

# Transformational Leadership: Relations to the Five-Factor Model and Team Performance in Typical and Maximum Contexts

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This study examined the 5-factor model of personality, transformational leadership, and team performance under conditions similar to typical and maximum performance contexts. Data were collected from 39 combat teams from an Asian military sample ( $N = 276$ ). Results found that neuroticism and agreeableness were negatively related to transformational leadership ratings. Team performance ratings correlated at only .18 across the typical and maximum contexts. Furthermore, transformational leadership related more strongly to team performance in the maximum rather than the typical context. Finally, transformational leadership fully mediated the relationship between leader personality and team performance in the maximum context but only partially mediated the relationship between leader personality and team performance in the typical context. The Discussion section focuses on how these findings, although interesting, need to be replicated with different designs, contexts, and measures.

Over the past 20 years, research on transformational leadership has become one of the dominant leadership theories in the organizational sciences (Judge & Bono, 2000). Although there are several reasons for this, perhaps one of the most important is that transformational leadership appears to be extremely important for modern work. For example, the growing number of mergers and acquisitions, globalization, and uncertainty with the stock market require leaders to not only exhibit confidence and direction but also instill motivation and commitment to organizational objectives. Numerous studies have found that followers' commitment, loyalty, satisfaction, and attachment are related to transformational leadership (Becker & Billings, 1993; Conger & Kanungo, 1988; Fullagar, McCoy, & Shull, 1992; Niehoff, Enz, & Grover, 1990; Pitman, 1993). Indeed, this has led researchers such as Bass (1998) to conclude that "transformational leadership at the top of the organization is likely to be needed for commitment to extend to the organization as a whole" (p. 19).

Despite the importance of transformational leadership in practice and the wealth of research on the topic, there are still many questions relating to the antecedents and consequences of transformational leaders. For example, only two studies have examined the dispositional basis of transformational leadership using the five

factor model (FFM; e.g., Judge & Bono, 2000; Ployhart, Lim, & Chan, 2001), and more research is needed to understand how personality is manifested in transformational leadership behaviors. Similarly, previous research examining the consequences of transformational leadership has been focused almost exclusively at the individual level (i.e., leader effectiveness). However, many have argued that leadership may have its most important consequences for teams and thus a focus on the team level is also important (Bass, Avolio, Jung, & Berson, 2003; Dvir, Eden, Avolio, & Shamir, 2002; Hogan, Curphy, & Hogan, 1994; Judge, Bono, Ilies, & Gerhardt, 2002). Further, research by Ployhart et al. (2001) suggests that transformational leadership may be most important for maximum performance contexts rather than for typical performance contexts.

The purpose of this study was to examine these neglected antecedents and consequences of transformational leadership. We first examine how leader personality, based on the FFM, relates to subordinate ratings of the leader's transformational behaviors. Second, we examine how transformational leadership relates to team performance assessed under typical and maximum performance contexts. Third, we assess whether transformational leadership fully or partially mediates the relationship between team performance and the FFM of personality. Thus, this study contributes to the research on transformational leadership by examining the FFM determinants of transformational leadership, examining how transformational leadership predicts team criteria, and determining whether the strength of prediction differs across typical and maximum performance contexts. This study therefore integrates and simultaneously tests the findings by Judge and Bono (2000) and Ployhart et al. (2001) by assessing the FFM determinants and the consequences of transformational leadership. Figure 1 provides an overview of the relationships examined in this study.

In the following section, we discuss the FFM antecedents of transformational leadership. Next, we examine the consequences

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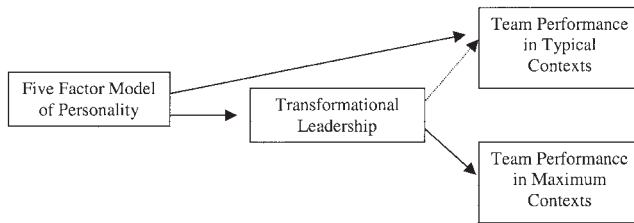


Figure 1. Proposed relationships among the variables. The dotted line indicates a posited weak relationship.

of transformational leadership for team performance in typical and maximum contexts.

### Transformational Leadership and the FFM of Personality

Much progress has been made in the field of leadership research. From the early work on a one-dimensional model of leadership (Katz, Maccoby, & Morse, 1950) to the two-dimensional model of initiating structure and consideration (Stogdill & Coons, 1957) to the recent transformational-charismatic leadership theory (e.g., Bass & Avolio, 1993; Conger & Kanungo, 1988; Shamir, House, & Arthur, 1993), the field has witnessed significant advances in theory development and empirical work. Despite the existence of numerous leadership theories and paradigms, it is safe to say that for the past two decades, transformational leadership theory has captured much of the research attention (Judge & Bono, 2000). The concept of transformational leadership can be traced back to Burns's (1978) qualitative classification of transactional and transformational political leaders, although it was the conceptual work by House (1977) and Bass (1981) that brought the concept of transformational leadership to the forefront of leadership research. Transformational leadership is often contrasted to transactional leadership. *Transactional leadership* is often depicted as contingent reinforcement; leader-subordinate relationships are based on a series of exchanges or bargains between the leader and the subordinate (Howell & Avolio, 1993). *Transformational leaders*, however, rise above the exchange relationships typical of transactional leadership by developing, intellectually stimulating, and inspiring subordinates to transcend their own self-interests for a higher collective purpose, mission, or vision (Howell & Avolio, 1993). We point out that one consequence of this perspective is a focus on unit-level interests beyond those of the individual person.

Transformational leadership consists of four constructs (Bass 1998): charisma or idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. A leader is charismatic if his or her followers seek to identify with the leader and emulate him or her. Transformational leaders motivate and inspire their followers by providing meaning and challenge to their work. Intellectually stimulating leadership aims to expand the followers' use of their potential and abilities. Finally, individually considerate leaders are attentive to their followers' needs for achievement and growth. These leaders act not only as superiors but also as coaches and mentors to their subordinates. In short, transformational leaders concentrate their efforts on longer term goals, emphasize their vision (and inspire subordinates to achieve the shared vision), and encourage their subordinates to take on greater responsibility for both subordinates' own development and

the development of others (Avolio, Bass, & Jung, 1999; Bass, 1985; Bycio, Hackett, & Allen, 1995; Howell & Avolio, 1993). They are also receptive to innovations and are likely to promote creativity in their subordinates (Avolio et al., 1999; Bass, 1985). Finally, they are more likely than transactional leaders to cater to individual followers' needs and competencies (Bycio et al., 1995; Howell & Avolio, 1993). In contrast, transactional leaders tend to focus on the short-term goals and needs of their followers because transactional leaders operate predominantly through an economic exchange model, as exemplified by path-goal theory (Koh, Steers, & Terborg, 1995).

Since the inception of the transformational leadership theory two decades ago, considerable empirical evidence has accumulated in support of the theory (Kirkpatrick & Locke, 1996). Despite this empirical support, questions remain as to what determines or predicts transformational leadership. Surprisingly little empirical evidence exists to answer this question. Although much theoretical work has been done linking personality to transformational leadership (e.g., Bass, 1998; Hogan et al., 1994; Stogdill, 1974), most research has used so many different types of traits that relationships obtained are difficult to comprehend or integrate (see Bass, 1998). However, organizing these findings around the FFM of personality allows researchers to have a common platform to examine the relationships between personality and transformational leadership. To our best knowledge, only one study thus far has directly linked the FFM of personality to transformational leadership. Judge and Bono (2000) found that Extroversion (corrected  $r = .28$ ) and Agreeableness (corrected  $r = .32$ ) positively predicted transformational leadership. Although Openness to New Experience correlated positively with transformational leadership, its effect attenuated once the influence of the other traits was controlled. Despite the small-to-moderate relationships found, Judge and Bono provided preliminary evidence that certain FFM traits may be related to transformational leadership. Clearly, more empirical research is necessary to help refine a theory linking the FFM of personality to transformational leadership.

Consistent with the results of Judge and Bono (2000), we predicted that extroversion, agreeableness, and openness to new experience would be positively related to transformational leadership. For example, we believed that extroversion should be related because of the dominance and expressive components of the trait, agreeableness should be related because individual consideration requires empathy (a key component of agreeableness), and openness should be related because of the need for creativity to intellectually stimulate subordinates (see Judge & Bono, 2000, for more detail). Although Judge and Bono failed to find the hypothesized negative relationship between neuroticism and transformational leadership in their study, given our military sample we believed that neuroticism would be negatively related to transformational leadership. As neuroticism is often associated with anxiousness, nervousness, low self-confidence, and low self-esteem (McCrae & Costa, 1991), military leaders high in neuroticism would not be able to exhibit transformational leadership given the nature of the military environment (i.e., a context inherently hazardous and often life threatening to both leaders and subordinates, thus requiring a strong command structure and leadership). Such a finding is consistent with the results of Ployhart et al.'s (2001), study, which found that leaders who were high in Neuroticism performed worse on leadership exercises than did leaders who

were low in Neuroticism. Finally, like Judge and Bono and Ployhart et al. (2001), we did not expect Conscientiousness to be related to transformational leadership. Our hypotheses were as follows:

*Hypothesis 1:* Extroversion will be positively related to transformational leadership behavior.

*Hypothesis 2:* Openness to new experiences will be positively related to transformational leadership behavior.

*Hypothesis 3:* Agreeableness will be positively related to transformational leadership behavior.

*Hypothesis 4:* Neuroticism will be negatively related to transformational leadership behavior.

### Transformational Leadership and Team Performance Under Typical and Maximum Contexts

One reason for the interest in transformational leadership is that it predicts a variety of important criteria. For example, a meta-analysis by Lowe, Kroeck, and Sivasubramaniam (1996) found that transformational leadership, aggregated across the four dimensions, was related to objective (corrected  $r = .30$ ) and subjective (corrected  $r = .73$ ) measures of leadership effectiveness. These relationships generalized across low-level (corrected  $r = .62$ ) and high-level leaders (corrected  $r = .63$ ) in organizations from both the private (corrected  $r = .53$ ) and public sectors (corrected  $r = .67$ ). Another meta-analysis found that transformational leadership correlated with leader effectiveness even when transformational leadership and effectiveness were independently measured (corrected  $r = .34$ ; Fuller, Patterson, Hester, & Stringer, 1996).

However, nearly all of the conceptual development and empirical work in transformational leadership research has been directed toward individual-level outcomes (e.g., individual satisfaction and performance). Little attention has been paid to the influence of a leader on group or organizational processes and outcomes (Conger, 1999; Yukl, 1999). In fact, a recent meta-analysis by Judge et al. (2002) did not find a single leadership study that had used group performance as the leadership effectiveness measure. Since then, only two empirical studies have linked transformational leadership to unit-level performance criteria. Bass et al. (2003) found that transformational leadership predicted unit performance in infantry teams, and Dvir et al. (2002) found that transformational leadership training resulted in better unit performance relative to groups that did not receive training. Thus, although many argue that leadership effectiveness should be assessed in terms of team or organizational effectiveness (e.g., Hogan et al., 1994), in reality most studies evaluate leadership effectiveness in terms of ratings provided by superiors, peers, or subordinates (Judge et al., 2002).

Obviously, this is a critical void in the leadership literature, despite the clear implications of transformational leadership for team-level outcomes. For example, the theory predicts that transformational leaders will inspire followers to transcend their own self-interests for a higher collective purpose (Howell & Avolio, 1993). Likewise, Bass (1998) hypothesized that transformational leadership fosters "a greater sense of a collective identity and collective efficacy" (p. 25). Transformational leaders are also instrumental for the development of important team processes such

as unit cohesion and team potency (Bass et al., 2003; Dvir et al., 2002; Guzzo, Yost, Campbell, & Shea, 1993; Sivasubramaniam, Murry, Avolio, & Jung, 2002; Sosik, Avolio, Kahai, & Jung, 1998; Sparks & Schenk, 2001). Given the instrumental role of transformational leadership to the development of important team processes, it is hardly surprising that teams with transformational leaders should outperform teams without such leaders (e.g., Dvir et al., 2002).

Theory and research must demonstrate links between transformational leadership and unit-level performance because without such empirical research we are forced to rely on findings at the individual level. This is a potentially dangerous practice, as research on levels of analysis (e.g., Klein, Dansereau, & Hall, 1994; Kozlowski & Klein, 2000; Rousseau, 1985) has shown that findings at one level of analysis cannot automatically be assumed to exist at a higher level of analysis. Similarly, in practice, leaders are expected to influence collective outcomes such as team performance and organizational effectiveness, and they are often held accountable for accomplishing such outcomes (Yammarino, Dansereau, & Kennedy, 2001). Clearly, for both theoretical and practical reasons, it is critical that transformational leadership be linked to team performance.

In the present study, we intend to provide some preliminary data on this issue by linking transformational leadership to team performance. On the basis of prior theory (e.g., Bass, 1985; Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996) and previous empirical findings (Bass et al., 2003; Dvir et al., 2002), we expected a positive relationship to exist.

Yet beyond this simple relationship, we examined the relationship between transformational leadership and team performance assessed under typical and maximum performance contexts. As noted by Sackett, Zedeck, and Fogli (1988), maximum performance contexts occur when the following conditions are satisfied: (a) One is aware that he or she is being evaluated, (b) the instructions to perform maximally on the task are accepted, and (c) the task is of relatively short duration so that the person can maximize effort. An important necessary condition to compare typical and maximum measures is that only the performance context changes; the content of the performance domain must remain the same.

Sackett and colleagues demonstrated the importance of this distinction at the individual level by showing that typical and maximum performance are different constructs and have different antecedents (DuBois, Sackett, Zedeck, & Fogli, 1993; Sackett et al., 1988; see also Ployhart et al., 2001). In this study, we do not claim to have direct measures of typical and maximum performance constructs, rather, we assessed team performance under typical and maximum performance contexts. As such, we proposed that teams face maximum performance contexts with the conditions of short time span, awareness of being evaluated, and acceptance of instructions to exert maximum effort being critical features of such maximum contexts (see Kozlowski et al., 1996). Common examples include SWAT teams, small unit combat teams, and even project teams responding to crises.

One implication of distinguishing between the two performance contexts is that the determinants and consequences of transformational leadership may likewise differ. Preliminary evidence supports this assertion, as Ployhart et al. (2001) found that the criterion-related validities of the FFM differed for both typical and maximum leadership performance measures in a military sample.

Openness to new experiences was predictive of transformational leadership performance in a maximum performance condition, neuroticism was most predictive of transformational leadership in a typical performance condition (having an adverse effect on performance), and extroversion was predictive of both. It is important to note that they found that the effect sizes tended to be stronger for maximum performance. However, they did not directly assess transformational leadership; they used ratings of transformational behaviors at the individual level. Thus, it is not known whether and how transformational leadership might relate differently to team performance in typical and maximum settings.

In this study, we extend these findings to propose that transformational leadership will be more predictive of team performance in maximum rather than typical performance contexts. This expectation is consistent with theory, as many of the reasons offered as requiring transformational leadership are inherently maximum performance unit-level phenomena (e.g., maintaining unit performance during a merger, military units in combat). For example, Bass (1985, 1988, 1998) has repeatedly argued the importance of transformational leadership to groups and organizations during periods of stress, crisis, instability, and turmoil. Indeed, transformational leadership makes a difference in these situations. First, transformational leaders, using inspirational motivation and individualized consideration behaviors, are able to reduce the stress experienced by followers by instilling a sense of optimism and collective efficacy (Bass, 1998). Second, transformational leaders, using idealized influence behaviors, can direct followers' attention to a superordinate goal and lead followers toward the resolution of the crisis (Bass, 1998). Third, transformational leaders, using intellectual stimulation behaviors, are able to break out from old rules and mind-sets and encourage their followers to do likewise by promoting an effective decision-making process whereby different ideas, opinions, and alternatives are freely articulated before the leader arrives at a decision (Atwater & Bass, 1994; Bass, 1990). On the basis of this theoretical reasoning, we proposed the following:

*Hypothesis 5:* Transformational leadership will be more predictive of team performance in maximum rather than typical performance contexts.

### Transformational Leadership as a Mediator Between the FFM and Team Performance

Thus far, we have discussed the antecedents and consequences of transformational leadership in a bivariate fashion. Yet as Figure 1 shows, the FFM, transformational leadership, and team performance are theoretically expected to relate to each other in a mediated multivariate model. Such a model is consistent with recent suggestions to develop process models linking personality to work outcomes (e.g., Barrick, Mount, & Judge, 2001).

Extending the logic outlined in the previous sections, we propose transformational leadership will fully mediate the relationship between the FFM and team performance in the maximum performance context but only partially mediate the relationship between the FFM and team performance in the typical context. We base these hypotheses on several lines of evidence. First, as noted previously, transformational leadership is expected to be most important in times of extreme time pressure, stress, and instabili-

ty—maximum performance conditions (e.g., Bass, 1988, 1998; Ployhart et al., 2001). In such conditions, transformational leadership should be the primary determinant of team performance. Second, transformational leadership will still be important under typical performance contexts but to a lesser extent than in maximum performance contexts, and the more mundane nature of typical performance will allow personality to also be important. This is based on previous theory and research arguing that personality is a stronger predictor of typical performance because the personality-based behaviors of effort and choice are more constrained in maximum performance contexts. In contrast, the long time periods involved with performance in typical contexts allow individual differences in effort and choice to more strongly manifest themselves and thus personality determines performance (e.g., Cronbach, 1949, 1960; DuBois et al., 1993; Ployhart et al., 2001; Sackett et al., 1988).

*Hypothesis 6:* Transformational leadership will fully mediate the relationship between leader personality (in terms of the FFM) and team performance in maximum contexts.

*Hypothesis 7:* Transformational leadership will partially mediate the relationship between leader personality (in terms of the FFM) and team performance in typical contexts.

## Method

### Sample

The sample comprised participants from the Singapore Armed Forces: (a) 39 team leaders, (b) 202 followers, (c) 20 superiors of these combat teams, and (d) 15 assessment center assessors. Hence, in total, 276 military personnel participated in the study. The team leaders and soldiers constituted 39 combat teams. These were intact teams going through training; team leaders and team members had originally been randomly assigned to form these teams according to standard military practice. These combat teams had been training together for nearly 3 months prior to the commencement of the study. The size of these teams varied from 4 to 7 members with a mean of 5 members. These participants were all men who were enlisted for compulsory National Service. Their age ranged from 18 to 23 years ( $M = 19.3$ ,  $SD = 1.04$ ). The racial composition of the sample mirrored the general population, which is predominantly Chinese.

Team performance was measured by ratings from various sources (superiors and assessment center assessors) under maximum and typical performance contexts. Team performance measures under the typical performance context were obtained via supervisory ratings near the end of the team training. As described by Sackett et al. (1988), these performance measures are similar to performance appraisal ratings in organizations in that they assess performance over a longer time period. However, team performance measures under the maximum performance context were obtained during a 1-day assessment conducted to evaluate the combat proficiency of the team. We note that there was no overlap between raters providing performance ratings across the two conditions. Further, no raters knew the team members, because the raters came from other military units (a brief survey administered post hoc to six assessors and four supervisors supported these expectations). Whereas we cannot definitively equate these two sets of performance measures as reflecting latent typical performance and maximum performance constructs (a point we return to in the *Limitations and Directions for Future Research* section), the fact that the ratings were obtained under two very different measurement contexts is consistent with the requirements for typical and maximum performance conditions (e.g., Sackett et al., 1988). That is, participants were fully aware that the assessment center was an evaluative context, they were given



explicit instructions to maximize their performance, and the assessment center took place over a short period of time (i.e., 1 day).

### Procedure

Participants were team members of intact military teams undergoing military training. Leaders and team members were originally randomly assigned to form these teams by the unit commanders. Approximately 10 weeks into the training, leaders completed a measure of the FFM of personality and their subordinates' ratings of the leaders' transformational leadership were obtained through a survey administered by one of the primary researchers and several assistants. Given the highly intensive and interactive time subordinates spent with their leaders, followers should have had sufficient opportunity to observe and thus provide accurate ratings of transformational leadership. Approximately 3 weeks later, supervisors' ratings of the teams' training performance were collected. These ratings of the teams over the 3-month training course are reflective of performance under more typical conditions. The teams were trained to perform basic military tasks such as capturing an enemy observation post or laying an ambush. At approximately the same time, an assessment center designed to evaluate the combat proficiency of the combat team was used to obtain measures of the team's performance in maximum performance contexts. Different sets of evaluators were used to provide typical and maximum performance measures. Given that different sources completed the various measures, same-source bias was less of an issue in this study, although this does not eliminate other potential sources of shared contamination between the ratings (an issue we address more fully in the *Limitations and Directions for Future Research* section). Prior to the data collection, we checked with the unit commanders to ensure that these combat teams were being trained and evaluated in accordance with the stipulated training doctrine.

### Measures

**Leader personality.** The personality of the leaders was measured using the International Personality Item Pool (IPIP) developed by Goldberg (1998, 1999). The IPIP is a broad-bandwidth, public domain personality inventory that directly measures the FFM. It was developed as part of an international development program (e.g., Hofstee, de Raad, & Goldberg, 1992). Although items were also developed to measure facets, we did not collect these data, as Judge and Bono (2000) found that the specific facets of the FFM predict transformational leadership less well than do the general factors. The IPIP instrument is a 50-item measure with 10 items for each factor of the FFM (i.e., extroversion, agreeableness, conscientiousness, neuroticism, and openness to new experience). In this study, we found the following alpha reliabilities: .77, .74, .72, .82, and .80, respectively. These reliabilities are similar to those of Ployhart et al. (2001): .80, .67, .75, .83, and .77, respectively. Each item was assessed using a 5-point scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*), and each factor was scored such that higher numbers indicate greater quantities of the trait.

**Transformational leadership.** Transformational leadership of the military leaders was measured using the 36-item Multifactor Leadership Questionnaire (MLQ Form 5X; Avolio, Bass, & Jung, 1999). Followers described their leader using a frequency scale ranging from 1 (*not at all*) to 5 (*frequently, if not always*). The MLQ Form 5X uses a 0- to 4-point rating scale; we used a 1- to 5-point scale in this study to be consistent with existing military answer sheets. However, the items and anchors for our rating scale were identical to those from the MLQ, thus the change in scale is a straightforward linear transformation. Furthermore, raters should have used the rating scales in an equivalent manner because considerable research suggests that it is rater training and not the rating format that most influences rating variance (for reviews, see Landy & Farr, 1980; see Murphy & Cleveland, 1995). The five scales used to measure transformational leadership were: charisma-idealized influence (attributed),

charisma-idealized influence (behavior), inspirational motivation, intellectual stimulation, and individualized consideration. Similar to previous research (Judge & Bono, 2000), we combined these dimensions into an overall measure of transformational leadership. The internal consistency reliability of the overall transformational leadership scale was .88. To justify aggregation, we calculated intraclass correlation coefficients (ICCs<sub>1</sub>; Ostroff & Schmitt, 1993). In the present study, the ICC<sub>1</sub> was .22 ( $p < .05$ ). Past research has used ICC<sub>1</sub> levels ranging from .12 (James, 1982) to .20 (Ostroff & Schmitt, 1993) to justify aggregation. Hence, given the high level of ICC<sub>1</sub>, aggregating followers' transformational leadership scores to reflect the transformational leadership of the team leader is statistically justified.

### Team Performance in Typical Contexts

Supervisors' ratings of team training performance were obtained near the end of the team training. Five supervisors provided performance ratings for each team. As these supervisors were directly involved in the training of these teams, they had ample opportunity to observe the teams in action. Supervisors were asked to rate the team's performance on two dimensions: the efficiency of the team actions and the quality of the team actions. That is, supervisors rated the team's effectiveness and efficiency in learning and in practicing for the military exercises that were later evaluated in the assessment center (i.e., maximum performance condition). Supervisors were instructed not to base their assessments on the team's performance in day-to-day garrison activities (e.g., guard duty, physical fitness training, administration) but to focus on the behaviors associated only with the training program (e.g., actions taken to secure a critical road junction for friendly forces). Therefore, the performance measures across the two contexts tapped the same performance domains at the same level of specificity (e.g., Sackett et al., 1988). Each of these two items was rated on a 5-point Likert-type scale, ranging from 1 (low) to 5 (high), in which higher scores reflect higher efficiency or higher quality of team actions. As these two scores were highly correlated ( $r = .72$ ), we decided to average them to form a composite team performance score. Given that the ICC<sub>1</sub> = .35 ( $p < .05$ ) and ICC<sub>2</sub> = .85, we averaged the scores across raters to form an overall typical team performance rating for each team.

### Team Performance in Maximum Contexts

These ratings were collected during a 1-day assessment center conducted at the end of the team training to evaluate the combat proficiency of the team. One external assessor was randomly assigned to evaluate the performance of the team over a series of six military tasks (e.g., the team may be tasked by headquarters to evacuate a casualty from one place to another); these tasks comprehensively summarized the types of tasks performed as part of the team training. The assessor used a 5-point Likert-type scale to evaluate the efficiency and the quality of team actions on each of the tasks. As there was only one assessor per team, interrater reliability was not available; however, the intertask reliability for the efficiency measure was .90 and the intertask reliability for the quality of team actions was .87. As with the ratings collected under the typical performance context, both of these measures were highly correlated ( $r = .67$ ,  $p < .01$ ) and a composite team performance measure was created.

### Content Equivalence of the Performance Ratings

To ensure that the content and specificity of the performance measures were sufficiently similar across the two performance contexts, we asked 10 subject-matter experts (SMEs) with extensive experience in training and evaluating this type of combat team to respond to a 10-item survey. The survey sought their opinions about the overlap of the performance domains being assessed by the supervisors and the assessors under the two performance conditions. As shown in Table 1, the responses from these SMEs

Table 1  
*Responses From 10 Subject Matter Experts on the Performance Content Survey*

Question	<i>M</i>	<i>SD</i>
1. To what extent does the Assessment Center reflect the knowledge, skills, abilities, and tasks acquired during the team training?	5.3	0.48
2. To what extent does team performance (rated at the end of the team training phase) reflect the knowledge, skills, abilities, and tasks required during the team training?	5.0	0.47
3. To what extent is the content of the Assessment Center similar to the content of the team training?	5.3	0.67
4. To what extent does the team performance rated in the team training phase tap the same performance domain as the team performance rated in the Assessment Center?	5.2	0.63
5. To what extent do the ratings from the Assessment Center and the ratings from the team training phase tap the same dimensions of performance?	5.1	0.88
6. To what extent are the team training objectives similar to the performance criteria used in the Assessment Center?	4.7	0.67
7. To what extent are the team training objectives similar to the performance ratings used in the team training phase?	5.3	0.48
8. To what extent are the team tasks (e.g., quick attack) performed in the Assessment Center similar to the team tasks learned in team training?	5.5	0.53
9. To what extent are the behaviors (e.g., fire and movement) exhibited in the Assessment Center similar to the behaviors exhibited during team training?	5.3	0.48
10. Yes or no: Does the Assessment Center measure the same content, tasks, knowledge, skills, abilities, and other characteristics as the team training?	Yes 10	No 0

*Note.*  $n = 10$ . These experts do not use the term *performance ratings in typical contexts*; rather, in the language of this organization, such ratings are known as *team performance rated in the team training phase*. We therefore used the language familiar to these experts to refer to the performance measures across both contexts. Response scale: 1 = *To no extent*, 2 = *To a limited extent*, 3 = *To some extent*, 4 = *To a considerable extent*, 5 = *To a great extent*, 6 = *Perfectly*.

demonstrated that the performance domains assessed by the supervisors and the assessors were highly similar in terms of content. The mean response from these SMEs on the 10-item survey was 5.2 on a 6-point scale, indicating that these raters believed the overlap between the two performance measures was present to at least a *great extent*. This information, coupled with the fact that raters were instructed to consider only team behaviors associated with the content of the training and that the same performance dimensions and response scales were used for both conditions, suggests that the performance ratings assessed the same performance domain with the same degree of specificity. Thus, the ratings obtained under the two contexts differed in terms of the performance demands placed on the team (typical or maximum) and perhaps also differed in the knowledge that the raters had about the teams and the leaders (a point we return to in the *Limitations and Directions for Future Research* section).

## Results

### *Power Analysis and Data*

In contrast with research at the individual level of analysis, the difficulty of collecting data from large samples of intact teams usually results in smaller sample sizes. For instance, Liden et al. (1999) analyzed 41 work groups and Marks, Sabella, Burke, and Zaccaro (2002) analyzed 45 teams. Indeed, S. G. Cohen and Bailey (1997) reported that the average number of teams in project-team research (the type of teams most similar to those in the present study) averaged only 45 per study. Such is the case in this study, making a careful consideration of power,  $p$  values and effect size important.

A power analysis shows that given a sample size of 39 teams, there is only a 59% chance of detecting moderate effects at  $p < .05$  (one-tailed; J. Cohen, 1988). However, with a one-tailed test and

$p < .10$ , power becomes 73%. Hence, we considered values with  $p < .10$  (one-tailed) to be statistically significant instead of  $p < .05$  (one-tailed) because of the low statistical power arising from small sample size (however, if values are less than  $p < .05$ , we report the lower  $p$  value). Because we hypothesized a specific direction for our hypothesis tests, a one-tailed test is appropriate (J. Cohen & Cohen, 1983). In light of recent recommendations (e.g., Wilkinson & the Task Force on Statistical Inference, 1999) and to help better interpret the magnitude of these effects, we also report 90% confidence intervals (CIs) around each of our hypothesis tests. Thus, by presenting effect sizes,  $p$  values, and CIs, we feel that readers should best be able to determine the importance of the effects and tests we report.

A different concern, perhaps more important with smaller sample sizes, is the presence of outliers and extreme cases. To ensure that the results were not biased by extreme cases, we examined the distributions of the variables in terms of skewness and kurtosis (zero represents perfectly normal distributions, skewness  $> \pm 3$  and kurtosis  $> \pm 7$  are indicative of nonnormal distributions; see West, Finch, & Curran, 1995). None of the measures were nonnormal, with openness to new experiences showing the largest deviation from normality (skewness =  $-1.27$ , kurtosis =  $4.37$ ) but still falling well within the range of appropriate normality.

### *Performance Ratings Across Typical and Maximum Contexts*

Table 2 shows the means, standard deviations, and correlations for all measures. As reflected in Table 2, the low correlation

Table 2  
Leader and Team Descriptive Statistics for All Measures

Measures	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Extroversion	2.97	0.70	—							
2. Conscientiousness	3.55	0.58	.15	—						
3. Neuroticism	2.97	0.65	-.63*	-.04	—					
4. Openness to experience	3.35	0.62	.42*	.45*	-.32*	—				
5. Agreeableness	3.84	0.62	.22*	.21*	-.04	.58*	—			
6. Transformational leadership	2.35	0.55	.31*	-.09	-.39*	-.08	-.29*	—		
7. Maximum-like team performance	3.87	1.04	.11	-.05	-.13	-.31*	-.21*	.60*	—	
8. Typical-like team performance	3.52	0.46	.50*	.18	-.56*	.37*	.28*	.32*	.18	—

Note.  $n = 39$  (leaders and teams).

\*  $p < .10$ , one-tailed.

between the team performance measures across the typical and maximum performance contexts ( $r = .18$ , *ns*) suggests that the ratings from these contexts are not interchangeable.

### Hypotheses

Hypotheses 1–4 predicted that extroversion (Hypothesis 1), openness to new experiences (Hypothesis 2), and agreeableness (Hypothesis 3) would be positively related to transformational leadership, whereas neuroticism (Hypothesis 4) would be negatively related. As shown in the last row of Table 2, transformational leadership is positively related to extroversion ( $r = .31$ ,  $p < .05$ , CIs = .04, .53) but negatively related to both neuroticism ( $r = -.39$ ,  $p < .05$ , CIs = -.59, -.14) and agreeableness ( $r = -.29$ ,  $p < .05$ , CIs = -.52, -.03). Transformational leadership was not significantly related to openness to experience nor to conscientiousness. Hence Hypotheses 1 and 4 were supported whereas Hypotheses 2 and 3 were not. Although the relationship between transformational leadership and agreeableness was significant, it was in the opposite direction as hypothesized.

In line with Murphy's (1996) recommendation that personality be examined using a multivariate framework, we also conducted a multiple regression analysis in which transformational leadership was regressed on all of the FFM constructs. As shown in Table 3, the overall model comprising the five personality factors was significant, explaining 28% of the variance in transformational leadership ratings,  $F(5, 33) = 2.59$ ,  $p < .05$ . However, only neuroticism ( $\beta = -.29$ ,  $p < .10$ , CIs = -.57, -.01) and agreeable-

ness ( $\beta = -.30$ ,  $p < .10$ , CIs = -.58, -.02) were significant predictors at  $p < .10$  (one-tailed).

Next, Hypothesis 5 predicted that transformational leadership would be more predictive of team performance in maximum rather than in typical performance contexts. As Table 2 shows, transformational leadership was significantly related to team performance in both typical contexts ( $r = .32$ ,  $p < .05$ , CIs = .06, .54) and maximum contexts ( $r = .60$ ,  $p < .05$ , CIs = .40, .75). The formula proposed by Williams (1959) and Steiger (1980) was used to test for the difference between two nonindependent correlations. We found these correlations to be significantly different,  $t(36) = 1.63$ ,  $p < .10$  (one-tailed), although the CIs overlapped slightly. Thus, we concluded that the relationship between transformational leadership and team performance was significantly stronger in the maximum context than in the typical context, supporting Hypothesis 5.

### Mediation Hypotheses

We examined transformational leadership as a mediator of the relationship between leader personality (i.e., the FFM) and team performance using a procedure outlined by Baron and Kenny (1986). Hypothesis 6 predicted that transformational leadership would fully mediate the relationship between the FFM and team performance in maximum contexts, whereas Hypothesis 7 predicted that transformational leadership would partially mediate the relationship between the FFM and team performance in typical contexts. To test transformational leadership as a mediator, we first examined whether the FFM accounted for significant variance in transformational leadership and both team performance measures and whether transformational leadership was related to both team performance measures. If these regression models were statistically significant, we could then examine the effects of the FFM on both team performance measures after controlling for transformational leadership.

Results from the multiple regression analyses show that the FFM explained significant variability in transformational leadership,  $R^2 = .28$ ,  $F(5, 33) = 2.59$ ,  $p < .05$  (one-tailed), team performance in typical contexts,  $R^2 = .41$ ,  $F(5, 33) = 4.50$ ,  $p < .05$  (one-tailed), and team performance in maximum contexts,  $R^2 = .20$ ,  $F(5, 33) = 1.62$ ,  $p < .10$  (one-tailed). These findings indicate that the FFM is associated with transformational leadership and both team performance measures.

Table 3  
Regression for the Five-Factor Model on Transformational Leadership

Variable	Transformational leadership	
	$\beta$	Overall $R^2$
Extroversion	.24	
Neuroticism	-.29*	
Conscientiousness	-.04	
Openness to experience	-.07	
Agreeableness	-.30*	
		.28**

Note.  $n = 39$  (leaders and teams).

\*  $p < .10$ , one-tailed. \*\*  $p < .05$ , one-tailed.

To test for mediation, we entered the FFM into the regression equation after controlling for transformational leadership. The FFM did not produce a significant increment in variance for predicting team performance in maximum contexts,  $\Delta R^2 = .12$ ,  $\Delta F(5, 31) = 1.42$ , *ns*. However, the FFM accounted for significant incremental variance in predicting team performance in typical contexts after controlling for transformational leadership,  $\Delta R^2 = .34$ ,  $\Delta F(5, 31) = 3.87$ ,  $p < .05$ . Hence, both Hypotheses 6 and 7 are supported. That is, transformational leadership fully mediated the relationship between the FFM and team performance in the maximum performance context but only partially mediated the relationship between the FFM and team performance in the typical performance context. One must keep in mind that this finding is primarily due to the fact that the relationship between the FFM model and performance in the typical context was about twice as strong as it was in the maximum context, whereas the relationship between transformational leadership and performance was about twice as strong in the maximum context as it was in the typical context.

### Discussion

The purpose of this study was to examine the antecedents and consequences of transformational leadership. Four of the FFM of personality constructs were hypothesized as being antecedents of transformational leadership, and the consequences of transformational leadership were expected to occur for team performance across typical and maximum performance contexts, but more strongly for the latter. The results suggest that transformational leadership is positively related to extroversion, and negatively related to agreeableness and neuroticism, although in a multiple regression only neuroticism and agreeableness were predictive. The results also show that transformational leadership has important consequences for team performance, but the magnitude of these relationships is dependent on whether performance is assessed in typical or maximum contexts. In particular, transformational leadership appears to be more predictive of team performance in maximum contexts. In addition, we found that transformational leadership fully mediated the relationship between the FFM and team performance in maximum contexts whereas it only partially mediated the relationship between FFM and team performance in typical contexts. We now describe these major findings in more detail.

### Major Findings

Consistent with our bivariate hypotheses, extroversion was positively related to transformational leadership and neuroticism was negatively related. Contrary to our hypotheses, openness was unrelated to transformational leadership, and the significant effect for agreeableness was negative and opposite to our prediction. The multivariate analyses found that only extroversion and agreeableness were significantly related to transformational leadership.

Comparing our multivariate effects with the multivariate findings of Judge and Bono (2000) shows both similarities and differences (we compared the multivariate models rather than the bivariate effects because in practice, these various traits influence behavior in combination; Murphy, 1996). Both studies found effects for agreeableness, and no effects for conscientiousness and

openness to new experience. Yet this study found that the effect for agreeableness was negative, whereas Judge and Bono (2000) found that the effect for agreeableness was positive. In other words, the more agreeable military leaders were rated as less transformational by their followers. Another area of difference with Judge and Bono is that this study found a significant effect for neuroticism whereas they found a significant effect for extroversion.

The differences between our study and Judge and Bono's (2000) study may exist because of the nature of our sample, which was primarily young and entirely male (a point we return to shortly). Alternatively, they might suggest the existence of moderators on the relationship between personality and transformational leadership, specifically setting (military vs. civilian). For example, military samples were used in both Ployhart et al.'s (2001) study and the present study, and both found that neuroticism and agreeableness had an adverse effect on transformational leadership. In contrast, the Judge and Bono sample consisted of business leaders and found no effect for neuroticism and a positive effect for agreeableness. Compared with business leaders, military personnel often have to work under hazardous and life-threatening situations, hence the ability to remain calm, secure, and nonanxious is critical. Followers will often look to them for direction and leadership in these critical times; perhaps under such conditions being agreeable does not contribute to perceptions of effective leadership (e.g., followers may want direction in crisis situations). Future research is necessary to determine whether context truly acts as a moderator of the personality-transformational leadership relationship.

With respect to the team performance measures, we found that the correlation between team performance assessed in typical and maximum contexts was small and nonsignificant, a finding consistent with research conducted at the individual level (e.g., DuBois et al., 1993; Ployhart et al., 2001; Sackett et al., 1988). The consequence of this distinction at the team level can be seen when examining relations to leadership, as transformational leadership was more predictive of team performance when it was assessed in maximum performance contexts. Whereas it may be too early to draw any definitive conclusions given the small sample size and potential limitations of the design (discussed below), future research linking transformational leadership to team performance might consider this distinction. Previous research has found that transformational leaders are capable of developing important team processes (e.g., unit cohesion, team potency, collective efficacy, organizational trust and commitment, a sense of higher purpose or shared vision; Bass et al., 2003; Shamir et al., 1993); we speculate that the consequences of these team processes may matter most in maximum performance conditions. More empirical research using tighter designs is definitely needed to test this hypothesis.

The finding that transformational leadership fully mediated the relationship between the FFM and team performance assessed in maximum contexts but only partially mediated the relationships between the FFM and team performance assessed in typical contexts is consistent with the hypothesis that typical predictors (such as personality) are more strongly related to typical performance measures than they are to maximum performance measures (Cronbach, 1949, 1960; DuBois et al., 1993; Sackett et al., 1988). This difference is due to the fact that individual differences in personality primarily manifest themselves in typical performance contexts; in maximum performance contexts, effort and choice are



more constant across people (Cronbach, 1949, 1960). This was found in our data because the relationship between the FFM and performance in the typical context was about twice as large as the relationship between the FFM and performance in the maximum context. Transformational leadership showed the opposite pattern, with the effect size being greater in the maximum than in the typical context. These findings suggest that transformational leadership may become more critical in maximum performance contexts and may have several implications for both transformational leadership and personality research. For example, there may be a greater need to evaluate leadership performance in light of team performance. If effective leadership is hypothesized to ultimately improve team effectiveness, then team performance across different contexts may provide an additional criterion construct that may be used for leader selection, training, and development.

### *Limitations and Directions for Future Research*

Like any field study, there are a number of potential issues we could not control that may influence the interpretation of our findings. Readers should be mindful of these alternative explanations because they must be carefully considered in the design of any future research. Indeed, future theory building will be dependent on researchers adopting more stringent methods and designs that address the limitations noted here. One of the most pressing issues is for future research to eliminate the potential contamination present among the various ratings. Despite the fact that several sources of ratings were used (e.g., supervisor, followers), these ratings may be contaminated to various degrees by different sources of information or common sources of information, ultimately making it difficult to cleanly demonstrate causal relationships. These are important concerns, and we discuss them in some detail.

First, it is impossible to definitively conclude that the team performance measures collected under the typical and maximum performance contexts represent typical and maximum performance constructs. Although our results may be consistent with this hypothesis, an alternative explanation is that raters differed in the type and amount of information they had for each leader and team in each context. For example, assessors were able to observe the teams and leaders only during the 1-day exercise and thus could use only this on-task information to make their ratings. Alternatively, raters providing ratings in the typical condition were with the teams and leaders for several weeks and could have been influenced (whether consciously or not) by nontask information (e.g., the personality of the leader, how well they got along with the team) despite the presence of rater training. Thus, as noted by an anonymous reviewer, an alternative explanation of these findings is that differences in raters' implicit theories of leadership accounted for the findings and not differences due to typical and maximum performance. It is also possible that differences in the reliability for the two sets of ratings partly explain our findings. For these reasons, it is important to realize that our results and theoretical implications speak only to there being a distinction between the two performance conditions; they do not provide strong evidence as to why the differences exist.

This is clearly an important area for future research, as studies should measure the relevant explanatory constructs (e.g., liking) to rule out this alternative explanation. Such research would contrib-

ute to a better understanding of the features and conditions underlying typical and maximum performance constructs. Although the three conditions proposed by Sackett et al. (1988) have helped stimulate research on this topic, they may be in need of further refinement. Research must begin to assess what are essentially manipulation checks to distinguish between the two conditions (e.g., assess perceptions of effort, instruction acceptance, duration; assessor biases and perceptions). With that said, the present study may still have implications for practice, as finding a difference between the two contexts has consequences for how organizations should use the two types of performance measures. Regardless of whether the difference is explained by differences in the performance construct or differences in raters' implicit theories of performance, organizations that assess performance in typical and maximum conditions must realize that these measures may not be interchangeable. For example, the practical question facing the organization examined in this study is which type of rating is most useful for different administrative purposes (e.g., assessment or validation, performance appraisal, development, promotion). In addition, theoretical and empirical work on typical versus maximum performance should be conducted at the team level of analysis, given their increasing frequency in organizations (Devine, Clayton, Philips, Dunford, & Melner, 1999).

A second and equally important issue relating to contamination concerns the followers' ratings of transformational leadership. As noted by an anonymous reviewer, follower ratings of transformational leadership may have been affected by the team's performance in the stressful training exercises held during the first few weeks of training, and this may account for the large (.60) relationship between transformational leadership and team performance in maximum contexts. That is, the success of the team in challenging contexts may have led followers to rate their leader as more transformational, thus there is a shared source of variance contributing to the relationship between transformational leadership and team performance. To the extent this contamination exists, it decreases our ability to make inferences of how much transformational leadership causes (or at least predicts) team performance.

A related concern is the potential for informal communication among the various sources that could contribute to common variance among the correlations. This is not method bias in the traditional sense but is the potential for common information about the quality of the unit to be known by assessors, supervisors, and followers. We noted earlier that assessors and followers were from different units, assessors were not aware of how the teams were performing in the training, and supervisors were not familiar with how their teams performed in the assessment exercises. Our post hoc survey of supervisors and assessors supported these expectations, but the fact remains that some informal means of communicating team quality may have occurred.

Such concerns with contamination among the ratings must be addressed in future research for stronger causal relationships to be theoretically supported. For example, Kozlowski, Chao, and Morrison (1998) and Murphy and Cleveland (1995) reviewed evidence showing that the provision of ratings for administrative purposes is largely a political process. In contrast, ratings collected for research-only purposes may often show better psychometric properties. Future research might therefore implement a formal research-only design whereby the ratings are completely anony-

mous and confidential. Likewise, ratings may be supplemented with other sources of performance information (e.g., objective or administrative indices) to help understand the construct validity of the ratings. Finally, quasi-experimental designs such as the one used by Dvir et al. (2002) would be most helpful in establishing stronger inferences of causality.

A third limitation is the relatively small sample size. Although more than 276 military personnel participated in this study, as the unit of analysis is at the team and leader level, this reduced the sample size to 39 teams and leaders. To some extent, this is the reality of team research in the field (e.g., S. G. Cohen & Bailey, 1997). However, our sample was also unique in that the participants were primarily young and entirely male. One implication of these realities is that effect sizes may be different in other contexts and settings. An important avenue for future research will be to replicate and extend this study using different samples (military or business), cultures, measures, designs, and contexts.

A fourth limitation is that we did not examine any team process variables in this study, thus there is no way to determine why and how transformational leadership is related to team performance across the two contexts. Future research should include team process variables so that important mediators of the relationship between transformational leadership and team performance can be determined (e.g., Bass et al., 2003). Such mediated models also help establish stronger inferences of the causal sequence of psychological processes. Our prediction is that the mediators may be somewhat different across typical and maximum performance contexts, or at least the effect sizes of these mediating processes will be relatively different. An interesting question for future research is that whereas transformational leaders are capable of developing important team processes, the incremental value of these team processes will be brought to bear only when teams must perform in maximum conditions.

A final potential limitation regarding transformational leadership is that although we used the group mean as an indicator of the team leader's transformational leadership, the dispersion of team members' leadership ratings (operationalized in terms of standard deviation or  $R_{wg}$ ) may in and of itself be an important reflection of team alignment. Indeed, Bliese and Halverson (1998) found that group consensus about leadership is related to important psychological well-being. Future research should explore this issue further, perhaps in conjunction with mediating processes.

## Conclusions

In today's dynamic workplace, organizations must increasingly contend with varying degrees of uncertainty for such reasons as mergers and acquisitions, global competition, and changes in the economy and the stock market. It is in such times that transformational leadership is critically needed to lead these organizations out of uncertainty. This study attempts to fill several important voids in the transformational leadership literature by examining the potential dispositional antecedents of transformational leadership and the consequences of transformational leadership on collective performance under typical and maximum performance contexts. We found that transformational leadership appears to be more critical for team performance under a maximum performance context than a typical performance context. Future research should address the limitations present in this field study to help build

theories linking transformational leadership to collective performance in typical and maximum contexts. A quote from Bass (1998) elegantly captures the essence of transformational leadership and our findings: "To be effective in crisis conditions, the leaders must be transformational . . . transforming crises into challenges" (p. 42, 45). Future leadership research likewise needs to transform our understanding of individual-level process in typical performance contexts to multilevel process in typical and maximum performance contexts.

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