SELECTING INDIVIDUALS IN TEAM SETTINGS: THE IMPORTANCE OF SOCIAL SKILLS, PERSONALITY CHARACTERISTICS, AND TEAMWORK KNOWLEDGE

FREDERICK P. MORGESON
The Eli Broad Graduate School of Management
Michigan State University

MATTHEW H. REIDER
Reider Research

MICHAEL A. CAMPION
Krannert School of Management
Purdue University

Although work is commonly organized around teams, there is relatively little empirical research on how to select individuals in team-based settings. The goal of this investigation was to examine whether 3 of the most commonly used selection techniques for hiring into traditional settings (a structured interview, a personality test, and a situational judgment test) would be effective for hiring into team settings. In a manufacturing organization with highly interdependent teams, we examined the relationships between social skills, several personality characteristics (Conscientiousness, Extraversion, Agreeableness, and Emotional Stability), teamwork knowledge, and contextual performance. Results indicate that each of these constructs is bivariately related to contextual performance in a team setting, with social skills, Conscientiousness, Extraversion, and teamwork knowledge incrementally predicting contextual performance (with a multiple correlation of .48). Implications of these results for selection in team and traditional settings are discussed.

Designing work around autonomous or semi autonomous teams has become a fact of organizational life (Cascio, 1995; Hackman, 1990; Manz & Sims, 1993). But this movement toward team-based designs has not been accompanied by research on the types of human resource systems that will support the use of teams. This is particularly true for selection systems. It is not clear if the vast amount of research on individual personnel selection will transfer to situations where individuals are expected to

work in collaborative, highly interdependent work teams. In fact, there is reason to believe that the knowledge, skill, ability, and other characteristics (KSAOs) needed for successful performance in team contexts might be somewhat different than the KSAOs needed in more traditional individually oriented jobs.

For example, it has been suggested that the skills, knowledge, and motivation needed to function effectively in a team go well beyond the core technical skills often measured in traditional selection contexts (Barrick, Stewart, Neubert, & Mount, 1998; Guion, 1998). Others have noted that selecting individuals for teams requires one to consider problems that are seldom considered when selecting individuals to work by themselves (Jones, Stevens, & Fischer, 2000). To address these issues, we examine the validity of social skills, personality, and teamwork knowledge in predicting performance in a manufacturing organization that is entirely organized around teams.

Compared to task performance, contextual performance is particularly important in team settings. Task performance reflects activities that are formally recognized as part of the job, support the organization's technical core, and directly impact organizational goal accomplishment. This has been the focus in traditional, individually oriented selection systems. Contextual performance reflects activities that support the organizational, social, and psychological environment (Borman & Motowidlo, 1993), thereby facilitating effective team functioning. For example, the interpersonal helping, job dedication, and initiative reflective of contextual performance helps make teams work in organizational settings. Without this kind of contextual performance, the development and maintenance of teams will not be successful.

In fact, LePine, Hanson, Borman, and Motowidlo (2000, p. 67) have noted that, "Because individual task performance in teams requires cooperation among team members, acts of helpfulness could well be required aspects of task performance. However, helpful actions in teams will still have contextual implications . . . Thus, actions that contribute only to contextual performance in many organizational settings can contribute to both task performance and contextual performance in team settings." This suggests that what might be viewed as contextual performance at the individual level may reflect aspects of task performance at the team level. For example, cooperation and helping behaviors in a team setting are likely to be viewed as task behaviors because they are formally recognized as a part of the job, support the organizational technical core, and impact goal accomplishment. Although both task and contextual performance are important in team settings, the need for contextual performance necessitates the selection of individuals who possess an additional set of capabilities than has traditionally been considered, which we detail below.

This study contributes to the personnel selection literature in at least four different ways. First, it delineates the implications of a team setting for individual selection and then evaluates the criterion-related validity of social skills, personality characteristics, and teamwork knowledge in a team-based organization. Even though many organizations utilize teams to perform work, they still need to assess and select at the individual level. That is, organizations do not hire teams. They hire individuals and place them in teams. As such, entry-level hiring still occurs at the individual level. Second, we focus on the contextual performance of team members compared to a more traditional focus on task performance. We suggest that the heightened need for contextual performance in team settings makes additional incumbent characteristics important. Third, this study not only examines the bivariate relationships between these constructs and performance, it also examines incremental validity, an issue that has become increasingly important as researchers consider the consequences of combining the best of our constructs and measures (Schmidt & Hunter, 1998). Fourth, this is a primary study, as compared to the recent studies that estimate incremental validity based on meta-analytically derived studies of bivariate relationships (e.g., Bobko, Roth, & Potosky, 1999; Schmidt & Hunter, 1998). As such, it answers recent calls for additional primary studies (Bobko et al., 1999) that actually examine incremental validity.

Views on Selection in Team Settings

In developing the hypotheses outlined below, we relied on four distinct literatures. First, we looked to the small literature on team selection. Second, given the focus on team settings (and the notion that contextual performance might reflect team level task behavior), we examined the literature that identifies how individual differences might affect team performance. Third, we examined the literature on the predictors of contextual performance. Fourth, we considered the literature on individual-level selection where appropriate.

Social Skills

One of the distinguishing features of teamwork settings is that individuals must be able to work effectively with others. Mohrman and Cohen (1995) suggested that when individuals work in teams, a number of interpersonally oriented skills increase in importance. In particular, "an individual needs to be able to communicate with others, listen to others, influence others, and so forth" (p. 384). This constellation of skills has been called social skills and includes such things as social perceptiveness, coordination, persuasion, negotiation, instructing, and helping

others (Mumford, Peterson, & Childs, 1999). These social skills reflect "interpersonal perceptiveness and the capacity to adjust one's behavior to different situational demands and to effectively influence and control the responses of others" (Ferris, Witt, & Hochwarter, 2001, p. 1076).

Social skills are particularly important in team settings because working in teams increases the interdependence among workers, typically producing greater conflict, workload sharing, and coordination demands than work that is performed independently (Campion, Medsker, & Higgs, 1993). This increases the importance of social roles, which reflect behaviors focused on regulating and maintaining a team's existence. Social roles have been forwarded as one of the keys to team cohesion and effective team functioning (Bales, 1950; Stewart, Fulmer, & Barrick, 2005). Strong social skills enable individuals to adopt the social roles needed to manage conflict, coordinate their work, and otherwise work in a more cooperative and integrated fashion with others.

Recent research has found that the employment interview can be an effective way to assess social skills (Huffcutt, Conway, Roth, & Stone, 2001; Posthuma, Morgeson, & Campion, 2002). In their recent research into the constructs assessed in the employment interview, Huffcutt et al. (2001) found that what they term "applied social skills" is one of the most commonly measured constructs in the interview. In fact, applied social skills are the most commonly measured constructs in high-structure interviews, and the interview used in this study has high structure. Huffcutt et al. (2001, p. 908) conclude, "Our results suggest that personality traits and applied social skills are rated more often in employment interviews than are any other type of construct. These constructs reflect behavioral tendencies and provide employers with an idea of how potential employees are likely to act on the job and how well they can interact with other employees." The fact that team settings place a premium on social skills suggests that social skills will be positively related to contextual performance.

> *Hypothesis 1*: Social skills will be positively related to contextual performance in team settings.

Personality Characteristics

Research on contextual performance has suggested that personality characteristics are likely to be particularly good predictors of contextual performance (Borman & Motowidlo, 1993; Motowidlo & Van Scotter, 1994; Van Scotter & Motowidlo, 1996). A variety of meta-analytic research studies have indeed found that Conscientiousness, Extraversion, Agreeableness, and Emotional Stability are positively related to different aspects of contextual performance (Hogan & Holland, 2003; Hough,

1992; Hurtz & Donovan, 2000; Organ & Ryan, 1995). Each of these different aspects of personality will influence contextual performance and team functioning in a number of ways.

In highly interdependent teams where individual contributions are essential to overall team success, job success will accrue to individuals who are hardworking and dependable. These personality attributes are reflected in individuals high in Conscientiousness (Costa & McCrae, 1988). Conscientious individuals are likely to be valued team members for at least four reasons. First, given the positive relationship between Conscientiousness and performance across all jobs and tasks (Barrick & Mount, 1991; Hurtz & Donovan, 2000), conscientious individuals are willing to perform any role within the team and thus contribute to team performance regardless of their specific assigned role (Barrick et al., 1998; Neuman & Wright, 1999). In teams where there is any amount of workload sharing and job rotation, this is an essential personal characteristic.

Second, conscientious individuals are task focused and will be particularly concerned with performing their required behaviors and accomplishing the team's goals (LePine, Hollenbeck, Ilgen, & Hedlund, 1997). In essence, conscientious individuals can be relied upon to perform their part of the work with a minimum of oversight. Hences, Conscientiousness is likely to be important in team settings because hierarchical control is reduced, producing a commensurate increase in the need for self-discipline (Mount, Barrick, & Stewart, 1998). Such self-discipline is essential if the use of teams is accompanied by high task and reward interdependence (i.e., compensation based on performance of the entire team) because pay may be dependent on the successful performance of each individual team member.

Third, given their task focus, conscientious individuals are also likely to avoid social loafing (Latané, Williams, & Harkins, 1979) and free-riding (Albanese & Van Fleet, 1985; Olson, 1965), two group processes that reflect the propensity to withhold effort when working in team settings (Kidwell & Bennett, 1993). The self-discipline and dependability of conscientious individuals working within the team is likely to create a work team climate that fosters personal accountability and norms counter to social loafing and free-riding (Barry & Stewart, 1997; Neumann & Wright, 1999).

Fourth, success in team settings requires cooperative behavior (LePine et al., 2000). LePine and Van Dyne (2001) found that when work is interdependent and requires smooth interpersonal relationships, conscientious individuals will engage in greater cooperative behavior. In a similar manner, Porter, Hollenbeck, Ilgen, Ellis, West, and Moon (2003) found that what they termed "backing up" behaviors (essentially helping other team members) was positively related to Conscientiousness, whereas Hogan

and Holland (2003) provided meta-analytic evidence that the personality characteristic of prudence (which they linked to Conscientiousness) was related to "getting along" behaviors (i.e., demonstrating interpersonal skill, working with others). Finally, in a meta-analysis of 11 studies that focused on jobs involving interpersonal interactions, Mount et al. (1998) found that Conscientiousness was positively related to performance.

Hypothesis 2: Conscientiousness will be positively related to contextual performance in team settings.

Another personality characteristic that is likely to be important in team settings is Extraversion (Mohammed, Mathieu, & Bartlett, 2002; Witt, 2002). Extraverted individuals are often described as sociable, gregarious, assertive, talkative, and active (Digman, 1990). This will be important in team settings for at least three reasons. First, extraverted individuals are more likely to have a desire to work with others (Barrick et al., 1998) and be more confident in their ability to work effectively within a team structure (Thoms, Moore, & Scott, 1996). Such self-efficacy is an essential element of work-related success, particularly when an individual is joining a new organization that utilizes team-based forms of work.

Second, because extraverted individuals are sociable and have enhanced social skills (McCrae & Costa, 1999), they are more likely to communicate within the team. This can lead to discussion of performance strategies and development of norms (Barry & Stewart, 1997), both of which are important to team success (Hackman, 1987). Third, Extraversion contains elements of positive affectivity, which is an overall sense of well-being and the tendency to experience positive emotional states. This has been shown to promote positive and cooperative interactions with others (Hogan & Holland, 2003; LePine & Van Dyne, 2001), potentially through a process of emotional contagion (Hatfield, Cacioppo, & Rapson, 1994).

Hypothesis 3: Extraversion will be positively related to contextual performance in team settings.

The third personality characteristic important for team settings is Agreeableness. Agreeableness reflects such traits as selflessness, cooperativeness, helpfulness, and flexibility (Digman, 1990). Agreeableness will be important in team settings for at least three reasons. First, Agreeableness becomes relevant in team settings where collaboration and joint action is required (Witt, Burke, Barrick, & Mount, 2002). Agreeable individuals are more likely to work cooperatively (as opposed to competitively) with others (Hogan & Holland, 2003; LePine & Van Dyne, 2001), in part because they are viewed as helpful and non threatening (Neumann & Wright,

1999). In team settings where there are interdependencies within a team as well as between different teams, working cooperatively is essential.

Second, agreeable individuals are better able to resolve conflict (or facilitate its resolution) when it arises (Barrick et al., 1998; Neumann & Wright, 1999). Conflict resolution has been identified as one of the interpersonal aspects essential for team success (Stevens & Campion, 1994). Third, because agreeable individuals are more sympathetic toward others and likely to help (Organ & Ryan, 1995), they will be more likable. Such interpersonal attraction among team members is a key component of team cohesion, which has been shown to be enhanced by Agreeableness (Barrick et al., 1998). In turn, cohesion has been shown to lead to team effectiveness (Beal, Cohen, Burke, & McLendon, 2003; Mullen & Cooper, 1994).

> *Hypothesis 4*: Agreeableness will be positively related to contextual performance in team settings.

The final personality characteristic important for team settings is Emotional Stability. Emotional Stability is the tendency to handle stress, maintain an even temperament, and possess composure and self-confidence across most situations (Mount, Barrick, Laffitte, & Callans, 1999). Emotional Stability will be important in team settings for at least three reasons. First, emotionally stable individuals are able to tolerate stress, allowing them to better manage demanding or ambiguous situations, which are more likely given the autonomy inherent in team settings (Mount et al., 1998).

Second, emotionally unstable individuals are likely to experience negative affect (Digman, 1990). Research has shown that teams composed of individuals high in negative affect will develop negative work climates, ultimately leading to reduced team performance (George, 1990). This is likely to occur because emotionally unstable individuals are more likely to express negative attitudes in the team context (LePine & Van Dyne, 2001). Just as positive emotions can have a positive effect on the team (see above), negative emotional contagion can also occur, even if there is only a single team member low in Emotional Stability (Kenrick & Funder, 1988). Third, individuals low in Emotional Stability are less likely to be cooperative and will tend to have lower quality interactions with others in the work setting (LePine & Van Dyne, 2001). A variety of research studies have shown that low levels of Emotional Stability are related to less helping (Porter et al., 2003), less "getting along" (Hogan & Holland, 2003), and less teamwork (Hough, 1992). This all suggests that Emotional Stability is important for contextual performance in team settings.

Hypothesis 5: Emotional Stability will be positively related to contextual performance in team settings.

Teamwork Knowledge

Another view on team selection concerns the knowledge, skill, and ability (KSA) individuals possess about how to function in team settings (Stevens & Campion, 1994). Also termed team competencies (Cannon-Bowers, Tannenbaum, Salas, & Volpe, 1995), this view suggests there is a set of fundamental individual-level capabilities that will facilitate performance in team settings. In teamwork settings, employees need the KSAs to perform the job as individuals as well as the KSAs to work effectively in a team because both are important for team performance (West & Allen, 1997). Stevens and Campion (1994) developed a conceptual model that suggested there is a set of interpersonal (including conflict resolution, collaborative problem solving, and communication) and self-management (including goal setting/performance management and planning/task coordination) KSAs essential for effective team performance. These teamwork capabilities become important in teamwork settings because of the increased social and interpersonal requirements (Stevens & Campion, 1994).

To assess these capabilities, Stevens and Campion (1999) developed a situational judgment test that assesses the knowledge an individual has about how to act in team situations. They found this test was significantly related to several task and team criteria in two samples (rs ranged from .21–.56). Even though it demonstrated strong relationships with job aptitude measures, the teamwork measure was shown to provide incremental validity over a battery of traditional job aptitude tests in one of two samples. This approach shares much in common with the mental ability and job knowledge perspective long known to predict individual performance (Hunter, 1986; Hunter & Hunter, 1984; Schmidt & Hunter, 1998). Much as job knowledge is a prerequisite for successful task performance, teamwork knowledge should be a prerequisite for successful contextual performance. This suggests that teamwork knowledge will be significantly related to contextual performance.

Hypothesis 6: Teamwork knowledge will be positively related to contextual performance in team settings.

Incremental Prediction

Another important question concerns whether these constructs will incrementally predict performance in team settings. This is important because if incremental prediction does not occur, there is unnecessary redundancy with other constructs and measures, wasting candidate time and

organizational resources. The notion of incremental validity has become an important issue in traditional selection contexts, with primary interest on validity beyond mental ability measures (Cortina, Goldstein, Payne, Davison, & Gilliland, 2000; Schmidt & Hunter, 1998).

Personality characteristics have been consistently found to be unrelated to cognitively oriented measures. This is particularly true for Conscientiousness (Cortina et al., 2000; Schmidt & Hunter, 1998). This suggests that if Conscientiousness significantly predicts job performance, it will independently contribute to its prediction. The incremental prediction of Conscientiousness, Extraversion, Agreeableness, and Emotional Stability, however, is complicated by the fact that these personality characteristics are often significantly related to one another (intercorrelations can be substantial; see Witt, 2002; Witt et al., 2002). Multicollinearity would make it difficult to assess the separate effects of these personality characteristics. Notwithstanding this, these personality characteristics are conceptually separate from one another and teamwork knowledge. As such, we expect Conscientiousness, Extraversion, Agreeableness, Emotional Stability, and teamwork knowledge to incrementally predict contextual performance in a team setting.

The social skills measured by many structured interviews, on the other hand, are more complex. They are often related to both knowledge and personality constructs (Cortina et al., 2000), partly because the interview can assess a wide range of constructs (Huffcutt et al., 2001). The incremental validity research evidence is also mixed, with some studies finding no incremental validity (Campion, Pursell, & Brown, 1988; Shahani, Dipboye, & Gehrlein, 1991; Walters, Miller, & Ree, 1993) and other studies finding incremental validity (Campion, Campion, & Hudson, 1994; Latham & Sue-Chan, 1999).

We believe we will find incremental validity for at least two reasons. First, the structured interview developed in this study was expressly designed to tap into individual characteristics not otherwise measured in the selection process (i.e., social skills). This should serve to lessen the relationship between the social skills measured in the interview and the other constructs and maximize incremental prediction. Second, personality characteristics and knowledge constructs reflect an individual's underlying capabilities or tendencies to behave in certain ways. In contrast, structured interviews measure what an individual has actually done (via past behavior questions) or what they are likely to do (via situational questions). This represents a different aspect of candidate behavior and one that is likely to provide unique prediction of performance.

Hypothesis 7: Social skills, Conscientiousness, Extraversion, Agreeableness, Emotional Stability, and teamwork knowledge will incrementally predict contextual performance in team settings.

Method

Setting and Participants

Because the purpose of this study is to investigate individual selection in a team setting, it is important to demonstrate the extent to which the research setting utilized teams to accomplish its goals. The data were collected in a Midwest mill of a national steel corporation. At a corporate level, the organization had a set of "commitment" human resource practices (Arthur, 1994). Consistent with this, the organization was very decentralized, had a flat organizational structure, and emphasized employee involvement and empowerment. Each mill operated as an autonomous unit, and even though the organization as a whole consisted of over 7,000 employees, there were only three levels of management.

The mill had approximately 500 employees across five different departments: (a) material handling, (b) melting and casting, (c) hot mill, (d) cold mill, and (e) maintenance. All hiring was done at the entry, individual level without reference to any particular team. In this way, the organization sought to assess and select individuals who have the greatest likelihood of success in any team in the organization. Placement decisions were made after hiring. Employees eventually learned all the jobs in their team to facilitate job rotation and workload sharing. Teams ranged in size from 5 to 10 individuals, with multiple teams within each department across multiple shifts (e.g., in the cold mill one team might be operating the reversing mill and another team operating the galvanizing line on each shift).

Teams were used to perform all production-oriented tasks, with most of the day-to-day decisions being made at the team level. One way to understand the extent to which this was a team (as opposed to individual) setting is to compare the teams used by the organization to common definitions of teams. Guzzo and Dickson (1996, pp. 308–309) suggest that teams are made up of individuals who:

> (a) "see themselves and who are seen by others as a social entity," (b) "who are interdependent because of the tasks they perform as members of a group," (c) "who are embedded in one or more larger social systems (e.g., community, organization)," and (d) "who perform tasks that affect others (such as customers or coworkers)."

The teams included in this study meet each of the criteria. First, in terms of team identity, the teams in this study were viewed as distinct teams by others in the organization. This was reflected in the unique attributes certain types of teams were thought to possess when compared to other teams (e.g., the manager of the hot mill suggested that to work on teams

in the hot mill a person "had to be a little bit of a Cro-Magnon," reflecting the fact that they worked with molten metal and the challenging working conditions and effort required to be successful in this part of the plant). In addition, the teams had a strong sense of their own identity, which was reflected in the fact that teams had a very stable membership over time (i.e., low turnover) with essentially no movement from one team to another. Teams were also very concerned about whom to let in their team when the need arose, and all team members were hired by the manager of that department and the supervisor of that team. All these characteristics gave the teams a strong sense of identity as a distinct social entity.

Second, in terms of interdependence, there were high levels of task interdependence within the team. Task interdependence was high in two ways. First, the organization had a lean staffing philosophy in which no more than the absolute minimum number of team members was employed. As a consequence, each team member was essential for team success (i.e., if one of the team members performed poorly, the performance of the entire team suffered). Second, the overall technical system involved sequential interdependence (Thompson, 1967). That is, each department depended on the preceding department in order to complete its task. A failure at one point in the production process affected all subsequent steps. The work itself was conjunctive (Steiner, 1972) in nature, such that team success required the performance of all team members. Absent all team member contributions, the work simply could not be accomplished. The nature of the work also required the coordinated action of multiple team members. Team members could not successfully work in isolation to successfully complete their jobs. Casting and rolling a solid band of steel on a continuous line required the highest levels of sequential and reciprocal interdependence.

Third, in terms of embeddedness, these teams worked within the context and goals of the larger organizational system. The bonus system epitomized these collective goals. Every team member was on a bonus system that was based on team productivity. This team-based incentive system was a considerable source of income for team members, averaging from 80% to 150% of an employee's base pay. As such, teamwork was highly valued by the team members, and selection decisions revolved around hiring individuals who could work effectively in an autonomous and team-focused environment. This task, goal, and feedback and reward interdependence are what distinguish team settings from individually oriented settings (Campion et al., 1993). Fourth, in terms of performing tasks that affect others, the sequential interdependence inherent in the technical system required coordination between the different teams. For all these reasons, this organization represents an ideal setting within which to examine team-based selection.

Job incumbents participated in this study as part of their normal job duties. Department managers were asked to identify 20 employees from their department to participate. This was done because there were not enough resources to study the entire population of 500 employees. We chose 20 employees from each department because it ensured adequate statistical power (see below). In choosing participants, department managers were asked to identify individuals with a range of experience and performance levels. We did this to ensure a representative range of participants in terms of experience, individual characteristics, and performance and that the participants represented the full range of likely applicants for entry-level jobs. Although it is impossible to determine what effect this procedure had on the representativeness of the sample, we feel this procedure resulted in a representative sample for three reasons. First, we explained to the managers the importance of a representative sample prior to their selection decisions. Second, although the managers knew we sought employees for the validation study, at the point the sampling occurred they were not aware of what assessments and performance measures we were using. As such, it is unlikely they would have selected employees with this in mind. Third, we did not see evidence for range enhancement when compared to norms of the published instruments we used.

If an individual was unable to participate or did not wish to participate, department managers selected another incumbent. Of the 100 selected, 90 had complete data on all measures. Five participants were female. Statistical power to detect a significant bivariate correlation was 90% to detect a medium-sized effect ($r = .30$) and 74% to detect a moderately small effect ($r = .20$; $p < .05$, one-tailed; Cohen, 1988), which are common effects sizes observed in the selection literature.

Job Analysis and Description of Work

Because all hiring was done at the entry level and employees needed to be multi skilled, a job analysis was conducted to identify the basic KSAOs needed for successful performance in this team setting. This included considering both on-task activities as well as more contextual performance elements. The job analysis consisted of an examination of existing job descriptions and documentation, observation of all major work processes, interviews with each department manager, interviews with job incumbents from a range of jobs across all departments, and the completion of the Occupational Information Network (O*NET) skill, ability, and work styles surveys (Peterson et al., 2001) by supervisors and experienced employees. This resulted in job descriptions for each job and a summary of the skills, abilities, work styles, and other attributes needed for successful performance. The information was used to develop the structured interview and

determine the other important work-related constructs through the construction of a construct by selection measure matrix. This matrix ensured that all the key constructs were measured in the selection process.

Team members performed a range of different activities in the different departments. Teams in material handling delivered and distributed raw materials (primarily scrap metal) to the melting and casting department and shipped finished product to customers. Teams in melting and casting took the raw materials (scrap metal and various alloys) and combined them in the furnace to produce molten steel that is delivered to the hot mill. Teams in the hot mill processed the molten steel to produce rolled steel of appropriate thickness and quality. Teams in the cold mill took the rolled steel and subjected it to a number of different processes (e.g., reducing thickness, galvanizing, annealing) depending on customer requirements. Teams in maintenance performed routine and emergency maintenance to keep the mill running. As noted earlier, effective teamwork was needed to successfully perform all these tasks.

Structured Interview

The components of structure identified by Campion, Palmer, and Campion (1997) were used to develop a highly structured interview. Twenty-eight items were developed based on the job analysis information, with 14 situational (Latham, Saari, Pursell, & Campion, 1980) and 14 past behavior (Janz, 1982) questions. Five-point rating scales were developed for each question, with the five, three, and one points anchored with definitions, descriptions, and example anchors. Situational and past behavior questions were of comparable length and administered in the same manner by the same interviewers. Situational questions were asked before past behavior questions because it was thought to be easier for candidates to begin with hypothetical questions.

Interview questions were written to assess the social skills and characteristics needed for successful performance as identified in the job analysis. This included active listening skills (listening to what other people are saying and asking questions), speaking skills (talking to others to effectively convey information), social perceptiveness (being aware of others' reactions and understanding why they react the way they do), coordination skills (adjusting actions in relation to others' actions), service orientation (actively looking for ways to help people), time management skills (managing one's own time and the time of others), cooperation (being pleasant with others on the job and displaying a good-natured, cooperative attitude encouraging people to work together), and stress tolerance (accepting criticism and dealing calmly and effectively with high stress situations) taken

TABLE 1

Examples of Structured Interview Questions

Situational Question: Usually unpleasant tasks (e.g., hot, dirty, physically demanding, boring, etc.) are shared among employees. Suppose you thought you were being given more than your share of unpleasant tasks. What would you do?

    (5) Excellent answer (top third of candidates)—I would do the tasks. I would mention it to my supervisor only after a while, because there is probably a good explanation and it is hard to share all work equally.

    (3) Good answer (middle third)—I would do the work and then ask the supervisor.

    (1) Marginal answer (bottom third)—Ask the supervisor. Or do the work because rookies need to pay dues, but I would not expect it to continue after I got more seniority.

Past Behavior Question: In our company culture, it is important to be pleasant with others on the job and display a good-natured, cooperative attitude. Please tell us about a time on a past job when your good attitude was put to the test. What was the situation and what did you do?

    (5) Excellent answer (top third of candidates)—Provided a specific example of a time when faced with such a situation and there was a positive outcome attributable to the candidate.

    (3) Good answer (middle third)—Provided an example but did not clearly identify what was done in the situation, or positive outcome but not clearly attributable to the candidate.

    (1) Marginal answer (bottom third)—General answer only (e.g. I always have a positive attitude), or negative outcome attributable to candidate.

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from the O*NET skills and work styles domains (Peterson et al., 2001). Example situational and past behavior questions are shown in Table 1.

Forty-seven different managers, supervisors, and consultants served as interviewers. Interview panels generally consisted of three members (one consultant and two managers or supervisors). There were three instances where only one manager or supervisor was available, and two instances where three managers or supervisors were used (for two- or four-person panels, respectively). In no case did the panel include an employee's supervisor or manager and no employees (i.e., the level of people involved in the validation study) served on a panel. Interviewers served on an average of six panels. Given the large number of interviewers used, the composition of the panels was quite varied.

The structure of the interview was enhanced by: (a) basing the questions on a job analysis; (b) all candidates were asked the exact same questions; (c) all candidates were interviewed by multiple interviewers; (d) the interviewers took notes about the candidate's answers; (e) the candidate's answers were judged on anchored rating scales; (f) the number of follow-up questions asked by the candidate was limited; and (g) the interview panel did not elaborate on the questions. This can be thought of as a high

level of interview structure (cf. Huffcutt & Arthur, 1994; Huffcutt, Roth, & McDaniel, 1996). Interrater reliability [ICC (2)] was .89 and internal consistency reliability was .84. As noted by Bliese (2000), ICC(2) provides an estimate of the reliability of the group means. Hence, in this setting this is the extent to which the multiple interviewer ratings of different interviewees covary with one another and reflect the stability of ratings across multiple raters. This value represents the estimated correlation between the mean of the panel and the mean of a hypothetical panel drawn from the same population (although it is important to recognize that these estimates may not apply to any particular interview panel).

Personality Characteristics

To assess Conscientiousness, Extraversion, Agreeableness, and Emotional Stability, we used the Personal Characteristics Inventory (PCI), which is a measure developed by Barrick, Mount, and associates (Mount et al., 1999) to explicitly assess the "Big Five" personality characteristics. Paper-and-pencil questionnaires were administered to existing employees. The test publisher of the PCI reports internal consistency reliability estimates of .87, .86, .82, .86, and test–retest reliability estimates ranging between .77–.84, .73–.91, .66–.77, and .73–.85 for the Conscientiousness, Extraversion, Agreeableness, and Emotional Stability easures, respectively (Mount et al., 1999; we did not have access to item-level data to calculate reliability estimates).

Teamwork Knowledge

Teamwork knowledge was assessed by the 35-item Teamwork-KSA test developed by Stevens and Campion (1997, 1999). This is a paper-and-pencil situational judgment test based on the conceptual model outlined in Stevens and Campion (1994). This test presents a series of hypothetical situations in which the respondent is asked to choose the best response from among several options (see McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001, for a discussion of situational judgment tests). The test assesses interpersonal (conflict resolution, collaborative problem solving, and communication) and self-management (goal setting/performance management and planning/task coordination) KSAs. Although conceptualized as separate categories, the interpersonal and self-management categories are highly related, which has led Stevens and Campion (1997) to recommend using the overall score in selection contexts. The overall score can be interpreted as the amount of teamwork knowledge an individual possesses because it reflects knowledge of how to act in team situations (McClough & Rogelberg, 2003). The test

publisher reports internal consistency reliability of .80 (Stevens & Campion, 1997; we did not have access to item-level data to calculate reliability estimates).

Contextual Performance

Department managers (i.e., the supervisor of the team members) provided ratings of the contextual performance of individual team members on a five-point scale, with higher ratings indicating better performance. Ratings were provided on nine items taken from Moorman and Blakely (1995), Motowidlo and Van Scotter (1994), and Van Scotter and Motowidlo (1996) with minor modifications to explicitly anchor them with a team referent. These items include such things as cooperating with team members, going out of his or her way to help other team members, and so on (see the Appendix). This reflects interpersonal facilitation, interpersonal helping, job dedication, and individual initiative. We chose these items because they reflected important aspects of performance in this context. In particular, we focused on those behaviors needed for cooperative functioning and involved a focus on such team processes as communication, cooperation, helping others, and team morale. These kinds of activities have been shown to be important in team contexts (e.g., Stevens & Campion, 1994), and the results of the job analysis demonstrated that these kinds of interpersonal and "working with others" activities were essential for effective team functioning. We did not expect these items to factor into separate dimensions of performance, and an exploratory factor analysis indicates a single factor accounts for the nine items. Internal consistency reliability was .98.

Task Performance

Department managers also provided ratings of the task performance of individual team members on a five-point scale, with higher ratings indicating better performance. Ratings of task performance were provided on the following five dimensions: (a) efficiently performing his/her job duties, (b) using tools and equipment, (c) performing routine maintenance, (d) planning and organizing work, and (e) working safely. Internal consistency reliability was .91. Although there were no formal hypotheses associated with task performance, examining the relationship between contextual and task performance provides insight into the extent to which higher levels of contextual performance is associated with higher levels of task performance.

TABLE 2

Descriptive Statistics and Correlations Among Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Social skills	3.45	.45	–						
2. Conscientiousness	2.79	.18	.02	–					
3. Extraversion	2.19	.33	.11	.03	–				
4. Agreeableness	2.64	.29	.14	.49	.06	–			
5. Emotional Stability	2.54	.33	.02	.57	.08	.63	–		
6. Teamwork knowledge	22.40	4.70	.23	−.07	.03	.02	.05	–	
7. Contextual performance	3.16	1.20	.28	.21	.21	.18	.17	.32	–
8. Task performance	3.59	.91	.17	.25	.18	.12	.15	.36	.89

$N = 90$.

95% confidence interval (.00 < .21 < .40). 90% confidence interval (.00 < .18 < .34).

Procedure

Employees were scheduled to take the interview and tests during work time. Contextual performance measures were collected concurrently from department managers. Control of the data was maintained at all times such that those involved in the interviews or those who provided performance ratings did not have access to the participant results. We did this to avoid biasing the judgments of the managers and supervisors. To avoid knowledge-of-predictor bias, employees were interviewed by managers and supervisors from other departments (who did not know the employee being interviewed). They were instructed not to discuss their judgments with anyone else.

Results

Table 2 presents means, standard deviations, and intercorrelations. Conscientiousness, Extraversion, Agreeableness, and Emotional Stability were generally unrelated to either social skills or teamwork knowledge. Conscientiousness and Agreeableness ($r = .49$, $p < .01$), Conscientiousness and Emotional Stability ($r = .57$, $p < .01$), Agreeableness and Emotional Stability ($r = .63$, $p < .01$) and social skills and teamwork knowledge ($r = .23$, $p < .01$) were significantly related. The strong relationship between contextual and task performance ($r = .89$) suggests that in this team-based setting where there are high levels of interdependence among team members, there is little to separate contextual from task performance. Therefore, to effectively do one's task work, one also must work well as a team member.

As hypothesized, social skills (Hypothesis 1; $r = .28$, 90% CI is .11 < .28 < .43), Conscientiousness (Hypothesis 2; $r = .21$, 90% CI is .03 < .21 < .37), Extraversion (Hypothesis 3; $r = .21$, 90% CI is

TABLE 3

*Relationships Between Personality Dimensions, Personality Facets,
and Contextual Performance*

	Correlation	90% Confidence interval
Conscientiousness	.21	.03 < .21 < .37
Dependability	.12	−.05 < .12 < .29
Achievement striving	.22	.05 < .22 < .38
Efficiency	.15	−.02 < .15 < .32
Extraversion	.21	.03 < .21 < .37
Sociability	.18	.01 < .18 < .34
Need for recognition	.04	−.13 < .04 < .21
Leadership orientation	.25	.08 < .25 < .41
Agreeableness	.18	.01 < .18 < .34
Cooperation	.11	−.07 < .11 < .28
Consideration	.19	.02 < .19 < .35
Emotional Stability	.17	−.01 < .17 < .33
Even-temperament	.12	−.06 < .12 < .29
Self-confidence	.16	−.01 < .16 < .33

$N = 90$.

.03 < .21 < .37), Agreeableness (Hypothesis 4; $r = .18$, 90% CI is .01 < .18 < .34), and teamwork knowledge (Hypothesis 6; $r = .33$, 90% CI is .15 < .32 < .47) each predicted contextual performance. Hypothesis 5 was marginally supported, as the 90% confidence interval for emotional stability just included zero ($r = .17$, 90% CI is −.01 < .17 < .33).

As these results demonstrate, the relationships between the personality measures and contextual performance are smaller than social skills and teamwork knowledge. Some have suggested that greater predictive power can be achieved by focusing on the relationships between the different personality facets that underlie the major personality dimensions (Block, 1995; Hough, 1992). For example, the PCI provides data on the following personality facets for each major personality dimension. Conscientiousness includes dependability, achievement striving, and efficiency; Extraversion includes sociability, need for recognition, and leadership orientation; Agreeableness includes cooperation and consideration; and Emotional Stability includes even temperament and self-confidence. Table 3 shows the relationships between the major personality dimensions, personality facets, and contextual performance. As shown, the relationships between the personality dimensions and contextual performance are generally equal to (within .01) or higher than the relationships between the personality facets and contextual performance. The only exception is leadership orientation, which is .04 higher ($r = .25$) than Extraversion ($r = .21$), although this is not significantly greater.

TABLE 4

Regression of Contextual Performance on Social Skills, Conscientiousness, Extraversion, Agreeableness, Emotional Stability, and Teamwork Knowledge

	B	SE B	β	90% Confidence interval
Social skills	4.34	2.44	.18	$.01 < .18 < .35$
Conscientiousness	12.20	7.25	.20	$.00 < .20 < .40$
Extraversion	5.51	3.19	.17	$.01 < .17 < .33$
Agreeableness	1.79	4.85	.05	$-.17 < .05 < .26$
Emotional Stability	−.39	4.47	−.01	$-.24 < -.01 < .21$
Teamwork knowledge	.66	.23	.29	$.12 < .29 < .45$

Total $R^2 = .23$
Adjusted $R^2 = .17$
$F (6,89) = 4.03$

$N = 90$.

One other way to examine the predictive power of personality dimensions versus facets is to use the dimensions and facets in separate regression equations. When included with social skills and teamwork knowledge, the personality dimensions account for 23% of the variance in contextual performance. When included with social skills and teamwork knowledge, the personality facets account for 24% of the variance in contextual performance. In total, these analyses suggest that little is gained by using personality facets instead of the broader personality dimensions in predicting contextual performance.

Hypothesis 7 suggested that each of these constructs would incrementally predict contextual performance. To test this possibility, the predictors were simultaneously regressed on the performance measure. Evidence of incremental prediction would be obtained if the regression parameter estimate for each predictor was significant. As Table 4 indicates, each construct except Agreeableness and Emotional Stability incrementally predicts contextual performance, accounting for 23% of the variance in performance (multiple correlation of .48). These results largely support Hypothesis 7. The failure of Agreeableness and Emotional Stability to incrementally predict contextual performance is likely due to the multicollinearity of these measures with each other and Conscientiousness.

To test the relative importance of each of these sets of predictors, a series of hierarchical regression analyses were conducted, with the predictors entered as a block in all possible orders. This will provide an estimate of the incremental gain for each set of predictors. It is necessary to enter the predictors in all possible orders because the amount of variance accounted for depends on the order in which variables are entered

TABLE 5

Summary of Changes in R^2 for Hierarchical Regression Analysis of Social Skills, Personality Characteristics, and Teamwork Knowledge on Contextual Performance Entered as a Block in Each Sequence of Entry

	Variable	R^2	ΔR^2
Step 1	Social skills	.08	
Step 2	Personality characteristics	.15	.07
Step 3	Teamwork knowledge	.23	.08***
Step 1	Social skills	.08	
Step 2	Teamwork knowledge	.15	.07**
Step 3	Personality characteristics	.23	.08*
Step 1	Personality characteristics	.09	
Step 2	Social skills	.15	.06**
Step 3	Teamwork knowledge	.23	.08**
Step 1	Personality characteristics	.09	
Step 2	Teamwork knowledge	.20	.11**
Step 3	Social skills	.23	.03*
Step 1	Teamwork knowledge	.10	
Step 2	Social skills	.15	.05*
Step 3	Personality characteristics	.23	.08*
Step 1	Teamwork knowledge	.10	
Step 2	Personality characteristics	.20	.10**
Step 3	Social skills	.23	.03*

*$p < .05$, one-tailed. **$p < .01$, one-tailed.
$N = 90$.

into the regression equation. As Table 5 shows, depending on entry order, social skills account for between 3% and 8% of unique variance in contextual performance; personality characteristics account for between 7% and 10% of unique variance in contextual performance; and teamwork knowledge accounts for between 7% and 11% of unique variance in contextual performance.

Discussion

The results of this study generally support the hypotheses such that social skills as measured by a structured interview, the personality characteristics of Conscientiousness, Extraversion, Agreeableness, and Emotional Stability, and teamwork knowledge as measured by a situational judgment test all predict contextual performance. Results also indicate that most of these constructs incrementally predict contextual performance, suggesting that these constructs are uniquely important for performance in teamwork settings. The uncorrected multiple correlation ($R = .48$) is relatively large

in a selection context. This is all the more impressive given the fact that the employees participating in the study were originally hired using a basic mental ability test. This indirect range restriction is likely to underestimate the true validity of the social skills and teamwork knowledge measures (the personality characteristics are unlikely to be affected).

The structured interview used in the study was designed to principally assess the social skills the job analysis identified as important. As a consequence, we expected the interview to be relatively independent of personality and teamwork knowledge. The interview was unrelated to the personality characteristics but was significantly related to teamwork knowledge. Because others have found relationships between the teamwork knowledge measure used in this study and various ability measures (Stevens & Campion, 1999), there may be an underlying mental ability explanation for the relationship between social skills and teamwork knowledge. Other previous research has also shown that ability-oriented measures are significantly related to interview performance (Huffcutt et al., 1996). Regardless of the interview content, there are many reasons why candidates with higher ability might receive higher interview scores, such as the influence of overall ability impressions, more effective use of impression management behaviors by high-ability candidates, potential relationships between ability and previous experience, and so on. It may also be the case that individuals who possess greater teamwork knowledge also possess greater social skills or are better able to describe these skills. Finally, higher teamwork knowledge might be the result of greater experience working in teams and collaborative environments. This increased experience would likely yield better answers to the interview questions, particularly past behavior questions. Future research should include measures of cognitive ability to examine this possibility.

Barrick and Mount (1991) offer support for the use of different personality characteristics in personnel selection, albeit not explicitly in a team setting. Others have recently extended this support to teams and jobs involving interpersonal interaction (e.g., Hough, 1992; Mohammed et al., 2002; Mount et al., 1998; Neuman & Wright, 1999; Witt, 2002; Witt et al., 2002). The present research offers further support for the use of different personality characteristics in selection and provides support for broadening the applicability of Conscientiousness, Extraversion, Agreeableness, and Emotional Stability into selection for teams. Given the small magnitude of some of these relationships, however, additional work is needed to further specify when the use of personality measures may be most effective.

We directly examined whether certain personality facets (as compared to the overall dimension score) would be more strongly related to contextual performance. We found no support for the idea that more specific

aspects of personality would be better predictors of contextual performance behaviors. It may be that the additional specificity gained at the facet level is offset by the lower reliability of the measure (when compared to the dimension scales). Another issue suggested by recent research concerns the interaction of various personality characteristics (Witt, 2002; Witt et al., 2002). Given the fact that interaction effects are often small in magnitude and there is relatively low statistical power in this study to examine interactive effects, we chose not to investigate the interactions among the constructs. This is a potential area for future research, particularly across construct domains (e.g., teamwork knowledge and personality characteristics).

It is important to recognize that this study was not conducted with job applicants. The participants were current employees. As such, socially desirable responding was not an issue. Although there is evidence that socially desirable responding may not eliminate the validity of personality tests (Barrick & Mount, 1996), others have suggested that under certain conditions (i.e., top-down selection, low selection ratios) socially desirable responding can present problems (Christiansen, Goffin, Johnston, & Rothstein, 1994; Rosse, Stecher, Miller, & Levin, 1998). In operational settings where candidates are motivated to present themselves in the best possible light, results might be weaker. It is interesting to note, for instsnce, that the validity observed here is higher than many of the uncorrected meta-analytic estimates previously found. This may be because of the concurrent design, or it might be because personality is more important in a teamwork setting than in individually oriented settings. Future research should explore this possibility.

Using these different approaches to selection allowed for stronger prediction of performance in team settings by providing relatively unique perspectives on the candidate. In fact, the different construct types were relatively independent of one another. The low intercorrelations among the different constructs are unusual and positively influence our ability to find incremental validity. These low intercorrelations are likely due to three factors. First, previous research has shown that the teamwork knowledge has a mental ability component. Because personality measures are generally unrelated to cognitive ability measures, this may account for our low intercorrelations. Second, the interview was a different methodology than the paper-and-pencil tests. Such different methodologies are likely to minimize the interrelationships. Third, these different constructs and measures were explicitly chosen because they tap into distinctly different candidate characteristics.

Although the use of multiple constructs in an attempt to explain more of the criterion domain space is fairly common in other areas of research, no research has investigated the extent to which these six constructs predict

contextual performance in a team setting. This research suggests there may be some heightened requirements (e.g., social skills and Extraversion), but the constructs shown to be effective in traditional settings appear to transfer to team settings. Future research should extend this research by examining whether these constructs can also predict team-level performance given our focus on individual contextual performance. Some initial research has already been conducted (e.g., Barry & Stewart, 1997; Neuman & Wright, 1999), but much more needs to be done.

Because of the high levels of interdependence in these teams, one concern might be whether it is possible for supervisors to accurately distinguish and assess individual contextual performance independent of judgments of overall team performance. We feel individual performance was meaningfully assessed for three reasons. First, the organization has a highly interdependent production process in which individual variations in performance is very observable to other team members and management. Second, the content of the performance measures constitutes a set of behaviors that are likely to be readily distinguishable within a team. Third, the range of performance ratings was large, suggesting that supervisors were distinguishing between individual performance levels and not simply using their general knowledge of team performance in making the performance ratings.

In addition, because these individuals are current employees, it might be impossible to disentangle the causal direction of the observed relationships. For example, the performance ratings may be a function of halo error such that managers know which teams perform well and then rate team members from high-performing teams higher than those from low-performing teams. Unfortunately, we do not have a measure of whole team performance to use as a control variable, so we cannot directly investigate this possibility. We do not believe this to be a serious limitation to this research for four reasons. First, care was taken to ensure that managers and supervisors from different departments conducted the interview for each employee. As such, the managers and supervisors did not know the employee being interviewed and could not have used knowledge of team performance in making the interview ratings. Second, the teamwork and personality tests were objectively scored, thus information on job performance could not bias these measures. Third, managers making the performance ratings did not know how the employee being rated performed on the interview or tests. In this way, there was no knowledge-of-predictor bias. Finally, the managers, supervisors, and interviewers did not score any of the tests or summarize any of the data. Everything was turned over to the researchers for summarization, so it could not have biased any judgments.

Another potential limitation pertaining to the use of job incumbents concerns whether the individual differences studied here will be found in

an applicant population. In essence, it might be that these characteristics are developed through experience in team settings and not job applicant capabilities. There has been some suggestion, nonetheless, that these individual differences are stable traits that will not be affected by experience. In addition, regardless of their origin, the finding that social skills, some personality characteristics, and teamwork knowledge are related to contextual performance is useful information for the team selection context. It suggests that individuals with higher levels of these characteristics (regardless of the absolute level) will have high contextual performance and that by making selection decisions based on these characteristics an organization should ultimately have better performing teams. Finally, research has shown that for aptitudes, there is little evidence of differences between predictive and concurrent validation designs (Barrett, Phillips, & Alexander, 1981). This would suggest that we are unlikely to find a large difference if an applicant sample was used. Notwithstanding these reasons, it is important to recognize that this study only provides initial evidence supporting our hypotheses. Clearly, additional research with other designs is needed to disentangle these relationships and extend our findings to applicant samples.

The manner in which participants were selected for inclusion in the study is another potential limitation. Department managers were asked to identify employees from their departments. Although we articulated earlier why we feel we were able to obtain a representative sample, it is possible that this sample was unrepresentative in unknown ways.

Finally, it might be that there is some interaction between elements of the context (e.g., team size, task demands) and individual differences in predicting contextual performance. Although we did not collect information on specific team size and different task demands, this is a potentially important area of future research for at least two reasons. First, team size would seem to be most important when it comes to how to compose the team. For example, smaller teams might need team members with a more "generalist" set of capabilities whereas larger teams might need "specialists" who are particularly strong in a more limited set of areas. Although these composition issues are not the main focus of this research (we focused on entry, individual-level selection rather than post hire placement into teams), it is an important area of future research. Second, the specific demands of the task might be important because it can have an effect on the level of interaction and communication needed among team members. For example, in less interdependent teams there might be less need for good social skills. In order to investigate this issue, it would be important to study teams in which there is some variation in task demands.

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APPENDIX

Contextual Performance Items

1. Cooperates with others in the team.
2. Offers to help other team members accomplish their work.
3. Voluntarily does more than the job requires to help others or contribute to team effectiveness.
4. Talks to other team members before taking actions that might affect them.
5. Goes out of the way to help team members with work-related problems.
6. Goes out of the way to make newer members feel welcome in the team.
7. Shows genuine concern and courtesy toward team members, even under the most trying business or personal situations.
8. Encourages team members to try new and more effective ways of doing their jobs.
9. Encourages hesitant or quiet team members to voice their opinions when they otherwise might not speak up.