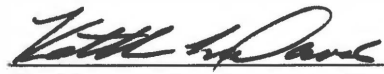


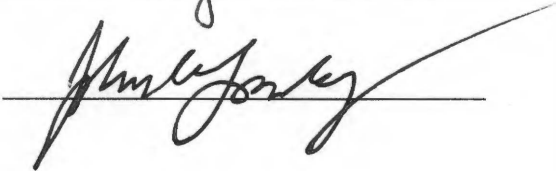
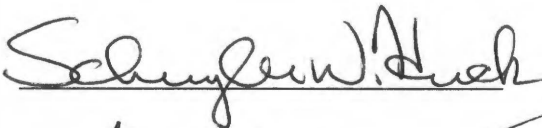
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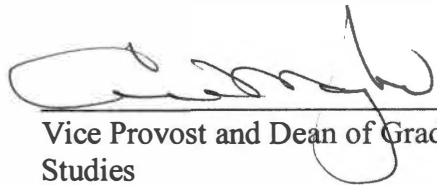


Kathleen L. Davis, Major Professor

We have read this dissertation
and recommend its acceptance:



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Vice Provost and Dean of Graduate
Studies

A VALIDATION STUDY ON THE
TEAMWORK RECEPTIVENESS INVENTORY

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Matthew E. Fearrington
August 2004

Thesis
2004b
.F37

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Dedication

This dissertation is dedicated to my girlfriend, Jamie Yarbrough, for her love and patience during this process. I could not have done this without you.

Acknowledgments

I want to express my appreciation to all of the people who provided guidance and support in my dissertation process. First, my sincerest gratitude goes to my major professor, Dr. Kathleen Davis, who has served as a wonderful role model. Her invaluable suggestions and unfailing willingness to help me were instrumental in the completion of this dissertation. I would also like to thank the other members of my doctoral committee. Dr. John Lounsbury assisted me in the creation of the scale used in this project and provided statistical guidance throughout the process. Dr. Elaine Seat provided abundant assistance in the collection of my data. Dr. Sky Huck offered helpful suggestions regarding the methodology used in the study and provided support throughout the process. All of my committee members contributed generous amounts of time to aid in my development as a student and an aspiring professional.

I also would like to thank Dr. Theresa Kline, who granted me permission to use the Team Player Inventory in my research, and the Institute of Personality and Ability Testing, Inc., which allowed me to use the Q2 scale from the 16 PF. Many thanks also go to my family: parents, William and Cynthia; grandmother, Annie; sister, Sarah; and brother-in-law, Bob. Their love and support sustained me through this process.

Abstract

As the use of work teams has increased in American corporations during the last 30 years, much of the empirical research has focused upon the relationship between individual personality traits and job performance rather than on individual attitudes about working in team settings. This study attempted to establish the construct (convergence of indicators and discriminant validity) and criterion-related validity of an instrument designed to measure individual receptiveness to working in teams. Four hundred seventy-four undergraduate, first-year engineering students (over 80% were male) were asked to complete the Teamwork Receptiveness Inventory (TRI; Fearington, 2001), the NEO-FFI (Costa and McCrae, 1992a), the Self-Reliance (Q2) scale on the 16-PF (Cattell, Cattell, & Cattell, 1994), the Team Player Inventory (TPI; Kline, 1999), and the BIDR Version 6 (Paulhus, 1991), as well as answer a question about the number of teams/groups in which they had participated during the previous 2 years. A principal components analysis was performed to examine the underlying factor structure of the TRI. Pearson Product Moment correlations were calculated between the TRI and all of the aforementioned measures. The findings suggest that the TRI is composed two primary factors rather than just one. The convergence of indicators for the TRI was supported by the significant correlations with the TPI, Q2, and 2 of the NEO-FFI scales: Extraversion and Agreeableness. Discriminant validity was supported by the absence of significant correlations between the TRI and 3 of the NEO-FFI scales: Neuroticism, Conscientiousness, and Openness. The criterion-related validity of the TRI was not supported, as the TRI was not significantly correlated with the number of teams in which

the students had participated during the previous 2 years. These results support the construct validity of the TRI, but there is a need for further research to establish the criterion-related validity. It is recommended that future research explore the underlying factor structure of the TRI to determine if the instrument measures a unique construct.

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Chapter I

Introduction

Statement of the Problem

Work teams have been increasingly utilized in American corporations for the last 30 years (Sundstrom, McIntyre, Halfhill, & Richards, 2000), and they will most likely continue to be utilized in the foreseeable future (Lawler, Mohrman, & Ledford, 1998). Due to this trend in corporate America, there is a great deal of research related to team composition (Barrick, Stewart, Neubert, & Mount, 1998; Guzzo & Shea, 1992; Ilgen, 1999; Sundstrom, DeMeuse, & Futrell, 1990) and an increasing amount of research that attempts to correlate individual personality traits with job performance (Barrick & Mount, 1991; Barrick et al., 1998; Barry & Stewart, 1997). However, one area of teamwork that has been relatively overlooked is that of individual receptiveness to working in a team environment. In fact, there is currently only one instrument (Team Player Inventory; Kline, 1999) found in the literature that has been designed to measure a construct similar to individual receptiveness to teamwork.

As Klimoski and Zukin (1999) suggested, one of the most vital issues in initial team staffing is to appraise individual attitudes towards teamwork. There is also a significant body of research that suggests a relationship exists between individual receptiveness to teamwork and group performance (Cummings, 1981; Erez & Somech, 1996; Hackman & Oldham, 1980; Jung & Sosik, 1999). However, in order to further investigate individual receptiveness to teamwork, there needs to be a valid measure of the

construct. This study will be the first step in the construct validation process for a new measure of individual receptiveness to teamwork.

The Teamwork Receptiveness Inventory (TRI; Fearrington, 2001; see Appendix A), an instrument created to measure individual receptiveness to working in a team, will be examined in this study. In a previous study, the TRI was administered to a sample of 355 undergraduate engineering students (Fearrington). In that study, internal consistency was established (Nunnally & Bernstein, 1994), as the coefficient alpha was found to be .88. Additionally, the nine test items that were included in the final version of the scale all had corrected item-total correlations above .35, which indicates that the test items have a degree of common variance and add to the reliability of the instrument (Nunnally & Bernstein).

Review of Literature

Definitions of work teams will be reviewed and presented and then a discussion of the increasing use of work teams in corporate America will be addressed in this literature review. The literature related to team composition will be examined, with a focus on the area of individual differences in perspective team members. Two personality instruments, the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992a) and the 16 Personality Factor Questionnaire (16 PF; Cattell, Cattell, & Cattell, 1994) will be reviewed, as they have been used to some degree in the assessment of individual differences as they relate to team membership. Scales from both of these instruments are used in this study in an effort to establish a convergence of indicators and

the discriminant validity for the TRI. Criterion-related validity is examined by comparing the TRI with the number of group/team activities in which the individuals have been involved over the past two years. This review also includes a discussion of socially desirable responding because socially desirable responding can be an issue whenever self-report measures are used.

Work Teams

Although work teams are utilized in fields as diverse as health care (Beckham, 1998; Yeatts & Steward, 2000), safety (Conley, 2000; Shivers, 1999), law enforcement (Ramirez, 1999), engineering (Bailey, 2000), and business (Spreitzer, Cohen, & Ledford, Jr., 1999), there is not a substantial difference in the definitions of work teams used in the various fields. Work teams are commonly referred to as self-directed (Beckham; Blejwas & Marshall, 1999; Caramanica, Ferris, & Little, 2001; Conley) or self-managed (Chansler, Swamidass, & Cammann, 2003; Thoms, Pinto, Parente, & Druskat, 2002; Yeatts & Steward). Regardless of whether the work teams are referred to as self-managed or self-directed, all of the definitions emphasize the autonomy and the problem-solving ability of the work team. These teams are typically responsible for the technical portion of their job, as well as the management responsibilities.

In terms of specific definitions of work teams, Sundstrom et al. (1990) defined work teams as a collection of individuals who share the responsibility for certain outcomes within their organizations. For purposes of this study, McGrath's (1984) more complex definition of a work team is used. He defines a work team as: "a relatively

small set of persons within an organization who are the role incumbents with whom a given individual interacts, and who are highly interdependent in terms of those organizational roles” (p. 7). In this definition, the organization, whether it is a corporation or an academic program, is often viewed as the source of some of the most influential pressures on overall group performance. Additionally, in accordance with Guzzo and Shea (1992) and Sundstrom et al. (2000), there is no distinction made between the terms work team and work group because either label will accurately apply to the definition of work team that is being used in this study.

Many different models of work groups also have been proposed, from several different disciplines, in an effort to find the factors that influence the overall effectiveness of a team. Models from social psychology (McGrath, 1984), socio-technical theory (Pasmore, Francis, Haldeman, & Sani, 1982), and industrial engineering (Davis & Wacker, 1987) have all been developed. One prominent model, from organizational psychology, describes teams in terms of an input-process-output model (Guzzo & Shea, 1992; Hackman, 1987). In this model, input refers to the various abilities, attitudes, demographic variables, and personality characteristics that individuals bring into the team setting. Process refers to all the interactions that occur among the group members, and output obviously denotes the products or work completed by the group.

The current study utilizes the organizational psychology model, and focuses specifically on the input aspect of this model, which has been subcategorized into three major groups: individual-level factors (member attributes), group-level factors (structure

and size), and environmental-level factors (tasks and rewards) (Hackman, 1987). This study pertains to the individual-level factors that are present in a work team and might ultimately affect overall team performance.

In the past thirty years, organizations have begun to move away from a focus on individual employees to a more team or group-oriented approach. As Sundstrom et al. (2000) noted, work groups were initiated on a limited, experimental basis in some organizations in the early 1970's. At the time these groups were viewed as quite innovative and novel. By the mid 1970's, Leavitt (1975) began to speculate about the possibility that groups or teams would surpass individuals as the basic foundations of organizations. Although this line of thinking might have been premature in the 70's, it has become increasingly prophetic.

In the early 1980's, Peters and Waterman (1982) postulated that small groups had already become the foundation of strong organizations. Around the same time, Thurow (1983) noted that teams, not individuals, had come to dominate industry. Even as early as 1983, work teams were becoming so prevalent that Reich (1983) predicted that their increased prominence would continue for many years to come. Indeed, throughout the decade of the '80's, large corporations in a number of diverse industries were increasingly utilizing work teams. For example, such prominent companies as Boeing, Caterpillar, Champion International, and General Electric all implemented work teams to some degree (Hoerr, 1989).

By 1990, a survey of 476 Fortune 1000 companies found that despite the fact that only 7% of the work force was actually functioning on teams, half of the companies surveyed stated that they increasingly would be relying on teams in the years ahead (Dumaine, 1990). The widespread utilization of work teams certainly did not see any decline during the 1990's. As Stewart, Manz, and Sims, Jr. (1998) noted, "we believe that nearly every U.S. company is currently trying or considering some form of empowered work teams somewhere in their organization, and our own informal estimate is that within the next five years 40 to 50 percent of the U.S. workforce may work in some kind of empowered team" (p. 7). Lawler et al. (1998) echoed the same sentiment, as they predicted that the applications of work groups would continue to expand in the same manner as they did in the 1990's. Work teams have clearly become, and most probably will remain, an integral part of corporate America.

Team Composition

As stated previously, the input-process-output model (Guzzo & Shea, 1992; Hackman, 1987) is the theoretical model forming the basis of this study. Specifically, this study is focused on the individual-level factors that are part of the input aspect of the model. Articles dealing with these individual-level factors have typically focused on team composition or membership (Barrick et al., 1998; Guzzo & Shea, 1992; Ilgen, 1999; Sundstrom et al., 1990). Additionally, much of the literature dealing with group composition also focuses on the heterogeneity of individual members and its affect on the groups' process and output. In fact, there is a significant body of literature that supports

the notion that heterogeneity, with regard to group members' gender, ethnicity, skills, and abilities, can significantly improve team performance (Bettenhausen, 1991; Eisenhardt & Tabrizi, 1995). The increased level of performance is thought to be attributable to the fact that diverse groups can bring many different perspectives and qualities to bear when faced with a team task.

Despite the fact that there is a great deal of support for team heterogeneity in the literature, there is also some evidence that increased diversity can lead to conflict and tension within the group, which then leads to process losses (Shepperd, 1993; Watson, Kumar, & Michaelson, 1993; Williams & O'Reilly, 1998). Clearly, the issue of heterogeneity is a complicated one. As previously stated, team heterogeneity appears throughout the literature in relation to group demographics, abilities, and personality factors. Although there is a significant body of work related to both demographics (e.g., Fiedler, 1966; Fiedler, Meuwese, & Oonk, 1961; Jackson, Brett, Sessa, Cooper, Julin, & Peyronnin, 1991; O'Reilly, Caldwell, & Barnett, 1989; Zenger & Lawrence, 1989) and abilities (e.g., Campion, Medsker, & Higgs, 1993; Goldman, 1965; Guzzo, 1988; Hill, 1982; Laughlin, Branch, & Johnson, 1969; Tziner & Eden, 1985), this study will focus on a personality factor, receptiveness to working in teams, which might be useful in selecting effective team members.

Team Performance and Personality

There is an extensive body of literature that advances the possibility of a relationship between individual personality dimensions and team performance. As far

back as 1951, Cattell hypothesized that personality factors could predict group performance. Golembiewski (1962) predicted that knowledge of personality facets could enhance an understanding of group dynamics, and Hackman and Morris (1975) suggested that personality factors might have both negative and positive affects on overall team performance.

Despite the fact that personality factors are routinely hypothesized to be related to group performance, there is some conflicting evidence concerning the validity of this relationship. Driskell, Hogan, and Salas (1987) suggested that there are specific reasons why the evidence regarding this relationship is murky. The first reason is that personality psychology has typically focused on detecting pathology rather than on healthy, well-adjusted individuals who might be effective team members. Indeed, Hogan, Carpenter, Briggs, and Hanson (1985) pointed out the fact that a lack of pathology does not necessarily mean that competence is present in an individual.

According to Driskell et al. (1987), a second reason that the evidence for a relationship between team performance and personality has been slow to emerge in the literature is due to the fact that there has been little consensus about how personality should be measured and defined. To support their assertion, they cited a literature review by Mann (1959) that found that over 500 different personality measures had been utilized in team performance. Although Mann did not list all 500 measures, he did note that he was able to classify the majority of the measures within seven broad personality dimensions: intelligence, extroversion-introversion, adjustment, dominance, masculinity-

femininity, interpersonal sensitivity, and conservatism. However, Mann also stated that 150 out of the 500 measures that he examined were not classified into any of the seven dimensions. Ultimately, Driskell et al. concluded that the different personality researchers simply used different names for the same personality constructs, despite the fact that some of the constructs in Mann's review were obviously unique.

In a similar line of research, Barrick and Mount (1991) conducted a meta-analysis to examine the relationship between personality factors and job performance. They cited various studies (e.g. Ghiselli, 1973; Guion & Gottier, 1965; Locke & Hulin, 1962; Reilly & Chao, 1982; Schmitt, Gooding, Noe, & Kirsch, 1984) that failed to substantiate the notion that personality could predict job performance. In a similar vein as Driskell et al. (1987), Barrick and Mount noted that at the times of the aforementioned studies, there was no agreed-upon taxonomy for personality dimensions. Essentially, there was some debate about how many dimensions were actually needed to adequately account for all the facets of personality. This lack of a taxonomy thus made it impossible to determine whether a true relationship between personality factors and team performance does indeed exist.

In a more recent article, Kichuk and Wiesner (1998) suggested that personality might be an appropriate team selection measure. Specifically, they proposed that personality has three major roles in team selection. First, they stated that personality variables might be able to add incremental validity (beyond cognitive or physical ability) to measures of job performance for each team member. Second, the authors

hypothesized that personality characteristics might be used to identify individuals who are capable of working effectively on teams. Third, personality measures might help identify optimal combinations of individual profiles to ensure good working relationships among team members. Indeed, the authors made a strong case for the assessment of personality dimensions in predicting team performance.

Although Kichuk and Wiesner (1998) noted that personality measures might help to identify optimal combinations of individual personality profiles for team members, there is some debate in the literature about what the optimal combinations would be. For instance, several authors (e.g., Guzzo, 1986; Hoffman, 1959; Hoffman & Maier, 1961; Janis, 1982; Stein, 1982; Ziller, 1965) contended that groups will perform better when members have heterogeneous personality profiles. However, several authors (e.g., Bass, 1954; George, 1990; Hoffman & Maier, 1961; Tziner, 1985) noted that teams with homogeneous personality profiles would be less likely to have interpersonal conflicts that might hinder team performance. In an attempt to reconcile the debate over the optimal combinations, Driskell et al. (1987) and Kichuk and Weisner have noted that different personality factors might be related to different tasks. Thus, any attempts to discover the underlying relationship between personality factors and team performance need to take into account the task that is being performed within the group.

In 1992, Guzzo and Shea predicted that the categorizing and selection of individuals most suited for working in teams would be increasingly addressed in the research literature. More recently, Klimoski and Zukin (1999) noted that one of the

biggest issues in team staffing today is the identification of individuals who can work well with others in a team setting. Much of the recent literature has attempted to identify specific personality factors among team members that relate to team performance.

Team Performance and the Big Five Personality Factors

Over the course of the last decade, there has been an increase in research attempting to find a relationship between job performance and specific personality dimensions. A great deal of this research has focused on the Big Five personality factors. Barrick and Mount (1991) offered a brief history of the development of the Big Five factors, as they traced the origin of the Big Five factors back to the work of McDougall (1932), who first hypothesized that personality might be best accounted for by five broad factors. A few years later, in an effort to create a personality taxonomy, Cattell (1943, 1946, 1947, 1948) found eight second-order factors and 16 personality factors. In subsequent studies, Fiske (1949), Tupes (as cited in Barrick & Mount), and Tupes and Christal (as cited in Barrick & Mount) attempted to replicate the work of Cattell, but found that a five-factor model better accounted for the data. This five-factor model was then corroborated in four more studies (Borgatta, 1964; Hakel, 1974; Norman, 1963; Smith, 1967). Research related to the five-factor model has continued, and Digman (1990) has noted that the five personality factors seem to adequately explain the variance among personality traits.

Although there is some disagreement about the precise meanings and labels of the five factors, it is generally agreed upon that there are in fact five primary personality

factors (Barrick & Mount, 1991). Costa and McCrae (1992a) provided descriptions for each of the five factors. Agreeableness is essentially a dimension of interpersonal behaviors dealing with altruism and sympathy. Conscientiousness is related to the processes of planning, organizing, and implementing tasks. Neuroticism is essentially a measure of emotional stability related to how individuals react to and perceive stress. Extraversion is primarily an interpersonal dimension that includes not only sociability, but also affect and energy level. Openness is a dimension related to elements such as imagination, intellectual curiosity, and independence of judgment. Additionally, Costa and McCrae (1992b) noted that the five broad factors are each composed of several personality traits that define them.

In an effort to discover the relationship between the Big Five factors and job performance, Barrick and Mount (1991) conducted a meta-analysis that included not only the five factors, but also three job performance criteria (job proficiency, personnel data, and training proficiency) for five different occupation groups (police, professionals, managers, skilled/semi-skilled, and sales). The most notable finding in this study was that the dimension of Conscientiousness was a valid predictor of all job performance measures across all occupational groups. Extraversion was found to be a valid predictor of all three performance criteria for both salespeople and managers. Both occupations require a social interaction component. Additionally, both Extraversion and Openness to Experience (referred to as simply Openness on the NEO-PI-R and the NEO-FFI; Costa & McCrae, 1992a) were found to be valid predictors of training proficiency. Although the

authors of this meta-analysis examined job performance at the individual level, they set the stage for future research to address the issue of personality factors and team performance.

Barry and Stewart (1997) investigated the relationship between the Big Five personality factors and group performance in problem-solving situations. The authors found a strong relationship between Extraversion and performance at both the individual and group levels. At the individual level, Extraverted members were perceived by the other team members to have a greater effect on performance than Introverts. At the group level, Extraversion was found to be curvilinearly related to performance. Although the authors predicted that groups with more Extraverts would lose some task focus, they actually found that groups with 20% to 40% of highly Extraverted individuals performed better than groups with either more or fewer Extraverted members. Another important finding in this study was that Conscientiousness did not correlate with performance at either the individual or group level. This is a direct contradiction to the results of Barrick and Mount's (1991) study.

Kichuk and Wiesner (1998) cited an earlier study that they conducted examining the relationship between the Big Five personality factors and team performance by engineers. Whereas many other studies operationalized performance in terms of such measures as satisfaction, amount of time used to complete a task, or number of solutions generated, the authors chose to operationalize team performance in terms of precise performance goals. Specifically, each engineering team was required to build a bridge to

specification, and the bridge was then scored based upon the measured dimensions, the time that it took the group to complete the bridge, and a strength test. Consequently, the results differed somewhat from other related studies. For instance, while Conscientiousness was not found to predict overall team performance, teams with members who had similar Conscientiousness scores tended to perform better than teams whose members were more heterogeneous. Extraversion was not found to be significantly related to team performance, but successful teams did tend to have higher levels of Extraversion than did less successful ones. Similarly, Agreeableness was not significantly related to team performance, yet successful teams did have higher levels of Agreeableness than did unsuccessful ones. Although the results of this study were not exactly in line with those of some related studies, they do not completely contradict the other results either.

Barrick et al. (1998) conducted a study with 51 work teams in an organizational setting in which they examined the relationship between personality traits, general mental ability, team process, and team outcomes. In terms of the Big Five factors, the authors found a significant positive correlation between Conscientiousness, Agreeableness, Emotional Stability (referred to as Neuroticism on the NEO-PI-R and the NEO-FFI; Costa & McCrae, 1992a) and team performance, as measured by supervisor ratings. Additionally, Extraversion and Emotional Stability were significantly, positively correlated with high supervisor ratings for team viability (the ability for a team to sustain itself). In a study similar to the aforementioned ones, Neuman and Wright (1999) utilized

measures of cognitive ability, job-skills, and the Big Five personality factors at the individual and group levels in order to predict team performance in 79 work teams in an organizational setting. At the individual level, the Agreeableness and Conscientiousness factors were more predictive of peer ratings of work team member performance than the measures of job skills or cognitive ability. Additionally, these same two factors were found to predict supervisor performance ratings, objective measures of team accuracy, and the amount of work completed at the group level. As the authors note in their discussion, the results of this study, especially when taken with the results from similar studies, suggest that personality factors might be useful in predicting team performance.

Although research related to personality dimensions and team performance is in its relative infancy, the results thus far suggest that the Big Five factors might play an important predictive role in assessing team performance. As Kichuk and Wiesner (1998) noted, “team member personality seems a likely candidate for selecting optimal teams” (p. 29). Indeed, there does seem to be a general agreement in the literature that personality measures have the possibility to be useful in staffing teams and predicting performance.

Attitudes Toward Teamwork

As research on team performance has shifted to begin to include personality factors, there has been an increased interest in examining individual attitudes toward teamwork. In fact, Klimoski and Zukin (1999) suggested that one of the primary issues in initial team staffing is to assess individual attitudes towards teamwork. Campion et al.

(1993) cited Cummings (1981) and Hackman and Oldham (1980) to support the notion that individuals who prefer to work in groups might be more satisfied and productive in a group setting. Further support for this hypothesized relationship between preference for group work and team performance comes from Erez and Somech (1996) who found that when people with high levels of group preference are allowed to work in groups, their individual performance is enhanced, as is that of the group.

Jung and Sosik (1999) conducted a study with 31 student work groups in an effort to find empirical support for the hypothesized relationship between attitude towards teamwork and group performance. They measured preference for group work with 3 questions taken from a longer questionnaire that was used in a study by Campion et al. (1993). Group performance was evaluated objectively by two independent raters through an anonymous review process. The results suggested that preference for group work is a strong predictor of group performance. Additionally, the preference for group work was stable over a six-week time period, and it was not affected by previous performances. The authors noted that these results suggest that the preference for group work can be measured as a stable disposition. They also concluded that a preference for group work might be useful in the design and development of work groups.

Although evidence points to preference for group work as an important factor in selecting members for group participation, there has been little research conducted in establishing and validating a measure of this construct. The only such effort was conducted by Kline (1999), who developed and attempted to validate an instrument,

Team Player Inventory (TPI), using several related measures: (a) Individualism-Collectivism Scale (Early, 1993); (b) Cooperativeness Scale of the Classroom Life Instrument (Johnson & Johnson, 1983); (c) Social Participation subscale of the Jackson Personality Inventory (Jackson, 1976b); (d) Self Reliant (Q2) subscale of the 16PF (Institute for Personality and Ability Testing, 1991); (e) Independence Work Style subscale of the Jackson Vocational Interest Survey (Jackson, 1977); and the (f) Autonomy, Social Interactions, and Social Relations subscales of the Values Scale (Macnab, Fitzsimmons, & Casserly, 1987). Despite the fact that all but one of the hypotheses regarding the convergence of indicators and the discriminant validity of the TPI were supported, the TPI has only been used in one other study (Kline, 2001). If the construct of preference for group work is to be accurately measured, then an instrument must be sufficiently validated. The purpose of the current study is to validate just such an instrument.

Personality Factors and Teamwork Receptiveness

Although there is little research specifically related to teamwork receptiveness in the literature, several established personality factors are conceptually related to the construct and will be included in the current study. Specifically, the Big Five personality factors (Neuroticism/Emotional Stability, Extraversion, Openness, Agreeableness, and Conscientiousness) are included, as is the concept of self-reliance.

Neuroticism.

In the professional manual for the NEO-FFI, Costa and McCrae (1992a) wrote that the core of the Neuroticism domain is comprised of an individual's tendency to experience such negative emotions as fear, sadness, anger, or guilt. However, they also noted that the domain is more than just an individual's propensity to psychological distress. They contended that individuals high in Neuroticism are prone to have irrational beliefs, have difficulty with their impulse control, and handle stress more poorly than others. In fact, Neuroticism has been shown to have a significant, negative relationship with rational thinking styles (Pacini & Epstein, 1999), and Cote and Moskowitz (1998) found a significant, positive relationship with unpleasant affect. With such a focus on the internal processes of the individual, Neuroticism is clearly much more of an intrapersonal dimension than an interpersonal one.

Neuroticism has also been found to be significantly related to several psychological symptoms or disorders. For instance, a significant, positive relationship has been found between Neuroticism and measures of anxiety and dysthymia (McCrae, 1991), as well as with measures of paranoid and obsessive-compulsive personality disorder symptoms (Trull, 1992). High Neuroticism scores have also been shown to predict smoking relapse in individuals attempting to break a nicotine addiction (Gilbert, Crauthers, Mooney, McClemon, Jensen, 1999). Based upon the literature, there does appear to be a link between psychological problems and Neuroticism.

Although Neuroticism is often thought of as a psychological disorder, it is important to note that, in the context of the NEO-FFI and the five-factor model of personality, it is actually a measure of normal personality (Costa & McCrae, 1992a). Indeed, Costa and McCrae noted that it is possible to score high on the Neuroticism scale and still not have any diagnosable psychiatric disorder. Additionally, they noted that not all individuals with diagnosable disorders score high on the Neuroticism scale. However, Neuroticism has been shown to have a significant, negative relationship with agreeable and dominant behavior, as well as significant, positive relationships with quarrelsome and submissive behaviors (Cote & Moskowitz, 1998). Additionally, high levels of Neuroticism have been found to have a significant, negative association with social status within groups for men (Anderson, John, Keltner, & Kring, 2001).

Individuals with low Neuroticism scores are typically characterized by emotional stability (Costa & McCrae, 1992a). Costa and McCrae described these individuals as calm, relaxed, and able to handle stress without becoming overly upset. Barrick et al. (1998) used the Personal Characteristics Inventory (a measure of the Big Five; Barrick & Mount, 1993) and found that emotional stability (low Neuroticism) had a significant, positive relationship with the social cohesiveness of work teams. While the results of the Barrick et al. study support the assumption that individuals with low Neuroticism scores would probably make better team members than individuals with high scores, there is nothing in the literature to suggest that these individuals would be inherently more or less

receptive to working in teams. Based upon the literature, it does not appear that Neuroticism should have a significant relationship with teamwork receptiveness.

Conscientiousness.

Costa and McCrae (1992a) described Conscientiousness as being somewhat similar to Neuroticism in that it relates to impulse control. However, they also noted that Conscientiousness is composed of much more active processes than Neuroticism. Specifically, Conscientiousness is composed of the processes of planning, organizing, and implementing tasks. Costa and McCrae (1988) found Conscientiousness to be significantly, positively associated with measures of achievement, low impulsiveness, cognitive structure, order, and social desirability. Additionally, the Conscientiousness scale has been found to be significantly, positively related to a rational thinking style (Pacini & Epstein, 1999).

The authors (Costa and McCrae, 1992a) of the NEO-FFI described individuals high in Conscientiousness as being purposeful, determined, and strong-willed. They further noted that they doubt that many people have become athletes or great musicians without high levels of Conscientiousness. Indeed, the Conscientiousness domain has also been referred to as will to achieve (Digman & Takemoto-Chock, 1981).

Conscientiousness has also been found to be significantly, positively related to individual job performance (Barrick & Mount, 1993; Salgado, 1997), as well as to team performance (Neuman & Wright, 1999). Although Conscientiousness is not an interpersonal dimension, it has been shown to be positively associated with the frequency

with which an individual contacts his or her family members (Asendorpf & Wilpers, 1998). Individuals with high levels of Conscientiousness typically perform well in academic and occupational settings, and tend to be scrupulous and reliable, although individuals with extremely high levels of Conscientiousness may engage in such negative actions as compulsive neatness or workaholic behavior (Costa & McCrae, 1992a).

It is important to note that individuals with low Conscientiousness scores are not necessarily unmotivated or unscrupulous (Costa & McCrae, 1992a). Instead, individuals with low Conscientiousness scores are simply not as focused on applying their moral principles or working towards firm goals (Costa & McCrae). There is also some evidence that these individuals are typically more hedonistic (McCrae, Costa, & Busch, 1986).

Due to the fact that Conscientiousness is an intrapersonal dimension rather than an interpersonal one, there is no reason to believe that it would be related to teamwork receptiveness. There is nothing in the literature to suggest that the Conscientiousness dimension would affect an individual's willingness to work in a team setting. Although Conscientiousness might ultimately help to predict the success of a team, it does not seem likely that it would be significantly associated with teamwork receptiveness.

Extraversion.

Costa and McCrae (1992a) noted that individuals who score high on the Extraversion scale of the NEO-FFI are typically not simply social, but also assertive, talkative, and active. However, these individuals also do tend to like people and prefer

large groups and gatherings to solitude. As Piedmont (1998) noted, the dimension of Extraversion encompasses not only the degree to which an individual enjoys the company of others, but also individual energy level (e.g., personal tempo and activity level). In fact, Asendorpf and Wilpers (1998) found a significant, positive relationship between Extraversion and the size of peer networks, the average perceived level of support from opposite sex friends, and frequency of contact with family members.

Extraversion also has been shown to have a significant, positive relationship with the closeness of friends and the importance of friends in young adulthood (Neyer & Asendorpf, 2001). Von Dras and Siegler (1997) found Extraversion to be a valid predictor of both social support and social activity at midlife. Additionally, Extraversion has been found to have a significant, positive association with the number of positive interpersonal exchanges an individual has (Mohr, Armeli, Tennen, Carney, Affleck, Hromi, 2001), as well as positive framing, relationship building, and social integration (Wanberg & Kammeyer-Mueller, 2000). Clearly, Extraverts actively seek groups of people for interaction. Thus, it would not be a stretch to think that these individuals would be highly receptive to working in teams.

Extraversion also has been shown to be strongly related to intrapersonal processes. For example, Trull, Ueda, Costa, and McCrae (1995) found a significant, positive relationship between Extraversion and positive emotionality, as measured by the Psychopathology Five (Harkness, McNulty, & Ben-Porath, 1995). Extraversion was also found to be significantly and positively correlated with pleasant affect (e.g.,

happiness, pleased, joyful; Cote & Moskowitz, 1998). Furthermore, Extraversion was found to have a significant, negative relationship with a measure of avoidant personality disorder symptoms (Trull, 1992).

Individuals who score low on the Extraversion scale are generally Introverted, but Costa and McCrae (1992a) cautioned that Introversion is not just the opposite of Extraversion. Indeed, Introverts can best be thought of as lacking the characteristics of Extraverts. Introverted individuals typically are reserved, independent, and even-paced (Costa & McCrae). Thus, Introverts would not be expected to seek out membership in groups or teams. Based upon the research, one would expect that a significant, positive relationship would exist between Extraversion and teamwork receptiveness.

Openness.

Costa and McCrae (1992a) described individuals with high scores on the Openness scale of the NEO-FFI as being interested in novel ideas and unconventional values. Additionally, the Openness construct incorporates such characteristics as intellectual curiosity, preference for variety, and an active imagination. In a similar vein, Ferguson and Patterson (1998) found that the Openness construct is related to problem solving abilities, and a significant, positive relationship has been found between Openness and a rational thinking style (Pacini & Epstein, 1999). Although Ferguson and Patterson found Openness to be significantly related to a measure of problem solving, Openness also was related to the other four personality factors in the five-factor model.

Rothstein, Paunonen, Rush, & King (1994) found a significant, positive relationship between Openness and classroom participation for students in a graduate business program. George and Zhou (2001) found Openness to be one of the variables in an interaction (along with feedback valence and unclear means for performing a task) that accounted for a significant portion of variance in creative behavior at work. Hill, Diemer, and Heaton (1997) found a significant, positive relationship between Openness and attitudes towards dreams and absorption. Hill et al. note that “A person high in absorption is emotionally responsive to engaging sights and sounds, can become absorbed in vivid and compelling recollections and imaginings, and experiences episodes of expanded awareness and other altered states” (p. 55).

Although Openness is not primarily an interpersonal measure like Agreeableness or Extraversion, it has also been found to positively relate to both individual satisfaction with co-workers and the job in general (Schneider, 1999). Openness has also been found to be a valid predictor for job training proficiency (Barrick & Mount, 1991; Salgado, 1997). In fact, McCrae (1996) noted that Openness should be examined when investigating such issues as attitude formation, social identity, and personal change. Schmutte & Ryff (1997) found a significant, positive relationship between Openness and personal growth (self-improvement across the life span). Judge and Bono (2000) found Openness to be significantly and positively correlated with three measures of transformational leadership behaviors (idealized influence, inspirational motivation, and individualized consideration), as well as with leadership effectiveness.

Individuals who score low on the Openness scale of the NEO-FFI tend to be conservative and conventional (Costa & McCrae, 1992a). These people are much slower to embrace new ideas or views, and they typically have a narrower range of interests. Low Openness scores have also been found to be significantly related to submissive dependency (Pincus & Gurtman, 1995). Peterson, Smirles, & Wentworth (1997), using the Big Five Inventory (John, Donahue, & Kentle, 1991), found Openness to be significantly and negatively correlated with a measure of authoritarianism. Based upon the literature, Openness appears to encompass such concepts as intellect, curiosity, and imagination. Therefore, there does not appear to be a valid reason to think that Openness would have a significant correlation with a measure of teamwork receptiveness.

Agreeableness.

Costa and McCrae (1992a) noted that Agreeableness is like Extraversion in that it is distinctly related to interpersonal tendencies. Agreeable individuals are generally altruistic and sympathetic to others. They are also eager to help others and believe that others will be willing to help them. Costa and McCrae (1988) found a significant, positive relationship between Agreeableness and nurturance. In fact, Agreeableness has been shown to have a significant, negative relationship with the amount of conflict that individuals have with opposite-sex peers (Asendorpf & Wilpers, 1998).

Agreeableness has also been found to be significantly and negatively related to unpleasant affect (e.g., worried, frustrated, depressed; Cote & Moskowitz, 1998). Trull (1992) found a significant, negative relationship between Agreeableness and paranoid

personality disorder symptoms (a suspiciousness of others). Additionally, Agreeableness has been found to be positively associated with high supervisor ratings for team performance (Barrick et al., 1998). With such characteristics as altruism and nurturance, Agreeableness would seem to be conceptually related to teamwork receptiveness.

In contrast, individuals who score low on the Agreeableness scale are usually more egocentric and skeptical of other people's intentions than individuals who score high (Costa & McCrae, 1992a). Additionally, people with low Agreeableness scores tend to be more competitive than cooperative (Costa & McCrae). As Goldberg (1990) noted, these individuals with low Agreeableness scores are often pretentious and egotistical. Low Agreeableness scores have also been found to significantly and negatively relate to aggressiveness (Costa & McCrae, 1988; Trull et al., 1995) and quarrelsome behavior (Cote & Moskowitz, 1998). With such a focus on competitive behaviors, individuals with low Agreeableness scores would probably not be drawn to work in team settings. Characteristics such as aggressiveness, conceitedness, and quarrelsome behavior would appear to be negatively related to teamwork receptiveness.

Self-Reliance.

Conn and Rieke (1994b) noted that the self-reliance scale (Q2) on the 16PF (Cattell et al., 1994) is related to social involvement. Indeed, high scores on the Q2 scale indicate that an individual is self-reliant, whereas low scores on the Q2 indicate that an individual is group-oriented (H.E.P. Cattell, 1994). Wives of alcoholics have been found to have high scores on the self-reliance scale (Kodandaram, 1996), as have youth who

reported their intentions to smoke cigarettes as adults (Tucker, 1984). H.E.P. Cattell described these people as being solitary, individualistic, resourceful, and self-sufficient. She also notes that these individuals prefer to make their own decisions. Similarly, Meyer and Dietsch (1996) noted that these individuals like spending time alone and rarely feel lonely.

The concept of self-reliance also has been discussed in a cultural context. For instance, Triandis, Bontempo, Villareal, Asai, & Lucca (1988) noted that in an individualist culture, self-reliance is equated with doing one's own thing and competing with others, whereas in a collectivist culture, self-reliance is associated with not being a burden on one's ingroup. Triandis et al. also noted that competition is unrelated to self-reliance in a collectivist culture. Additionally, self-reliance has been found to be positively associated with perceived kinship support in African-American youth (Taylor, 1996).

Self-reliance also has been associated with interpersonal relationships and attachment styles. Daus and Joplin (1999) used a classification system for self-reliance that incorporated three attachment styles found in the management literature: interdependence, counterdependence, and overdependence. The authors noted that the model was developed from Ainsworth, Blehar, Waters, and Wall's (1978) research on attachment in children and from the works of Quick, Nelson, and Quick (1987) and Nelson, Quick, and Joplin (1991) on attachment styles in management. Daus and Joplin found that an interaction of group member's coping strategies and self-reliance could

predict group effectiveness. Mikulincer (1998) also examined adult attachment styles and he found that the positive self-views held by avoidant individuals were associated with their attempts to establish their self-reliance. In regard to interpersonal relationships, Sanderson and Cantor (1995) noted that individuals might be likely to focus on self-reliance after they have had negative interpersonal experiences such as break-ups, deaths, or divorces.

H.E.P. Cattell (2001) noted that individuals with extremely high scores on the Q2 scale might have trouble working collaboratively. Kline (1999) reversed the normal scoring method for the Q2 scale and found a significant, positive relationship between the Q2 scale and a measure (TPI) designed to assess predisposition for individuals to want to work in teams. Thus, Kline found that group orientation was positively related to individual preference to want to work in a team and self-reliance was negatively related to it. With the previously mentioned characteristics, individuals with high scores on self-reliance would not be expected to be particularly receptive to teamwork.

Conversely, individuals with low scores on the self-reliance scale would certainly be expected to be receptive to teamwork. Indeed, these individuals are generally group-oriented and outgoing (Conn & Rieke, 1994b). Conn and Rieke also noted that low scores are related to constructs such as affiliation, sociability, warmth, and trust. Similarly, H.E.P. Cattell (1994) described individuals with low self-reliance scores as being affiliative, joiners, and sound followers. H.E.P. Cattell (2001) noted that these individuals tend to enjoy being around people and working in teams. Meyer and Deitsch

(1996) described individuals with low scores as often having strong family attachments and typically showing tendencies towards high rates of proximity-seeking behaviors. It is proposed that these individuals would be expected to be interested in being members of teams or groups.

Socially Desirable Responding

The subject of socially desirable responding (SDR) has been an important topic in self-report assessment since Bernreuter's (1933) validation study of a personality inventory. SDR, along with terms such as faking, self-enhancement, denying common faults and unpopular attitudes, and frankness (Ones, Viswesvaran, Reiss, 1996), refers to a type of response distortion inherent in self-report assessment. Paulhus (2001) defined SDR as the propensity to give positive self-descriptions.

Paulhus and his colleagues (Paulhus, 1984, 1991; Paulhus & Reid, 1991; Zerbe & Paulhus, 1987) have thoroughly investigated the construct of SDR. Their research suggests that SDR is composed of two primary factors: self-deception and impression management. Self-deception refers to the tendency on the part of the individuals to exaggerate their claims of positive cognitive characteristics. Specifically, self-deception refers to individuals' overconfidence in their own judgments and rationality. The impression management factor is based upon the belief that individuals tend to overreport their performance on desirable behaviors and underreport undesirable behaviors.

As personality factors have been increasingly tied to job performance in the literature (e.g. Barrick & Mount, 1991; Barry & Stewart, 1997; Tett, Jackson, &

Rothstein, 1991), the issue of SDR has been debated as it relates to personnel selection (which impacts team composition). There are two opposing viewpoints about how much SDR actually impacts the assessment of personality in selection situations. On one hand, there is a body of literature that suggests that while SDR does affect the criterion-related validities of personality measures, it does not reduce them to unacceptable levels (Barrick & Mount, 1996; Christiansen, Goffin, Johnston, & Rothstein, 1994; Hough, 1998; Ones et al., 1996). If this area of research is to be believed, then SDR does not pose a significant problem in utilizing personality assessments in personnel selections.

Although SDR might not invalidate personality assessment for personnel selection, there is a considerable amount of research that suggests that personality measures are fakeable (Furnham & Craig, 1987; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990; Thornton & Gierasch, 1980). If the measures can be faked, then it becomes important to at least have a clear understanding of when SDR is occurring so as not to make an error in the selection process. As Hogan, Hogan, and Roberts (1996) noted, social desirability scales can generally detect individuals who attempt to artificially enhance their scores.

Although there are several social desirability scales in print, one of the most popular scales is the Balanced Inventory of Desirable Responding (BIDR) Version 6 (Paulhus, 1991). The BIDR consists of two scales: an impression management scale and a self-deception scale. The BIDR has been utilized in a wide variety of studies ranging from computer test administration (Booth-Kewley, Edwards, & Rosenfeld, 1992; Potosky

& Bobko, 1997) to sexuality self-reports (Meston, Heiman, Trapnell, & Paulhus, 1998) to religious orientation (Trimble, 1997) to mating success (Linton & Wiener, 2001).

Furthermore, the BIDR has been utilized to assess the level of SDR in consumer satisfaction reports and measures of psychological stress (Sabourin, Laferriere, Sicuro, Coallier, Cournoyer, & Gendreau, 1989).

In this study, the research participants were undergraduate engineering students who knew that they were required to work in teams as part of their curriculum. Thus, the BIDR was administered to assess the level of SDR in this study.

Test Validation

As previously stated, the nine-item TRI had very respectable internal consistency and corrected item-total correlations (Farrington, 2001). The next step in the test construction process is to establish the construct validity of the instrument because as Nunnally and Bernstein (1994) wrote, "...internal consistency is necessary but not sufficient for construct validity" (p. 90). The author of this study attempted to support the construct validity of the TRI by comparing it to established constructs that either should, or should not, be related to team performance. If data are supportive, the procedures establish both a convergence of indicators and discriminant validity. Additionally, the author attempted to establish the criterion-related validity of the TRI by assessing its relationship with a behavior related to teamwork receptiveness.

As Campbell and Fiske (1959) noted, a convergence of indicators can be established by comparing a new measure with an established measure in an effort to see

whether they lead to similar ends. Indeed, a convergence of indicators has been defined as the tendency for a test to have a high correlation with other tests measuring the same construct (Bolt & Rounds, 2000). In order to establish a convergence of indicators for the TRI, four scales: (a) Q2 of the 16 Personality Factor Questionnaire (Cattell et al, 1994); (b) Extraversion on the NEO Five-Factor Inventory (Costa & McCrae, 1992a); (c) Agreeableness on the NEO Five-Factor Inventory (Costa & McCrae); and (d) TPI (Kline, 1999), believed to be related to personal interest in working in groups and working on teams, were used. However, significant correlations alone will not adequately support the convergence of indicators for the TRI. To adequately support a convergence of indicators, the correlations must also be substantial. Although there is no universally agreed upon minimum, substantial correlation, several researchers (e.g., Kline; Lilienfeld, 1996; Myers, Martin, Rohsenow, & Monti, 1996; Neuberg, Judice, & West, 1997) have claimed evidence for a convergence of indicators with correlations over .30. For purposes of this study, correlations greater than (+ or -) .30 were considered substantial and evidence of a convergence of indicators.

Campbell and Fiske (1959) also noted that discriminant validity can be established by comparing a new measure to established measures that should not be significantly related. Nunnally and Bernstein (1994) noted that discriminant validity refers to the ability of a test to demonstrate relevant group differences. In order to explore the discriminant validity of the TRI, three scales: (a) Openness on the NEO Five-Factor Inventory (Costa & McCrae, 1992a); (b) Conscientiousness on the NEO Five-

Factor Inventory (Costa & McCrae); and (c) Neuroticism on the NEO Five-Factor Inventory (Costa & McCrae) were used. As previously noted, these three scales are not believed to be related to receptiveness to teamwork. The convergence of indicators for the TRI is being tested in relation to personality constructs, therefore, discriminant validity also is explored in terms of personality constructs. Several researchers (e.g., Kline, 1999; Lilienfeld, 1996; Myers, Martin, Rohsenow, & Monti, 1996; Salekin, Rogers, & Sewell, 1997) have claimed evidence for discriminant validity with correlations no larger than $-.29$ or $.24$. For purposes of this study, correlations less than or equal to $-.30$ and $.30$ were considered evidence of discriminant validity. Although correlations in this range might be significant due to the large sample size used in this study, they would indicate a relationship that accounts for less than 9% of the variance overlap for the TRI and the other variables.

Criterion-related validity refers to using a test to estimate some behavior that is external to the test itself (Nunnally & Bernstein, 1994). Nunnally and Bernstein also noted that this type of validity rarely yields correlations between the test and the behavior that are above $.30$ or $.40$. In this study, criterion-related validity was examined by assessing the relationship between the TRI and the number of group/team situations in which the participants have been involved over the past two years. In accordance with Nunnally and Bernstein, a correlation above $.30$ was considered substantial as it relates to the criterion-related validity of the TRI. In order to insure that the results were not tainted by socially desirable responding, the Balanced Inventory of Desirable Responding

(BIDR) Version 6 (Paulhus, 1991) was administered. The TRI also was correlated with demographic variables such as gender, age, and racial/ethnic status to insure that the instrument is not biased against any particular subgroups in the current sample.

By examining these three different types of validity, it was hoped that the TRI would begin to fit into a orderly pattern of expected relationships with established instruments and constructs. This orderly pattern of expected relationships is what Cronbach and Meehl (1955) referred to as a nomological network. The specific hypotheses for this study are as follows.

Hypothesis 1: Total TRI scores will have a significant, positive, and substantial ($r > .30$) correlation with the Extraversion scores on the NEO-FFI.

Hypothesis 2: Total TRI scores will have a significant, positive, and substantial ($r > .30$) correlation with the Agreeableness scores on the NEO-FFI.

Hypothesis 3: Total TRI scores will have a significant, negative, and substantial ($r > -.30$) correlation with Q2 scale scores on the 16-PF.

Hypothesis 4: Total TRI scores will have a significant, positive, and substantial ($r > .30$) correlation with the TPI.

Hypothesis 5: Total TRI scores will not have a substantial relationship ($r \leq .30$ or $-.30$) with the Openness scale on the NEO-FFI.

Hypothesis 6: Total TRI scores will not have a substantial relationship ($r \leq .30$ or $-.30$) with the Conscientiousness scale on the NEO-FFI.

Hypothesis 7: Total TRI scores will not have a substantial relationship ($r \leq .30$ or $-.30$) with the Neuroticism scale on the NEO-FFI.

Hypothesis 8: Total TRI scores will have a significant, positive, and substantial ($r > .30$) correlation with the number of group/team activities in which the respondent has participated in the last two years.

Chapter II

Method

Participants

Four hundred seventy-four undergraduate, first-year engineering students at a large southeastern university participated in this study. Three hundred eighty-one (80.4%) of the participants identified themselves as male, 91 (19.2%) were female, and two (.4%) did not disclose their gender. The ages of the participants ranged from 16 to 46 with a mean age of 18.9 (SD= 2.7). Of the 474 participants, 385 (81.2%) were Caucasian, 34 (7.2%) were African-American, 17 (3.6%) were Asian-American, 7 (1.5%) were Hispanic-American, 8 (1.7%) identified themselves as “other”, and 23 (4.9%) participants did not indicate their ethnic identity. All of the participants were part of an academic program that required them to work in teams for the entire year.

The participants completed packets of assessment instruments in groups ranging between 25 and 30 members. Seventy-five minutes were allotted for the completion of the test packets. The participants were required to complete the test packets as part of a class assignment, but they had the option of having their results removed from the data pool. None of the participants requested to have their results removed. Although the participants' names and social security numbers were included in the packets, no identifying information was on the instruments used in this study. Appendix B contains the informed consent form used in the study.

In order to determine the necessary sample size, a table by Cohen (1992) was consulted. A minimum sample size of 125 was required for a test with a power of .80, a confidence level of 99%, and a medium effect size (.30). With a power level of .80, there was an 80% probability of rejecting a false null hypothesis. A power level of .80 was selected for this study based on Cohen's recommendation for statistical power. As Cohen noted, a substantially larger power value would necessitate an inordinately large sample size whereas a substantially smaller value would significantly increase the chance of a Type II error (i.e., failure to reject a false null hypothesis). However, the 474 participants in this study far exceeded the sample size required for .80 power, and, in fact, increased the power value to greater than .99. Thus, there was a greater than 99% chance of rejecting a false null hypothesis in this study.

Procedure

Each participant was asked to complete the Teamwork Receptiveness Inventory (TRI; Fearington, 2001), the NEO-FFI (Costa and McCrae, 1992a), the Self-Reliance (Q2) scale on the 16-PF (Cattell et al., 1994), the Team Player Inventory (TPI; Kline, 1999), and the BIDR Version 6 (Paulhus, 1991), as well as the Myers-Briggs Type Indicator (MBTI; Myers & McCaulley, 1998). A question about group participation in the previous two years was added to the MBTI answer sheet. The demographic information (age, gender, and ethnicity) used in this study also was taken from the MBTI answer sheet. However, the results of the MBTI were not used in this study, as they are

part of a separate testing program. The participants completed the MBTI first and the other instruments were presented in a randomized order.

Instruments

The TRI was initially developed in a graduate-level psychometrics class to measure the degree to which an individual is willing to work in a team setting (Farrington, 2001). In the original study, the TRI consisted of 11 items and responses were measured on a 5-point Likert scale (Likert, 1932). Some of the items were reverse scored. A response of 1 on an item indicated that the respondent strongly disagreed with the item, and a response of 5 indicated strong agreement. A response of 3 suggested a neutral feeling about the item. High composite scores indicated a strong receptiveness to teamwork.

In the Farrington (2001) study, the TRI was administered to 355 undergraduate engineering students ranging in age from 17 to 33 years (the vast majority were between the ages of 17 and 19 years) at a large southeastern university. There were 280 males and 75 females in the study. Two hundred seventy-two of the students identified themselves as Caucasian, while 35 identified themselves as African-Americans. Seven participants were Asian and three were Hispanic. The remaining 33 did not indicate their ethnicity.

An item analysis was conducted and the corrected item-total correlations were examined. Items with correlations below .35 were excluded in accordance with recommendations found in the statistical literature (Nunnally & Bernstein, 1994; Rust & Golombok, 1999). Two items failed to meet the selection criteria and were thus deleted.

Ultimately, the TRI consists of nine items that all have corrected item-total correlations above the .40 level. Scores can range from 9 to 45. The nine-item instrument was found to have a coefficient alpha value of .88, which is a strong indicator of internal consistency (Nunnally & Bernstein, 1994). Although the high level of internal consistency lends support for the construct validity of the TRI, it alone is certainly not sufficient proof of construct validity (Nunnally & Bernstein, 1994).

The NEO-FFI (Costa & McCrae, 1992a) is a 60-item (plus three validity check items) instrument that asks individuals to respond to the items on a five-point Likert scale. The shorter version of the instrument measures only the five major personality dimensions and not the traits or facets that make up the five dimensions on the NEO PI-R. The instrument was designed to be used in situations in which test time is limited and only a general measure of personality is needed (Costa & McCrae). Each of the five scales consists of 12 items. Scores on the five scales may range between 12 and 60. According to the test manual, the NEO-FFI requires a sixth-grade reading level and can be used with individuals 17 years of age and older.

Costa and McCrae (1992a) noted that the Neuroticism dimension contrasts emotional stability with maladjustment. High scores on the Neuroticism scale do not necessarily indicate the presence of psychopathology, but they do indicate that the individual is likely to experience negative affects such as anger, disgust, and sadness (Costa & McCrae). Individuals who score low on the scale tend to be calm, relaxed, and able to handle stress without becoming upset (Costa & McCrae). The coefficient alpha is

reported as .86 (N=1,539) for the Neuroticism scale on the NEO-FFI (Costa & McCrae). The correlation between the Neuroticism scale on the NEO-FFI and the corresponding scale on the longer version of the instrument was reported as .92 (N=983; Costa & McCrae). Although the authors noted that the Neuroticism scale on the NEO-FFI is not equivalent to the same scale on the longer form (NEO PI-R), they stated that the scales on the shorter form carry with them some portion of the validity of the longer form scales. Indeed, the NEO-FFI Neuroticism scale has a significant, positive correlation ($r=.62$, N=375) with a Neuroticism scale that was based on adjective self-reports (Costa & McCrae). Further related to the construct validity of the Neuroticism scale, Paunonen (1998) found significant, positive correlations between Neuroticism on the NEO-FFI and the Anxiety ($r=.68$, N=92), Conformity ($r=.39$, N=92), and Interpersonal Affect ($r=.29$, N=92) scales on the Jackson Personality Inventory (JPI; Jackson, 1976a). Additionally, Paunonen (1998) found significant, negative correlations between Neuroticism and the Energy Level ($r= -.30$, N=92) and Self Esteem ($r= -.40$, N=92) scales.

The Conscientiousness dimension is related to achievement motivation, as well as planning and organizing processes (Costa & McCrae, 1992a). High scores are related to determination, punctuality, and reliability (Costa & McCrae). Individuals who score low in this scale often have difficulty working towards goals and are typically less organized and punctual than individuals with high scores (Costa & McCrae). The coefficient alpha for the Conscientiousness scale on the NEO-FFI is reported as .81 (N=1,539; Costa & McCrae). The correlation between the Conscientiousness scale on the NEO-FFI and the

Conscientiousness scale on the longer form (NEO PI-R) is $r=.87$ ($N=983$; Costa & McCrae). The Conscientiousness scale on the NEO-FFI also has a significant, positive correlation ($r=.61$, $N=375$) with the corresponding scale on the adjective self-report measure (Costa & McCrae). In further support of the construct validity of the Conscientiousness scale, Paunonen (1998) found significant, positive correlations between Conscientiousness on the NEO-FFI and the Energy Level ($r=.33$, $N=92$), Responsibility ($r=.24$, $N=92$), and Organization ($r=.61$, $N=92$) scales on the JPI (Jackson, 1976a).

According to Costa and McCrae (1992a), high scores on the Extraversion scale indicate that the person is very sociable, prefers group settings, and can also be assertive, talkative, and active. The coefficient alpha for the Extraversion scale on the NEO-FFI is reported as .77 ($N=1,539$), which is less than the coefficient alpha score for Extraversion on the longer NEO PI-R, but still is an acceptable reliability coefficient (Costa & McCrae). Additionally, the Extraversion scale on the NEO-FFI has a $r=.90$ ($N=983$) with the same scale on the longer form (Costa & McCrae). The Extraversion scale on the NEO-FFI also has a significant, positive correlation ($r=.60$, $N=375$) with the corresponding scale on the adjective self-report measure (Costa & McCrae). Paunonen (1998) found that the Extraversion scale on the NEO-FFI has significant, positive correlations with the Energy Level ($r=.23$, $N=92$), Interpersonal Affect ($r=.28$, $N=92$), Self Esteem ($r=.50$, $N=92$), and Social Participation ($r=.44$, $N=92$) scales on the JPI

(Jackson, 1976a). These findings offer support for the construct validity of the Extraversion scale.

Costa and McCrae (1992a) noted that the Openness scale is related to characteristics such as intellectual curiosity and preference for variety. The coefficient alpha for the Openness scale was reported as .73 (N=1,539), which is an acceptable reliability coefficient (Costa & McCrae). The Pearson product-moment correlation coefficient (r) was equal to .91 (N=983) for the Openness scales on the NEO-FFI and the corresponding scale on the longer version of the instrument (NEO PI-R; Costa & McCrae). A significant, positive correlation ($r=.56$, N=375) also exists between the Openness scale on the NEO-FFI and the adjective self-report measure (Costa & McCrae). In support of the construct validity of the Openness scale, Paunonen (1998) found significant, positive correlations between Openness on the NEO-FFI and the Breadth of Interest ($r=.68$, N=92), Complexity ($r=.62$, N=92), Innovation ($r=.50$, N=92), Energy Level ($r=.39$, N=92), N=92), Self Esteem ($r=.25$, N=92), Risk Taking ($r=.24$, N=92), and Tolerance ($r=.25$, N=92) scales on the JPI (Jackson, 1976a). Paunonen also found significant, negative correlations between Openness and the Social Participation ($r= -.24$, N=92), Conformity ($r= -.26$, N=92), and Value Orthodoxy ($r= -.27$, N=92) scales on the JPI (Jackson)

Costa and McCrae (1992a) stated that Agreeableness, much like Extraversion, is primarily a measure of interpersonal tendencies. Individuals who score high on this scale are typically altruistic and individuals with low scores are often egocentric and

antagonistic (Costa & McCrae). The coefficient alpha for the Agreeableness scale on the NEO- FFI was calculated as .68 (N=1,539), which is a low value for internal reliability, but acceptable, at least according to the authors. The Pearson product-moment correlation coefficient was found to be .77 (N=983) for the Agreeableness scale on the NEO-FFI and the corresponding scale on the longer version of the instrument (NEO PI-R; Costa & McCrae). The Agreeableness scale on the NEO-FFI also has a significant, positive correlation ($r=.57$, N=375) with the Agreeableness dimension on the adjective self-report measure (Costa & McCrae). Paunonen (1998) found that the Agreeableness scale on the NEO-FFI has significant, positive correlations with the Tolerance ($r=.25$, N=92), Conformity ($r=.36$, N=92), and Responsibility ($r=.36$, N=92) scales on the JPI (Jackson, 1976a), and significant, negative correlations with the Complexity ($r= -.22$, N=92), Risk Taking ($r= -.41$, N=92), Innovation ($r= -.28$, N=92), and Self Esteem ($r= -.25$, N=92) scales, also on the JPI.

The Self-Reliance (Q2) scale on the fifth edition of the 16 PF (Cattell et al., 1994) is related to social involvement, which denotes the degree to which an individual affiliates with others. In three different samples (N=820; N=2,500; N=1,340), the average internal consistency for the Self-Reliance scale was calculated at .78 (Conn, 1994). Additionally, the test-retest reliability was calculated at .86 (N=204) for two weeks and at .69 (N=159) for two months (Conn). In terms of construct validity, Conn and Rieke (1994b) noted that this scale is negatively correlated with the Warmth, Positive Emotions, and Gregariousness facets on the Extraversion scale and the Trust facet on the

Agreeableness scale of the NEO PI-R. High scores on this scale indicate that the individual might often search out solitude and might remain distant even when in a group setting (Conn & Rieke, 1994b). Low scores indicate that the individual is outgoing and group oriented (Conn & Rieke, 1994b). The scale is written at approximately a fifth-grade reading level. There are 10 items on the Q2 (Cattell et al.), and each item has three potential response choices. Total scale scores range from 0 to 20. According to Conn and Rieke (1994a), once the raw scores are obtained, they are normally converted into sten scores in order to make it easier to compare an individual's scores across the various scales on the 16 PF (Cattell et al.). However, for purposes of this study only the raw scores were used because none of the other 16 PF scales were used, and thus, the sten scores would not be particularly useful.

The Team Player Inventory (TPI; Kline, 1999) is a 10-item instrument designed to measure the degree to which an individual has a positive inclination to work in a team setting. All of the items are answered on a 5-point Likert scale, and total scores range from a low score of 10 to a high score of 50. In two different samples, the coefficient alphas were reported as .87 (N=80) and .83 (N=75) (Kline, 1999). In a subsequent study, the coefficient alpha was reported as .68 (N=112) (Kline, 2001). In Kline's (1999) study, a convergence of indicators was supported by significant relationships between the TPI and six related measures: (a) Individualism-Collectivism Scale (Early, 1993), $r=.66$, (N=80); (b) Cooperativeness Scale of the Classroom Life Instrument (Johnson & Johnson, 1983), $r=.50$, (N=80); (c) Social Participation subscale of the Jackson

Personality Inventory (Jackson, 1976b), $r=.55$, ($N=75$); (d) Q2 subscale of the 16PF (Institute for Personality and Ability Testing, 1991), $r=.40$, ($N=80$); (e) Social Interactions subscale of the Values Scale (Macnab, Fitzsimmons, & Casserly, 1987), $r=.51$, ($N=79$); and (f) Social Relations subscale of the Values Scale (Macnab et al.), $r=.30$, ($N=80$). A significant negative correlation was found between the TPI and the Autonomy subscale of the Values scale (Macnab et al.), $r= -.29$ ($N=80$). No significant relationships were found between the TPI and the Independence Work Style subscale of the Jackson Vocational Interest Survey (Jackson, 1977), and either age or gender of the respondents. Additionally, criterion-related validity was supported by the significant relationship between the TPI and the number of team/group activities individuals had participated in over the previous two years, $r=.30$, ($N=79$).

The BIDR Version 6 (Paulhus, 1991) was included in this study in order to assess the level of social desirability present in the participants' responses. The BIDR consists of 40 items that are stated as propositions and are rated on a seven-point scale with 1 being "not true" and 7 being "very true." The first 20 items assess self-deception and the second 20 items assess impression management. Some items are reverse scored. One point is added for each answer of 6 or 7, so there is a minimum total of 0 and a maximum total of 20 on each scale. In a sample of 433 college students, Paulhus (as cited in Paulhus, 1991) reported an alpha coefficient of .83 on the combined scales, and test-retest correlations over a five-week period of .69 and .65 for the self-deception and impression management scales, respectively. Additionally, Paulhus (as cited in Paulhus, 1991)

reported that all 40 items displayed concurrent validity ($r = .71$, $N = 433$) with the Marlowe-Crowne Social Desirability scale (Crowne & Marlowe, 1960).

In order to assess the criterion-related validity of the TRI, the undergraduates also were asked to provide information about the number of groups/teams in which they had participated during the two years prior to the study. The mean number of group/team participation was 18.59 ($SD = 78.34$) with a range of 0 to 1000.

Data Analysis

The data was analyzed on a personal computer equipped with the SPSS software package. SPSS was used to total the item scores for the TRI, each of the five NEO-FFI scales, the Q2 scale, the TPI, the impression management subscale on the BIDR, and the self-deceptive enhancement subscale on the BIDR. Descriptive statistics were calculated for each of the ten scales and a reliability analysis (see Table C1) was also run on the TRI.

A principal components analysis was performed to determine if all the items on the TRI measure the same construct. Pearson Product Moment correlations were conducted between the TRI and the five NEO-FFI scales, the Q2 scale, the TPI, the total number of group interactions that the individual had experienced in the past two years, and the two subscales of the BIDR (impression management and self-deceptive enhancement). Additionally, a Pearson Product Moment correlation was calculated between the TRI and age and Point Biserial correlations were calculated between the TRI and gender and race/ethnicity (i.e., “caucasian” or “other”) of the participants.

Chapter III

Results

The primary purpose of this study was to establish the construct validity of the Teamwork Receptiveness Inventory (TRI; Fearington, 2001). To this end, a factor analysis procedure was conducted to determine if all nine items measured the intended underlying construct of teamwork receptiveness. Additionally, eight hypotheses, concerning the convergence of indicators and discriminant and criterion-related validity of the TRI, were made and tested.

The TRI was designed to be a unidimensional measure of the construct of individual receptiveness to teamwork. In order to determine whether all of the TRI items do, in fact, measure the intended construct, a principal components analysis was performed. Results of the principal components analysis indicated that two components are present on the nine-item TRI. Each component has an eigenvalue greater than 1.0 and the two primary components account for approximately 64% of the variance, with the first component accounting for 51.96%. Table C2 contains the factor loadings for each TRI item, as well as the eigenvalues and percentages of variance explained for each of the two components.

Although several of the TRI items loaded highly on both of the components found in the principal components analysis, only Item 2 loaded more highly on the second component than on the first. However, Item 2 also had an acceptable ($>.40$) loading on the first component. The first component includes eight items that primarily measure

individual attitudes about working in teams. The second component, and specifically Item 2, is a general statement related to an opinion about the effectiveness of teams rather than an attitude about working in teams. Due to the amount of cross-loadings among the two components and the fact that the second component was judged to measure an important aspect of teamwork receptiveness, the two-component model was used and all nine of the items on the TRI were retained.

In order to test the eight research hypotheses, Pearson Product Moment correlations were conducted comparing the total scores of the TRI, the Team Player Inventory (Kline, 1999), the Self-Reliance (Q2) scale on the fifth edition of the 16 PF (Cattell et al., 1994), and all five scales on the NEO-FFI (Costa & McCrae, 1992a), as well as the number of groups in which the participants had been involved over the past two years. Table 1 contains correlation coefficients and sample sizes for the nine variables. Descriptive statistics for all of the variables examined in this study are contained in Table C3.

The convergence of indicators for the TRI was addressed by the first four hypotheses. Significant and substantial correlations between the TRI and other measures related to teamwork receptiveness were predicted. Due to the large number of correlations and the possibility of a Type I error, the alpha level was set at .01. Thus, there was only a 1% probability that any of the correlations would be significant due to chance. The first hypothesis, that total TRI scores would have a significant, positive, and

Table 1

*Pearson Product Moment Correlations and Sample Sizes for the Nine Research**Variables*

	Groups	N	E	O	A	C	Q2	TPI	TRI
N									
Corr.	-.08								
n	401								
E									
Corr.	.16**	-.34*							
n	400	450							
O									
Corr.	.03	-.10	.12*						
n	397	447	449						
A									
Corr.	.07	-.27**	.35**	.08					
n	399	449	451	448					
C									
Corr.	-.01	-.26**	.18**	-.02	.28**				
n	398	447	449	446	448				
Q2									
Corr.	.13*	.16**	-.58**	.00	-.39**	-.02			
n	407	438	438	436	437	435			
TPI									
Corr.	.15*	-.17**	.52**	.09	.45**	.14*	-.63**		
n	408	447	447	444	446	444	452		
TRI									
Corr.	.13*	-.19**	.52**	.05	.39**	.12*	-.66**	.85**	
n	407	447	447	444	446	444	450	460	

Note. * = Significant at .01 level; ** = Significant at .001 level; Corr = Pearson Product Moment

Correlation; n = Sample Size; Groups = Number of Groups in which respondents participated in over past 2 years; N = Neuroticism scale from NEO-FFI; E = Extraversion scale from NEO-FFI; O = Openness scale from NEO-FFI; A = Agreeableness scale from NEO-FFI; C = Conscientiousness scale from NEO-FFI; Q2 = Q2 scale from 16PF; TPI = Team Player Inventory; TRI = Teamwork Receptiveness Inventory

substantial correlation with the Extraversion scores on the NEO-FFI, was supported ($r=.52$, $p<.001$).

The second hypothesis, that total TRI scores would have a significant, positive, and substantial correlation with the Agreeableness scores on the NEO-FFI, also was supported ($r=.39$, $p<.001$). The third hypothesis, that total TRI scores would have a significant, negative, and substantial correlation with the Q2 scale scores, was supported as well ($r=-.66$, $p<.001$). Finally, the fourth hypothesis, that total TRI scores would have a significant, positive, and substantial correlation with the TPI, was supported ($r=.85$, $p<.001$).

The next three hypotheses were related to the discriminant validity of the TRI. No substantial relationship between the TRI and the other measures was predicted. Hypothesis five, that total TRI scores would not have a substantial relationship with the Openness scores on the NEO-FFI, was supported ($r=.05$). The sixth hypothesis, that total TRI scores would not have a substantial relationship with the Conscientiousness scores on the NEO-FFI, also was supported ($r=.12$). The seventh hypothesis, that total TRI scores would not have a substantial relationship with the Neuroticism scores on the NEO-FFI, was supported ($r=-.19$). Although the correlations in the sixth and seventh hypotheses were both significant, they were not large enough to be considered substantial ($r >.30$ or $-.30$), as previously defined.

The criterion-related validity of the TRI was addressed by the eighth hypothesis. This hypothesis, that total TRI scores would have a significant, positive, and substantial

correlation with the number of group/team activities in which the respondents had participated during the last two years, was rejected ($r=.13$, $p<.01$) due to the lack of a substantial correlation.

To check for the possibility of socially desirable responding influencing participants' responses on the TRI, a Pearson Product Moment correlation was conducted between the TRI and the impression management and self-deceptive enhancement subscales of the Balanced Inventory of Desirable Responding (BIDR) Version 6 (Paulhus, 1991). The correlation coefficient ($r=.12$, $p<.01$) between the TRI and the self-deceptive enhancement subscale was significant but not substantial ($r >.30$ or $-.30$). The correlation coefficient ($r=.11$, $p<.05$) between the TRI and the impression management subscale was neither significant nor substantial. The lack of substantial correlations between the TRI and the two subscales of the BIDR indicated that socially desirable responding did not account for a considerable source of variance in the data set.

In order to assess for potential test bias, correlations were run between the TRI and the age, gender, and race/ethnicity of the participants. A Pearson Product Moment correlation was calculated between the TRI and age ($r=.01$, $p<.90$). Point Biserial correlations were calculated between the TRI and gender ($r_{pb} = -.02$, $p<.74$) and race/ethnicity ($r_{pb}=.09$, $p<.06$). The three correlations were neither significant nor substantial, as previously defined. The lack of significant correlations indicates that the TRI is free of test bias, at least in regard to the age, gender, and race/ethnicity of the participants in this sample.

Chapter IV

Discussion

The results of the principal components analysis used in this study suggest that the TRI includes two primary components rather than just one. The results also offer preliminary support for the convergence of indicators and the discriminant validity of the Teamwork Receptiveness Inventory (TRI; Fearington, 2001). However, there was little support found for the criterion-related validity of the instrument, at least with the criterion measure used in this study.

Explanation of Findings

As previously mentioned, the TRI appears to contain two distinct components. Although there were three items with substantial cross-loadings (items numbered two, three, and six), the first component is composed of eight items and the second contains only item two (“I think that individuals usually accomplish more than teams”). As previously noted, the first component contains items that primarily assess individual attitudes about working in teams, whereas the second component appears to measure a global opinion about teams. All of the loadings on the first component are greater than .40, which is generally regarded as the minimum score for inclusion within a component (Clark & Watson, 1995; Floyd & Widaman, 1995; Hua, Chang, & Chen, 1997).

However, Clark and Watson (1995) recommended that any item that loads higher on a subsequent component should be included in that component. Other researchers (e.g. Marmar, Weiss, & Gaston, 1989; Multon, Patton, & Kivlighan, 1996; Kivlighan, Multon,

& Brossart, 1996) have assigned items to factors based upon a minimum difference in the factor loadings of between .14 and .17. Based upon the aforementioned criterion, item two clearly belongs in the second component, as it loads higher on the second component and the difference between its loading on the first and second component exceeds the minimum recommended difference. This two-component model is further supported by the fact that both components have eigenvalues greater than one and, combined, they account for almost 64% of the variance.

Although the two-component model was ultimately retained, item two was initially considered for deletion in order to create a single underlying component measuring teamwork receptiveness (i.e., willingness to work in a team setting). Additional evidence for deleting item two included a relatively low level of internal consistency and an increase in the consistency if item two were deleted. However, as Clark and Watson (1995) noted, there is really no reason to attempt to boost internal consistency once the .80 level has been reached. Additionally, Floyd and Widaman (1995) noted that smaller components are often included on scales when the components are believed to be important pieces of the intended construct. For example, the Marital Satisfaction Questionnaire for Older Persons (Haynes et al., 1992) contains a one-item Health factor that the authors felt was important enough to retain despite the fact that it only accounts for a very small percentage of the variance. Finally, item two and the second component were retained because evidence suggests that strong components are not adversely affected by overextraction (Fava & Velicer, 1992). Overextraction can best be

understood as the retention of additional factors from a factor analysis (or principal components analysis) that do not account for a substantial portion of the overall variance. As Gorsuch (1997) noted, “keeping an additional factor or two is not likely to be a problem” (p. 546). Thus, even if item two and the second component do not account for a substantial portion of the variance related to teamwork receptiveness, there should not be any harm in retaining them on the TRI.

All of the hypotheses related to the convergence of indicators for the TRI were supported. The TRI was significantly, positively, and substantially correlated with both the Extraversion and Agreeableness scales from the NEO-FFI (Costa & McCrae, 1992a), as well as with the Team Player Inventory (TPI; Kline, 1999). Specifically, it appears that individuals who score high on the Extraversion, Agreeableness, and TPI scales also are very likely to be highly receptive to working in teams, as measured on the TRI.

The strong association between the Extraversion scale and the TRI was expected because Extraversion is conceptually related to the construct of teamwork receptiveness. The Extraversion scale measures such characteristics as sociability, optimism, and cheerfulness (Costa & McCrae, 1992a). Extraverts also typically prefer large groups and like people (Costa & McCrae), and tend to perform better than Introverts at jobs with a social component (Barrick & Mount, 1991; Salgado, 1997). Additionally, Extraversion has been found to significantly impact classroom participation (Rothstein, et al., 1994), as Extraverts tend to participate more than Introverts. LePine and Van Dyne (2001) found Extraversion to be positively related to cooperative behavior and a willingness to utilize

change-oriented communication (i.e., unafraid to express opinions and challenge the status quo). Extraversion also has been found to predict leadership emergence within groups (Riggio, Riggio, Salinas, & Cole, 2003). Based upon the research, Extraverts appear to thrive in group settings and enjoy working with others, characteristics that would seem to be strongly related to teamwork receptiveness.

Although the Agreeableness scale was not as strongly related to teamwork receptiveness as the Extraversion scale was, Agreeableness still had a strong, positive association with individual willingness to work in a team setting. This relationship makes sense conceptually because the Agreeableness scale measures interpersonal characteristics such as altruism, helpfulness, cooperativeness, and sympathy towards others (Costa & McCrae, 1992a). Mount, Barrick, & Stewart (1998) found Agreeableness to have a strong association with performance in jobs that required teamwork and significant interaction with coworkers. Similarly, Witt, Burke, Barrick, and Mount (2002) found that Agreeableness moderated individual performance ratings for jobs that required cooperative exchanges with others. Witt et al. equated Agreeableness with interpersonal sensitivity and noted that highly Conscientious workers might still be ineffective in jobs requiring cooperative behavior if they lack interpersonal sensitivity. Agreeableness also has been found to predict individual team member performance, overall team performance, total amount of work completed, team accuracy, and interpersonal skills (Neuman & Wright, 1999). Based on the literature, it appears that individuals with high Agreeableness scores typically have strong interpersonal skills

and find success in team settings, and, thus, these individuals would probably be receptive to working in a team environment.

A strong relationship between the TRI and the TPI was expected because these two instruments measure very similar constructs. Although similar, the constructs measured by the TRI and the TPI are different, at least in theory. As Kline (1999) noted, the TPI was designed to assess “the degree to which individuals are predisposed to want to work in a team-based environment” (p. 103). The TRI was designed simply to measure individual willingness to work in a team setting. The construct of teamwork receptiveness does not include the component of desire for a team setting that is included in the construct of the “team player.” However, the relationship between the TRI and the TPI was not expected to be quite as large as it turned out to be. Despite the fact that none of the items on the instruments are duplicated, a correlation this large raises the question of whether the two instruments are measuring essentially identical, rather than similar, constructs. This issue will be addressed further in the “Limitations of the Study” section.

The strong negative association between the TRI and the Self-Reliance (Q2) scale on the fifth edition of the 16 PF (Cattell et al., 1994) was also evidence for the convergence of indicators for the TRI. The Q2 scale measures a construct (group mindedness) similar to teamwork receptiveness. Specifically, the Q2 scale measures characteristics such as group dependence, group adherence, and level of affiliation (H.E.P. Cattell, 1994). The items on the Q2 scale primarily assess how individuals prefer to spend their time (i.e., either alone or with others). Indeed, a couple of the items on the

Q2 scale are very similar to items on the TRI, as they assess individual attitudes about group versus individual work. Although the constructs of group mindedness and teamwork receptiveness are not identical, they both tap aspects of individual attitudes towards group work. However, low scores on the Q2 indicate group mindedness whereas high scores indicate self-sufficiency. Thus, the negative association between the TRI and the Q2 seems to support the underlying constructs on the two scales, as well as the different foci of the scales.

With regard to the discriminant validity of the TRI, all of the hypotheses were supported. The TRI was not substantially related to the remaining three scales from the NEO-FFI: Neuroticism, Openness, and Conscientiousness. It is again important to note that although the correlations with both the Neuroticism and Conscientiousness scales were statistically significant, they did not meet the established criteria to be considered substantial. The fact that the correlation was significant simply may be due to the large sample size in the study.

Individuals with high scores on the Neuroticism scale could be expected to have difficulty coping with stress, impulse control problems, and irrational ideas (Costa & McCrae, 1992a). Indeed, Neuroticism has been found to be negatively related to supervisor and coworker ratings of emotional displays (i.e., the ability to express positive emotions and suppress negative emotions at work), as well as job satisfaction (Diefendorff & Richard, 2003). The aforementioned characteristics might not affect individual receptiveness to teamwork, but they would certainly tend to make the

individuals with these characteristics difficult to deal with in a team setting. The general sense of negativity typically found in an individual with a high score on the Neuroticism scale could certainly cause conflict within a group and probably would have a negative impact on the overall group performance. However, there is nothing in the literature to suggest that this negativity would affect an individual's willingness to actually work in a team.

Characteristics measured on both the Openness (e.g., intellectual curiosity, preference for variety, and active imagination) and the Conscientiousness (e.g., academic/occupational achievement, determination, punctuality, and reliability) scales (Costa & McCrae, 1992a) might have a strong relationship to team performance, but not necessarily with receptiveness to teamwork. For instance, Conscientiousness has been found to be positively associated with performance motivation (Judge & Ilies, 2002) and job performance (Barrick & Mount, 1991; Salgado, 1997), whereas Openness has been found to be related to team decision-making performance (LePine, 2003). Although certain characteristics of Openness and Conscientiousness might be desirable for effective teamwork, they do not appear to be related to an individual's receptiveness to actually working in a team setting, as measured by the TRI.

The lack of support for the criterion-related validity of the TRI was, on the surface, the biggest surprise in the study. Based on the results of Kline's (1999) study, it was hypothesized that individuals with high levels of teamwork receptiveness would self-select to participate in a large number of groups/teams. Kline found a significant

positive relationship between the TPI and the number of groups/teams in which individuals participated during the previous two years. It was presumed that those individuals who participated in a large number of groups were having mostly positive experiences and, thus, would continue their participation. Conversely, those individuals with less participation were presumed to have had primarily negative group experiences. These presumptions may not have been true for a large number of students in this study.

One reason that these presumptions might have been incorrect is due to the differences in the test items on the TRI and the TPI. All of the items on the TPI include the term “team/group” (Kline, 1999, p.111), whereas all of the items on the TRI only include the word “team.” It is quite possible that the participants in this study interpreted “team” differently than the participants in Kline’s study interpreted “team/group,” and thus, the different interpretations could account for the disparate results. Additionally, perhaps some of the students were required to work in teams/groups in educational or work settings and had primarily negative experiences. If the students had no control over their team/group participation, then the self-selection supposition would obviously be false. The lack of a substantial relationship also could be due to the criterion measure that was used. The possible problems with the measure will be discussed further in the “Limitations of the Study” section.

Based upon the unsubstantial correlations between the TRI and the Self-Deceptive Enhancement and the Impression Management subscales of the Balanced Inventory of Desirable Responding (BIDR) Version 6 (Paulhus, 1991), it does not appear that socially

desirable responding was a significant factor in the study. Although the very small correlations with the TRI were statistically significant, the significance may be primarily a factor of the large sample size.

Limitations of the Study

As previously mentioned, the extremely high correlation between the TRI and the TPI indicates that the two scales might be measuring the same construct. Although the TRI was designed to measure an individual's willingness, rather than desire, to work in a team, it appears that there is significant overlap in the two constructs. Despite the fact that the items and the hypothetical constructs differ on the two instruments, the current study could almost be viewed as a replication of the study conducted by Kline (1999). Further research would be needed to determine whether or not the two instruments are measuring the same construct.

The criterion measure in this study also was potentially problematic. While it is certainly possible that the TRI lacks criterion-related validity, it seems more probable that the manner in which the criterion was measured was simply too flawed to accurately assess the validity. The participants were asked to indicate how many groups/teams they had participated in over the past two years. This open-ended question led to responses ranging from zero to 1000, but the average number of groups/teams was 18.59. Additionally, over 90% of the participants indicated participating in 20 or fewer groups/teams. The results were almost certainly influenced by the less than 10% of participants who indicated having participated in more than 20 groups. In retrospect, it

would probably have been better to offer the participants a range of numbers from which they could choose. A range of 0, 1-5, 6-10, 11-15, 16-20, and greater than 20 might have worked better because it would have prevented the occurrence of statistical outliers and it might have led to a more accurate calculation of the correlation.

The criterion measure might also have been improved by including a definition of groups/teams. As the question was presented, there was no way to know how the participants defined the groups/teams criterion. For example, one participant noted that he had worked as a camp counselor the previous summer. He stated that as a counselor he had been involved in a wide variety of group activities, ranging from sports to campfire sing alongs. Although participation on sports teams would be relevant to the criterion, there are many other types of group activities that are not closely related to teamwork. A definition that limited group/team participation to only those groups/teams that were goal-oriented and met for a minimum of three times would more effectively measure the relevant criterion because it would eliminate the potential for participants to include their membership in groups that would not require teamwork, such as support or social groups.

Another potential problem with the results of this study is related to fatigue of the participants. As previously noted, all participants completed the MBTI prior to beginning any of the inventories for this study. Although the instruments for this study were counterbalanced in the test packets, the participants could, in reality, complete them

in any order that they wished (despite the fact that they were instructed not to do so).

Indeed, 54 participants failed to complete at least one of the instruments.

Another potential limitation is related to the self-report nature of the instruments used in this study. Each instrument had strong face validity, and thus, it was easy to understand what construct each was designed to measure. It is highly probable that many of the participants gained an understanding of which constructs were being measured. In fact, several participants commented that they could easily see what was being measured. Although there was no strong indication of socially desirable responding in the data, it is certainly possible that the participants could have completed the instruments in such a way as to appear to have characteristics that they do not actually have or vice versa.

Finally, generalizability of the results is a huge concern, as it is whenever a college population is used. The sample was fairly homogeneous in age, education, and field of study. Even gender and ethnicity were essentially homogeneous in this sample. The lack of a heterogeneous sample makes it difficult, if not impossible, to generalize the results. The average participant in this study was a caucasian male, approximately 19 years of age, who was beginning his first year in an engineering program. For the TRI to be used effectively, and fairly, with any population other than the one just noted would require further research on its applicability to other populations. Indeed, before the TRI can be used in practical settings, further research should be conducted to establish the reliability and validity of the scale across a wide range of populations.

Implications of Findings for Practice and Research

The results of this study have several implications for both practice and research. However, the most immediate implication is that further research is needed to establish the utility of the TRI. First, the construct of teamwork receptiveness needs to be further evaluated to determine if it is unique. Additional factor analytic techniques could be used to determine whether the items on the TRI and the TPI measure unique constructs or the same construct. For instance, a principal components analysis could be performed using the items from both the TRI and the TPI. If all of the TRI items load on a separate component than all of the TPI items, then there would be evidence that the two scales measure distinct constructs. However, if there are substantial cross-loadings or all the items load on only one component, then there would be considerable doubt that the TRI measures a unique construct. Although there is evidence supporting the construct validity of both the TRI and the TPI, it remains to be seen if the two purported constructs are actually different.

Another area of potential research would address the criterion-related validity of the TRI. As previously noted, the criterion-related validity of the TRI was the one area in this study that was not supported. Future research could focus on criterion-related validity by correlating TRI scores with measures of attitudes of individuals working in teams. For example, an individual with a high score on the TRI could reasonably be expected to have a positive attitude when working in a team setting and vice versa. There

are several ways to assess the criterion-related validity of the TRI and this is an area where further research is needed if the TRI is to ever be a useful inventory.

As noted in the limitations section, the participants were extremely homogeneous. Future research could focus on establishing the reliability and validity of the TRI in populations substantially different from the sample in this study. There is a specific need to get a sample with more females and members of ethnic minority groups. Currently, it is impossible to know conclusively whether or not the TRI contains any gender or ethnic bias. Additionally, in order for the inventory to be used effectively and fairly with other populations, the TRI needs to be given to an older population and to individuals who are outside of an educational setting. If the TRI is to ever be useful in a business setting, then it must be administered to a sample of that population to establish ecological validity.

The final step in the validation process of the TRI would be to establish predictive validity. If the TRI is found to measure only one construct and have both construct and criterion-related validity, then further research would be needed to support the use of TRI scores to accurately predict some meaningful measure of performance. In an educational setting, this measure could be the final grade in a class that requires teamwork and assigns group, rather than individual, grades. In a business environment, the TRI could be correlated with a measure of overall team performance at the end of a project. If the predictive validity of the TRI is supported, then the inventory would become very useful in applied settings.

In terms of practical use, the TRI could ultimately be used to select team members in either an educational or a business setting. If the TRI is found to be psychometrically sound, then administrators, educators, and team leaders could legally and ethically use the TRI as a means of screening potential team members. Individuals with high scores could be expected to be good team members from the beginning, whereas individuals with low scores might benefit from some team building training. Perhaps the TRI could be useful in helping to identify potentially problematic members before the team begins working.

The TRI was originally created to identify individuals who were receptive to working in a team environment. It was hoped that TRI scores would ultimately aid in the selection of potentially effective team members in educational and corporate settings. Although the results of this study support the construct validity of the TRI, much work still needs to be done to establish the usefulness of the scale.

REFERENCES

References

- Ainsworth, M.D.S., Blehar, M.C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological analysis of the strange situation*. Hillsdale, NJ: Erlbaum.
- Anderson, C., John, O.P., Keltner, D., & Kring, A.M. (2001). Who attains social status? Effects of personality and physical attractiveness in social groups. *Journal of Personality and Social Psychology*, 81, 116-132.
- Asendorpf, J.B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, 74, 1531-1544.
- Bailey, D.E. (2000). Modeling work group effectiveness in high-technology manufacturing environments. *IIE Transactions*, 32, 361-368.
- Barrick, M.R., & Mount, M.K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1-26.
- Barrick, M.R., & Mount, M.K. (1993). Autonomy as a moderator of the relationships between the big five personality dimensions and job performance. *Journal of Applied Psychology*, 78, 111-118.
- Barrick, M.R., & Mount, M.K. (1996). Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology*, 81, 261-272.

- 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(3), 377-391.
- Barry, B., & Stewart, G.L. (1997). Composition, process, and performance in self-managed groups: The role of personality. *Journal of Applied Psychology*, 82, 62-78.
- Bass, B.M. (1954). The leaderless group discussion. *Psychological Bulletin*, 51, 465-492.
- Beckham, R. (1998). Self-directed work teams: The wave of the future? *Hospital Materiel Management Quarterly*, 20, 48-60.
- Bernreuter, R.G. (1933). Validity of the personality inventory. *Personnel Journal*, 11, 383-386.
- Blejwas, L., & Marshall, W. (1999). A supervisory level self-directed work team in health care. *The Health Care Supervisor*, 17, 14-21.
- Bolt, D.M., & Rounds, J. (2000). Advances in psychometric theory and methods. In S.D. Brown & R.W. Lent (Eds.), *Handbook of counseling psychology* (3rd ed., pp. 140-176). New York: John Wiley & Sons.
- Booth-Kewley, S., Edwards, J.E., & Rosenfeld, P. (1992). Impression management, social desirability, and computer administration of attitude questionnaires: Does the computer make a difference? *Journal of Applied Psychology*, 77, 562-566.

- Borgatta, E.F. (1964). The structure of personality characteristics. *Behavioral Science*, 12, 8-17.
- Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validation by the multi-trait-multi-method matrix. *Psychological Bulletin*, 56, 81-105.
- Campion, M.A., Medsker, J.G., & Higgs, A.C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46, 823-850.
- Caramanica, L., Ferris, S., & Little, J. (2001). Self-directed work teams: Use with caution. *Nursing Management*, 32, 77.
- Cattell, H.E.P. (2001). The sixteen personality factor (16PF) questionnaire. In W.I. Dorfman & M. Hersen (Eds.), *Understanding Psychological Assessment* (pp. 187-215). New York: Plenum Publishers.
- Cattell, H.E.P. (1994). Development of the 16PF fifth edition. In S.R. Conn & M.L. Rieke (Eds.), *The 16PF fifth edition technical manual* (pp. 3-20). Champaign, IL: Institute for Personality and Ability Testing.
- Cattell, R.B. (1943). The description of personality: Basic traits resolved into clusters. *Journal of Abnormal Social Psychology*, 38, 476-506.
- Cattell, R.B. (1946). *The description and measurement of personality*. Yonkers, NY: World Book.
- Cattell, R.B. (1947). Confirmation and clarification of primary personality factors. *Psychometrika*, 12, 197-220.

- Cattell, R.B. (1948). The primary personality factors in women compared with those in men. *British Journal of Psychology*, 1, 114-130.
- Cattell, R.B. (1951). New concepts for measuring leadership, in terms of group syntality. *Human Relations*, 4, 161-184.
- Cattell, R.B., Cattell, A.K., & Cattell, H.E.P. (1994). *Sixteen Personality Factor Questionnaire* (5th ed.). Champaign, IL: Institute for Personality and Ability Testing.
- Chansler, P.A., Swamidass, P.M., & Cammann, C. (2003). Self-managing work teams: An empirical study of group cohesiveness in “natural work groups” at a Harley-Davidson Motor Company plant. *Small Group Research*, 34, 101-120.
- Christiansen, N.D., Goffin, R.D., Johnston, N.G., & Rothstein, M.G. (1994). Correcting the 16PF for faking: Effects on criterion-related validity and individual hiring decisions. *Personnel Psychology*, 47, 847-860.
- Clark, L.A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309-319.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- Conley, M. (2000). Self-directed work teams. *Safety & Health*, 161, 54.
- Conn, S.R. (1994). Reliability and equivalency: Comparison of the 16PF fifth edition and fourth edition. In S.R. Conn & M.L. Rieke (Eds.), *The 16PF fifth edition technical manual* (pp. 77-99). Champaign, IL: Institute for Personality and Ability Testing.

- Conn, S.R., & Rieke, M.L. (1994a). Characteristics of the norm sample. In S.R. Conn & M.L. Rieke (Eds.), *The 16PF fifth edition technical manual* (pp. 35-51).
Champaign, IL: Institute for Personality and Ability Testing.
- Conn, S.R., & Rieke, M.L. (1994b). Construct validation of the 16PF fifth edition. In S.R. Conn & M.L. Rieke (Eds.), *The 16PF fifth edition technical manual* (pp. 103-142). Champaign, IL: Institute for Personality and Ability Testing.
- Costa, P.T., & McCrae, R.R. (1988). From catalog to classification: Murray's needs and the five-factor model. *Journal of Personality and Social Psychology*, 55, 258-265.
- Costa, P.T., & McCrae, R.R. (1992a). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P.T., & McCrae, R.R. (1992b). Normal personality assessment in clinical practice: The NEO personality inventory. *Psychological Assessment*, 4, 5-13.
- Cote, S., & Moskowitz, D.S. (1998). On the dynamic covariation between interpersonal behavior and affect prediction from neuroticism, extraversion, and agreeableness. *Journal of Personality and Social Psychology*, 75, 1032-1046.
- Cronbach, L.J., & Meehl, P.E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281-302.
- Crowne, D.P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.

- Cummings, T.G. (1981). Designing effective work groups. In P.C. Nystrom & W.H. Starbuck (Eds.), *Handbook of organizational design* (pp. 250-271). New York: Oxford University Press.
- Daus, C.S., & Joplin, J.R.W. (1999). Survival of the fittest: Implications of self-reliance and coping for leaders and team performance. *Journal of Occupational Health Psychology, 4*, 15-28.
- Davis, L.E., & Wacker, G.J. (1987). Job design. In G. Salvendy (Ed.), *Handbook of human factors* (pp. 431-452). New York: John Wiley & Sons.
- Diefendorff, J.M., & Richard, E.M. (2003). Antecedents and consequences of emotional display rule perceptions. *Journal of Applied Psychology, 88*, 284-294.
- Digman, J.M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41*, 417-440.
- Digman, J.M., & Takemoto-Chock, N.K. (1981). Factors in the natural language of personality: Re-analysis, comparison, and interpretation of six major studies. *Multivariate Behavioral Research, 16*, 149-170.
- Driskell, J.E., Hogan, R., & Salas, E. (1987). Personality and group performance. In C. Hendrick (Ed.), *Group process and intergroup relations*. Newbury Park, CA: Sage.
- Dumaine, B. (1990, May 7). Who needs a boss? *Fortune, 1*, 52-60.
- Early, P.C. (1993). East meets West meets Mideast: Further exploration of collectivist and individualistic work groups. *Academy of Management Journal, 36*, 319-348.

- Eisenhardt, K.M., & Tabrizi, B.N. (1995). Accelerating adaptive processes: Product innovation in the global computer industry. *Administrative Science Quarterly*, 40, 84-110.
- Erez, M., & Somech A. (1996). Is group productivity loss the rule or the exception? Effects of culture and group-based motivation. *Academy of Management Journal*, 39, 1513-1537.
- Fava, J.L., & Velicer, W.F. (1992). The effects of overextraction on factor and component analysis. *Multivariate Behavioral Research*, 27, 387-415.
- Fearrington, M.E. (2001). *Measuring teamwork receptiveness: A pilot study*.
Unpublished manuscript.
- Ferguson, E., & Patterson, F. (1998). The five factor model of personality: Openness a distinct but related construct. *Personality and Individual Differences*, 24, 789-796.
- Fiedler, F.E. (1966). The effect of leadership and cultural heterogeneity on group performance: A test of the contingency model. *Journal of Experimental Social Psychology*, 2, 237-264.
- Fiedler, F.E., Meuwese, W.A.T., & Oonk, S. (1961). Performance of laboratory tasks requiring group creativity. *Acta Psychologica*, 18, 100-119.
- Fiske, D.W. (1949). Consistency of the factorial structure of personality ratings from different sources. *Journal of Abnormal Social Psychology*, 44, 329-344.

- Floyd, F.J., & Widaman, K.F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7, 286-299.
- Furnham, A., & Craig, S. (1987). Fakeability and correlates of the Perception and Preference Inventory. *Personality and Individual Differences*, 8, 459-470.
- George, J.M. (1990). Personality, affect, and behavior. *Journal of Applied Psychology*, 75, 107-116.
- George, J.M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86, 513-524.
- Ghiselli, E.E. (1973). The validity of aptitude tests in personnel selection. *Personnel Psychology*, 26, 461-477.
- Gilbert, D.G., Crauthers, D.M., Mooney, D.K., McClemon, F.J., & Jensen, R.A. (1999). Effects of monetary contingencies on smoking relapse: Influences of trait depression, personality, and habitual nicotine intake. *Experimental and Clinical Psychopharmacology*, 7, 174-181.
- Goldberg, L.R. (1990). An alternative "description of personality": The search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of personality and social psychology* (pp.141-165). Beverly Hills, CA: Sage.

- Goldman, M.A. (1965). A comparison of individual and group performance for varying combinations of initial ability. *Journal of Personality and Social Psychology*, 1, 210-216.
- Golembiewski, R.T. (1962). *The small group: An analysis of research concepts and operation*. Chicago: University of Chicago Press.
- Gorsuch, R.L. (1997). Exploratory factor analysis: Its role in item analysis. *Journal of Personality Assessment*, 68, 532-560.
- Guion, R.M., & Gottlier, R.F. (1965). Validity of personality measures in personnel selection. *Personnel Psychology*, 18, 135-164.
- Guzzo, R.A. (1986). Group decision making and group effectiveness in organizations. In P.S. Goodman (Ed.), *Designing effective work groups* (pp. 34-71). San Francisco: Jossey-Bass.
- Guzzo, R.A. (1988). Financial incentives and their varying effects on productivity. In P. Whitney & R.B. Ochsman (Eds.), *Psychology and productivity* (pp. 81-92). New York: Plenum.
- Guzzo, R.A., & Shea, G.P. (1992). Group performance and intergroup relations in organizations. In M.D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 269-313). Palo Alto, CA: Consulting Psychologists Press.
- Hackman, J.R. (1987). The design of work teams. In J.W. Lorsch (Ed.), *Handbook of organizational behavior* (pp. 315-342). Englewood Cliffs, NJ: Prentice Hall.

- Hackman, J.R., & Morris, C.G. (1975). Group tasks, group interaction process, and group performance effectiveness: A review and proposed integration. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol.8, pp. 45-97). New York: Academic Press.
- Hackman, J.R., & Oldham, G.R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Hakel, M.D. (1974). Normative personality factors recovered from ratings of personality descriptors: The beholder's eye. *Personnel Psychology*, 27, 409-421.
- Harkness, A.R., McNulty, J.L., & Ben-Porath, Y.S. (1995). The Personality Psychopathology Five (Psy-5): Constructs and MMPI-2 scales. *Psychological Assessment*, 7, 104-114.
- Haynes, S.N., Floyd, F.J., Lemsky, C., Rogers, E., Winemiller, D., Heilman, N et al. (1992). The Marital Satisfaction Questionnaire for Older Persons. *Psychological Assessment*, 4, 473-482.
- Hill, C.E., Diemer, R.A., & Heaton, K.J. (1997). Dream interpretation sessions: Who volunteers, who benefits, and what volunteer clients view as most and least helpful. *Journal of Counseling Psychology*, 44, 53-62.
- Hill, M. (1982). Group versus individual performance. Are N + 1 heads better than one? *Psychological Bulletin*, 91, 517-539.
- Hoerr, J. (1989, July 10). The payoff from teamwork. *BusinessWeek*, 1, 56-62.

- Hoffman, L.R. (1959). Homogeneity of member personality and its effect on group problem-solving. *Journal of Abnormal and Social Psychology*, 58, 27-32.
- Hoffman, L.R., & Maier, N.R.F. (1961). Sex differences, sex composition, and group problem-solving. *Journal of Abnormal and Social Psychology*, 63, 453-456.
- Hogan, R., Carpenter, B.N., Briggs, S.R., & Hansson, R.O. (1985). Personality assessment in industry: A historical and conceptual overview. In H.J. Bernardin & D.A. Bownas (Eds.), *Personality assessment in industry* (pp. 21-52). New York: Praeger.
- Hogan, R., Hogan, J., & Roberts, B.W. (1996). Personality measurement and employment decisions: Questions and answers. *American Psychologist*, 51, 469-477.
- Hough, L.M. (1998). Effects of intentional distortion in personality measurement and evaluation of suggested palliatives. *Human Performance*, 11, 209-244.
- Hough, L.M., Eaton, N.K., Dunnette, M.D., Kamp, J.D., & McCloy, R.A. (1990). Criterion-related validities of personality constructs and the effect of response distortion on those validities. *Journal of Applied Psychology*, 75, 581-595.
- Hua, M., Chang, S., & Chen, S. (1997). Factor structure and age effects with an aphasia test battery in normal Taiwanese adults. *Neuropsychology*, 11, 156-162.
- Ilgen, D.R. (1999). Teams embedded in organizations: Some implications. *American Psychologist*, 54(2), 129-139.

- Institute for Personality and Ability Testing. (1991). *Administration manual for the Sixteen Personality Factor Questionnaire*. Champaign, IL: Author.
- Jackson, D. (1976a). *Jackson Personality Inventory manual*. Port Huron, MI: Research Psychologists Press.
- Jackson, D. (1976b). *Jackson Personality Survey*. London, Ontario, Canada: Research Psychologists Press.
- Jackson, D. (1977). *Jackson Vocational Interest Survey*. London, Ontario, Canada: Research Psychologists Press.
- Jackson, S.E., Brett, J.F., Sessa, V.I., Cooper, D.M., Julin, J.A., & Peyronnin, K. (1991). Some differences make a difference: Individual dissimilarity and group heterogeneity as correlates of recruitment, promotions, and turnover. *Journal of Applied Psychology*, 76, 675-689.
- Janis, I.L. (1982). *Groupthink: Psychological studies of policy decisions and fiascoes*. Boston: Houghton Mifflin.
- John, O.P., Donahue, E.M., & Kentle, R. (1991). *The "Big Five" Inventory-Versions 44 and 54* (Tech. Rep.). Berkeley, CA: Institute of Personality and Social Psychology.
- Johnson, D.W., & Johnson, R. (1983). Social interdependence and perceived academic and personal support in the classroom. *Journal of Social Psychology*, 120, 77-82.
- Judge, T.A., & Bono, J.E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85, 751-765.

- Judge, T.A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of Applied Psychology*, 87, 797-807.
- Jung, D.I., & Sosik, J.J. (1999). Effects of group characteristics on work group performance: A longitudinal investigation. *Group Dynamics*, 3(4), 279-290.
- Kichuk, S.L., & Wiesner, W.H. (1998). Work teams: Selecting members for optimal performance. *Canadian Psychology*, 39, 23-32.
- Kivlighan, D.M., Multon, K.D., & Brossart, D.F. (1996). Helpful impacts in group counseling: Development of a multidimensional rating system. *Journal of Counseling Psychology*, 43, 347-355.
- Klimoski, R.J., & Zukin, L.B. (1999). Selection and staffing for team effectiveness. In E.Sundstrom and associates (Eds.), *Supporting Work Team Effectiveness* (pp. 63-91). San Francisco: Jossey-Bass.
- Kline, T.J.B. (1999). The Team Player Inventory: Reliability and validity of a measure of predisposition toward organizational team-working environments. *Journal for Specialists in Group Work*, 24, 102-112.
- Kline, T.J.B. (2001). Predicting team performance: Testing a model in a field setting. *Journal for Specialists in Group Work*, 26, 185-197.
- Kodandaram, P. (1996). Personality of wives of alcoholics. *Indian Journal of Clinical Psychology*, 23, 21-23.

- Laughlin, P.R., Branch, L.G., & Johnson, H.H. (1969). Individual versus triadic performance on a unidimensional complementary task as a function of initial ability level. *Journal of Personality and Social Psychology*, 12, 144-150.
- Lawler, E. E., Mohrman, S. A. & Ledford, G. E. (1998). *Strategies for high performance organizations- The CEO report: Employee involvement, TQM, and reengineering programs in Fortune 1,000 corporations*. San Francisco: Jossey-Bass.
- Leavitt, H. (1975). Suppose we took groups seriously... In E.L. Cass & F.G. Zimmer (Eds.), *Man and work in society* (pp. 67-77). New York: Van Nostrand Reinhold.
- 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.
- Likert, R. (1932). A technique for the measure of attitudes. *Archives of Psychology*, 140, 52.
- Lilienfeld, S.O. (1996). The MMPI-2 antisocial practices content scale: Construct validity and comparison with the psychopathic deviate scale. *Psychological Assessment*, 8, 281-293.
- Linton, D.K., & Wiener, N.I. (2001). Personality and potential conceptions: Mating success in a modern western male sample. *Personality and Individual Differences*, 31, 675-688.

- Locke, E.A., & Hulin, C.L. (1962). A review and evaluation of the validity studies of activity vector analysis. *Personnel Psychology*, 15, 25-42.
- Macnab, D., Fitzsimmons, G., & Casserly, K. (1987). *Administration manual for the Life Roles Inventory-Values Scale and Salience Inventory*. Edmonton, Alberta, Canada: Psychometrics Canada Ltd.
- Mann, R.D. (1959). A review of the relationships between personality and performance in small groups. *Psychological Bulletins*, 56, 241-270.
- Marmar, C.R., Weiss, D. S., & Gaston, L. (1989). Toward the validation of the California Therapeutic Alliance Rating System. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1, 46-52.
- McCrae, R.R. (1991). The five-factor model and its assessment in clinical settings. *Journal of Personality Assessment*, 57, 399-414.
- McCrae, R.R. (1996). Social consequences of experiential openness. *Psychological Bulletin*, 120, 323-337.
- McCrae, R.R., Costa, P.T., Jr., & Busch, C.M. (1986). Evaluating comprehensiveness in personality systems: The California Q-Set and the five-factor model. *Journal of Personality*, 54, 430-446.
- McDougall, W. (1932). Of the words character and personality. *Character Personality*, 1, 3-16.
- McGrath, J.E. (1984). *Groups: Interaction and performance*. Englewood Cliffs, NJ: Prentice-Hall.

- Meston, C.M., Heiman, J.R., Trapnell, P.D., & Paulhus, D.L. (1998). Socially desirable responding and sexuality self-reports. *Journal of Sex Research*, 35, 148-157.
- Meyer, R.G., & Deitsch, S.E. (1996). *The clinician's handbook: Integrated diagnostics, assessment, and intervention in adult and adolescent psychopathology* (4th ed.). Needham Heights, MA: Allyn & Bacon.
- Mikulincer, M. (1998). Adult attachment style and affect regulation: Strategic variations in self-appraisals. *Journal of Personality and Social Psychology*, 75, 420-435.
- Mohr, C.D., Armeli, S., Tennen, H., Carney, M.A., Affleck, G., & Hromi, A. (2001). Daily interpersonal experiences, context, and alcohol consumption: Crying in your beer and toasting good times. *Journal of Personality and Social Psychology*, 80, 489-500.
- Mount, M.K., Barrick, M.R., & Stewart, G.L. (1998). Five-Factor Model of personality and performance in jobs involving interpersonal interactions. *Human Performance*, 11, 145-165.
- Multon, K.D., Patton, M.J., & Kivlighan, D.M. (1996). Development of the Missouri Identifying Transference Scale. *Journal of Counseling Psychology*, 43, 243-252.
- Myers, I.B., & McCaulley, M.H. (1998). *Manual: A guide to the development and use of the MBTI*. Palo Alto, CA: Consulting Psychologists Press.
- Myers, M.G., Martin, R.A., Rohsenow, D.J., & Monti, P.M. (1996). The Relapse Situation Appraisal Questionnaire: Initial psychometric characteristics and validation. *Psychology of Addictive Behaviors*, 10, 237-247.

- Nelson, D.L., Quick, J.C., & Joplin, J.R. (1991). Psychological contracting and newcomer socialization: An attachment theory foundation. *Journal of Social Behavior and Personality*, 6, 55-72.
- Neuberg, S.L., Judice, T.N., & West, S.G. (1997). What the Need for Closure Scale measures and what it does not: Toward differentiating among epistemic motives. *Journal of Personality and Social Psychology*, 72, 1396-1412.
- Neuman, G.A., & Wright, J. (1999). Team effectiveness: Beyond skills and cognitive ability. *Journal of Applied Psychology*, 84, 376-389.
- Neyer, F.J., & Asendorpf, J.B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, 81, 1190-1204.
- Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Ones, D.S., Viswesvaran, C., & Reiss, A.D. (1996). Role of social desirability in personality testing for personnel selection: The red herring. *Journal of Applied Psychology*, 81, 660-679.
- O'Reilly, C.A., Caldwell, D.F., & Barnett, W.P. (1989). Work group demography, social integration, and turnover. *Administrative Science Quarterly*, 34, 21-37.
- Pacini, R., & Epstein, S. (1999). The relation of rational and experiential processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology*, 76, 972-987.

- Pasmore, W.A., Francis, C., Haldeman, J., & Sani, A. (1982). Sociotechnical systems: A North American reflection on empirical studies of the seventies. *Human Relations, 35*, 1179-1204.
- Paulhus, D.L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology, 46*, 598-609.
- Paulhus, D.L. (1991). Measurement and control of response bias. In J.P. Robinson, P.R. Shaver, & L.S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes: Measures of social psychological attitudes, Vol. 1* (pp. 17-59). San Diego, CA: Academic Press.
- Paulhus, D.L. (2001). Socially desirable responding: The evolution of a construct. In H.I. Braun & D.N. Jackson (Eds.), *The role of constructs in psychological and educational measurement* (pp. 37-48). Mahwah, NJ: Lawrence Erlbaum Associates.
- Paulhus, D.L., & Reid, D.B. (1991). Enhancement and denial in socially desirable responding. *Journal of Personality and Social Psychology, 60*, 307-317.
- Paunonen, S.V. (1998). Hierarchical organization of personality and prediction of behavior. *Journal of Personality and Social Psychology, 74*, 538-556.
- Peters, T.J., & Waterman, R.H. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Harper and Row.

- Peterson, B.E., Smirles, K.A., & Wentworth, P.A. (1997). Generativity and Authoritarianism: Implications for personality, political involvement, and parenting. *Journal of Personality and Social Psychology*, 72, 1202-1216.
- Piedmont, R.L. (1998). *The revised NEO personality inventory: Clinical and research applications*. New York: Plenum Press.
- Pincus, A.L., & Gurtman, M.B. (1995). The three faces of interpersonal dependency: Structural analyses of self-report dependency measures. *Journal of Personality and Social Psychology*, 69, 744-758.
- Potosky, D., & Bobko, P. (1997). Computer versus paper-and-pencil administration mode and response distortion in noncognitive selection tests. *Journal of Applied Psychology*, 82, 293-299.
- Quick, J.C., Nelson, D.L., & Quick, J.D. (1987). Successful executives: How independent? *Academy of Management Executive*, 1, 139-145.
- Ramirez, S.M. (1999). Self-directed work teams. *FBI Law Enforcement Bulletin*, 68, 20-24.
- Reich, R.B. (1983). *The next American frontier*. New York: Times Books.
- Reilly, R.R., & Chao, G.T. (1982). Validity and fairness of some alternative employee selection procedures. *Personnel Psychology*, 35, 1-62.
- Riggio, R.E., Riggio, H.R., Salinas, C., & Cole, E.J. (2003). The role of social and emotional communication skills in leadership emergence and effectiveness. *Group Dynamics: Theory, Research, and Practice*, 7, 83-103.

- Rothstein, M.G., Paunonen, S.V., Rush, J.C., & King, G.A. (1994). Personality and cognitive ability predictors of performance in graduate business school. *Journal of Educational Psychology*, 86, 516-530.
- Rust, J., & Golombok, S. (1999). *Modern psychometrics: The science of psychological assessment*. London: Routledge.
- Sabourin, S., Laferriere, N., Sicuro, F., Coallier, J-C., Cournoyer, L-G., & Gendreau, P. (1989). Social desirability, psychological distress, and consumer satisfaction with mental health treatment. *Journal of Counseling Psychology*, 36, 352-356.
- Salekin, R.T., Rogers, R., & Sewell, K.W. (1997). Construct validity of psychopathy in a female offender sample: A multitrait-multimethod evaluation. *Journal of Abnormal Psychology*, 106, 576-585.
- Salgado, J.F. (1997). The five factor model of personality and job performance in the European community. *Journal of Applied Psychology*, 82, 30-43.
- Sanderson, C.A., & Cantor, N. (1995). Social dating goals in late adolescence: Implications for safer sexual activity. *Journal of Personality and Social Psychology*, 68, 1121-1134.
- Schmitt, N., Gooding, R.Z., Noe, R.A., & Kirsch, M. (1984). Meta-analyses of validity studies published between 1964 and 1982 and the investigation of study characteristics. *Personnel Psychology*, 37, 407-422.

- Schmutte, P.S., & Ryff, C.D. (1997). Personality and well-being: Reexamining methods and meanings. *Journal of Personality and Social Psychology*, 73, 549-559.
- Schneider, M.H. (1999). The relationship of personality and job setting to job satisfaction. *Dissertation Abstracts International*, 59 (11), 6103B. (UMI No. 9912441)
- Shepperd, J. (1993). Productivity loss in performance groups: A motivational analysis. *Psychological Bulletin*, 113, 67-81.
- Shivers, C.H. (1999). Self-directed work teams: Development & safety performance. *Professional Safety*, 44, 34-37.
- Smith, G.M. (1967). Usefulness of peer ratings of personality in educational research. *Educational and Psychological Measurement*, 27, 967-984.
- Spreitzer, G.M., Cohen, S.G., & Ledford, Jr., G.E. (1999). Developing effective self-managing work teams in service organizations. *Group & Organization Management*, 24, 340-366.
- Stein, M.I. (1982). Creativity, groups, and management. In R.A. Guzzo (Ed.), *Improving group decision making in organizations*. New York: Academic Press.
- Stewart, G.L., Manz, C.C., & Sims, H.P., Jr. (1999). *Team work and group dynamics*. New York: John Wiley & Sons.
- Sundstrom, E., DeMeuse, K.P., & Futrell, D. (1990). Work teams: Applications and effectiveness. *American Psychologist*, 45, 120-133.

- Sundstrom, E., McIntyre, M., Halfhill, T., & Richards, H. (2000). Work groups: From the Hawthorne studies to work teams of the 1990's and beyond. *Group Dynamics: Theory, Research, and Practice*, 4, 44-67.
- Taylor, R.D. (1996). Adolescents' perceptions of kinship support and family management practices: Association with adolescent adjustment in African-American families. *Developmental Psychology*, 32, 687-695.
- Tett, R.P., Jackson, D.N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology*, 44, 703-742.
- Thoms, P., Pinto, J.K., Parente, D.H., & Druskat, V.U. (2002). Adaptation to self-managing work teams. *Small Group Research*, 33, 3-31.
- Thornton, G.C., & Gierasch, P.F. (1980). Fakability of an empirically derived selection instrument. *Journal of Personality Assessment*, 44, 48-51.
- Thurrow, L.C. (1983). *Dangerous currents*. New York: Random House.
- Triandis, H.C., Bontempo, R., Villareal, M.J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and Social Psychology*, 54, 323-338.
- Trimble, D.E. (1997). The religious orientation scale: Review and meta-analysis of social desirability effects. *Educational and Psychological Measurement*, 57, 970-987.
- Trull, T.J. (1992). DSM-III-R personality disorders and the five-factor model of personality. *Journal of Abnormal Psychology*, 101, 553-560.

- Trull, T.J., Ueda, J.D., Costa, P.T., & McCrae, R.R. (1995). Comparison of the MMPI-2 Personality Psychopathology Five (Psy-5), the NEO-PI, and the NEO-PI-R. *Psychological Assessment*, 7, 508-516.
- Tucker, L.A. (1984). Psychological differences between adolescent smoking intenders and nonintenders. *Journal of Psychology*, 118, 37-43.
- Tziner, A. (1985). How team composition affects task performance: Some theoretical insights. *Psychological Reports*, 57, 1111-1119.
- Tziner, A., & Eden, D. (1985). Effects of crew composition on crew performance: Does the whole equal the sum of the parts? *Journal of Applied Psychology*, 70, 85-93.
- Von Dras, D.D., & Siegler, I.C. (1997). Stability in extraversion and aspects of social support at midlife. *Journal of Personality and Social Psychology*, 72, 233-241.
- Wanberg, C.R., & Kammeyer-Mueller, J.D. (2000). Predictors and outcomes of proactivity in the socialization process. *Journal of Applied Psychology*, 85, 373-385.
- Watson, W.E., Kumar, K., & Michaelson, L.K. (1993). Cultural diversity's impact on interaction process and performance: Comparing homogeneous and diverse task groups. *Academy of Management Journal*, 36, 590-602.
- Williams, K.Y., & O'Reilly, C.A. (1998). Demography and diversity in organizations: A review of 40 years of research. In B.M. Staw & L.L. Cummings (Eds.), *Research in organizational behavior* (pp. 77-140). Greenwich, CT: JAI Press.

- Witt, L.A., Burke, L.A., Barrick, M.R., & Mount, M.K. (2002). The interactive effects of conscientiousness and agreeableness on job performance. *Journal of Applied Psychology, 87*, 164-169.
- Yeatts, D.E., & Seward, R.R. (2000). Reducing turnover and improving health care in nursing homes: The potential effects of self-managed work teams. *The Gerontologist, 40*, 358-363.
- Zenger, T.R., & Lawrence, B.S. (1989). Organizational demography: The differential effects of age and tenure distributions on technical communications. *Academy of Management Journal, 32*, 353-376.
- Zerbe, W.J., & Paulhus, D.L. (1987). Socially desirable responding in organizational behavior: A reconception. *Academy of Management Review, 12*, 250-264.
- Ziller, R.C. (1965). Towards a theory of open and closed groups. *Psychological Bulletin, 64*, 164-182.

APPENDICES

Appendix A

Teamwork Receptiveness Inventory

1. I enjoy being a member of a team.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. I think that individuals usually accomplish more than teams.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. I work better on my own than as a member of a team.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. I do my best work on teams.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. I hate being a member of a team.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. I am very willing to be a member of a team

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Appendix A-continued

7. I see many benefits of working in teams.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. Most of the time, I do not see a need to work in teams.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. I prefer to work on a team rather than as an individual.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Appendix B

Informed Consent

Information Sheet Entry Data Gathering for Freshman Engineering Students

You are invited to join an ongoing research project. The *engage* Freshman Engineering Program has been based on learning about students and how to best teach them the material in the freshman year. We learn about our students by understanding their individual differences and their performance characteristics. This data is used to improve curriculum, instruction, and retention of engineering students.

All that is required for your participation is your agreement to allow us to add your personal data from the NEO PI-R and Myers Briggs Personality surveys, team receptivity surveys, and the Team Developer behavior survey to our database. These surveys will be given as a part of the Engineering Fundamentals class, and you are required to take them as a part of the curriculum. We will not add you to the database of all engineering students without your permission.

Your only risk is that someone might access the database and discover your personality type of team skill evaluation. This risk is minimized by having a single person, a professor, in charge of the database. Anytime your data is used in a study, all identifiers are stripped and the researcher just gets a data file of information without any tie back to an actual person. The data that might be revealed is about your personality and team tendencies – not about anything that is right or wrong, or better or worse.

This research will benefit future students by allowing us to understand more about students and how to improve their performance in engineering school.

The data from this research is kept confidential. As soon as this data is entered into the master database of all engineering students, the forms are destroyed. Access to the master database is limited and strictly controlled.

You are not required to allow us to use your data. To remove yourself from the database, all you have to do is ask the instructor in your current Engineering Fundamentals class, or drop in at any time and leave your request with Dr. Elaine Seat in 101 Estabrook Hall. There is no penalty for declining to participate now or at any time in the future. Unless you ask for removal from the study, it is presumed that you have agreed that your data may be included.

If you have any questions about the use of this data or the procedures, please drop by or contact Dr. Elaine Seat, 101 Estabrook Hall, 974-9812, seat@utk.edu.

If you have questions about your rights as a participant, please contact the Compliance Office at the University's Research Office at 865-974-3466, located in Andy Holt Tower.

Appendix C

Table C1

Summary of Reliability Analyses for the Teamwork Receptiveness Inventory Items

Item	Mean	Standard Deviation	Corrected Item- Total Correlation	Alpha if Item Deleted
1	3.99	.81	.67	.86
2	3.30	.97	.35	.89
3	3.16	.95	.68	.86
4	3.35	.91	.70	.85
5	4.20	.79	.62	.86
6	4.21	.74	.64	.86
7	4.20	.68	.67	.86
8	3.53	.90	.60	.86
9	3.45	.91	.68	.86

Note. N= 464; Alpha= .87

Table C2

Factor Loadings, Eigenvalues, and Percentages of Variance from the Principal Components Analysis on the Teamwork Receptiveness Inventory

	Component	
	1	2
Item 1	.769	-.233
Item 3	.742	.404
Item 4	.785	.146
Item 5	.731	-.304
Item 6	.751	-.405
Item 7	.771	-.233
Item 8	.683	.123
Item 9	.763	.123
Item 2	.422	.693
Eigenvalue	4.68	1.06
%Variance	51.96	11.78
Cum.%	51.96	63.74

Table C3

Descriptive Statistics for All Research Variables

	Mean	Std. Deviation	N
TRI	33.39	5.45	464
SD	7.04	3.31	455
IM	6.52	3.83	443
N	20.38	7.94	453
E	31.47	6.58	453
O	26.91	6.68	450
A	29.82	6.55	452
C	31.92	6.37	450
Q2	5.47	4.14	455
TPI	35.44	6.06	464

Note. TRI= Teamwork Receptiveness Inventory; SD= Self-Deceptive Enhancement subscale of the BIDR; IM= Impression Management subscale of the BIDR; N= Neuroticism scale from NEO-FFI; E= Extraversion scale from NEO-FFI; O= Openness scale from NEO-FFI; A= Agreeableness scale from NEO-FFI; C=Conscientiousness scale from NEO-FFI; Q2= Q2 scale from 16PF; TPI= Team Player Inventory

Vita

Matthew E. Fearington was born and raised in Winston-Salem, North Carolina. He received his Bachelor of Arts degree in Psychology from Wake Forest University in 1997. He went on to obtain a Master of Science degree in Community Counseling in 1999 from The University of North Carolina at Greensboro. In the fall of 1999, he moved to Tennessee to pursue a doctoral degree in Counseling Psychology from the University of Tennessee, Knoxville. He is currently a pre-doctoral intern at the Counseling and Psychological Services Center of Appalachian State University.

