (Moon et al., 2008). Conversely, learning goal orientation—mediated through creative self-efficacy—is an individual difference that has been linked to increases in employee creativity (Gong, Huang, & Farh, 2009). As was mentioned earlier, these personological linkages can be traced back to dopaminergic circuitry in the prefrontal cortex (e.g., Flaherty, 2005).

Whereas some evidence suggests that some individual differences have direct effects on employee creativity, creativity researchers are increasingly finding that individual differences play a more subtle role in creativity and often interact with the social environment. For example, openness to experience has been found to have an effect on innovation only when social networks, or more specifically, idea networks—social ties that provide access and exposure to novel insights have been found to increase creativity—are diverse and large (Baer, 2010). Further, the effects of conscientiousness and growth need strength on creativity are dependent on a supportive coworker environment (George & Zhou, 2002; Shalley, Gilson, & Blum, 2009). Similarly, the effect of learning goal orientation on creativity depends on project team learning behavior (Hirst, Van Knippenberg, & Zhou, 2009). Finally, the relationship between openness to experience and creativity

has also been found to depend on feedback positivity and uncertainty of project ends/means (George & Zhou, 2002), support for creativity, and time pressure (Baer & Oldham, 2006). Hence, a growing literature suggests that creativity is due to a combination, often multiplicative, of a person *and* his or her social environment.

The role of employee emotions in creativity is, perhaps, one of the most interesting directions currently under investigation. Most notably, research on emotions suggests, counter to prevailing perspectives (see Baas, De Dreu, & Nijstad, 2008, for a discussion), that creativity is best facilitated by a combination of positive *and* negative emotions. Experiencing both positive and negative emotions, called *emotional ambivalence*, is an important state allowing for the identification of novel patterns and empirically linked to creativity (Fong, 2006). Importantly, however, deriving from research reviewed above, a recent study has found, not only is it important for negative and positive mood to be high for creativity, but also that social environment aspects such as developmental feedback, supervisory support, and trust must accompany positive and negative mood for the greatest effect on creativity (George & Zhou, 2007). Such research on emotions suggests that—contrary to the bulk of research, which finds that negative affect leads to uniformly negative outcomes (e.g., high CWB, low task performance; Kaplan, Bradley, Luchman, & Haynes, 2009)—experiencing *some* negative affect may not always be a bad thing.

Withdrawal Behavior

For some jobs, the most important aspect of performance is the presence of the person whose job it is. In production jobs controlled by an assembly line and for which completion of a task (not its quality) is of central interest, the most important performance variable is whether the worker comes to work and remains at work. In these jobs, tardiness, absenteeism, and turnover are often used as the primary outcome or performance index. Even for jobs in which the employee has flexibility with respect to where and when he/she does the required tasks, research has shown that turnover, absenteeism, and tardiness broadly defined are important. For example, McElroy, Morrow, and Rude (2001) linked various forms of turnover to the measures of organizational performance.

Using turnover, absenteeism, and tardiness as performance indices produces a variety of well-known definitional and measurement problems (Johns, 1994). Hulin (1991) has argued that these variables and others should be considered in the aggregate as measures of a withdrawal construct. Hanisch (1995) has presented a model that includes organizational, job, and work withdrawal constructs. Each of these aggregate variables has multiple, specific, behavioral manifestations. For example, work withdrawal might be indicated by tardiness, leaving work early, absenteeism, taking long and unauthorized work breaks, and increased drug abuse. A worker who cannot withdraw in this manner may strike out at the organization in other ways, such as stealing supplies, filing grievances, or, in extreme cases, in a violent manner. On the positive side, an engaged worker might display organizational citizenship behaviors such as organizing parties, cleaning the workplace, or volunteering for special projects. Attitudinal correlates of these behaviors include work and organizational commitment. In the Hanisch (1995) model, individual differences (values, personality, work attitudes) play a role in moderating the relationship between cognitive and attitudinal antecedents (e.g., stress, pay inequity, satisfaction) and withdrawal. Hanisch, Hulin, and Roznowski (1998) reviewed a series of studies in which this general model was used to predict withdrawal constructs as a function of sexual harassment, job attitudes, and organizational commitment. As expected, these aggregate withdrawal measures are more highly correlated with various predictors than is usually found with single indicator measures of withdrawal.

This theory of adaptive behavior suggests that researchers will achieve a greater understanding of such behaviors by studying them as aggregates rather than as isolated measures of performance. The theory also suggests that different isolated withdrawal behaviors are a function of the same psychological processes, that they should be correlated, and have a common set of antecedents including individual difference variables. Although this theory provides a promising new approach to a set of variables that have proved difficult to understand and predict, there is not, to our knowledge, any research that has focused on the use of these variables as criteria in selection research.

Harrison and Martocchio (1998), in their excellent review of the literature on absenteeism, argue similarly with respect to the time period over which absenteeism is aggregated in research studies. These authors provide a discussion of absenteeism theory and empirical research suggesting that personality and demographic variables are distal long-term determinants of absenteeism that might determine attitudes toward attendance at work, organizational commitment, job satisfaction, job involvement, and social context, which in turn determine the short-term daily decision to attend work. They provide a fairly short and simple list of precursors of absenteeism that should

be helpful in subsequent selection research in which the major outcome of interest is attendance.

Podsakoff, LePine, & LePine (2007) tested many of these hypotheses meta-analytically and found that job attitudes mediated the relationships between various stressors and turnover. Iverson and Deery (2001) presented a personological theory of withdrawal and found that a variety of dispositions predicted various withdrawal behaviors. Extending this work, Barrick and Zimmerman (2005) found that biodata and disguised-purpose dispositional retention scales uniquely predicted turnover, whereas clear-purpose dispositional scales did not. Zimmerman (2008) conducted a meta-analysis in which various personality variables were linked to turnover decisions.

Other work has explored the performance-withdrawal relationship (e.g., Allen & Griffeth, 2001). It should be noted, however, that the vast majority of the work on withdrawal has focused on turnover, with almost all of the rest focusing on absenteeism. This is probably due to the relative availability of turnover data. These pragmatic considerations, however, do not diminish the importance of variables such as tardiness, about which we know very little.

Counterproductive Behavior

A large and growing body of research in I-O psychology focuses on "deviant" or counterproductive behavior in the workplace. Developing from research on *integrity testing* —a selection method used to identify potential thieves and low-performing employees (e.g., Murphy & Lee, 1994; Sackett & Wanek, 1996)—counterproductive workplace behavior tends to encompass a constellation of behaviors that includes arson, bribery, blackmail, discrimination, fraud, violence, sabotage, harassment of coworkers, and even some forms of whistleblowing (e.g., Giacalone & Greenberg, 1997; Gruys & Sackett, 2003; Murphy, 1993). Although CWBs are thought to derive from reactions to frustration (Spector, 1997; Spector & Fox, 2010), recent research has demonstrated that CWB or "harming" at work is *not* synonymous with "not helping" at work. That is, CWB is not the opposite of OCB (Dalal, 2005). In fact, research suggests that individuals in one's social network can be both helped and harmed by the same individual—hence, OCB and CWB can be positively related (Venkataramani & Dalal, 2007). More recently, theorizing relating OCB and CWB has used attribution theory as a framework (Spector & Fox, 2010), which should help to further conceptually disentangle the OCB and CWB constructs.

Further attempts to refine the construct domain of CWB also have been undertaken in recent years, with notable efforts made by Sackett and DeVore (2001), Gruys and Sackett (2003), as well as Spector et al. (2006). Such research tends to find separate dimensions of theft-related behavior, physical and verbal abuse (including sexual harassment), withdrawal-type behavior (e.g., leaving work early), and destruction or sabotage, as well as misuse of company resource or time. Owing to the rather severe nature of many behaviors ascribed to the CWB domain, it may come as no surprise that research finds CWB weighs heavily on the minds of performance raters. Indeed, in a policy-capturing study of performance raters' subjective weighting of different performance dimensions, CWB obtained importance weights very nearly the magnitude of task performance (Rotundo & Sackett, 2002).

Because CWB is thought to be a frustration reaction, selection researchers have noted that attempting to identify individuals more prone to frustration could be useful. Indeed, recent years have seen an increase in the variety of predictors used to predict and explain CWB. For example, affectivity or emotionality has been consistently linked to CWB (Hershcovis et al., 2007; Kaplan et al., 2009; Roberts, Harms, Caspi, & Moffitt, 2007) and trait anger (Douglas & Martinko, 2001; Hershcovis et al., 2007). Hence, motivational traits tend to be theorized as antecedents to CWB, a sentiment echoed in findings that behavioral activation sensitivity (reflected by sensation seeking, reward sensitivity, and psychological "drive") and personal mastery as well as trait honesty predict interpersonal and organizational CWB (Diefendorff & Mehta, 2007; Marcus, Lee, & Ashton, 2007).

Whereas much research has focused on motivational traits as antecedents to CWB, research has begun to investigate mediating mechanisms such as job attitudes like job satisfaction (Mount, Ilies, & Johnson, 2006). Indeed, the effects of job attitudes and affect are increasingly the focus of CWB research (Dalal et al., 2009; Lee & Allen, 2002). However, attitudes and trait effects have also been found to be contingent on aspects of the social environment (e.g., coworker or public violence; LeBlanc & Kelloway, 2002). For example, self-esteem plays an indirect role in CWB, as when an employee's self-esteem is contingent on workplace performance, he or she will *not* respond to workplace stressors with CWB (Ferris, Brown, Lian, & Keeping, 2009). Moreover, dissimilarity between oneself and one's coworkers on personal characteristics such as extraversion, gender, and conscientiousness has been linked to higher CWB (Liao, Joshi, & Chuang, 2004). Finally, the effects of perceived organizational support

and perceptions of a developmental work environment on CWB are dependent on the personality of the perceiver. Such research finds that environments geared toward personal development reduce CWBs for neurotic and unconscientious employees, and perceptions of support reduce CWBs for disagreeable employees (Colbert, Mount, Harter, Witt, & Barrick, 2004).

Increasingly, CWB is being recognized not only as a response to negative treatment, work perceptions, and traits, but more generally as self-regulatory failure. Indeed, multiple studies have found that self-control is related to CWB and other problematic behaviors (Douglas & Martinko, 2001; Marcus & Schuler, 2004; Roberts et al., 2007). Importantly, one study found that, when controlling for other influences, internal self-control was the only predictor of CWB (Marcus & Schuler, 2004). Self-control as an important predictor of CWB is echoed in a recent meta-analysis on unethical behavior, which found that locus of control, cognitive moral development, principled ethical climate, and enforcement of ethical code were strong predictors of unethical behavior—all related to self-control-type reasons to avoid CWB (Kish-Gephart, Harrison, & Treviño, 2010). Moreover, recent research points to intelligence or cognitive ability as a robust predictor of CWB, likely for its inhibitory, self-regulation role (Dilchert et al., 2007). These findings mirror similar self-control research in social psychology (Hofmann, Friese, & Strack, 2009; Hofmann, Gschwendner, Friese, Wiers, & Schmitt, 2008). Given the convergence in findings across fields, research on the role of self-control in CWB seems especially promising and may serve as a mechanism to integrate CWB findings related to cognitive ability with personality and attitudes.

Health and Safety Outcomes

Historically, health and safety issues have been studied through the examination of on-the-job accidents. Here, accidents have traditionally been conceptualized as indicators of performance as opposed to a form of performance—often being studied using post hoc analysis of particular cases (Kaempf, Klein, Thordsen, & Wolf, 1996), analyzing "near-miss" accidents (Hofmann & Stetzer, 1998), or by developing checklist measures and observational techniques to measure a person's safe behavior (Hofmann & Stetzer, 1996). Importantly, methods of studying accidents focus on human performance in the accident situation as opposed to the occurrence of the accident itself, as accidents likely have causes (work conditions, machine malfunction, etc.) that are not under the control of the employee. As a consequence, researchers usually focus on predicting and understanding unsafe behavior rather than accidents per se.

Whereas accidents have not been historically recognized as a separate domain of performance, Safety is increasingly being recognized as a domain of performance that is independent of other aspects of job performance (i.e., task, contextual, or adaptive performance). For example, a recent study has developed a model of safety performance that is dependent on employee knowledge about safety procedures (Burke, Sarpy, Tesluk, & Smith-Crowe, 2002), which has been distinguished from task performance in subsequent research (Wallace & Chen, 2006). Within the safety performance literature, safety climate (Clarke, 2006; Neal & Griffin, 2004) has emerged as one of the most important precursors to workplace safety and accident prevention. Indeed, safety climate has been demonstrated to be a precursor to safety performance as well as reduced accidents and injuries (Christian, Bradley, Wallace, & Burke, 2009) and to predict safety motivation at time lags of up to 2 years (Neal & Griffin, 2006). An increasingly fruitful area in the study of occupational safety research is on individual differences predictors of safety. Research has examined the role of "accident proneness" (i.e., characteristics that make an individual more likely to have accidents in any situation)—however, with limited empirical support (McCormick & Ilgen, 1985; Whitlock, Clouse, & Spencer, 1963). As was mentioned earlier, motivational and knowledge (safety knowledge and motivation; Christian et al., 2009) as well as personality-based (conscientiousness and locus of control; Christian et al., 2009) predictors have proven to be much more useful in the prediction of workplace accidents and are likely to be important for future research on the role of selection in safety performance.

Litigation and Social Responsibility

Over the past 3 or 4 decades, personnel selection and its impact on members of diverse groups have been the subject of legislation (Civil Rights Acts of 1964 and 1991, Americans with Disabilities Act), professional guidelines (AERA, APA, & NCME, 1999; SIOP, 1987), executive orders (e.g., President Johnson's executive order 11,246 establishing the Office of Federal Contract Compliance), governmental guidelines (Uniform Guidelines on Employee Selection Procedures, 1978), and extensive litigation and case law development (for a review, see Sharf & Jones, 1999). These external events have challenged personnel selection researchers to reexamine not only the

usual validity and reliability issues addressed in much of this chapter, but also the impact that these measures have on the opportunities afforded members of diverse groups in our society. The latter has stimulated a new term, *consequential validity* (Messick, 1998), which refers to the broad set of outcomes that result from use of a selection procedure in addition to the prediction of some organizationally relevant criterion.

The research that this external attention generated has clarified some points. First, tests have not been found to be psychometrically biased, in that predicted outcomes for various protected groups do not seem to be lower than actual outcomes. Second, there are large minority–majority subgroup differences on some tests, especially cognitive ability tests. Various attempts to remove these subgroup differences in measured cognitive ability may serve to diminish subgroup differences, but large differences in subgroup performance remains, and these differences often produce legally defined levels of adverse impact on minority groups. There is no general agreement on how to prevent discrimination or its past effects. Affirmative action programs seem to have negative consequences for perceptions of employees who are thought to be hired based on group membership rather than merit (Heilman, Battle, Keller, & Lee, 1998), though most of this research has been conducted in the laboratory and does not consider similar impact over a long period of time. Affirmative action programs do seem to result in employment improvement for minority groups and women (Kravitz et al., 1997; Pyburn, Ployhart, & Kravitz, 2008), though reverse discrimination cases now indicate that race or irrelevant class membership criteria cannot be used in selection decisions.

The results regarding the lack of predictive bias in ability tests and large subgroup differences in test scores suggest that overall utility of a selection procedure will be diminished when tests are not utilized in an optimal manner (Boudreau, 1991). However, studies conducted at the organizational level (Leonard, 1990; Steel & Lovrich, 1987) do not indicate a negative relationship between the proportion of minorities or women in organizations and organizational efficiency measures. In an analysis of 3,200 employers in four large metropolitan areas, Holzer and Neumark (1996) showed little evidence of substantially weaker job performance among most groups of minority and female affirmative action hires. Consideration of the outcomes related to various human resource interventions including selection at the organizational level has become increasingly common in human resources research (e.g., Schneider et al., 2000). This research; an increased sense of the importance of corporate social responsibility (see the October 1999 issue of the *Academy of Management Journal*) and multiple corporate stakeholders; and the recognition on the part of many large corporations (Doyle, 2000) that a well-educated, highly diverse workforce composed of people who have learned to work productively and creatively with individuals from many races, religious, and cultural histories, is the key to maintaining organizational global competitiveness (e.g., Joshi, Liao, & Jackson, 2006). These trends suggest that personnel selection researchers need to broaden the criteria by which they judge individual and organizational effectiveness. Such broadening may change the KSAOs we judge to be important for success, and they may change the research questions we ask when considering the KSAO–performance relationships across various subgroups in our society.

Another interesting line of research has involved the social psychology concept of stigma. Certain groups of people are stigmatized in the workplace because of superficial characteristics, many of which have no particular bearing on performance. This stigmatization has important implications for selection. In an experimental field study involving confederates caparisoned in pregnancy prostheses, Hebl, King, Glick, Singletary, and Kazama (2007) showed that pregnant women were treated differently from nonpregnant women by retail staff, and that the nature of the difference depended on whether the women were asking for sales help or for information regarding employment. King, Shapiro, Hebl, Singletary, and Turner (2006), using a similar sort of design, showed that obese customers were treated differently by customer service employees and that the nature of this difference depended on nonverbal cues relating to the degree to which the target was making attempts to address their obesity.

Customer Satisfaction and Loyalty

Focusing on the customer by building satisfaction and loyalty has in recent years, been linked to important organizational outcomes such as financial performance (Kumar, Venkatesan, & Reinartz, 2008; Schneider, Macey, Lee, & Young, 2009). In addition, the proportion of the workforce that is directly involved in service to customers has risen and is projected to continue to rise (see Bureau of Labor Statistics, www.bls.gov/emp/ep_table_203.htm). Moreover, research indicates that measures of customer service satisfaction have adequate construct validity. Indeed, customer service satisfaction tends

to cluster into four factors: courtesy or interpersonal treatment, competence, convenience or efficiency, and ability to resolve problems dimensions (Johnson, 1996; Schneider, White, & Paul, 1998)—all of which have been linked to "objective" customer patronage or loyalty behavior (Rogg, Schmidt, Shull, & Schmitt, 2001). Such promising research in combination with an increased emphasis on service quality and customer satisfaction has, therefore, generated interest in the relationship between employee behavior and attitudes and customer satisfaction. Recent studies on customer service indicate that higher perceived organizational support is related to more customer-helping behavior (Vandenberghe et al., 2007), and high employee satisfaction is related to increased customer satisfaction (Payne & Webber, 2006). Moreover, a recent meta-analysis suggests that business-level job satisfaction and engagement have consistent positive relationships with customer satisfaction ratings (e.g., mean observed correlation, 0.16).

In recent years, several attempts have been made to evaluate how stable individual differences (e.g., personality, knowledge) contribute to customer service. Studies show that conscientiousness, agreeableness, neuroticism, and extraversion all contributed to service performance (Liao & Chuang, 2004); other research suggests that customer service knowledge has incremental validity over and above conscientiousness, cognitive ability, and work experience (Motowidlo, Brownlee, & Schmit, 2008). Findings that customer service knowledge is important for customer service performance are echoed in another recent study, which demonstrates that customer relations knowledge mediates the relationship between personality (e.g., self-monitoring, openness) and ability predictors (problem solving, arithmetic ability) with sales and service performance (Bergman et al., 2008). Such research has direct implications for selection research as it suggests that the validation of customer service knowledge instruments requires behavioral measures derived from customers as well as attention to various organizational constraints and aides (Schneider, Wheeler, & Cox, 1992).

SOCIETAL AND ORGANIZATIONAL ISSUES

There are a number of larger or macro issues that affect selection practices in organizations, or at least the manner in which they are examined. On most of these issues, there are few empirical studies, but we believe that research addressing these concerns is needed and will be conducted in the next several years. The first three of these issues demand that we attend to levels-of-analysis issues in our research on selection (Klein & Kozlowski, 2000; Schneider et al., 2000). Both theory and data analyses must be oriented appropriately to a consideration of variables at individual, group, or organizational levels.

First, there seems to be an increasing interest in examining the effect of human resource efforts, including selection at the organizational level. Terpstra and Rozell (1993) represent the only systematic study of the relationship between specific selection practices and organizational level measures of performance. They reported correlational data supporting the conclusion that organizations employing relatively greater numbers of selection practices (e.g., structured interviews, cognitive ability tests, biodata, and evaluations of recruiting sources) had higher annual profit, profit growth, and overall performance. Studies assessing a wider variety of human resource criteria and their relationship to organizational outcomes have become more common (e.g., Huselid, Jackson, & Schuler, 1997; Shaw, Delery, Jenkins, & Gupta, 1998). Typically, these studies report statistically significant, but low (<0.10) correlations between these organizational-level variables. The measures of human resource efforts used in these studies are often quite simple single-item measures, and the studies themselves are usually cross-sectional surveys. Much more conceptual and empirical work is needed in assessing the impact of selection on organizational performance.

Second, Johns (1993) has argued that selection researchers must view their efforts as organizational interventions subject to the same mechanisms and processes described in the innovation diffusion and implementation literatures rather than as technical improvements that any rational manager would adopt if he or she understands validity data. Johns (1993) presents a number of propositions, the central thesis being that variance in the adoption of psychology-based interventions is a function of the decision-making frame of managers, the nature of the industrial–organizational theory and research presented to them, and critical events and actors in the external environment of the adopting organization. Most practitioners will be able to cite technically meritorious practices that are not adopted or are modified in inappropriate ways for a variety of social and organizational reasons. Validation work that includes assessment and evaluation of the role of these factors may prove useful in discerning individual difference–performance relationships.

Third, there is a trend among organizational scholars to think of selection as a means to further organizational

strategic objectives. Traditionally, the focus in selection research has been on the match between a person and a job. A common notion among strategic planners (Snow & Snell, 1993) is to view selection as methods of staffing an organization with persons whose KSAs help effectively implement organizational strategy. This idea is similar to the job-match focus, but some believe that selection should or can drive organizational strategy. If an organization hires a great many innovative personnel, over a period of time its research and development efforts may become more important than its production capabilities. If selection is to propel strategy, we may need to focus on broader KSAs that indicate an individual's capacity to adapt to and change her or his environment (Chan, 1997; Pulakos et al., 2000).

Fourth, many organizations today have facilities or markets in countries throughout the world. This globalization requires communication among people from different cultures and frequently the relocation of personnel from one country or culture to another. Because of the enormous expense associated with these moves, the selection, training, adaptation, and repatriation of these international assignees has begun to receive research attention (Black et al., 1991). The empirical literature available suggests that previous experience, interpersonal skills and self-efficacy in dealing with people of diverse cultures, non–work life concerns, and the nature of the host country's culture have been found to be critical in expatriate adjustment. Certainly, adjustment to other cultures requires a set of nontechnical interpersonal skills that are not normally evaluated by organizations.

Fifth, many organizations have outsourced parts of their human resource function including selection in efforts to downsize. When this happens, the function is often provided by consultants. When this is the case, it is critical that organizational personnel value the service provided and understand the manner in which it is to be used. Without adequate implementation plans and sufficiently committed and trained personnel, even the best developed assessment center or structured interview will not be used appropriately and will undoubtedly fail to contribute what it otherwise might to the identification of human talent. The impact of outsourcing on the effectiveness of selection procedures and even the type and quality of the procedures that are developed has not been examined.

There are undoubtedly other external societal issues that influence the capability of personnel selection researchers in their attempts to understand and predict employee performance. These represent some we believe should or will be important in the short term.

CONCLUSIONS

Ten years ago, we concluded the chapter with the following paragraph:

> Personnel selection research has clearly expanded from its early interest in documenting predictor-criterion relationships. There has been great progress in considering a broader range of predictors and outcomes and in their measurement. Sophisticated performance models are being proposed and tested. The broader social significance of personnel selection and the reactions of examinees to our procedures are receiving greater attention. We believe these are positive trends and hope that the many questions we posed throughout this chapter will be addressed in the near future.

These statements ring as true today as they did then.

REFERENCES

Ackerman, P. L. (1987). Individual differences in skill learning: An integration of psychometric and information processing perspectives. *Psychological Bulletin*, *102,* 3–27.

Ackerman, P. L., & Cianciolo, A. T. (1999). Psychomotor abilities via touch-panel testing: Measurement innovations, construct, and criterion validity. *Human Performance*, *12,* 231–273.

Ackerman, P. L., & Heggestad, E. D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin*, *121,* 219–245.

Adis, C., & Thompson, J. C. (in press). A brief primer of neuroimaging methods for industrial/organizational psychology. In J. M. Cortina & R. S. Landis (Eds.), *Modern research methods for the study of behavior in organizations*. New York, NY: Routledge.

Aguinis, H., Cortina, J. M., & Goldberg, E. (1998). A new procedure for computing equivalence bands in personnel selection. *Human Performance*, *11,* 351–365.

Allen, M. T., Cheng, Y. A., Putka, D. J., Hunter, A., & White, L. (2010). Analysis and Findings. In Knapp, D. J., & Heffner, D. S. (Eds.), *Expanded enlistment eligibility metrics (EEEM): Recommendations on a non-cognitive screen for new soldier selection*. Technical report for the U.S. Army Research Institute for the Behavioral and Social Sciences.

Allen, D. G., & Griffeth, R. W. (2001). Test of a mediated performance–turnover relationship highlighting the moderating roles of visibility and reward contingency. *Journal of Applied Psychology 86*(5), 1014–1021.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: American Psychological Association.

Anderson, N. (2003). Applicant and recruiter reactions to new technology in selection: A critical review and agenda for future research. *International Journal of Selection and Assessment, 11,* 121–136.

Arthur, W. Edwards B. D., & Barrett, G. V. (2002). Multiple-choice and constructed response tests of ability: Race-based subgroup performance differences on alternative paper-and-pencil test formats. *Personnel Psychology*, *55,* 985–1008.

Arthur, W., & Villado, A. J. (2008). The importance of distinguishing between constructs and methods when comparing predictors in personnel selection research and practice. *Journal of Applied Psychology*, *93*(2), 435–442.

Austin, J. T., & Villanova, P. (1992). The criterion problem: 1917–1992. *Journal of Applied Psychology*, *77,* 803–835.

Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin*, *134* (6), 779–806.

Bachrach, D. G., Powell, B. C., Bendoly, E., & Rickey, R. G. (2006). Organizational citizenship behavior and performance evaluations: Exploring the impact of task interdependence. *Journal of Applied Psychology, 91* (1), 193–201.

Baer, M. (2010). The strength-of-weak-ties perspective on creativity: A comprehensive examination and extension. *Journal of Applied Psychology*, *95* (3), 592–601.

Baer, M., & Oldham, G. R. (2006). The curvilinear relation between experienced creative time pressure and creativity: Moderating effects of openness to experience and support for creativity. *Journal of Applied Psychology*, *91,* 963–970.

Baker, W. E., & Sinkula, J. M. (1999). The synergistic effect of market orientation and learning orientation on organizational performance. *Journal of the Academy of Marketing Science*, *27,* 411–427.

Ball, C. T., Langholtz, H. J., Auble, J., & Sopchak, B. (1998). Resource-allocation strategies: A verbal protocol analysis. *Organizational Behavior & Human Decision Processes*, *76,* 70–88.

Barber, A. E., Hollenbeck, J. R., Tower, S. L., & Phillips, J. M. (1994). The effects of interview focus on recruitment effectiveness: A field experiment. *Journal of Applied Psychology*, *79,* 886–896. doi: 10.1037/0021-9010.79.6.886

Barber, A. E., & Roehling, M. V. (1993). Job postings and the decision to interview: A verbal protocol analysis. *Journal of Applied Psychology*, *78,* 845–856.

Barber, A. E., & Wesson, M. J. (1998). Using verbal protocol analysis to assess the construct validity of an empirical measure: An examination of the OCP. In J. A. Wagner (Ed.), *Advances in qualitative organization research* (Vol. 1, pp. 67–104). Greenwich, CT: JAI Press.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17* (1), 99–120.

Barrick, M. R., & Mount, M. K. (1991). The Big-Five personality dimensions in job performance: A meta-analysis. *Personnel Psychology*, *44,* 1–26.

Barrick, M. R., Shaffer, J., & DeGrassi, S. D. (2009). What you see may not be what you get: Relationships among self-presentation tactics and ratings of interview and job performance. *Journal of Applied Psychology*, *94,* 1394–1412.

Barrick, M. R., Stewart, G. L., Neubert, M. J., & Mount, M. K. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology*, *83,* 377–391.

Barrick, M. R., Stewart, G. L, & Piotrowski, M. (2002). Personality and job performance: Test of the mediating effects of motivation among sales representatives. *Journal of Applied Psychology*, *87* (1), 43–51.

Barrick, M. R., Swider, B. W., & Stewart, G. L. (2010). Initial evaluations in the interview: Relationships with subsequent interviewer evaluations and employment offers. *Journal of Applied Psychology*, *95* (6), 1163–1172.

Barrick, M.R. & Zimmerman, R.D. (2005). Reducing voluntary, avoidable turnover through selection. *Journal of Applied Psychology*, *90* (1), 159–166

Bauer, T. N., Erdogan, B., Liden, R. C., & Wayne, S. J. (2006). A longitudinal study of the moderating role of extraversion: Leader–member exchange, performance, and turnover during new executive development. *Journal of Applied Psychology*, *91,* 298–310.

Bauer, T. N., Maertz, C. P., Jr., Dolen, M. R., & Campion, M. A. (1998). Longitudinal assessment of applicant reactions to employment testing and test outcome feedback. *Journal of Applied Psychology*, *83,* 892–903.

Bergman, M. E., Donovan, M. A., Drasgow, F., Overton, R. C., & Henning, J.B. (2008). Test of Motowidlo et al.'s (1997) theory of individual differences in task and contextual performance. *Human Performance, 21,* 227–253

Berry, C. M., & Sackett, P. R. (2009). Faking in personnel selection: Tradeoffs in performance versus fairness resulting from two cut-score strategies. *Personnel Psychology*, *62,* 833–863.

Berry, C. M., Sackett, P. R., & Landers, R. N. (2007). Revisiting interview–cognitive ability relationships: Attending to specific range restriction mechanisms in meta-analysis. *Personnel Psychology*, *60,* 837–874.

Bettencourt, L., Gwinner, K., & Meuter, M. (2001). A comparison of attitude, personality, and knowledge predictors of service-oriented organizational citizenship behaviors. *Journal of Applied Psychology*, *86,* 29–41.

Bing, M., Stewart, S., Davison, H., Green, P., McIntyre, M., & James, L. (2007). An integrative typology of personality assessment for aggression: Implications for predicting counterproductive workplace behavior. *Journal of Applied Psychology*, *92,* 722–744.

Bing, M. N., Whanger, J. C., Davison, H. K., & VanHook, J. B. (2004). Incremental validity of the frame-of-reference effect in personality scale scores: A replication and extension. *Journal of Applied Psychology*, *89,* 150–157.

Binning, J. F., & Barrett, G. V. (1989). Validity of personnel decisions: A conceptual analysis of the inferential and evidentiary bases. *Journal of Applied Psychology*, *74,* 478–494.

Black, J. S., Mendenhall, M., & Oddou, G. (1991). Toward a comprehensive model of international adjustment: An integration of multiple theoretical perspectives. *Academy of Management Review*, *16,* 291–317.

Bledow, R., & Frese, M. 2009. A situational judgment test of personal initiative and its relationship to performance. *Personnel Psychology*, *62,* 229–258.

Bobko, P., Roth, P. L., & Potosky, D. (1999). Derivation and implications of a meta-analytic matrix incorporating cognitive ability, alternative predictors, and job performance. *Personnel Psychology*, *52,* 561–589.

Bolino, M. C. (1999). Citizenship and impression management: Good soldiers or good actors? *Academy of Management Review*, *24,* 82–98.

Bolino, M. C. Turnley, W. H. (2005). The personal costs of citizenship behavior: The relationship between individual initiative and role overload, job stress, and work-family conflict. *Journal of Applied Psychology*, *90,* 740–748.

Borman, W. C., Hanson, M. A., & Hedge, J. W. (1997). Personnel selection. *Annual Review of Psychology*, *48,* 299–337.

Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations*. San Francisco, CA: Jossey-Bass.

Borman, W. C., & Motowidlo, S. J. (1997). Task performance and contextual performance: The meaning for personnel selection research. *Human Performance*, *10,* 99–110.

Borman, W. C., & Penner, L. A. (2001). Citizenship performance: Its nature, antecedents, and motives. In B. W. Roberts & R. Hogan (Eds.), *Personality psychology in the workplace* (pp. 45–61). Washington, DC: American Psychological Association.

Borman, W. C., White, L. A., Pulakos, E. D., & Oppler, S. H. (1991). Models of supervisory job performance ratings. *Journal of Applied Psychology*, *76,* 863–872.

Boudreau, J. W. (1991). Utility analysis for decisions in human resource management. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 621–746). Palo Alto, CA: Consulting Psychologists Press.

Bowler, W. M., & Brass, D. J. (2006). Relational correlates of interpersonal citizenship behavior: A social network perspective. *Journal of Applied Psychology*, *90,* 70–81.

Bridges, W. (1994, September, 19). The end of the job. *Fortune*, *130,* 62–74.

Brown, R. P., & Day, E. A. (2006). The difference isn't black and white: Stereotype threat and the race gap on Raven's Advanced Progressive Matrices. *Journal of Applied Psychology*, *91,* 979–985.

Budgell, G. R., Raju, N. S., & Quartetti, D. A. (1995). Analysis of differential item functioning in translated assessment instruments. *Applied Psychological Measurement*, *19,* 309–321.

Burke, M. J., Sarpy, S. A., Tesluk, P. E., & Smith- Crowe, K. (2002). General safety performance: A test of a grounded theoretical model. *Personnel Psychology*, *55,* 429–457.

Busemeyer, J. R., & Jones, L. E. (1983). Analysis of multiplicative combination rules when the causal variables are measured with error. *Psychological Bulletin*, *93,* 549–563.

Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 1, 2nd ed.). Palo Alto, CA: Consulting Psychologists Press.

Campbell, J. P. (1999). The definition and measurement of performance in the new age. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance* (pp. 399–429). San Francisco, CA: Jossey-Bass.

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

Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). A theory of performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations*. San Francisco, CA: Jossey-Bass.

Carlson, K. D., Scullen, S. E., Schmidt, F. L., Rothstein, H. R., & Erwin, F. (1999). Generalizable biographical data validity can be achieved without multi-organizational development and keying. *Personnel Psychology*, *52,* 731–755.

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. Cambridge, England: Cambridge University Press.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge, England: Cambridge University Press.

Chan, D. (1997). *Individual differences and learning perspectives on the construct of adaptability: An integrative person-situation approach*. Paper presented at the annual meeting of the Academy of Management, Boston, MA.

Chan, D. 2006. Interactive effects of situational judgment effectiveness and proactive personality on work perceptions and work outcomes. *Journal of Applied Psychology*, *91,* 475–481.

Chan, D., & Schmitt, N. (2004). An agenda for future research on applicant reactions to selection procedures: A construct-oriented approach. *International Journal of Selection and Assessment*, *12,* 9–23.

Chapman, D., & Webster, J. (2006). Toward an integrated model of applicant reactions and job choice. *International Journal of Human Resources Management*, *17,* 1032–1057.

Chapman, D. S., & Zweig, D. I. (2005). Developing a nomological network for interview structure: Antecedents and consequences of the structured selection interview. *Personnel Psychology*, *58,* 673–702.

Chipman, S. F., Schraagen, J. M., & Shalin, V. L. (2000). Introduction to cognitive task analysis. In J. M. Schraagen, S. F. Chipman, & V. L. Shalin (Eds.), *Cognitive task analysis* (pp. 3–24). Mahwah, NJ: Erlbaum.

Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, *94,* 1103–1127.

Christian, M. S., Edwards, B. D., & Bradley, J. C. (2010). Situational judgment tests: Constructs assessed and a meta-analysis of their criterion-related validities. *Personnel Psychology*, *63,* 83–117.

Christensen, B. T., & Schunn, C. D. (2009). The role and impact of mental simulation in design. *Applied Cognitive Psychology*, *23,* 327–344.

Clarke, S. (2006). The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology*, *11,* 315–327.

Clevenger, J., Pereira, G. M., Wiechmann, D., Schmitt, N., & Harvey, V. S. (2001). Incremental validity of the situational judgment inventory relative to cognitive ability, conscientiousness, experience, and job knowledge. *Journal of Applied Psychology*, *86* (3), 410–417.

Colbert, A. E., Mount, M. K., Harter, J. K., Witt, L. A., & Barrick, M. R. (2004). Interactive effects of personality and perceptions of the work situation on workplace deviance. *Journal of Applied Psychology*, *89,* 599–609.

Conway, J. M. (2000). Managerial performance development constructs and personality correlates. *Human Performance*, *13,* 23–46.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago, IL: Rand-McNally.

Cortina, J. M., Goldstein, N. B., Payne, S. C., Davison, H. K., & Gilliland, S. W. (2000). The incremental validity of interview scores over and above cognitive ability and conscientiousness scores. *Personnel Psychology*, *53,* 325–352.

Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, *31,* 874–900.

Dalal, R. S. (2005). A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior. *Journal of Applied Psychology*, *90,* 1241–1255.

Dalal, R. S., Lam, H., Weiss, H. M., Welch, E. R., & Hulin, C. L. (2009). A within-person approach to work behavior and performance: Concurrent and lagged citizenship–counterproductivity associations, and dynamic relationships with affect and overall job performance. *Academy of Management Journal*, *52,* 1051–1066.

Day, E. A., Arthur, W., Jr., & Gettman, D. (2001). Knowledge structures and the acquisition of a complex skill. *Journal of Applied Psychology*, *86,* 1022–1033.

DeChurch, L., & Mesmer-Magnus, J. (2010). The cognitive underpinnings of effective teamwork. *Journal of Applied Psychology*, *95,* 32–53.

De Dreu, C. K. W., & Nauta, A. (2009). Self-interest and other orientation in organizational behavior: Implications for job performance, prosocial behavior, and personal initiative. *Journal of Applied Psychology*, *94,* 913–926.

de Meijer, L. A. L., Born, M. P., van Zielst, J., & van der Molen, H. T. (2010). Construct-driven development of a video-based situational judgment test for integrity: A study in a multi-ethnic police setting. *European Psychologist*, *15,* 229–236.

Den Hartog, D. N., De Hoogh, A. H. B., & Keegan, A. E. (2007). The interactive effects of belongingness and charisma on helping and compliance. *Journal of Applied Psychology*, *92,* 1131–1139.

DeShon, R. P., Brown, K.G., & Greenis, J. L. (1996). Does self-regulation require cognitive resources? Evaluation of resource allocation models of goal setting. *Journal of Applied Psychology*, *81,* 595–608.

DeYoung, C. G., & Gray, J. R. (2009). Personality neuroscience: Explaining individual differences in affect, behavior, and cognition. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 323–346). New York, NY: Cambridge University Press.

DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience: Brain structure and the Big Five. *Psychological Science*, *21* (6), 820–828.

Diefendorff, J. M., & Lord, R. G. (2008). Goal-striving and self-regulation processes. In R. Kanfer, G. Chen, & R. D. Pritchard (Ed.), *Work motivation: Past, present, and future* (pp. 151–197). New York, NY: Routledge.

Diefendorff, J. M., & Mehta, K. (2007). The relations of motivational traits with workplace deviance. *Journal of Applied Psychology*, *92,* 967–977.

Digman, J. M. (1990). Personality structure: Emergence of the five factor model. *Annual Review of Psychology*, *41,* 417–440.

Dilchert, S., Ones, D. S., Davis, R. D., & Rostow, C. D. (2007). Cognitive ability predicts objectively measured counterproductive workplace behaviors. *Journal of Applied Psychology*, *92,* 616–627.

Dimotakis, N., Ilies, R., & Judge, T. A. (in press). Experience sampling methodology. In J. M. Cortina & R. S. Landis (Eds.), *Modern research methods for the study of behavior in organizations*. New York, NY: Routledge.

Dimotakis, N., Scott, B. A., & Koopman, J. (in press). An experience sampling investigation of workplace Interactions, affective states, and employee well-being. *Journal of Organizational Behavior.*

Dorsey, D. W., Campbell, G. E., Foster, L. L., & Miles, D. E. (1999). Assessing knowledge structures: Relations with experience and post-training performance. *Human Performance*, *12,* 31–57.

Dorsey, D., Cortina, J. M., & Luchman, J. (2010). Adaptive and citizenship-related behaviors at work. In Farr, J. L., & Tippins, N. T. (Eds.), *Handbook of employee selection*. New York, NY: Taylor and Francis.

Douglas, S. C., & Martinko, M. J. (2001). Exploring the role of individual differences in the predictions of workplace aggression. *Journal of Applied Psychology*, *86,* 547–559.

Doyle, R. A. (2000). GM supports University's stand on affirmative action. *The University Record*. Ann Arbor: University of Michigan.

Drasgow, F., & Olson-Buchanan, J. B. (1999). *Innovations in computerized assessment*. Mahwah, NJ: Erlbaum.

DuBois, D., & Shalin, V. L. (1995). Adapting cognitive methods to real-world objectives: An application to job knowledge testing. In P. D. Nichols, S. F. Chipman, & R. L. Brennan (Eds.), *Cognitively diagnostic assessment* (pp. 189–220). Hillsdale, NJ: Erlbaum.

DuBois, D., & Shalin, V. L. (2000). Describing job expertise using cognitively oriented task analyses (COTA). In J. M. Schraagen, S. F. Chipman, & V. L. Shalin (Eds.), *Cognitive task analysis* (pp. 41–56). Mahwah, NJ: Erlbaum.

Dudley, N. M. & Cortina, J. M. (2008). Knowledge and skills that facilitate the personal support dimension of citizenship. *Journal of Applied Psychology*, *93,* 1249–1270.

Dudley, N. M., Orvis, K. A., Lebiecki, J. E., & Cortina, J. M. (2006). A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits. *Journal of Applied Psychology*, *91,* 40–57. doi:10.1037/0021-9010.91.1.40

Dunnette, M. D. (1963). A note on the criterion. *Journal of Applied Psychology*, *47,* 251–254.

Edwards, B. D., & Arthur, W., Jr. (2007). An examination of factors contributing to a reduction in subgroup differences on a constructed-response paper-and-pencil test of scholastic achievement. *Journal of Applied Psychology*, *91,* 794–801.

Edwards, B. D., Day, E. A., Arthur, W., Jr., & Bell, S. T. (2006). Relationships among team ability composition, team mental models, and team performance. *Journal of Applied Psychology*, *91,* 727–736.

Ehrhart, M. (2004). Leadership and procedural justice climate as antecedents of unit-level organizational citizenship behavior. *Personnel Psychology*, *57,* 61–94.

Ellingson, J. E., Sackett, P. R., & Connelly, B. S. (2007). Personality assessment across selection and developmental contexts: Insights into response distortion. *Journal of Applied Psychology*, *92,* 386–395.

Ellingson, J. E., Sackett, P. R., & Hough, L. M. (1999). Social desirability corrections in personality measurement: Issues of applicant comparison and construct validity. *Journal of Applied Psychology*, *84,* 155–166.

Ellis, A. P. J., West, B. J., Ryan, A. M., & DeShon, R. P. (2002). The use of impression management tactics in structured interviews: A function of question type? *Journal of Applied Psychology*, *87,* 1200–1208.

Ely, K. (2009). *Sequencing training interventions to promote self-regulation, knowledge, and adaptive transfer*. Unpublished dissertation, George Mason University.

Ely, K., Zaccaro, S. J., & Conjar, E. A. (2009). Leadership development: Training strategies for growing adaptability in leaders. In C. Cooper, & R. Burke (Eds.), *The peak performing organization* (pp. 175–196). London: Routledge.

Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, *86,* 1270–1279.

Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis: Verbal reports as data*. Cambridge, MA: MIT Press.

Ferris, D. L., Brown, D. J., Lian, H., & Keeping, L. M. (2009). When does self-esteem relate to deviant behavior? The role of contingencies of self-worth. *Journal of Applied Psychology*, *94,* 1345–1353.

Finkel, E. J., & Fitzsimons, G. M. (2011). The effects of social relationships on self-regulation. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation* (2nd ed., pp. 390–406). New York, NY: Guilford Press.

Fitzsimons, G. M., & Finkel, E. J. (2011). Outsourcing self regulation. *Psychological Science*, *22,* 269–375.

Flaherty, A. W. (2005). Frontotemporal and dopaminergic control of idea generation and creative drive. *Journal of Comparative Neurology*, *493,* 147–153.

Fleishman, E. A., & Reilly, M. E. (1992). *Handbook of human abilities*. Palo Alto, CA: Consulting Psychologists Press.

Fong, C. T. (2006). The effects of emotional ambivalence on creativity. *Academy of Management Journal*, *49,* 1016–1030.

Ford, J. K., Smith, E. M., Weissbein, D. A., Gully, S. M., & Salas, E. (1998). Relationships of goal orientation, metacognitive activity, and practice strategies with learning outcomes and transfer. *Journal of Applied Psychology*, *83,* 218–233.

Frei, R. L., & McDaniel, M. A. (1998). Validity of customer service measures in personnel selection: A review of criterion and construct evidence. *Human Performance*, *11,* 1–27.

Gardner, H. (1999). *Intelligence reframed*. New York, NY: Basic Books.

Gellatly, I. R. (1996). Conscientiousness and task performance: Tests of cognitive process model. *Journal of Applied Psychology*, *81,* 474–482.

George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology*, *87,* 687–697.

George, J. M., & Zhou, J. (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management Journal*, *50,* 605–622.

Gialacone, R. A., & Greenberg, J., Eds. (1997). *Antisocial behavior in organizations*. Thousand Oaks, CA: Sage.

Gilliland, S. W. (1993). The perceived fairness of selection systems: An organizational justice perspective. *Academy of Management Review*, *18,* 694–734.

Gilliland, S. W. (1994). Effects of procedural and distributive justice in reactions to a selection system. *Journal of Applied Psychology*, *79,* 691–701.

Goffin, R. D., Rothstein, M. G., & Johnston, M. G. (1996). Personality testing and the assessment center: Incremental validity for managerial selection. *Journal of Applied Psychology*, *81,* 746–756.

Goldstein, I. L., Zedeck, S., & Schneider, B. (1993). An exploration of the job analysis–content validity process. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 3–32). San Francisco, CA: Jossey-Bass.

Good, G. W., Maisel, S. C., & Kriska, S. D. (1998). Setting an uncorrected visual acuity standard for police officer applicants. *Journal of Applied Psychology*, *83,* 817–824.

Gong, Y., Huang, J. C., & Farh, J. L. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee creative self-efficacy. *Academy of Management Journal*, *52*(4), 765–778.

Grant, A. M. (2008). Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity. *Journal of Applied Psychology*, *93,* 48–58.

Grant, A. M., & Mayer, D. M. (2009). Good soldiers and good actors: Prosocial and impression management motives as interactive predictors of affiliative citizenship behaviors. *Journal of Applied Psychology*, *94,* 900–912.

Grant, A. M., Parker, S. K., & Collins, C. G. (2009). Getting credit for proactive behavior: Supervisor reactions depend on what you value and how you feel. *Personnel Psychology*, *62,* 31–55.

Griffin, M. A., Neal, A. S., Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal*, *50*(2), 327–347.

Gruys, M. L., & Sackett, P. R. (2003). Investigating the dimensionality of counterproductive work behavior. *International Journal of Selection and Assessment*, *11,* 30–41.

Guastello, S. J., & Gaustello, D. D. (1998). Origins of coordination and team effectiveness: A perspective from game theory and nonlinear dynamics. *Journal of Applied Psychology*, *83,* 423–437.

Haaland, S., & Christiansen, N. D. (2002). Implications of trait-activation theory for evaluating the construct validity of assessment center ratings. *Personnel Psychology*, *55,* 137–163.

Haerem, T., & Rau, D. J. (2007). The influence of degree of expertise and objective task complexity on perceived task complexity and performance. *Journal of Applied Psychology*, *92,* 1320–1331.

Hakel, M. D. (1989). The state of employment interview theory and research. In R. W. Eder & G. R. Ferris (Eds.). *The employment interview: Theory, research, and practice,* (pp. 285–293). Thousand Oaks, CA: Sage.

Halbesleben, J. R. B., Bowler, W. B., Bolino, M. C., & Turnley, W. H. (2010). Organizational concern, prosocial values, or impression management? How supervisors attribute motives to organizational citizenship behavior. *Journal of Applied Social Psychology*, *40,* 1450–1489.

Hall, D. T. (1996). Protean careers of the 21st century. *Academy of Management Executive*, *10,* 9–16.

Hanisch, K. A. (1995). Behavioral families and multiple causes: Matching the complexity of responses to the complexity of antecedents. *Current Directions in Psychological Science*, *4,* 156–162.

Hanisch, K. A., Hulin, C. L., & Roznowski, M. (1998). The importance of individuals' repertoires of behaviors: The scientific appropriateness of studying multiple behaviors and general attitudes. *Journal of Organizational Behavior*, *19,* 463–480.

Hanson, M. A., Borman, W. C., Mogilda, H. J., Manning, C., & Hedge, J. W. (1999). Computerized assessment of skill for a highly technical job. In F. Drasgow & J. B. Buchanan (Eds.), *Innovations in computerized assessment* (pp. 197–220). Mahwah, NJ: Erlbaum.

Harris, K. J., Andrews, M., & Kacmar, K. (2007). The moderating effects of justice on the relationship between organizational politics and work-place attitudes. *Journal of Business & Psychology*, *22,* 135–144.

Harris, K. J., Kacmar, K. M., Zivnuska, S., & Shaw, J. D. (2007). The impact of political skill on impression management effectiveness. *Journal of Applied Psychology*, *92,* 278–285.

Harrison, D. A., & Martocchio, J. J. (1998). Time for absenteeism: A 20-year review of origins, offshoots, and outcomes. *Journal of Management*, *24,* 305–350.

Hausknecht, J. P., Day, D. V., Thomas, S. C. (2004). Applicant reactions to selection procedures: An updated model and meta-analysis. *Personnel Psychology*, *57,* 639–683.

Hebl, M. R., King, E. B., Glick, P., Singletary, S. L., & Kazama, S. (2007). Hostile and benevolent reactions toward pregnant women: Complementary interpersonal punishments and rewards that maintain traditional roles. *Journal of Applied Psychology*, *92,* 1499–1511.

Heilman, M. E., Battle, W. S., Keller, C. E., & Lee, R. A. (1998). Type of affirmative action policy: A determinant of reactions to sex-based preferential selection. *Journal of Applied Psychology*, *83,* 190–205.

Henry, R. A., & Hulin, C. L. (1987). Stability of skilled performance across time: Some generalizations and limitations on utilities. *Journal of Applied Psychology*, *72,* 457–462.

Hershcovis, S. M., Turner, N., Barling, J., Arnold, K. A., Dupre, K. E., Inness, M., ... Sivanathan, N. (2007). Predicting workplace aggression: A meta-analysis. *Journal of Applied Psychology*, *92,* 228–238.

Herriot, P. (2004). Social identities and applicant reactions. *International Journal of Selection and Assessment*, *12*(1/2), 75–83.

Hirst, G. Van Knippenberg, D. Zhou, J. (2009). A cross-level perspective on employee creativity: Goal orientation, team learning behavior, and individual creativity. *Academy of Management Journal*, *52,* 280-293.

Hochwarter, W. A., Witt, L. A., Treadway, D. C., & Ferris, G. R. (2006). The interaction of social skill and organizational support on job performance. *Journal of Applied Psychology*, *90,* 482–489.

Hoffman, B. J., Blair, C. A., Meriac, J. P., & Woehr, D. J. (2007). Expanding the criterion domain? A quantitative review of the OCB literature. *Journal of Applied Psychology*, *92,* 555–566.

Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science*, *4,* 162–176.

Hofmann, W., Gschwendner, T., Friese, M., Wiers, R. W., & Schmitt, M. (2008). Working memory capacity and self-regulation: Toward an individual differences perspective on behavior determination by automatic versus controlled processes. *Journal of Personality and Social Psychology*, *95,* 962–977.

Hofmann, D., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behavior and accidents. *Personnel Psychology*, *49,* 307–340.

Hofmann, D., & Stetzer, A. (1998). The role of safety climate and communication in accident interpretation: Implications for learning from negative events. *Academy of Management Journal*, *41,* 644–657.

Hogan, J. C. (1991). Physical abilities. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 2, pp. 753–831). Palo Alto, CA: Consulting Psychologists Press.

Hogan, J., Barrett, P., & Hogan, R. (2007). Personality measurement, faking, and employment selection. *Journal of Applied Psychology*, *92,* 1270–1285.

Hogan, J. C., & Roberts, B. W. (1996). Issues and non-issues in the fidelity/bandwidth tradeoff. *Journal of Organizational Behavior*, *17,* 627–638.

Hogan, J. C., Rybicki, S. L., Motowidlo, S. J., & Borman, W. C. (1998). Relations between contextual performance, personality and occupational advancement. *Human Performance*, *11,* 189–208.

Hogan, R., & Hogan, J. C. (1995). *Hogan personality inventory manual* (2nd ed.). Tulsa, OK: Hogan Assessment Systems.

Hogan, R., & Shelton, S. (1998). A socioanalytic perspective on job performance. *Human Performance*, *11,* 129–144.

Holzer, H., & Neumark, D. (1996). *Are affirmative action hires less qualified? Evidence from employer–employee data on new hires*. Cambridge, MA: National Bureau of Economic Research.

Hough, L. M. (1998). Personality at work: Issues and evidence. In M. D. Hakel (Ed.), *Beyond multiple choice: Evaluating alternatives to traditional testing for selection*. Mahwah, NJ: Erlbaum.

Hough, L. M., & Oswald, F. L. (2000). Personnel selection. *Annual Review of Psychology*, *51,* 631–664.

Huffcutt, A. I., Roth, P. L., & McDaniel, M. A. (1996). A meta-analytic investigation of cognitive ability in employment interview evaluations: Moderating characteristics and implications for incremental validity. *Journal of Applied Psychology*, *81,* 459–473.

Huffcutt AI, Conway JM, Roth PL, Stone NJ. (2001). Identification and meta-analytic assessment of psychological constructs measured in employment interviews. *Journal of Applied Psychology*, *86,* 897–913.

Hui, C., Lee, C., & Rousseau, D. M. (2004). Psychological contract and organizational citizenship behavior in China: Investigating generalizability and instrumentality. *Journal of Applied Psychology*, *89,* 311–321.

Hulin, C. L. (1991). Adaptation, persistence, and commitment in organizationsy. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 445–505). Palo Alto, CA: Consulting Psychologists Press.

Humphreys, L. G. (1960). Investigation of the simplex. *Psychometrika*, *25,* 313–323.

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behavior*, *29,* 340–362.

Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternate predictors of performance. *Psychological Bulletin*, *96,* 72–98.

Huselid, M. A., Jackson, S. E., & Schuler, R. S. (1997). Technical and strategic human resource management effectiveness as determinants of firm performance. *Academy of Management Journal*, *40,* 171–188.

Ilies, R., & Dimotakis, N., & Watson, D. (2010). Mood, blood pressure and heart rate at work: An experience-sampling study. *Journal of Occupational Health Psychology*, *15,* 120–130.

Ilies, R., Fulmer, I. S., Spitzmuller, M., & Johnson, M. D. (2009). Personality and citizenship behavior: The mediating role of job satisfaction. *Journal of Applied Psychology*, *94,* 945–959.

Ilies, R., & Judge, T. A. 2005. Goal regulation across time: The effects of feedback and affect. *Journal of Applied Psychology*, *90,* 453–467.

Ilies, R., Scott, B. A., & Judge, T. A. (2006). The interactive effects of personal traits and experienced states on intraindividual patterns of citizenship behavior. *Academy of Management Journal*, *49,* 561–575.

Ilgen, D. R., & Pulakos, E. D. (1999). Employee performance in today's organizations. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development*. San Francisco, CA: Jossey-Bass.

Iverson, R. D., & Deery, S. J. (2001). Understand the "personological" basis of employee withdrawal: The influence of affective disposition on employee tardiness, early departure, and absenteeism. *Journal of Applied Psychology*, *86,* 856–866.

James, L. R. (1998). Measurement of personality via conditional reasoning. *Organizational Research Methods*, *1,* 131–163.

James, L. R., McIntyre, M. D., Glisson, C. A., Green, P. D., Patton, T. W., LeBreton, J. M., … Williams, L. J. (2005). A conditional reasoning measure for aggression. *Organizational Research Methods*, *8,* 69–99.

Johns, G. (1993). Constraints on the adoption of psychology-based personnel practices: Lessons from organizational innovation. *Personnel Psychology*, *46,* 569–592.

Johns, G. (1994). How often were you absent? A review of the use of self-reported absence data. *Journal of Applied Psychology*, *79,* 574–591.

Johnson, J. W. (1996). Linking employee perceptions of service climate to customer satisfaction. *Personnel Psychology*, *49,* 831–852.

Joireman, J., Kamdar, D., Daniels, D., & Duell, B. (2006). Good citizens to the end? It depends: Empathy and concern with future consequences moderate the impact of a short-term time horizon on organizational citizenship behaviors. *Journal of Applied Psychology*, *91,* 1307–1320.

Joshi, A., Liao, H., & Jackson, S. E. (2006). Cross-level effects of work-place diversity on sales performance and pay. *Academy of Management Journal*, *49,* 459–481.

Judge, T. A., Erez, A., & Bono, J. E. (1998). The power of being positive: The relation between positive self-concept and job performance. *Human Performance*, *11,* 167–188.

Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of Applied Psychology*, *87,* 797–807.

Judge, T. A., Scott, B. A., & Ilies, R. (2006). Hostility, job attitudes, and workplace deviance: Test of a multilevel model. *Journal of Applied Psychology*, *91,* 126–138.

Kaempf, G., Klein, G., Thordsen, M., & Wolf, S. (1996). Decision making in complex command and control environments. *Human Factors*, *38,* 220–231.

Kanfer, R. (2009). Work motivation: Identifying use-inspired research directions. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *2,* 77–93.

Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology*, *74,* 657–690.

Kanfer, R., & Ackerman, P. L. (2000). Individual differences in work motivation: Further explorations of a trait framework. *Applied Psychology: An International Review*, *49,* 470–482.

Kanfer, R., Chen, G., & Pritchard, R. D. (2008). Work motivation: Forging new perspectives and directions in the post-millennium. In R. Kanfer, G. Chen, & R. D. Pritchard (Eds.), *Work motivation: Past, present, and future* (pp. 601–631). New York, NY: Taylor and Francis.

Kanfer, R., & Heggestad, E. D. (1997). Motivational traits and skills: A person-centered approach to work motivation. *Research in Organizational Behavior*, *19,* 1–56.

Kanfer, R., & Heggestad, E. D. (1999). Individual differences in motivation: Traits and self-regulatory skills. In P. L. Ackerman, P. C. Kyllonen, & Associates (Eds.), *Learning and individual differences: Process, trait, and content determinants* (pp. 293–313). Washington, DC: American Psychological Association.

Kaplan, S., Bradley, J. C., Luchman, J. N., & Haynes, D. (2009). On the role of positive and negative affectivity in job performance: A meta-analytic investigation. *Journal of Applied Psychology*, *94,* 162–176.

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

Keil, C. T., & Cortina, J. M. (2001). Degradation of validity over time: A test and extension of Ackerman's model. *Psychological Bulletin*, *127,* 673–697.

King, E., Shapiro, J. L., Hebl, M., Singletary, S., & Turner, S. (2006). The stigma of obesity in customer service: A mechanism for remediation and bottom-line consequences of interpersonal discrimination. *Journal of Applied Psychology*, *91,* 579–593.

Kirk, A. K., & Brown, D. F. (2003). Latent constructs of proximal and distal motivation predicting performance under maximum test conditions. *Journal of Applied Psychology*, *88,* 40–49.

Kish-Gephart, J. J., Harrison, D. A., & Treviño, L. K. (2010). Bad apples, bad cases, and bad barrels: Meta-analytic evidence about sources of unethical decisions at work. *Journal of Applied Psychology*, *95,* 1–31.

Klehe, U. C., & Anderson, N. (2007). Working hard and working smart: Motivation and ability during typical and maximum performance. *Journal of Applied Psychology*, *92,* 978–992.

Klein, H. J., Austin, J. T., & Cooper, J. T. (2008). Goal choice and decision processes. In R. Kanfer, G. Chen, & R. D. Pritchard (Eds.), *Work motivation: Past, present, and future* (pp. 101–150). New York, NY: Routledge.

Klein, K. J., & Kozlowski, S. W. J. (Eds.). (2000). *Multilevel theory, research, and methods in organizations*. San Francisco, CA: Jossey-Bass.

Kluemper, D. H., & Rosen, P. A. (2009). Future employment selection methods: Evaluating social networking Web sites. *Journal of Managerial Psychology*, *24*(6), 567–580.

Kohn, L. S., & Dipboye, R. L. (1998). The effects of interview structure on recruiting outcomes. *Journal of Applied Social Psychology*, *28,* 821–843.

Komar, S. G., Brown, D. J., Komar, J. A., Robie C. (2008). Faking and the validity of conscientiousness: A Monte Carlo investigation. *Journal of Applied Psychology, 93,* 140–154.

Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology*, *78,* 311–328.

Kraiger, K., & Wenzel, L. H. (1997). Conceptual development and empirical evaluation of measures of shared mental models as indicators of team effectiveness. In M. T. Brannick & E. Salas (Eds.), *Team performance assessment and measurement: Theory, methods, and applications* (pp. 63–84). Mahwah, NJ: Erlbaum.

Kravitz, D. A., Harrison, D. A., Turner, M. E., Levine, E. L., Chaves, W., Brannick, M. T., ... Conard, M. A. (1997). *Affirmative action: A review of psychological and behavioral research*. Bowling Green, OH: Society for Industrial and Organizational Psychology.

Kumar, V., Venkatesan, R., & Reinartz, W. (2008). Performance implication of adopting a customer focused sales campaign. *Journal of Marketing*, *72*(5), 50–68.

Lance, C. E., Foster, M. R., Gentry, W. A., & Thoresen, J. D. (2004). Assessor cognitive processes in an operational assessment center. *Journal of Applied Psychology*, *89,* 22–35.

Lance, C. E., Lambert, T. A., Gewin, A. G., Lievens, F., & Conway, J. M. (2004). Revised estimates of dimension and exercise variance components in assessment center postexercise dimension ratings. *Journal of Applied Psychology*, *89,* 377–385.

Landers, R. N., Sackett, P. R., Tuzinski, K. A. (2011). Retesting after initial failure, coaching rumors, and warnings against faking in online personality measures for selection. *Journal of Applied Psychology,* 202–210.

Lang, J. W. B., & Bliese, P. D. (2009). General mental ability and two types of adaptation to unforeseen change: Applying discontinuous growth models to the task-change paradigm. *Journal of Applied Psychology*, *94,* 411–428.

Langan-Fox, J., Code, S., & Langfield-Smith, K. (2000). Team mental models: Techniques, methods, and analytic approaches. *Human Factors*, *42,* 242–271.

Langer, E. J., & Imber, L. G. (1979). When practice makes imperfect: Debilitating effects of overlearning. *Journal of Personality and Social Psychology*, *37,* 2014–2024.

Law, K. S., Wong, C., & Song, L. (2004). The construct and criterion validity of emotional intelligence and its potential utility for management studies. *Journal of Applied Psychology*, *89,* 483–496.

LeBlanc, M. M., & Kelloway, E. K. (2002). Predictors and outcomes of workplace violence and aggression. *Journal of Applied Psychology*, *87,* 444–453.

LeBreton, J. M. Barksdale, C. D. Robin, J. D. James, L. R. (2007). Measurement issues associated with conditional reasoning tests: Indirect measurement and test faking. *Journal of Applied Psychology*, *92,* 1–16.

Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognitions. *Journal of Applied Psychology*, *87,* 131–142.

Leonard, J. S. (1990). The impact affirmative action regulation and equal employment law on Black employment. *Journal of Economic Perspectives*, *4,* 47–63.

LePine, J. A. (2003). Team adaptation and postchange performance: Effects of team composition in terms of members' cognitive ability and personality. *Journal of Applied Psychology*, *88,* 27–39.

LePine, J. A. (2005). Adaptation of teams in response to unforeseen change: Effects of goal difficulty and team composition in terms of cognitive ability and goal orientation. *Journal of Applied Psychology*, *90,* 1153–1167.

LePine, J. A., Erez, A., & Johnson, D. E. (2002). The nature and dimensionality of organizational citizenship behavior: A critical review and meta-analysis. *Journal of Applied Psychology*, *87,* 52–65.

Levashina, J., & Campion, M. A. (2006). A model of faking likelihood in the employment interview. *International Journal of Selection and Assessment*, *14,* 299–316.

Levashina, J., & Campion, M. A. (2007). Measuring faking in the employment interview: Development and validation of an interview faking behavior scale. *Journal of Applied Psychology*, *92,* 1638–1656.

Levy-Leboyer, C. (1994). Selection and assessment in Europe. In H. C. Triandis, M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 173–190). Palo Alto, CA: Consulting Psychologists Press.

Liao, H., & Chuang, A. (2004). A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal*, *47,* 41–58.

Liao, H., Joshi, A., & Chuang, A. (2004). Sticking out like a sore thumb: Employee dissimilarity and deviance at work. *Personnel Psychology*, *57,* 969–1000.

Lievens, F. (2002). Trying to understand the different pieces of the construct validity puzzle of assessment centers: An examination of assessor and assessee effects. *Journal of Applied Psychology*, *87,* 675–686.

Lievens, F., Chasteen, C. S., Day, E. A., & Christiansen, N. D. (2006). Large-scale investigation of the role of trait activation theory for understanding assessment center convergent and discriminant validity. *Journal of Applied Psychology*, *91,* 247–258.

Lievens, F., & Conway, J. M. (2001). Dimension and exercise variance in assessment center scores: A large-scale evaluation of multitrait–multimethod studies. *Journal of Applied Psychology*, *86,* 1202–1222.

Lievens, F., Sackett, P. R., & Buyse, T. (2009). The effects of response instructions on situational judgment test performance and validity in a high-stakes context. *Journal of Applied Psychology*, *94,* 1095–1101.

London, M., & Mone, E. M. (1999). Customer driven employee performance. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance*. San Francisco, CA: Jossey-Bass.

Mabon, H. (1998). Utility aspects of personality and performance. *Human Performance*, *11,* 289–304.

Marcus, B., Lee, K., & Ashton, M. C. (2007). Personality dimensions explaining relationships between integrity tests and counterproductive behavior: Big Five, or one in addition? *Personnel Psychology*, *60,* 1–34.

Marcus, B., & Schuler, H. (2004). Antecedents of counterproductive behavior at work: A general perspective. *Journal of Applied Psychology*, *89,* 647–660.

Marshall, S. P. (1993). Assessing schema knowledge. In N. Frederiksen, R. J. Mislevy, & I. I. Bejar (Eds.), *Test theory for a new generation of tests* (pp. 155–179). Hillsdale, NJ: Erlbaum.

Martin, S. L., & Klimoski, R. J. (1990). Use of verbal protocols to trace cognitions associated with self- and supervisor evaluations of

performance. *Organizational Behavior & Human Decision Processes*, *46,* 135–154.

Maurer, S. D. (2002). A practitioner-based analysis of interviewer job expertise and scale format as contextual factors in situational interviews. *Personnel Psychology*, *55,* 307–327.

Maurer, T. J., & Solaman, J. M. (2006). The science and practice of a structured employment interview coaching program. *Personnel Psychology*, *59,* 433–456.

Maurer, T. J., Solamon, J. M., Andrews, K. D., & Troxtel, D. D. (2001). Interviewee coaching, preparation strategies and response strategies in relation to performance in situational employment interviews: An extension of Maurer, Solamon & Troxtel (1998). *Journal of Applied Psychology*, *86,* 709–717.

Maurer, T. J., Solamon, J. M., & Lippstreu, M. (2008). How does coaching interviewees affect the validity of a structured interview? *Journal of Organizational Behavior*, *29,* 355–371.

Mayer, J. D., Salovey, P., & Caruso, D. (2000). Models of emotional intelligence. In R. J. Sternberg, (Ed.), *Handbook of intelligence* (pp. 396–422). Cambridge, MA: Cambridge University Press.

McBride, J. R. (1998). Innovations in computer-based ability testing. In M. D. Hakel (Ed.), *Beyond multiple choice: Evaluating alternatives to traditional testing for selection*. Mahwah, NJ: Erlbaum.

McCarthy, J., & Goffin, R. (2004). Measuring job interview anxiety: Beyond weak knees and sweaty palms. *Personnel Psychology*, *57,* 607–637.

McCloy, R. A., Campbell, J. P., & Cudeck, R. (1994). A confirmatory test of a model of performance determinants. *Journal of Applied Psychology*, *79,* 493–505.

McCormick, E. J., & Ilgen, D. R. (1985). *Industrial and organizational psychology*. Englewood Cliffs, NJ: Prentice Hall.

McDaniel, M. A., Hartman, N. S., Whetzel, D. L., Grubb, W. L. (2007). Situational judgment tests, response instructions, and validity: A meta-analysis. *Personnel Psychology*, *60,* 63–91.

McDaniel, M. A., Schmidt, F. L., & Hunter, J. E. (1988). A meta-analysis of the validity of methods for rating training and experience in personnel selection. *Personnel Psychology*, *41,* 283–314.

McDaniel, M. A., Whetzel, D. L., Schmidt, F. L., & Maurer, S. D. (1994). The validity of the employment interview: A comprehensive review and meta-analysis. *Journal of Applied Psychology*, *79,* 599–616.

McElroy, J. C., Morrow, P. C., & Rude, S. (2001). Turnover and organizational performance: A comparative analysis of the effects of voluntary, involuntary, and reduction-in-force turnover. *Journal of Applied Psychology*, *86,* 1294–1299.

McManus, M. A., & Kelly, M. L. (1999). Personality measures and biodata: Evidence regarding their incremental predictive value in the life insurance industry. *Personnel Psychology*, *52,* 137–148.

McNeely, B. L., & Meglino, B. M. 1994. The role of dispositional and situational antecedents in prosocial organizational behavior: An examination of the intended beneficiaries of prosocial behavior. *Journal of Applied Psychology*, *79,* 836–844.

Messick, S. (1998). Test validity: A matter of consequence. *Social Indicators Research*, *45,* 35–44.

Middendorf, C. H., Macan, T. H. (2002). Note-taking in the employment interview: Effects on recall and judgments. *Journal of Applied Psychology*, *87*(2), 293–303.

Moon, H., Kamdar, D., Mayer, D. M., & Takeuchi, R. (2008). Me or we? The role of personality and justice as other-centered antecedents to innovative citizenship behaviors within organizations. *Journal of Applied Psychology*, *93,* 84–94.

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

Motowidlo, S. J., & Beier, M. E. (2010). Differentiating specific job knowledge from implicit trait policies in procedural knowledge measured by a situational judgment test. *Journal of Applied Psychology*, *95,* 321–333.

Motowidlo, S. J., Borman, W. C., & Schmit, M. J. (1997). A theory of individual differences in task and contextual performance. *Human Performance*, *10,* 71–84.

Motowidlo, S. J., Brownlee, A. L., & Schmit, M. J. (2008). Effects of personality characteristics on knowledge, skill, and performance in servicing retail customers. *International Journal of Selection and Assessment*, *16,* 272–280.

Motowidlo, S. J., Dunnette, M. D., Carter, G. W. (1990). An alternative selection procedure: The low-fidelity simulation. *Journal of Applied Psychology*, *75*(6), 640–647.

Motowidlo, S. J., Hooper, A. C., Jackson, H. L. (2006a). Implicit policies about relations between personality traits and behavioral effectiveness in situational judgment items. *Journal of Applied Psychology*, *91*(4), 749–761.

Motowidlo, S. J., Hooper, A. C., & Jackson, H. L. (2006b). A theoretical basis for situational judgment tests. In J. Weekley & R. Ployhart (Eds.), *Situational judgment tests* (pp. 57–81). San Francisco, CA: Jossey-Bass.

Motowidlo, S. J., & Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied Psychology*, *79,* 475–480.

Mount, M., Ilies, R., & Johnson, E. (2006). Relationship of personality traits and counterproductive work behaviors: The mediating effects of job satisfaction. *Personnel Psychology*, *59,* 591–622.

Mount, M. K., Witt, L. A., & Barrick, M. R. (2000). Incremental validity of empirically keyed biodata scales over GMA and the five factor personality constructs. *Personnel Psychology*, *53,* 299–323.

Mueller-Hanson. R., Heggestad, E. D., Thornton, G. C. (2003). Faking and selection: Considering the use of personality from select-in and select-out perspectives. *Journal of Applied Psychology*, *88,* 348–355.

Mumford, T. V., Van Iddekinge, C. H., Morgeson, F. P., & Campion, M. A. (2008). The team role test: Development and validation of a team role knowledge situational judgment test. *Journal of Applied Psychology*, *93,* 250–267.

Mumford, M. D., & Stokes, G. S. (1992). Developmental determinants of individual action: Theory and practice in applying background measures. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 3, pp. 61–138). Palo Alto, CA: Consulting Psychologists Press.

Mumford, T. V., Van Iddekinge, C. H., Morgeson, F. P., & Campion, M. A. (2008). The team role test: Development and validation of a team role knowledge situational judgment test. *Journal of Applied Psychology*, *93,* 250–267.

Murphy, K. R. (1993). *Honesty in the workplace*. Pacific Grove, CA: Brooks/Cole.

Murphy, K. R. (1996). Individual differences and behavior in organizations: Much more than g. In K. R. Murphy (Ed.), *Individual differences and behavior in organizations* (pp. 3–30). San Francisco, CA: Jossey-Bass.

Murphy, K. R., & Lee, S. L. (1994). Personality variables related to integrity test scores: The role of conscientiousness. *Journal of Business and Psychology*, *8,* 413–424.

Murphy, K. R., & Shiarella, A. H. (1997). Implications of the multidimensional nature of job performance for the validity of selection tests: Multivariate frameworks for studying test validity. *Personnel Psychology*, *50,* 823–854.

Naglieri, J. A. (2003). Naglieri nonverbal ability tests. In R. MacCallum (Ed.), *Handbook of nonverbal assessment* (pp. 175–193). New York, NY: Plenum.

Naglieri, J. A., & Das, J. P. (1997). Intelligence revised: The planning, attention, simultaneous, successive (PASS) cognitive processing theory. In R. F. Dillon (Ed.), *Handbook on testing* (pp. 136–163). Westport, CT: Greenwood Press.

Neal, A., & Griffin, M. A. (2004). Safety climate and safety at work. In J. Barling & M. R. Frone (Eds.), *The psychology of workplace safety* (pp. 15–34). Washington, DC: American Psychological Association.

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, and accidents at the individual and group levels. *Journal of Applied Psychology*, *91,* 946–953.

Neisser, U., Boodoo, G., Bouchard, T. J., Jr., Boykin, A. W., Brody, N., Ceci, S. J., … Urbina, S. (1996). Intelligence: Known and unknowns. *American Psychologist*, *51,* 77–101.

Nelson, J. K., Zaccaro, S. J., & Herman, J. L. (2010). Strategic information provision and experiential variety as tools for developing adaptive leadership skills. *Consulting Psychology Journal: Practice and Research*, *62,* 131–142.

Nikolaou, I., & Judge, T. A. (2007). Fairness reactions to personnel selection techniques in Greece. *International Journal of Selection and Assessment*, *15,* 206–219.

O'Connell MS, Hartman NS, McDaniel MA, Grubb WL III, Lawrence A. (2007). Incremental validity of situational judgment tests for task and contextual job performance. *International Journal of Selection and Assessment.*

Ones, D. S., Viswesvaran, C., & Schmidt, F. L. (1993). Comprehensive meta-analysis of integrity test validities: Findings and implications fro personnel selection and theories of job performance. *Journal of Applied Psychology*, *78,* 679–703.

Oreg, S., Bayazit, M., Vakola, M., Arciniega, L., Armenakis, A. A., Barkauskiene, R., van Dam, K. (2008). Dispositional resistance to change: Measurement equivalence and the link to personal values across 17 nations. *Journal of Applied Psychology*, *93* (4), 935–944.

Organ, D. W. (1997). Organizational citizenship behavior: It's construct clean-up time. *Human Performance*, *10,* 85–97.

Pace, L. A., & Schoenfeldt, L. F. (1977). Legal concerns in the use of weighted applications. *Personnel Psychology*, *30,* 159–166.

Parker S. K., Williams, H. M., Turner, N. (2006). Modeling the antecedents of proactive behavior at work. *Journal of Applied Psychology*, *91* (3), 636–652.

Paronto, M. E., Truxillo, D. M., Bauer, T. N., & Leo, M. C. (2002). Drug testing, drug treatment, and marijuana use: A fairness perspective. *Journal of Applied Psychology 87* (6), 1159–1166.

Payne, S. C. (2000). *Efficiency orientation: Establishing measurement and predictive properties* [Unpublished dissertation]. George Mason University, Fairfax, VA.

Payne, S. C., & Webber, S. S. (2006). Effects of service provider attitudes and employment statues on citizenship behaviors and customers' attitudes and loyalty behavior. *Journal of Applied Psychology*, *91,* 365–378.

Pearlman, K., & Barney, M. F. (1999). Selection in a changing workplace. In J. Kehoe (Ed.), *Managing selection in changing organizations: Human resource strategies*. San Francisco, CA: Jossey-Bass.

Phillips, J. M., & Gully, S. M. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal-setting process. *Journal of Applied Psychology*, *82,* 792–802.

Ployhart, R. E. (2006). Staffing in the 21st century: New challenges and strategic opportunities. *Journal of Management*, *32,* 868–897.

Ployhart, R. E., & Hakel, M. D. (1998). The substantive nature of performance variability: Predicting interindividual differences in intraindividual performance. *Personnel Psychology*, *51,* 859–901.

Ployhart, R. E., Weekley, J. A., Holtz, B. C., & Kemp, C. (2003). Web-based and paper-and-pencil testing of applicants in a proctored setting: Are personality, biodata, and situational judgment tests comparable? *Personnel Psychology*, *56* (3), 733–752.

Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology*, *92,* 438–454.

Podsakoff, N. P., Whiting, S. W., Podsakoff, P. M., & Blume, B. D. (2009). Individual and organizational-level consequences of organizational citizenship behaviors: A meta-analysis. *Journal of Applied Psychology*, *94,* 122–141.

Podsakoff, N. P., Whiting, S. W., Podsakoff, P. M., & Mishra, P. (2011). Effects of organizational citizenship behaviors on selection decisions in employment interviews. *Journal of Applied Psychology*, *96,* 310–326.

Porath, C. L., & Erez, A. (2007). Does rudeness really matter? The effects of rudeness on task performance and helpfulness. *Academy of Management Journal*, *50,* 1181–1197.

Posthuma, R. A., Morgeson, F. P., & Campion, M. A. (2002). Beyond employment interview validity: A comprehensive narrative review of recent research and trends over time. *Personnel Psychology*, *55,* 1–81.

Pritchard, R. D. (1992). Organizational productivity. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 3, 2nd ed., pp. 442–472). Palo Alto, CA: Consulting Psychologists Press.

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: Development of a taxonomy of adaptive performance. *Journal of Applied Psychology*, *85,* 612–624.

Pulakos, E. D., & Schmitt, N. (1995). Experience based and situational interview questions: Studies of validity. *Personnel Psychology*, *48,* 289–307.

Pulakos, E. D., Schmitt, N., & Chan, D. (1996). Models of job performance ratings: An examination of ratee race, ratee gender, and rater level effects. *Human Performance*, *9,* 103–120.

Pyburn, K. M., Jr., Ployhart, R. E., & Kravitz, D. A. (2008). The diversity–validity dilemma: Overview and legal context. *Personnel Psychology, 61,* 143–151.

Quinones, M. A., Ford, J. K., & Teachout, M. S. (1995). The relationship between work experience and job performance: A conceptual and meta-analytic review. *Personnel Psychology*, *48,* 887–910.

Ree, M. J., Earles, J. A., & Teachout, M. S. (1994). Predicting job performance: Not much more than g. *Journal of Applied Psychology*, *79,* 518–524.

Rioux, S. M., & Penner, L. A. (2001). The causes of organizational citizenship behavior: A motivational analysis. *Journal of Applied Psychology*, *86,* 1306–1314.

Roberts, B. W., Harms, P. D., Caspi, A., & Moffitt, T. E. (2007). Predicting the counterproductive employee in a child-to-adult prospective study. *Journal of Applied Psychology*, *92,* 1427–1436.

Rogg, K. L., Schmidt, D. B., Shull, C., & Schmitt, N. (2001). Human resource practices, organizational climate, and customer satisfaction. *Journal of Management*, *27* (4), 431–449.

Ronen, S. (1989). Training the international assignee. In I. L. Goldstein (Ed.), *Training and development in organizations* (pp. 417–454). San Francisco, CA: Jossey-Bass.

Roth, P., Bobko, P., McFarland, L., & Buster, M. (2008). Work sample tests in personnel selection: A meta-analysis of black–white differences in overall and exercise scores. *Personnel Psychology*, *61,* 637–662.

Rothstein, H. R., Schmidt, F. L., Erwin, F. W., Owens, W. A., & Sparks, P. P. (1990). Biographical data in employment selection: Can validities be made generalizable? *Journal of Applied Psychology*, *75,* 175–184.

Rotundo, M., & Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: A policy-capturing approach. *Journal of Applied Psychology*, *87,* 66–80.

Ryan, A. M., Horvath, M., Ployhart, R. E., Schmitt, N., & Slade, L. A. (2000). Hypothesizing differential functioning in global employee opinion surveys. *Personnel Psychology*, *53,* 531–562.

Ryan, A. M., & Ployhart, R. E. (2000). Applicants' perceptions of selection procedures and decisions: A critical review and agenda for the future. *Journal of Management, 26,* 565–606.

Rynes, S. L. (1989). *The employment interview as a recruitment device*. In R. W. Eder, & G. R. Ferris (Eds.). *The employment interview: Theory, research, and practice* (pp. 127–141). Thousand Oaks, CA: Sage.

Rynes, S. L., Orlitzky, M. O., & Bretz, R. D., Jr. (1997). Experienced hiring versus college recruiting: Practices and emerging trends. *Personnel Psychology*, *50,* 309–340.

Sackett, P. R., & DeVore, C. J. (2001). Counterproductive behaviors at work. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology* (Vol. 1, pp. 145–164). London: Sage.

Sackett, P. R., Gruys, M. L., & Ellingson, J. E. (1998). Ability-personality interactions when predicting job performance. *Journal of Applied Psychology*, *83,* 545–556.

Sackett, P. R., Schmitt, N., Kabin, M. B., & Ellingson, J. E. (2001). High-stakes testing in employment, credentialing, and higher education: Prospects in a post-affirmative action world. *American Psychologist*, *56,* 302-318.

Sackett, P. R., & Wanek, J. E. (1996). New developments in the use of measures of honesty, integrity, conscientiousness, dependability, trustworthiness, and reliability for personnel selection. *Personnel Psychology*, *49,* 787–830.

Sackett, P. R., Zedeck, S., & Fogli, L. (1988). Relations between measures of typical and maximum job performance. *Journal of Applied Psychology*, *73,* 482–486.

Schmidt, F. L., & Hunter, J. E. (1993). Tacit knowledge, practical intelligence, general ability, and job knowledge. *Current Directions in Psychological Science*, *2,* 7–8.

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, *124,* 262–274.

Schmidt, F. L., Hunter, J. E., & Outerbridge, A. N. (1986). Impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job performance. *Journal of Applied Psychology*, *71,* 432–439.

Schmidt, F. L., Hunter, J. E., Outerbridge, A. N., & Goff, S. (1988). Joint relation of experience and ability with job performance: Test of three hypotheses. *Journal of Applied Psychology*, *73,* 46–57.

Schmidt, F. L., Zimmerman, R. D. (2004). A counterintuitive hypothesis about employment interview validity and some supporting evidence. *Journal of Applied Psychology*, *89,* 553–561.

Schmit, M. J., Kihm, J. A., & Robie, C. (2000). Development of a global measure of personality. *Personnel Psychology*, *53,* 153–193.

Schmit, M. J., Motowidlo, S. J., DeGroot, T. G., Cross, S. S., & Kiker, S. S. (1996). *Explaining the relationship between personality and job performance*. Presented at the 11th Annual Conference of the Society for Industrial and Organizational Psychology.

Schmit, M. J., & Ryan, A. M. (1992). Test-taking dispositions: A missing link? *Journal of Applied Psychology*, *77,* 629–637.

Schmitt, N., & Chan, D. (1998). *Personnel selection: A theoretical approach*. Thousand Oaks, CA: Sage.

Schmitt, N., & Chan, D. (1999). The status of research on applicant reactions to selection tests. *International Journal of Management Reviews*, *1,* 45–62.

Schmitt, N., & Chan, D. (2006). Situational judgment tests: Methods or constructs? In J. Weekley & R. E. Ployhart (Eds.), *Situational judgment tests: Theory, measurement, and application* (pp. 135–155). Mahwah, NJ: Erlbaum.

Schmitt, N., Cortina, J. M., Ingerick, M. J., & Weichmann, D. (2003). Personnel selection and employee performance. In I. B. Weiner (Editor-in-Chief), W. Borman, D. Ilgen, & R. Klimoski (Vol. Eds.), *Handbook of psychology: Vol. 12. Industrial and organizational psychology*. Hoboken, NJ: Wiley.

Schmitt, N., Oswald, F. L. (2006). The impact of corrections for faking on the validity of noncognitive measures in selection settings. *Journal of Applied Psychology*, *91,* 613–621.

Schmitt, N., Oswald, F. L., Kim, B. H., Gillespie, M. A., Ramsay, L. J., & Yoo, T. (2003). Impact of elaboration on socially desirable responding and the validity of biodata measures. *Journal of Applied Psychology*, *88,* 979–988.

Schmitt, N., & Pulakos, E. D. (1998). Biodata and differential prediction: Some reservations. In M. D. Hakel (Ed.), *Beyond multiple choice: Evaluating alternatives to traditional testing for selection*. Mahwah, NJ: Erlbaum.

Schneider, B., Macey, W. H., Lee, W., & Young, S. A. (2009). Organizational service climate drivers of the American Customer Satisfaction Index (ACSI) and financial and market value performance. *Journal of Service Research*, *32,* 3–14.

Schneider, B. J., Smith, D. B., & Sipe, W. P. (2000). Personnel selection psychology: Multilevel considerations. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 91–120). San Francisco, CA: Jossey-Bass.

Schneider, B. J., Wheeler, J. K., & Cox, J. F. (1992). A passion for service: Using content analysis to explicate service climate themes. *Journal of Applied Psychology*, *77,* 705–716.

Schneider, B. J., White, S. S., & Paul, M. C. (1998). Linking service climate and customer perceptions of service quality: Test of a causal model. *Journal of Applied Psychology*, *83,* 150–163.

Schraagen, J. M., Chipman, S. F., & Shalin, V. L. (Eds.). (2000). *Cognitive task analysis*. Mahwah, NJ: Erlbaum.

Schuelke, M. J., Day, E. A., McEntire, L. E., Boatman, P. R., Boatman, J. E., Kowollik, V., & Wang, X. (2009). Relating indices of knowledge structure coherence and accuracy to skill-based performance: Is there utility in using a combination of indices? *Journal of Applied Psychology*, *94*(4), 1076–1085.

Settoon, R. P., & Mossholder, K. W. (2002). Relationship quality and relationship context as antecedents of person- and task-focused interpersonal citizenship behavior. *Journal of Applied Psychology*, *87,* 255–267.

Shaffer, M. A., & Harrison, D. A. (1998). Expatriates' psychological withdrawal from international assignments: Work, nonwork, and family influences. *Personnel Psychology*, *51,* 87–118.

Shaffer, M. A., Harrison, D. A., Gregersen, H., Black, J. S., & Ferzandi, L. A. (2006). You can take it with you: Individual differences and expatriate effectiveness. *Journal of Applied Psychology*, *91,* 109–125.

Shalley, C. E., Gilson, L. L., & Blum, T. C. (2009). Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy of Management Journal*, *52,* 489–505.

Sharf, J. C., & Jones, D. P. (1999). Employment risk management. In J. F. Kehoe (Ed.), *Managing selection strategies in changing organizations*. San Francisco, CA: Jossey-Bass.

Shaw, J. D., Delery, J. E., Jenkins, G. D., Jr., & Gupta, N. (1998). An organization-level analysis of voluntary and involuntary turnover. *Academy of Management Journal*, *41,* 511–525.

Siebert, S. E., Crant, J. M., & Kraimer, M. L. (1999). Proactive personality and career success. *Journal of Applied Psychology*, *84,* 416–427.

Snow, C. C., & Snell, S. A. (1993). Staffing as strategy. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 448–480). San Francisco, CA: Jossey-Bass.

Society for Industrial and Organizational Psychology. (1987). *Principles for the validation and use of personnel selection procedures*. College Park, MD: Author.

Sonnentag, S., & Bayer, U. (2005). Switching off mentally: Predictors and consequences of psychological detachment from work

during off-job time. *Journal of Occupational Health Psychology*, *10,* 393–414.

Spearman, C. (1927). *The abilities of man*. New York, NY: McMillan.

Spector, P. (1997). The role of frustration in antisocial behavior. In R. A. Giacalone & J. Greenberg (Eds.), *Antisocial behavior in organizations* (pp. 1–17). Thousand Oaks, CA: Sage.

Spector, P. E., & Fox, S. (2010). Theorizing about the deviant citizen: An attributional explanation of the interplay of organizational citizenship and counterproductive work behavior. *Human Resource Management Review*, *20,* 132–143.

Spector, P. E., Fox, S., Penney, L. M., Bruursema, K., Goh, A., & Kessler, S. (2006). The dimensionality of counterproductivity: Are all counterproductive behaviors created equal? *Journal of Vocational Behavior*, *68,* 446–460.

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, *133,* 65–94.

Steel, P. König, C. J. (2006). Integrating theories of motivation. *Academy of Management Review*, *31,* 889–913.

Steel, B. S., & Lovrich, N. P. (1987). Equality and efficiency tradeoffs in affirmative—real or imagined? The case of women in policing. *Social Science Journal*, *24,* 53–70.

Sternberg, R. J. (2000). Intelligence and creativity. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 611–630). Cambridge, MA: Cambridge University Press.

Sternberg, R. J., Forsythe, G. B., Hedlund, J. R., Horvath, J. A., Wagner, R. K., Williams, W. M., … Grigorenko, E. L. (2000). *Practical intelligence in everyday life*. New York, NY: Cambridge University Press.

Sternberg, R. J., Wagner, R. K., Williams, W. M., & Horvath, J. A. (1995). Testing common sense. *American Psychologist*, *50,* 912–927.

Stevens, C. K. (1998). Antecendents of interview interactions, interviewers' ratings, and applicants reactions. *Personnel Psychology*, *51,* 55–85.

Stewart, G. L., Dustin, S. L., Barrick, M. R., & Darnold, T. C. (2008). Exploring the handshake in employment interviews. *Journal of Applied Psychology*, *93,* 1139–1146.

Stewart, G. L. Nandkeolyar, A. K. (2006). Adaptation and intraindividual variation in sales outcomes: Exploring the interactive effects of personality and environmental opportunity. *Personnel Psychology*, *59,* 307-332.

Takeuchi, H., Taki, Y., Sassa, Y., Hashizume, H., Sekiguchi, A., Fukushima, A., & Kawashima, R. (2010). Regional grey matter volume of dopaminergic system associate with creativity: Evidence from voxel-based morphometry. *NeuroImage*, *51,* 578–585.

Takeuchi, R., Wang, M., & Marinova, S. V. (2005). Antecedents and consequences of psychological workplace strain during expatriation: A cross-sectional and longitudinal investigation. *Personnel Psychology*, *58,* 925–948.

Tay, C., Ang, S., & Van Dyne, L. (2006). Personality, biographical characteristics, and job interview success: A longitudinal study of the mediating effects of interviewing, self-efficacy and the moderating effects of internal locus of causality. *Journal of Applied Psychology*, *91,* 446–454.

Taylor, A., & Greve, H. R. (2006). Superman or the Fantastic Four? Knowledge combination and experience in innovative teams. *Academy of Management Journal*, *49,* 723–740.

Terpstra, D. E., & Rozell, E. J. (1993). The relationship of staffing practices to organizational level measures of performance. *Personnel Psychology*, *46,* 27–48.

Tesluk, P. E., & Jacobs, R. R. (1998). Toward an integrated model of work experience. *Personnel Psychology*, *51,* 321–355.

Tett, R. P., Jackson, D. N., Rothstein, M., & Reddon, J. R. (1999). Meta-analysis of bi-directional relations in personality-job performance research. *Human Performance*, *12,* 1–30.

Treadway, D. C., Ferris, G. R., Duke, A. B., Adams, G. L., & Thatcher, J. B. (2007). The moderating role of subordinate political skill on supervisors' impressions of subordinate ingratiation and ratings of subordinate interpersonal facilitation. *Journal of Applied Psychology*, *92,* 848–855.

Truxillo, D. M., Bodner, T. E., Bertolino, M., Bauer, T. N., & Yonce, C. A. (2009) Effects of explanations on applicant reactions: A meta-analytic review. *International Journal of Selection and Assessment*, *17,* 346–361.

Truxillo, D. M., Bauer, T. N., Campion, M. A. & Paronto, M. E. (2002) Selection fairness information and applicant reactions: A longitudinal field study. *Journal of Applied Psychlogy*, *87,* 1020–1031.

Uleman, J. S., Adil Saribay, S., & Gonzalez, C. M. (2008). Spontaneous inferences, implicit impressions, and implicit theories. *Annual Review of Psychology*, *59,* 329–360.

Uniform Guidelines on Employee Selection Procedures. (1978). *Federal Register*, *43,* 38290–38315.

van der Zee, K. I., Bakker, B. A., & Bakker, P. (2002). Why are structured interviews so rarely used in personnel selection? *Journal of Applied Psychology*, *87,* 176–184.

Van Scotter, J. R., & Motowidlo, S. J. (1996). Interpersonal facilitation and job dedication as separate facets of contextual performance. *Journal of Applied Psychology*, *81,* 525–531.

Vancouver, J. B., & Kendall, L. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Psychology*, *91,* 1146–1153.

Vancouver, J. B., More, K. M., & Yoder, R. J. (2008). Self-efficacy and resource allocation: Support for a nonmonotonic discontinuous model. *Journal of Applied Psychology*, *93,* 35–47.

Vancouver, J. B., Putka, D. J., & Scherbaum, C. A. (2005). Testing a computational model of the goal-level effect: An example of a neglected methodology. *Organizational Research Methods*, *8*(1): 100–127.

Vancouver, J. B., Tamanini, K. B., & Yoder, R. J. (2010). Using dynamic computational models to reconnect theory and research: Socialization by the proactive newcomer example. *Journal of Management*, *36,* 764–793.

Vandenberghe, C., Bentein, K., Michon, R., Chebat, J., Tremblay, M., & Fils, J. (2007). An examination of the role of perceived support and employee commitment in employee-customer encounters. *Journal of Applied Psychology*, *92,* 1177–1187.

Varca, P. E., & Pattison, P. (1993). Evidentiary standards in employment discrimination: A view toward the future. *Personnel Psychology*, *46,* 239–258.

Venkataramani, V., & Dalal, R. S. (2007). Who helps and harms whom? Relational antecedents of interpersonal helping and harming in organizations. *Journal of Applied Psychology*, *92,* 952–966.

Viswesvaran, C., & Ones, D. S. (1999). Meta-analysis of fakability measures: Implications for personality measurement. *Educational and Psychological Measurement*, *59,* 197–210.

Vohs, K. D., Baumeister, R. F., & Ciarocco, N. J. (2005). Self-regulation and self-presentation: Regulatory resource depletion impairs impression management and effortful self-presentation depletes regulatory resources. *Journal of Personality and Social Psychology*, *88,* 632–657.

Wagner, R. (1949). The employment interview: A critical summary. *Personnel Psychology*, *2,* 279–294.

Wagner, R. K. (2000). Practical intelligence. In R. J. Sternberg (Ed.), *Handbook of intelligence* (pp. 380–395). Cambridge, MA: Cambridge University Press.

Wallace, S. R. (1965). Criteria for what? *American Psychologist*, *20,* 411–417.

Wallace, J. C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation, and performance. *Personnel Psychology*, *59,* 529–557.

Wallis, J. D. (2007). Orbitofrontal cortex and its contribution to decision making. *Annual Review of Neuroscience*, *30,* 31–56.

Weekley, J. A., & Ployhart, R. E. (2006). *Situational judgment tests: Theory, measurement, and application*. Mahwah, NJ: Erlbaum.

Weekley, J. A., Ployhart, R. E., & Harold, C. M. (2003, April). *Personality and situational judgment tests across applicant and incumbent settings*. Poster presented at 18th annual conference of the Society for Industrial Organizational Psychology, Orlando, FL.

Wiechmann, D., & Ryan, A. M. (2003). Reactions to computerized testing in selection contexts. *International Journal of Selection and Assessment*, *11* (2–3), 215–229.

Whetzel, D. L., McDaniel, M. A., & Nguyen, N. T. (2008). Subgroup differences in situational judgment test performance: A meta-analysis. *Human Performance*, *21,* 291–309.

Whiting, S. W., Podsakoff, P. M., & Pierce, J. (2008). Effects of task performance, helping, voice, and organizational loyalty on performance appraisal ratings. *Journal of Applied Psychology*, *93,* 125–139.

Whitlock, G. H., Clouse, R. J., & Spencer, W. F. (1963). Predicting accident proneness. *Personnel Psychology*, *16,* 35–44.

Winter, D. G., John, O. P., Stewart, A. J., Klohnen, E. C., & Duncan, L. E. (1998). Traits and motives: Toward an integration of two traditions in personality research. *Psychological Review*, *105,* 230–250.

Witt, L. A., & Ferris, G. R. (2003). Social skill as moderator of the conscientiousness-performance relationship: Convergent results across four studies. *Journal of Applied Psychology*, *88,* 809–821.

Yang, J., & Diefendorff, J. M. (2009). The relations of daily counterproductive workplace behavior with emotions, situational antecedents, and personality moderators: A diary study in Hong Kong. *Personnel Psychology*, *62,* 259–295.

Yeo, G. B., & Neal, A. (2004). A multilevel analysis of effort, practice, and performance: Effects of ability, conscientiousness, and goal orientation. *Journal of Applied Psychology*, *89,* 231–247.

Yeo, G. B., & Neal, A. (2006). An examination of the dynamic relationship between self-efficacy and performance across levels of analysis and levels of specificity. *Journal of Applied Psychology*, *91,* 1088–1101.

Yeo, G., & Neal, A. (2008). Subjective cognitive effort: A model of states, traits, and time. *Journal of Applied Psychology*, *93,* 617–631.

Zhao, H., Wayne, S. J., Glibkowski, B. C., & Bravo, J. (2007). The impact of PC breach on work-related outcomes: A meta-analysis. *Personnel Psychology*, *60,* 647–680.

Zimmerman, R. D. (2008). Understanding the impact of personality traits on individuals' turnover decisions: A meta-analytic path model. *Personnel Psychology*, *61* (2), 309–348.

Zimmerman, B. J., & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of metacognition in education* (pp. 299–315). New York, NY: Routledge.