ARI Research Note 2004-10

Development of a Conditional Reasoning Measure of Team Orientation

Patrick Gavan O'Shea
American Institutes for Research

James E. Driskell
Florida Maxima Corporation

Gerald F. Goodwin and Michelle L. Zbylut
U.S. Army Research Institute

Stephanie M. Weiss
American Institutes for Research

Leader Development Research Unit
Stanley M. Halpin, Chief

September 2004

U.S. Army Research Institute
for the Behavioral and Social Sciences

U.S. Army Research Institute
for the Behavioral And Social Sciences

A Directorate of the U.S. Army Human Resources Command

ZITA M. SIMUTIS
Director

Research accomplished under contract
for the Department of the Army

American Institutes for Research

Technical Review by

Trueman R. Tremble, U.S. Army Research Institute

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REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy)	2. REPORT TYPE	3. DATES COVERED (from. . . to)
September 2004	Final	Sept 30, 2001-Sept 29, 2003

4. TITLE AND SUBTITLE	5a. CONTRACT OR GRANT NUMBER
Development of a Conditional Reasoning Measure of Team Orientation	DASW01-01-C-0034
	5b. PROGRAM ELEMENT NUMBER 665801
6. AUTHOR(S) Patrick Gavan O'Shea (American Institutes for Research), James E. Driskell (Florida Maxima Corporation), Gerald F. Goodwin and Michelle L. Zbylut (U.S. Army Research Institute), and Stephanie M. Weiss (American Institutes for Research)	5c. PROJECT NUMBER MM15
	5d. TASK NUMBER 269
	5e. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) American Institutes for Research 1000 Thomas Jefferson Street, NW Washington, DC 20007-3835	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U. S. Army Research Institute for the Behavioral & Social Sciences ATTN: DAPE-ARI-IK 2511 Jefferson Davis Highway Arlington, VA 22202-3926	10. MONITOR ACRONYM ARI
	11. MONITOR REPORT NUMBER

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited

13. SUPPLEMENTARY NOTES

STTR Phase II. Sharon Ardison (COR)
Subject Matter POC: Sharon Ardison

14. ABSTRACT *(Maximum 200 words)*:

This paper describes a two-year effort to develop a measure of personality-based team orientation using conditional reasoning (CR). A model of team orientation is proposed and the conditional reasoning testing methodology is reviewed. This paper recounts the test development and validation efforts surrounding two CR tests. Although validation efforts indicated that the tests did not achieve acceptable validity and reliability coefficients, individuals who wish to construct CR tests may find the section of "lessons learned" to be particularly helpful.

15. SUBJECT TERMS

Conditional Reasoning, Testing, Selection, Measurement, Personality, Teams, Commitment

SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON
16. REPORT	17. ABSTRACT	18. THIS PAGE			Ellen Kinzer
Unclassified	Unclassified	Unclassified	Unlimited	133	Technical Publication Specialist 703-602-8047

ACKNOWLEDGEMENTS

The significant contributions of a number of individuals to this project warrant mention.

Sharon Ardison, Trueman Tremble, and Peter Legree from the U.S. Army Research Institute contributed to the conceptual work that supported the initial development and subsequent revisions of the conditional reasoning measure, and both Sharon and Trueman provided invaluable facilitation and guidance during our data collection efforts at Forts Stewart, Leonard Wood, Lewis, and Drum. Tonia Heffner also provided helpful counsel concerning the measurement of the specific commitment foci and bases in Study 4.

The theoretical contributions of Eduardo Salas at the University of Central Florida helped us to develop a clear articulation of the team-oriented constructs we have attempted to measure in our research. Moreover, Ed has supervised the data collection efforts conducted at UCF. Katherine Wilson, Kevin Stagl, and Heather Priest, also from UCF, played critical support- and coordination-oriented roles during the data collections conducted at UCF and at the forts noted above. Lily Clark from AIR also provided much needed assistance during our data collection trips.

Two members of the project team from AIR also deserve our thanks: Sigrid Gustafson for her methodological contributions and item development efforts and David Baker for his theoretical and conceptual contributions to the project.

Finally, we offer our gratitude to the POCs (SFC Rivera at Fort Lewis, SFC Gaddy at Fort Stewart, SSG Lattin at Fort Leonard Wood, and SFC West at Ft. Drum) whose efforts allowed us to effectively coordinate and supervise the data collections involving army personnel.

DEVELOPMENT OF A CONDITIONAL REASONING MEASURE OF TEAM ORIENTATION

EXECUTIVE SUMMARY

Research Requirement:

As the military evolves into a lighter, more deployable force, its traditional reliance on teams to perform vital missions will become even more pronounced. Consequently, the military's research agenda has focused increasingly on teamwork and team-related processes (Salas, Bowers, & Cannon-Bowers, 1995). Given this transformation, a thorough understanding of the factors that contribute to effective teamwork is critical. Moreover, methods for predicting and assessing who will be an effective team player are necessary to promote effective team performance. This paper describes a two-year effort undertaken by Florida Maxima Corporation and American Institutes for Research to develop a measure of personality-based team orientation using conditional reasoning (CR).

Procedure:

This paper reviews relevant research on teams and proposes a model of team orientation based on the five-factor model of personality. The conditional reasoning test methodology is reviewed and is proposed as a way to measure an individual's propensity toward team orientation.

As described by James (1998), CR items are designed to tap the implicit reasoning strategies that individuals employ to enhance the logical appeal of their behavior. CR items have the same basic structure and test administration conditions as objective reasoning items: they typically include an item stem and four response alternatives, and respondents are instructed to select the most reasonable/correct response alternative. However, while objective reasoning items have only one correct answer, CR items essentially have two "correct" answers (Cortina, 2004): one that reflects the sort of implicit assumptions, justification mechanisms, and information processing styles that are characteristic of the focal personality trait or motive, and another that reflects opposing implicit reasoning strategies. The first part of test development focused on identifying the implicit assumptions underlying the team orientation construct and then creating test items that tapped those implicit assumptions. Cognitive labs—a variant of the general class of procedures known as verbal protocol analysis (Ericsson & Simon, 1988)—were employed during the item revision process and used to examine the construct validity of the items. After describing the CR item development process, we present results from five studies that examined the psychometric properties and validity evidence for the team orientation measure. One study was conducted among a sample of undergraduate students, while the remaining four employed military personnel.

Findings:

Although the cognitive labs indicated that conditional reasoning items tapped the implicit assumptions that they were intended for, the five validation studies generally produced validity and reliability estimates that were discouraging. Even for items from common team orientation facets, the degree of covariance among items was low. However, a small subset of the items did exhibit a pattern of significant correlations with Soldier commitment ratings and supervisor performance ratings. For the most part, these items assessed a Negative World View, which encapsulates low emotional stability, lack of adjustment, neurotic tendencies, and anxiousness.

Utilization of Findings:

Although the results of the validation studies suggest that the conditional reasoning measure for team orientation failed to demonstrate acceptable psychometric properties, researchers might find the information contained in this report useful. Since identifying implicit assumptions and constructing items to tap those assumptions can be challenging for researchers who are developing conditional reasoning tests, researchers might find the discussion on cognitive labs helpful and informative. Additionally, this report focuses on several areas where future work might improve the CR team orientation measure: focusing on the two personality facets that reflect the converse or negative "flip side" of team-oriented attitudes (Negative World View and Controlling Entitlement) and rendering more focused versions of the implicit assumptions associated with these facets. The conclusion section also discusses "lessons learned" that might be helpful for researchers who wish to develop CR measures.

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TEAM ORIENTATION: THE ROLE OF PERSONALITY IN TEAM EFFECTIVENESS

As the military evolves into a lighter, more deployable force, its traditional reliance on teams to perform vital missions will become even more pronounced. Consequently, the military's research agenda has focused increasingly on teamwork and team-related processes (Salas, Bowers, & Cannon-Bowers, 1995). Given this transformation, a thorough understanding of the factors that contribute to effective teamwork is critical.

The military is not alone in its emphasis on teams. As Ilgen (1999) and others have noted, modern organizations have increased their reliance on teams, which has served to foster applied research on teams in task settings. The past decade has witnessed renewed interest in team phenomena, as evidenced by recent research on team training (Cannon-Bowers & Salas, 1998; Salas, Rozell, Driskell, & Mullen, 1999), team performance under stress (Driskell, Salas, & Johnston, 1999), team processes (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000), and individual differences in team member effectiveness (Neuman & Wright, 1999; Stevens & Campion, 1999).

Research suggests that cognitively loaded variables such as knowledge, skills, and abilities (KSAs) play an important role in team effectiveness and are predictive of team performance (Stevens & Campion, 1994, 1999). However, prediction of who will be successful in a team would be improved by incorporating measures of dispositional variables. Research has shown that non-cognitive measures, such as attitudes or dispositions, combined with cognitive ability measures, are often better predictors of performance than cognitive measures alone (Driskell, Hogan, Salas, & Hoskin, 1994). Goldberg (1993) noted "recent findings demonstrate quite clearly that some personality measures can provide substantial incremental validities over cognitive measures for the prediction of a variety of job-related criteria" (p. 32). Consequently, the scope of teams research should be expanded to investigate the dispositional factors that contribute to effective team membership and performance.

In addition to predicting team performance, dispositional variables might predict other important organizational outcomes, such as employee attrition. Attrition is a multifaceted problem that no single intervention is likely to solve (Carsten & Spector, 1987; George & Jones, 1996; Lee & Mowday, 1987), and the extent to which Soldiers' temperament and skills "fit" job demands is likely to affect retention within such a job (Gustafson & Mumford, 1995). Schneider's Attraction-Selection-Attrition model (ASA; Schneider, 1987; Schneider, Goldstein, & Smith, 1995) of person-organization fit provides one explanation as to why individuals "ill-equipped" to handle teamwork would be predisposed to quit the organization if their jobs occurred within a team context. The ASA model posits that attraction to organizations, selection into organizations, and attrition from organizations is at least partially influenced by the extent to which individuals meet position requirements (i.e., they "fit" the job) coupled with the degree to which they hold personal beliefs and values that are consonant with organizational beliefs and values (i.e., they 'fit' the place). Individuals who do not "fit" their job are expected to either perform poorly or to leave the organization. Similarly, individuals who do not "fit" the place are more likely to be candidates for organizational withdrawal or turnover. Thus, the extent to

which jobs in the Army require teamwork and the degree to which Soldiers possess team-oriented dispositions can jointly influence valued team and organizational outcomes such as attrition and performance.

In sum, for Army positions requiring extensive teamwork, Soldiers must possess the knowledge, skills, and abilities and other characteristics necessary to successfully execute the behaviors required by the position. These other characteristics likely include personality attributes, attitudes, values, and other dispositional characteristics of individuals. For example, team positions require Soldiers to cooperate with and be responsible to their peers, so Soldiers must be willing to interact with others in a sociable and positive manner. It could be argued that these behaviors, while drawing on a host of ability- and skill-related competencies, also are partially determined by one's personality characteristics and traits. Furthermore, Soldiers who are successful in team-oriented positions probably do not often attempt to dominate and control their peers, since such attributes generally undermine effective communication, interpersonal exchanges, and trust. Moreover, the extent to which Army positions require a considerable amount of teamwork and the degree to which the Soldiers who occupy such positions possess team-oriented competencies are likely to influence team and organizational outcomes. Specifically, when a Soldier possesses the interpersonal competencies required to function well within a team, he or she will be more likely to identify with the team and less likely to withdraw from that environment.

This paper explores the nature and measurement of the dispositional characteristics that comprise the effective team player. First, this paper presents the construct of team orientation, an individual-level personality variable thought to impact team effectiveness. The personality characteristics of dominance and affiliation are discussed with respect to team orientation, and the Five Factor Model of personality is used to further explicate the personality variables that might underlie successful team membership. Second, this paper presents the concept of the conditional reasoning (CR) measure as a method for assessing team orientation. This paper also details the development efforts surrounding the creation of a CR measure of team orientation, and discusses a second series of developmental efforts with respect to a revised version of the CR measure. Third, this paper describes five studies that examined the psychometric properties of the initial and revised versions of the CR measure. Discussion of the five studies and implications for future developers of CR measures are presented at the end of this paper.

Team Orientation

One of the most central features of a team, and usually one of the most obvious with respect to applied work groups, is that a team is a group of people who *work together*. Although team tasks differ in the degree of coordination required (see Shaw, 1981), an essential feature that defines a team is collective or interdependent behavior among group members. Moreover, empirical evidence suggests that collective behavior (or lack thereof) significantly impacts team performance. In one of the earliest studies of group performance, Shaw (1932) attributed the effectiveness of groups to the capability of group members to exchange and coordinate information. Furthermore, a lack of collective behavior often is evident in real-world descriptions of poor team performance. Foushee (1982) reported one flight crew incident in

which, after ignoring repeated flight advisories from a co-pilot, the captain responded, “Just look out the damn window” (p. 1063). Other studies of real-world teams have shown that the failure to exchange information and coordinate interaction is one factor that differentiates good teams from bad (Foushee, Lauber, Baetge, & Acomb, 1986; Foushee & Manos, 1981).

The concept of collective behavior as a critical factor in groups was identified early in small groups research. Mead (1934) observed that the basis for social conduct was the reciprocity of interaction, in which the action of one individual is the stimulus for the response of another. Weber (1947) noted that social action required a mutual orientation, so that the action of one person takes into account that of the other. In fact, many researchers have argued that interdependence or coordinated behavior, which Allport (1962) called the reciprocal give-and-take behaviors of group members, is the critical essence that defines a functioning group (see Lewin, 1948; McGrath, 1984; Steiner, 1986). Golembiewski (1962) defined a group as a system of “coordinated behavior” (p. 97), Shaw (1981) defined a group as requiring “mutual influence” (p. 8), McGrath and Kravitz (1982) defined a group as including members who are “mutually aware and take one another into account” (p. 199), and Steiner (1986) referred to a group's “mutual responsiveness” (p. 257).

In sum, the importance of collective behavior in teamwork is well established. However, substantially less is known about how to identify individuals who have a propensity toward or desire for collective behavior. In fact, Foushee and Helmreich (1988) claimed that pilot selection for years was based on what was assumed to be the “right stuff” for an aviator—resulting in selection of individuals who were self-sufficient, somewhat egotistical, and less prone to sharing responsibility with others. The authors noted that, while this may have been the right stuff for single seat pilots, such attributes were unlikely to result in good teamwork. Thus, research should address an individual’s “ team orientation,” or dispositional propensity to work well with others, seek other's input, contribute to the team outcome, and enjoy team membership.

Research suggests that individuals do differ in their propensity to work effectively in teams. Studying problem-solving groups, Davis (1969) found that the preference for working alone versus working with a group was related to both amount of group discussion and group performance. Comparing groups composed of those who preferred to work without a partner to those who preferred teamwork, he found that the groups consisting of team-oriented individuals interacted more, solved problems faster, and were more accurate. More recently, Driskell and Salas (1992) found that some team members were more egocentric and less collectively oriented than others, and these egocentric team members tended to be poor team players. Moreover, they found that collectively-oriented team members were more likely to attend to the task inputs of other team members and to use the information provided by other team members to improve team performance. On the other hand, egocentric team members tended to ignore task inputs from others and to rigidly reject input from teammates when making decisions. These results led the authors to conclude that collective orientation was a critical factor in team performance, but questions remained as to what factors comprise collective orientation and how to identify egocentric team members for training and/or remediation.

The Role of Dominance and Affiliation in Team Orientation

Numerous researchers have attempted to develop measures that tap some aspect of team orientation or interpersonal cooperation. Unfortunately, much of this research targeted friendships or spousal relationships (Hui, 1988), leisure activities (Lu & Argyle, 1991), and cooperation in school settings (Johnson & Norem-Hebeisen, 1988) rather than team performance in a work context.

In a notable exception, Driskell, Hughes, and Stout (1997) conducted research to examine individual differences in collective orientation (i.e., team orientation) and used their findings to develop a scale to assess team orientation. Their research suggested that team orientation was composed of two major factors: affiliation and dominance. The first factor, affiliation, reflected the extent to which individuals preferred to work as part of a team as opposed to working alone. The second factor, dominance/rigidity, reflected the extent to which individuals preferred to stick to their own opinions and reject the input of others. According to Driskell et al., individuals who possessed a strong team orientation were those high in affiliation and low in dominance.

Driskell et al. (1997) administered the team orientation scale to Naval personnel, and found that their measure was related to several established personality measures. The team orientation scale was positively related to the Likeability scale from the Hogan Personality Inventory (HPI; Hogan, 1986), the Group Productivities subscale of the Cooperativeness Scale (Lu & Argyle, 1991), the Cooperative Interdependence subscale from the Social Interdependence Scale (Johnson & Norem-Hebeisen, 1979), and a measure of Collectivism (Wagner, 1995). Moreover, team orientation was negatively related to Preference for Solitude (Burger, 1995). Such findings suggest that team-oriented individuals are predisposed to be affiliative without being overly dominant toward team members. Results also indicated that team orientation predicts team effectiveness on a range of team tasks, including decision-making and negotiation, suggesting that team orientation might play a role in team processes and outcomes.

The Five Factor Model and Team Orientation

It is clear that the two primary higher-level factors that underlie team orientation are *Dominance* (self-interest, dominance, and control vs. other-interest and cooperation) and *Affiliation* (the preference for working with others vs. working alone; Driskell et al., 1997). These two meta-factors also are evident in other research efforts. Digman (1997) described two higher-order factors that emerged in an analysis of 14 datasets; one factor was related to the dominance-submission aspect of extraversion, and the other factor was related to sociability. Digman noted that these two factors can be described as *Superiority Striving* and *Social Interest*. Barrick, Mount, and Judge (2000) similarly labeled these two broad constructs as *Striving for Status* (seeking status, power, and achievement) and *Striving for Communion* (striving for social acceptance). McClelland (1961) had earlier termed these types of factors as the *need for power* and the *need for affiliation.* Thus, at the highest level of abstraction, effective team members are those individuals who value cooperativeness over the need for power and control, and who value working with others versus working alone.

Although affiliation and low dominance are key components of team orientation, it should be noted that other personality characteristics are likely related to team orientation. Indeed, most theorists propose a hierarchical model of personality, with broad, higher-order traits that subsume and organize more specific lower-level traits (cf. Saucier & Ostendorf, 1999). Specifically, personality research suggests that an individual's personality can be described with respect to five factors or traits of personality: openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability. This factor structure is often referred to as the "Big Five" or the five-factor model (FFM) of personality. The FFM represents a broad set of constructs that are themselves a collection of many lower-level traits that have something in common. Additionally, the five-factor structure tends to be robust across cultures (Paunonen, Jackson, Trzebinski, & Fosterling, 1992).

Some research suggests that portions of the FFM are related to the constructs of affiliation and dominance. Additionally, given findings with respect to affiliation and dominance and the overwhelming research support for the FFM, it was our intent to integrate relevant components of the FFM with the constructs of affiliation and dominance into a model of team orientation. Based on a literature review of personality constructs and research conducted to date, we proposed a preliminary nomological network for the team orientation construct. Figure 1 presents an illustration of the hierarchical model of team orientation. The two primary meta-factors related to team orientation are Dominance and Affiliation (Driskell et al., 1997). The Dominance factor is related to the FFM trait of extraversion. The Affiliation factor is related to the FFM traits of agreeableness, emotional stability, and conscientiousness, as well as the sociability component of extraversion. These traits are, in turn, composed of 12 specific lower-level facets that define the team orientation construct. The following pages further elaborate on the team orientation model and the relationship among the higher order factors of affiliation and dominance; the traits of extraversion, agreeableness, emotional stability, and conscientiousness; and the lower-level facets subsumed under each trait.

Extraversion/Dominance

Extraversion has been viewed as a combination of assertiveness/dominance and sociability/affiliation (Judge & Bono, 2000; Lucas, Diener, Suh, Shao, & Grob, 2000). Some theorists view dominance as the primary marker of extraversion, and some view sociability as the primary component of extraversion. In fact, Hogan (1986) presented a six-factor model of personality, dividing extraversion into separate traits of sociability (outgoing, affiliative) and ambition (surgency, dominance). Guilford, Zimmerman and Guilford (1976) identified three components of a higher-order extraversion factor: (a) ascendance (dominance versus submissiveness), (b) sociability (social interest versus aloofness) and (c) general activity (energy versus sluggishness). Thus, it appears that extraversion has at least two components relevant to team orientation—one that relates to dominance and one that relates to affiliation. The lower-level facets of extraversion as identified by the FFM relevant to the higher order factor of Dominance are dominance, rigidity, and competitiveness.

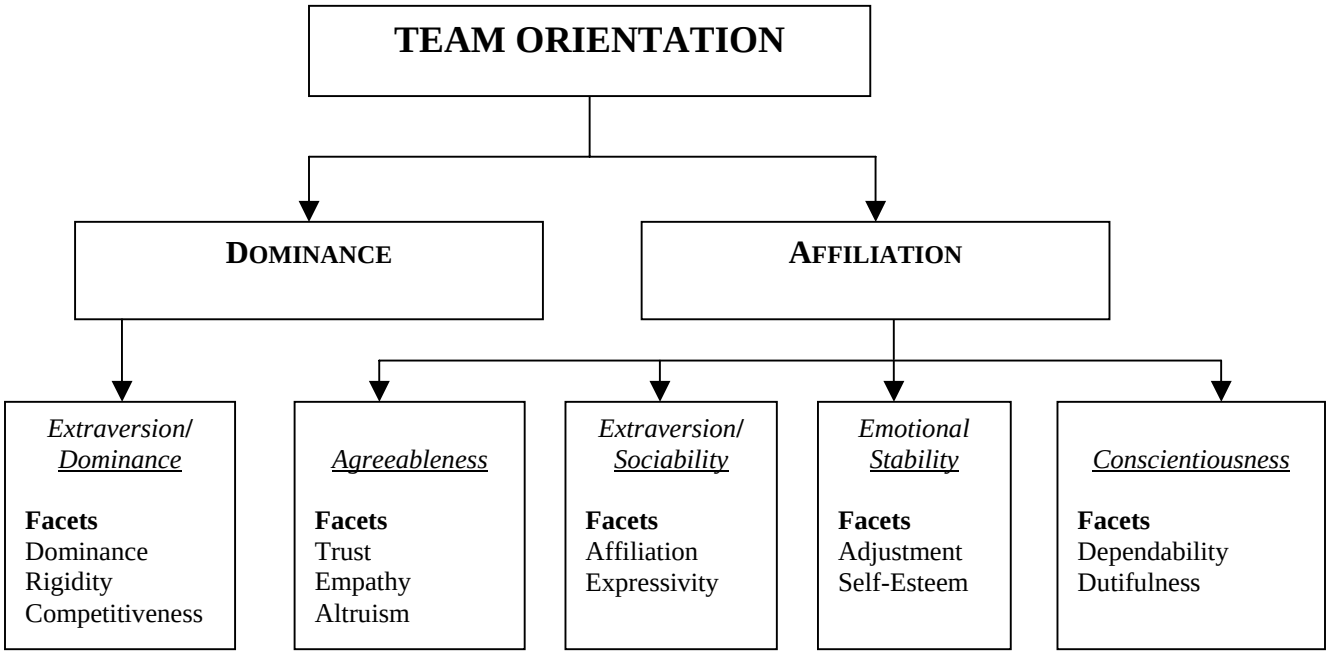

***Figure 1*. Theoretical Model of Team Orientation**

Dominance. The lower-level facet of dominance reflects striving for superiority, control, and influence over others. This specific facet has also been referred to as ascendance, assertiveness, or surgency (Watson & Clark, 1997; Costa & McCrae, 1992). Norton (1983) reported three components of dominance: (a) forcefulness (e.g., coming on strong, taking charge), (b) monopolizing (e.g., talking often and not letting others talk, and (c) involvement (e.g., taking precedence in interaction and not waiting for others). Dominance is related to authoritarianism, although authoritarianism is a multi-faceted construct that includes not only dominance but also conservatism, conventionalism, punitiveness, and other sub-traits.

Dominant individuals have a desire to control and influence others. Dominant people are headstrong, controlling, and combative. They tend to stand firmly to their own opinions and perspectives, view others' opinions as a threat or challenge, and see compromise as a concession. To the extent that interdependent team tasks often require exchange of information among team members who all hold valuable task information, the tendency to be authoritative, controlling, and unreceptive to other team members' opinions can be damaging to team interaction. Although the dominance component of extraversion may be related to leadership (i.e., leaders need to exert power and control), effective team members need to subvert the desire for personal ascendancy to work as part of an interdependent, mutually-reliant team. Hackman (1993) noted problems that aircrews face with pilots who are "autocrats" and have "crowned themselves King of their Domain" (p. 58). Altman and Haythorn (1967) found that teams composed of highly authoritarian members performed more poorly than low authoritarian teams on Navy decision-making and combat tasks.

Rigidity. Rigid people tend to be stubborn and headstrong, view uncertainty as a threat, and generally have a low tolerance for ambiguity. The facet of rigidity versus flexibility is critical to interdependent behavior. Paulhus and Martin (1988) defined functional flexibility as the ability to adjust one's behavior to suit changing interpersonal situations. Paulhus and Martin focused on the interpersonal advantages of flexibility, noting that in social situations, the flexible person can be assertive or submissive, warm or cold, as the situation demands. Zaccaro, Gilbert, Thor, and Mumford (1991) defined behavioral flexibility as one component of social intelligence. This conceptualization emphasizes the problem-solving aspects of behavioral flexibility in addition to the interpersonal aspects, defining behavioral flexibility as "the ability and willingness to respond in significantly different ways to correspondingly different situational requirements" (p. 322).

Recent research has discussed the importance of adaptability to teams (Kozlowski, Gully, Nason, & Smith, 1999) and work environments (Pulakos, Arad, Donovan, & Plamondon, 2000). Pulakos et al. identified several critical dimensions of adaptive performance, including flexibility in handling uncertain task conditions, interpersonal flexibility, and flexibility in problem solving. Thus, it appears that high flexibility, or low rigidity, might play an important role in team effectiveness.

Competitiveness. Competitive people tend to engage in interactions for the purpose of maximizing personal gain relative to others (Graziano, Hair, & Finch, 1997). Van Lange, De Bruin, Otten, and Joireman (1997) noted that some people are willing to give others the benefit of the doubt and approach them cooperatively, whereas others are inclined to approach others noncooperatively. They distinguished between those who are cooperative (who maximize outcomes for both self and others) and those who are competitive (who maximize outcomes for self relative to others). A third group, individualists (who maximize outcomes for self with no regard for others) are closer to representing our dominance facet. Van Lange (1999) noted that cooperative people approach others in a cooperative manner and continue to do so unless others fail to reciprocate. Thus, cooperative people may resort to noncooperative behavior if their cooperative intentions are not reciprocated. In contrast, competitive people approach others in a competitive manner, even if others prove to be cooperative, in the pursuit of relative advantage over the other.

The fact that cooperative people approach interaction in a cooperative manner, but may be drawn into competitive behavior by a competitive partner, suggests the dual disadvantage of having a competitive person in a team. Competitive people not only act in a competitive manner themselves, but draw competitive behavior out in others. In fact, Kelley and Staahelski (1970) found that competitive people are more likely to expect others to be competitive and to elicit competitive behavior from others. Thus, the competitive person's initial beliefs that others are competitive are likely to be confirmed by the competitive reactions that they evoke from others. Moreover, the competitive behavior of one individual might undermine a climate of cooperation within the entire team.

Graziano et al. (1997) described the competitive person thusly: "Before any interaction, some individuals *expect* social relations to be competitive." Graziano et al. further noted that competitive people are consistently competitive across situations, whereas cooperative people

are more variable (that is, they may approach a social situation in a cooperative manner, but be drawn into competitive behavior by a competitive partner). In sum, competitive team members may be more oriented to win than to cooperate with other team members.

Extraversion/Sociability

As noted previously, the higher-order trait of extraversion is generally viewed as composed of several distinct components, including ascendance (dominance versus submissiveness) and sociability (social interest versus aloofness; Guilford et al., 1976). Given the current focus on team performance, it is useful to distinguish separately the trait of sociability as reflecting affiliative tendencies versus introverted tendencies that reflect a lack of affiliation. People high on sociability are outgoing, friendly, interested in social interaction, and would generally prefer to interact with others than to be alone. People low on sociability are withdrawn, reserved, aloof, and prefer solitary tasks to social interactions in which they are less comfortable. The facets of sociability that are seen as most relevant to team interaction are affiliation and expressivity.

Affiliation. Affiliation refers to the individual's desire to engage in activities with other people versus working alone. Individuals high in affiliation are sociable and interested in others, whereas those low in affiliation are withdrawn and uninterested in social activities. Lucas et al. (2000) define this factor, which they term sociability, as the enjoyment of social activities and preference for being with others over being alone. Davis (1969) found that teams composed of members who preferred to work in a group interacted more and solved problems faster than teams composed of members who preferred to work alone. Wageman (1995) examined differences in preferences for autonomy, defined as the extent to which people like working with others versus working independently, and found that those with a high of preference for autonomy helped other group members less and learned less from others.

Some researchers have distinguished between low sociability (i.e., low affiliation), which is a non-fearful preference for being alone, and shyness, which reflects a social anxiety toward affiliating with others (Bruch, Gorsky, Collins, & Berger, 1989). In other words, low affiliation reflects a disinterest in affiliating or socializing with others, whereas shyness reflects a fear or distress of affiliating with others. Therefore, a low affiliative person may not necessarily be shy, but is likely to be cool, aloof, and withdrawn.

Expressivity. Individuals high in expressivity are interpersonally expressive and communicative, whereas those low in expressivity are more reserved, taciturn, and impassive. Emotional expressivity refers to the extent to which people outwardly display emotion (Kring, Smith, & Neale, 1994). Emotional expressivity is one component of the facet of expressivity, although as Gross and John (1998) have noted, early work on a general expressivity factor (Snyder, 1974) has become almost solely defined in recent research as emotional expressivity. However, conveying emotions is only one function of expressive behavior. Expressive behaviors serve multiple functions—to supplement and elaborate speech, accent or punctuate speech, regulate the timing and sequence of communication, and convey comprehension, confusion, agreement, and interest (Driskell & Radtke, in press). All of these functions can serve

to more fully convey information to the listener. Thus, we describe those high in expressivity as being *interpersonally* expressive; that is, they are good encoders of expressive behavior.

Gallaher (1992) defines one component of expressiveness as representing energetic behaviors used to communicate nonverbally, and further notes that expressiveness is related to sociability. Several aspects of expressivity are relevant to team interaction. Those low in expressivity are more difficult to read by other team members and are less likely to communicate effectively to others; thus, they are less informative. Furthermore, team members may see individuals low in expressivity as less likeable (Riggio & Friedman, 1986) and less competent (DeGroot & Motowidlo, 1999).

Agreeableness

Agreeableness is part of the affiliation factor, and some researchers have claimed that agreeableness might be the best predictor of performance in interpersonal settings (Mount, Barrick, & Stewart, 1998; Neumann & Wright, 1999). Wiggins (1996) noted that the primary component of agreeableness is altruism—the concern for others versus concern for self. Other facets of agreeableness include trust, the willingness to cooperate, straightforwardness with others, and empathy. People high in agreeableness are considerate, honest, helpful, warm and supportive. People low in agreeableness are uncaring, intolerant, unsympathetic, and critical. Thus, agreeableness seems to have high predictive validity for tasks involving cooperation and requiring interpersonal interactions. The facets of agreeableness most relevant to team interaction are trust, empathy, and altruism.

Trust. Trust reflects the belief in the dependability of other team members, as well as the belief that others care about the team's interests. Gurtman (1992) defined trust as an individual's belief that the sincerity, benevolence, and truthfulness of others can generally be relied upon. According to Judge, Locke, Durham, and Kluger (1998), the opposite of trust is cynicism, the belief that others lack integrity and are "out to get you". McKnight, Cummings, and Chervany (1998) proposed that the disposition to trust has two facets: (a) faith in humanity, the assumption that others are well-meaning and dependable, and (b) trusting stance, the assumption that one will achieve a better outcome by dealing with people as though they were trustworthy. Holmes and Rempel (1989) defined trust as composed of several components, including dependability, or the belief that others can be counted on to be honest, reliable, and benevolent; and faith, or the conviction that others are intrinsically motivated to be responsive and caring.

Individuals high in trust believe that others are honest and well-intentioned, while those with low trust are suspicious of the sincerity, motives and intentions of others. Yamagishi (2001) noted that trust is not the indiscriminate belief in the goodness of others, which may lead to gullibility; instead general trust is a *default* expectation of the trustworthiness of others. Those high in general trust assume that other people are trustworthy until evidence is provided indicating otherwise. Dirks (1999) noted that interpersonal trust is a hallmark of effective groups, and argued that high trust should lead to greater cooperation and helping behaviors, greater task commitment, and higher effort expended on the task. Empirical results showed that in high-trust groups, higher motivation was channeled into more cooperative behavior and better performance. Jarvenpaa and Leidner (1999) also found that lower levels of trust were associated

with lower team performance. In sum, trust increases the ability of team members to work together and enhances cooperation and joint effort.

Empathy. Team-oriented individuals are more likely to be socially perceptive and sensitive to the moods, motivations, and intentions of other team members. Empathy involves both the willingness to take the perspective of the other and accuracy in judging others' perspectives (Stinson & Ickes, 1992). Zaccaro, Foti, and Kenny (1991) defined social perceptiveness as sensitivity to social cues, or the capacity to recognize what others expect in social situations. Social perceptiveness has been viewed as one component of social intelligence, the other being behavioral flexibility (which is relevant to our *flexibility* facet). Social perceptiveness is related to social insight, social understanding, or empathy, and can be described as the awareness of motives, needs, and intentions of other group members and awareness of relations among group members. Jones and Day (1997) described two related factors of social perception (the ability to decode others' verbal and nonverbal behaviors) and social insight (the ability to comprehend and interpret others' behavior in a social context).

Rosnow, Skleder, Jaeger, and Rind (1994) discussed the capacity to infer the motivations behind another's social behavior, and noted that perspective-taking was a key component. Marlowe (1986) described social competence as the ability to understand the feelings, thoughts, and behaviors of others in interpersonal situations, and found empathy to be one factor comprising this construct. Thus, team members who are more socially perceptive should be more accurate in "reading" others with whom they are interacting, as well as more accurate in comprehending or interpreting relations between other team members. They should be more skillful at anticipating others' requirements, as they are more adept at interpreting others' needs and intentions. Golembiewski (1962) concluded that "individuals who accurately perceived the preferences of others were regarded as highly desirable, cooperative and efficient group members" (p. 257).

Altruism. Altruism refers to concern with others versus a concern with self. Team-oriented individuals are likely to be considerate, concerned with others, helpful, and supportive versus being selfish and intolerant. Although some have viewed altruism as other-oriented actions taken to achieve a common (vs. self) interest (Batson, Batson, Todd, Brummett, Shaw, and Aldeguer, 1995), others (e.g., Cialdini, Brown, Lewis, Luce, and Neuberg, 1997) have argued that altruistic behavior reflects the individual pursuing self-interest in circumstances in which the self is perceived to be merged with the other (e.g., the team). Regardless, altruism appears to be beneficial to teams. Prapavessis and Carron (1997) found that the extent to which team members took actions for the sake of the group relative to self-interests enhanced cohesiveness in sports teams.

Emotional Stability

Emotional stability refers to a lack of anxiety and nervous tendencies. People high in emotional stability are well-adjusted, calm, secure, and self-confident. People low in emotional stability tend to be moody, anxious, paranoid, nervous, insecure, jealous, and high-strung. In past studies involving military personnel, Haythorn (1953) reported that emotional stability was positively related to group effectiveness, and Greer (1955) found that nervousness and paranoid

tendencies were negatively related to effectiveness of Army teams. Other researchers also assert that emotional stability is a significant factor in teamwork or any task requiring coordinated behavior (Driskell et al, 1987; Barrick et al. 2001; Mount et al., 1998). The facets of emotional stability most relevant to team interaction are adjustment and self-esteem.

Adjustment. Hogan (1986) defined adjustment as freedom from anxiety, depression, and somatic complaints. Costa and McCrae (1992) described lack of adjustment as involving anxiety, hostility, and depression. Watson, Clark, and Tellegen, (1988) viewed lack of adjustment as Negative Affect, a general dimension of subjective distress and unpleasant engagement. Gunthert, Cohen, and Armeli (1997) described neurotic individuals as "caught in a web of negative behaviors, cognitions, and moods… They seem to experience (perhaps generate) more interpersonal stressors, their perceptions of daily events are more negative, and their coping choices are maladaptive" (p. 1099).

Given that those low in adjustment are prone to be distressed, upset, hostile, irritable, angry, fearful, and nervous, they are not likely to excel in interpersonal or team settings. Moreover, a person's mood can sometimes have an infectious quality, and team members sometimes reciprocate the mood of their fellow teammates (Totterdell, Kellett, Teuchmann, & Briner, 1998). Thus, not only are poorly adjusted team members unpleasant to be around, their negative affect can spread to other team members.

Self-esteem. Self-esteem is generally defined as a global assessment of self-worth or of one's value as a person (Crocker & Wolfe, 2001). Those with high self-esteem view themselves as good, worthy and successful, whereas those with low self-esteem view themselves as bad, unworthy, and unlikely to succeed. Judge, Locke, Durham, and Kluger (1998) described self-esteem as composed of two core components, self-worth and self-efficacy. They further noted that the appraisal of whether one is good and competent versus no good and incompetent has significant implications for how that person will approach and carry our job responsibilities. Baumeister (1997) has noted that those high in self-esteem not only have a favorable self-opinion, but also see themselves as competent and will work hard to succeed, whereas those low in self-esteem doubt that they will succeed and focus on avoiding failure.

Team members with high self-esteem are likely to be confident, self-assured, and positive towards others, whereas team members with low self-esteem are likely to be insecure, critical, and blame others for their mistakes. Indeed, those low in self-esteem are insecure and tend to project their self-doubts onto others (Murray, Holmes, MacDonald, & Ellsworth, 1998). Baumeister (1997) noted that those low in self-esteem tend to be both more critical of self and other individuals than those high in self-esteem, and Vancouver and Ilgen (1989) found that individuals who were confident in their abilities were more likely to prefer working in a team versus working alone. Thus, it appears that individuals high in self-esteem would not only be more predisposed to affiliate with others, but also would be more likely to promote healthy team functioning.

Conscientiousness

The trait of conscientiousness has been associated with a number of facets, including competence, order, achievement striving, and dutifulness (McCrae & Costa, 1992; Moon, 2001). In the current model, conscientiousness is defined primarily as dependability or responsibility. Conscientiousness reflects the tendency to be prepared and organized, to adhere to obligations and duties, to complete tasks thoroughly and on-time, and to be reliable. People who are conscientiousness are responsible, dependable, thorough, and organized. People who are not conscientiousness are impulsive, irresponsible, and disordered. The facets of conscientiousness most relevant to team interaction are dependability and dutifulness.

Dependability. Dependability refers to a tendency toward planning and discipline in carrying out tasks to completion. Those high in dependability are responsible, organized, careful, and trustworthy. Those low in dependability are irresponsible, disordered, and impulsive. Borman, White, Pulakos, and Oppler (1991) found that high dependability among military personnel led to fewer disciplinary infractions and higher performance ratings. Borman, White, and Dorsey (1995) also reported a strong relationship between dependability and both peer and supervisor performance ratings. Hough (1992) found that dependability was related to ratings of teamwork, and Barrick, Stewart, Neubert, and Mount (1998) found that work teams with higher levels of conscientiousness (broadly defined) received higher ratings of team performance. Behavioral markers of dependability reported by peers and supervisors in Borman et al. (1995) include "Count on for back up" and "Trust and depend on." Thus, team members high on dependability are likely to be more responsible and can be relied on to back up other team members. They are also likely to be more methodical, accept responsibilities, set goals, and follow through.

Dutifulness. Dutifulness refers to the tendency to value and adhere to obligations and duties that are held within the team. Ellemers, de Gilder, and van den Heuvel (1998) have examined a related construct of *team-oriented commitment*, which they defined as a sense of responsibility for team outcomes and motivation to help out teammates even if that required personal sacrifice. Moon (2001) defined duty as an other-centered component of conscientiousness that aligns closely with our facet of dutifulness. Moon stated that "duty captures differences in individuals' proclivity to do the right thing, not only for themselves, but also, for others" (p. 535). Duty is viewed as selfless behavior intended for the betterment of the group. Costa and McCrae (1992) defined duty as behavior evidenced by individual adherence to ethical principles and moral obligations. If we extend this definition to the team context, then we would view duty as adhering to team principles and team obligations.

Field Manual 22-100 states, "The essence of duty is acting in the absence of orders and direction from others, based on an inner sense of what is morally and professionally right" (General John Wickham, cited in FM 22-100, 1999). In comments to West Point cadets, General MacArthur stated, "Duty, Honor, Country—those three hallowed words reverently dictate what you ought to be, what you can be, what you will be. They are your rallying point to build courage when courage seems to fail, to regain faith when there seems to be little cause for faith, to create hope when hope becomes forlorn" (MacArthur, 1962). It would be remiss to ignore the contribution of duty in driving military team performance. A series of classic studies conducted

in World War II found that what motivated Soldiers in hostile conditions was not political ideals or hatred of the enemy, but group obligations and duty to others (Stouffer, Lumsdaine, Lumsdaine, Williams, Smith, Janis, Star, & Cottrell, 1949).

Summary of Team Orientation

In sum, using the concepts of Dominance and Affiliation and the FFM, we have identified twelve lower-level personality facets likely to be related to team orientation and descriptive of effective team players. In brief, effective team members are not ascendant or domineering (low dominance). They are adaptive rather than rigid, cooperative rather than competitive, and tend to view task outcomes as a joint effort. They trust other team members, are socially perceptive, and demonstrate support of and concern for others. Effective team members prefer to interact with others and are open and expressive; in addition, they are well-adjusted and confident. Finally, effective team members are dependable, with a strong sense of duty to the group.

However, it is important to note that these 12 facets are themselves not necessarily unidimensional. For example, within the competitiveness facet, some researchers have distinguished those who are cooperative (who tend to maximize outcomes for both self and others) from those who are competitive (who maximize outcomes for self relative to others) and from those who are individualists (who maximize outcomes for self with no regard for others; see Van Lange, De Bruin, Otten, & Joireman, 1997). We also note that we have selected these 12 core personality facets as relevant to team orientation based on a review of the existing personality literature, most of which does not specifically target team settings. A more finely detailed rendering of these facets is dependent on further empirical research that focuses on the specific setting (military teams) and on the specific outcomes (e.g., team performance, attrition, misconduct) of interest.

Having defined the team orientation construct, the question remains as how to best measure it. While off-the-shelf personality measures based on the FFM currently can be used to measure many of the facets identified in the team orientation model, traditional personality measures have several disadvantages. These disadvantages are discussed in the next section, and a relatively new approach known as conditional reasoning (CR) is discussed as an appropriate measurement alternative.

Measuring Team Orientation via Conditional Reasoning

One of the most common methods for assessing personality characteristics and dispositional variables is the use of self-reports. Self-report measures of personality typically ask respondents to indicate their level of agreement with various items about behavior. For example, an item that appears in the International Personality Item Pool (IPIP, 2001) for positive expressivity is, “I show my feelings when I am happy.” The individual then indicates whether he or she agrees or disagrees with the statement. Several self-report personality inventories are commercially available, and many of these inventories (e.g., Hogan Personality Inventory, HPI;

NEO Personality Inventory—Revised, NEO-PI-R; 16PF) could be used to measure the facets identified in the team orientation model.

The self-report method assumes that individuals are not only capable of providing accurate responses, but that they are willing to provide accurate responses. Although research supports the idea that individuals are capable of accurately reporting this information, the measurement context often has strong effects on an individual's willingness to report this information accurately. In settings where the results from such measures will be used to make high-stakes decisions (e.g., hiring or promotion decisions), an individual's motivation to report accurately his or her attitudes and beliefs can be overwhelmed by the desire to be perceived in a positive light. For this reason, many self-report measures of personality are highly susceptible to socially desirable responding, which can reduce both the accuracy of test scores and the predictive capabilities of the test.

Such drawbacks to the self-report method have motivated researchers to find alternative methods of personality assessment. One such alternative is the conditional reasoning (CR) test, which has been gaining popularity in the area of personality assessment. CR measures have been shown to index personality characteristics in a way that is more resistant to response distortion, and CR measures have demonstrated a strong relationship with performance across a variety of contexts, from students (James, 1998; James & McIntyre, 2000) to police officers (James & McIntyre, 2000) and hospital staff (Burroughs, LeBreton, Bing, & James, 2000).

CR measures are similar in basic structure to the reasoning items that appear on standardized tests like the Graduate Record Exam (GRE) and the tests for admission to medical school and law school (the M-CAT and the LSAT, respectively). That is, the item presents a situation followed by four or five response options that offer different explanations as to why the event occurred. Unlike traditional reasoning items, however, CR items are constructed such that the responses chosen by individuals as the most "rational" are "conditional" on the individual's implicit views of themselves and the world.

The theory underlying the CR method posits that observed personality is grounded in motives (James, 1998; Gustafson, 2000a). Individuals develop cognitive mechanisms to explain and justify their own behavior and the behavior of others, and these justification mechanisms reflect underlying personality characteristics and motives (James, 1998). For some personality constructs, individuals with different levels of the constructs can differ substantially in the justification mechanisms that are used to explain their behavior. Thus, CR items assess the justification mechanism utilized by the individual, and detection of the justification mechanism provides an indirect index of the personality construct driving the justification (James, 1998).

CR measures generally provide four or five alternatives per item, and typically only two of the response options represent different types of justification mechanisms. In the case of team orientation, for example, one viable response option would tap team- or collectively- oriented motives while the other viable response option would tap individually-oriented motives. The remaining response options for a CR item are " distractors" that serve to maintain the appearance of a traditional reasoning test.

In sum, CR measures are composed of scenarios that are designed to elicit a response based on particular justification mechanisms (James, 1998). The multiple choice response options provided for each scenario are designed to represent different justification mechanisms that an individual might reach based on the information described in the scenario. Ultimately, CR measures can legitimately be presented as tests of reasoning: respondents' selection of "reasonable" alternatives is determined by (i.e., are conditional on) their implicit motives. It should be noted, however, that CR measures are not situational judgment tests: while situational judgment tests ask respondents to either choose or evaluate the effectiveness of a behavior in a given situation, CR items provide the behavior and ask the respondent to draw an inference regarding why the behavior occurred.

The CR approach is a relatively new measurement technique, and only a few CR measures have been developed to date (e.g., Burroughs et al., 2000; Cortina, 2004; Gustafson, 1999, 2000a, 2000b; Ingerick, Cortina, Dudley, Margalit, Orvis, & Baughman, 2004; James, 1998). The small number of instances of this testing method is more reflective of the recency of development rather than a lack of utility. In fact, CR measures have exhibited substantial validity in predicting job-related criteria (James, 1998; Burroughs et al., 2000). Indeed, recent findings indicate that CR measures may be a means to break through any artificial ceiling on the potential validity of self-report personality tests (James, 1998; Hunter & Hunter, 1984). Zero-order correlations between a CR measure that assesses achievement motivation and job performance have ranged from .27 to .51, and incremental validities beyond cognitive ability have ranged from .17 to .32 (James, 1998).

In addition to the demonstrated validity of the conditional reasoning method, CR measures are desirable over traditional measures of personality because they are less susceptible to response distortion and impression management (James, 1998; LeBreton, Burgess, & James, 2000). Further, preliminary indications are that test takers have few negative reactions to CR measures (James, 1998). Moreover, because test takers believe that they are actually taking a reasoning test, not a personality test, few of the negative operational characteristics often associated with traditional self-report personality measures carry over to CR measures (James, 1998).

Given the disadvantages associated with self-report measures of personality and the advantages of conditional reasoning, team orientation might be better assessed using the CR method. In developing a preliminary CR measure of team orientation, we relied on the identified facet variables in Figure 1 to develop implicit assumptions associated with the construct. As such, the preliminary CR measure assessed the implicit assumptions underlying the trait variables associated with team orientation.

DEVELOPING A CONDITIONAL REASONING MEASURE OF TEAM ORIENTATION

The conditional reasoning approach proposes that people adopt or endorse justification mechanisms as a means to support or justify certain patterns of behavior. These justification mechanisms are the lenses through which individuals view and interpret their own behavior as well as the behavior of others. Our approach incorporates what James (1998) calls justification mechanisms into the more general term "implicit assumptions."[1]

Thus, our initial task in test development was to identify the core implicit assumptions that underlie each of the 12 facets that comprise the team orientation construct. We used two primary sources to identify implicit assumptions. First, we reviewed existing personality scales and subscales that assess a particular team orientation facet. For example, the NEO-PI-R (Costa & McCrae, 1992) contains the subscale Dutifulness, which is conceptually related to Dutifulness as we have defined it in this paper. Likewise, Ellemers, de Gilder, and van den Heuvel (1998) developed a seven-item scale designed to measure team-oriented commitment. We reviewed the items that comprised these scales (e.g., "I am prepared to do additional chores, when this benefits my team") to identify the core assumptions that reflected the behaviors and statements expressed in each item.

Second, we reviewed the existing research literature related to each particular facet. In some cases, this research was directly tied to classic military studies. For example, both Stouffer et al. (1949) and Grinker and Speigel (1945) wrote at length about group obligations and duty stemming from research conducted during World War II. Other research was more current: Moon (in press) recently examined the construct of duty as the individual's proclivity to do the right thing, not only for him- or herself, but also for others. Moon concluded that a key component of duty is that dutiful people demonstrate concern for others (the organization) even at their own expense. Others such as Ashton (1998), Van Dyne, Cummings, and Parks (1995), and Costa and McCrae (1992) examined duty as involving ethical principles and moral obligations. By reviewing this existing research, we attempted to identify the core elements of the duty facet that are related to teamwork. Moreover, we reviewed the literature for each facet in detail in a manner similar to the process described above.

The first stage of this process was to search for, identify, and obtain the research literature relevant to each facet. We compiled this research for each facet and reproduced and distributed it to each of the principal research staff. During writing sessions, we developed an inventory of core assumptions by facet. For example, a core assumption likely held by "dutiful"

[1] Consistent with Gustafson's (2000a) development strategy in developing the Aberrant Self-Promotion (ASP) instrument, our proposed approach incorporates what James (1998) calls "justification mechanisms" into the more general term "implicit assumptions." We adopted this approach because the phrase "justification mechanism" tends to connote a "healthy truth" from which an individual deviates when he or she "justifies" a given behavior. This position carries an implicit negativity regarding individual behavior that we wish to avoid. The term "implicit assumption" carries no such connotation; rather, as Gustafson states, "Everyone views his or her own reality through a perceptual lens" (2000a, p. 310). The present task is to use the variables we identified in the model to define the perceptual lens through which individuals view their world.

individuals is that good people adhere to their obligations and commitments. We then reviewed these assumptions and reduced them to the core assumptions shown in Appendix A.

Item Writing

The item-writing process represented a second major step in our test development efforts. As illustrated above, we conducted a thorough literature review to generate a series of implicit assumptions associated with each personality facet. This represented a critical stage in the development process, because each implicit assumption serves as an expression of the type of reasoning that individuals with particular dispositions employ in order to interpret and give meaning to others' intentions and interpersonal behavior. As such, implicit assumptions essentially represent the articulation of a goal, because they specify the construct-relevant reasoning styles that we endeavored to measure via the conditional reasoning methodology. Thus, these theoretically grounded implicit assumptions served as the building blocks for creating CR items.

In order to assess implicit assumptions with adequate precision, it was critical that each item stem establish a construct-relevant context. Implicit assumptions are triggered by specific types of situations: for example, a situation where individuals are able to choose whether they work alone or with co-workers to complete a task would likely trigger implicit assumptions concerning the relative merits of cooperation versus competition (e.g., "Competition drives the team to greater heights"). Likewise, a situation where a marketing team must decide whether they should try an unproven but promising new advertising technique would presumably activate implicit assumptions associated with flexibility/rigidity (e.g., "Change makes situations worse"). However, while establishing a construct-relevant context is a necessary condition when developing a quality CR item, it is not a sufficient one. The potential influence of irrelevant factors must be minimized. For example, if the situation involving the choice of whether to work alone or in a team also specified that management had a clear preference for one option, the situation then might also tap implicit assumptions involving authority (e.g., "In order to get ahead, it is best to always follow management's preferences"). As the context would then activate implicit assumptions related to both teamwork and authority, it could be very difficult to determine which implicit assumption drove the identification of a particular response as the most reasonable; one implicit assumption could be more dominant, or the two might work in tandem to impact the choice of a response. Thus, we attempted to create straightforward contexts for each item stem that triggered only the implicit assumption(s) associated with the focal construct.

While the quality of a CR item stem is dependent upon the degree to which it activates a construct-relevant implicit assumption, the quality of an item response option is predicated on the extent to which it reflects the type of reasoning associated with a given implicit assumption. For example, the cooperation versus competition context noted above would likely activate implicit assumptions highlighting the positive aspects of competition (e.g., "Competition leads to high quality," or "Competition brings out the best in people") among competitive people. Thus, one response option must reflect this type of reasoning: if the stem described a situation where people chose to work collectively and generated low-quality outcomes, it is likely that competitive people would implicitly attribute the low-quality outcome to a lack of competition.

As such, if the item queried the respondent about the factors that could increase the quality of the outcome, a response option noting lack of competition as a key factor (e.g., "People would have produced better outcomes if they were forced to compete with each other") would probably appear quite reasonable to a competitive person. Conversely, given that cooperative individuals' implicit assumptions would probably emphasize the negative aspects of competition (e.g., "Competition is not worth the trouble it causes," or "A person can best reach his/her goals if others around him/her achieve theirs as well"), the previous response option would not appear logical. Rather, cooperative individuals might find a response option that suggested other ways to improve the process appealing, particularly if that response emphasized the benefits associated with increased cooperation (e.g., "People would have produced better outcomes if they had worked in larger teams").

We used several of the various strategies described by James (1998) to develop the items. The first strategy involved creating response options reflecting the positive versus negative consequences that could flow from an action described in the item stem. For example, one altruism item describes a recently hired newspaper reporter named Laura who is always willing to proofread other reporters' work, and respondents are asked to predict the likely outcome of this behavior. As the implicit assumptions associated with altruism (e.g., "You should always help people in need, even if it is an inconvenience") would support such behavior, we expected that altruistic individuals would predict that positive consequences would likely result. Thus, the response designed to appeal to altruistic individuals was "More reporters soon start proofreading each other's work." On the other hand, the response "Laura misses deadlines because she is not focused enough on her own work" would ostensibly appeal to non-altruistic individuals, given the operation of implicit assumptions such as "The best way to help others is to help yourself."

A second strategy we employed during the item development process involved using a debatable assertion as the stem and then requiring respondents to identify the response that most contradicted the stated assertion. When such items work as intended, agreement with the assertion is predicated on the degree to which the respondent has a high or low standing on the focal trait. For example, one dominance item asked respondents to select the response that most goes against the assertion that all people are created equal. Given the activation of implicit assumptions such as "experts have an obligation to direct those who are less skilled, rather than let them figure things out by themselves," we expected that dominant individuals would disagree with the assertion of equality. On the other hand, the egalitarian sentiments expressed by the assertion of equality might be expected to resonate with non-dominant individuals. In order to allow non-dominant individuals to contradict or weaken an assertion with which they fundamentally agree, we created a wounding response: James (1998) noted that this allows the respondent to "…satisfy the requirement for logical weakening but in truth cause only minor logical damage" (p.141) to the assertion. As such, we expected the wounding response associated with our dominance item ("People are born with different talents") to appear most logical to non-dominant individuals; this response weakens the assertion that all people are created equal, and yet still leaves open the possibility that people could possess different yet equally important talents. In contrast, the response option "People are born to be leaders or followers" was intended to appeal to dominant individuals because it clearly expresses the view that people are not created equal and therefore invalidates the stated assertion.

The third strategy we employed to develop CR items evaluated differential biases in causal analyses. When this strategy was used, we asked respondents to select the response that offered the most reasonable explanation as to why an event described in the stem had occurred. For example, one of the Flexibility items requires respondents to attribute a cause for a woman's excitement after receiving flowers on her wedding anniversary. In essence, respondents must decide why Mrs. Barnaby is so pleased. As flexible individuals enjoy surprises and new ways of doing things, they would presumably think that Mr. Barnaby had surprised his wife with the flowers. Thus, the response "Mr. Barnaby had never sent his wife flowers before" would appear eminently reasonable to such individuals. In contrast, flexible people would not find the response "Mr. Barnaby sends flowers on every anniversary" equally reasonable, because it is probable that they would operate under the implicit assumption that routines are boring and tedious. However, rigid individuals would likely find the latter option more logical, given the operation of implicit assumptions such as "Change makes situations worse." Furthermore, if Mr. Barnaby had deviated from his typical anniversary plans, rigid individuals might also infer that his wife would be distressed by the disruption of a comforting and enjoyable routine.

Using the three strategies noted above, we developed 59 CR items that tapped the 12 personality facets associated with team orientation. Although the vast majority of the items were written by individual project team members, six were created collaboratively at a meeting in Orlando associated with the commencement of our item-writing efforts. All items were reviewed and edited by at least two additional team members prior to the cognitive lab sessions.

Cognitive Lab Sessions

In the course of developing assessment tools, test developers often attempt to ascertain whether respondents actually rely upon the cognitive processes and skills that test items have been written to tap. This information is vital, as item quality depends largely upon the degree to which the intended thinking is triggered in the respondent. However, thought processes occur within an individual, and this presents significant challenges to researchers who wish to understand those thought processes. One class of techniques, verbal protocol analysis, can be used to expose the thought processes of individuals. During this type of procedure, respondents are asked to "think out loud" as they decide which answer they will select; in some cases, they are asked probing questions that clarify and elaborate upon their original vocalizations (Ericsson & Simon, 1980). The cognitive labs employed during the development of the team-orientation CR measure belong to this general class of verbal protocol analyses.

Historically, cognitive labs have been used in the field of educational research as an adjunct to psychometric analyses during test development (e.g., Paulsen, 2002). Although psychometric techniques provide a wealth of useful information, they do have an important limitation in that they are unable to determine why a respondent has chosen a particular answer. Addressing this question is important, because it allows test developers to determine if individual test items measure the construct they are intended to reflect with fidelity. Prior to the work reported in this paper, items evaluated in cognitive labs were typically multiple-choice skill or ability items; such items have one objectively correct answer and are often used in standardized educational assessments. Thus, a central focus of cognitive labs involves learning why people

choose a correct answer over an incorrect answer. When items work as intended, the correct option is chosen because the respondent has mastered the construct that is being assessed. Nevertheless, other factors may lead to the correct option being selected: for example, the item may inadvertently contain a "clue" concerning which answer is correct, or a non-focal factor (such as verbal ability) may influence the test taker's response. As test development experts know the correct answer to each item, they may overlook the presence of subtle clues and valid alternative responses. However, because cognitive labs require respondents to articulate the reasons why response options are chosen, they often lead to the identification of items that suffer from the influence of such extraneous factors. Typically, the offending items either are removed from the test or undergo revision. In short, cognitive labs provide the sort of information viewed by Messick (1989) as the strongest form of construct validity evidence—a model of the cognitive processes that underlie test responses. By identifying the solution paths used by respondents to reach the different response options, we obtain information that indicates the extent to which the intended implicit assumptions are being used to respond to the item. This information supports the assertion that we are actually assessing what we intended to assess, albeit using qualitative rather than quantitative analysis. This assertion is fundamental to the overall concept of construct validity.

Issues surrounding optimal item wording also can be addressed via cognitive labs. First, items characterized by unclear phrasing or unnecessary expository material can be identified and revised. Second, issues of sensitivity and bias frequently emerge; careful analyses of verbal protocols thus help ensure that items do not unfairly disadvantage the performance of a particular group (e.g., males versus females) due to factors that are irrelevant to constructs the test intends to assess. Such factors could include wording that is potentially distracting or offensive to a certain group, or content that is subject to various interpretations or misunderstanding due to the diverse backgrounds of different group members.

Cognitive Labs and Conditional Reasoning: A Test of Assumptions

Our work represents an innovative use of cognitive labs, as the methodology to date has been used almost exclusively to develop various skill and ability measures in the educational arena. Nevertheless, as we will detail below, we believe that they are equally useful in the development of CR measures of personality. The conditional reasoning methodology rests on two key notions. First, the situation depicted in each item's stem is thought to activate implicit assumptions that are relevant to the construct being assessed. Second, once activated, the implicit assumptions guide which response option appears most reasonable to the test taker. Because people's implicit assumptions differ, their views about which response is most reasonable also should differ. In short, implicit assumptions provide an unseen "cognitive bridge" between item stem content and the choice of a response option.

Perhaps the greatest contribution of the cognitive lab is that it creates a setting in which implicit assumptions may be explicitly assessed. In other words, the method allows for the validation of a hypothesized cognitive process. To review, each CR item has four response options: two logical responses that reflect contrasting implicit assumptions (e.g., one might represent a team-oriented implicit assumption, while the other might represent an individually-oriented implicit assumption) and two illogical responses that are easily identified as such. It is

thought that once test takers reject the two distractors, they deliberate over the "correctness" of the two logical response alternatives. However, because the appeal of these two logical options is predicated on particular implicit assumptions, and because such implicit assumptions reflect contrasting views, one option will appear more logical than the other and will be selected by the test taker as the "correct" response.

The cognitive labs provide information about the implicit assumptions that support both of the logical responses for each item (e.g., the implicit assumption that drives the choice of one response as reasonable, as well as the implicit assumption that supports the rejected "logical" response). During cognitive labs, one question focuses on the chosen response: test takers are asked to articulate why they selected a particular response. In the context of a CR measure, this question provides a potential window into the operation of the implicit assumption(s) that support a test answer. In other words, through the process of providing an answer to this question, the participant might explicitly state a justification or series of justifications that closely echoes the hypothesized reasoning associated with a particular implicit assumption.

Two questions in the cognitive lab focused on the non-chosen logical response. The first asked the participant to note why he or she had rejected that particular response, while the other was hypothetical in nature: participants were asked "Even though you did not choose option __, why might someone choose that option?" In essence, each question focused on implicit assumptions that the participant did not make. Thus, asking these questions clarified the degree to which participants were able to access the sort of reasoning characteristic of the conflicting implicit assumption. For example, it is possible that the non-chosen logical response would simply appear wrong to the participant, and he or she might not be able to comprehend why someone would choose it. Alternatively, the implicit assumption may be accessed and then rejected (e.g., "You would need to assume __ in order to have this option appear reasonable, and I was not willing to make that assumption.").

In sum, CR measures are thought to work because items evoke particular implicit assumptions, which then drive the choice of a response option. By allowing for a direct examination of such assumptions, cognitive labs provide information that is critical to the process of validating inferences drawn from CR measure scores. In short, cognitive labs help support arguments concerning why the test might predict certain types of criteria. The importance of this type of information was noted by Klimoski (1993), who stated that "The traditional selection retort – 'We use it because it works' – is no longer viable. Selection specialists must be prepared to explain why it works" (p. 100). This perspective is consistent with the characterization of validation research as a unique case of theory development and testing (Binning & Barrett, 1989; Schmitt & Landy, 1993).

Over and above providing construct validity evidence, cognitive labs are useful for several other reasons. Because the distractors were written to appear clearly illogical, we expected that few (if any) cognitive lab participants would select them. Moreover, because the distractors were in many cases quite nonsensical, we anticipated that they would be rejected after little deliberation. Given these expectations, any non-trivial endorsement or deliberation over the correctness of a distractor indicated a need for revision. We also asked participants to underline the sections of the item stem that they used to determine which option was "correct," and to

remove information presented in the stem that they viewed as irrelevant when making this determination. This allowed us to simplify the wording of each item.

Procedure and Materials for Cognitive Labs

We conducted the cognitive labs at the University of South Florida (USF) in Orlando and the American Institutes for Research (AIR) in Washington, DC. The 15 participants at the USF sessions were graduate and undergraduate students in industrial/organizational and human factors psychology, while the nine AIR participants were either Research Assistants or Administrative Assistants. Although some sessions consisted of up to ten participants, the modal group size was three or four. The sessions were recorded using both video and audiotape, and typically lasted between two and three hours. Given the fact that the review of each item generally took from five to ten minutes, it was not possible to review the entire pool of 59 items during a single lab session. Therefore, we decided to focus on a subset of 20 items during each cognitive lab. Each item was reviewed in at least one lab, and most were reviewed twice.

As each session commenced, participants were read a general set of instructions emphasizing that we were interested in learning about the processes individuals engage in as they respond to each test question, and about why certain answers were chosen or rejected. Moreover, we noted that the test they would take was in a developmental stage, so they would not receive a test "score" per se. We also emphasized that cognitive labs were a commonly used procedure in test development to ascertain the quality of individual items. So as to protect the indirect nature of the CR measure, we briefly stated that the test assessed reasoning ability and did not tell participants that the test was a personality inventory.

Each participant received a test booklet that contained a single item on each page. Each item was followed by a series of questions. The first four questions asked for brief explanations concerning why participants either selected or rejected each of the four response options. Participants were then asked if they did not understand any information presented in either the stem or the response options. Finally, the sixth question focused on the logical response that had not been chosen; participants were asked why someone might have chosen this option rather than the one they had selected. Once participants answered these six questions for an item, they discussed their answers with the rest of the group before proceeding to the next item.

The discussion that followed the written responses to each item primarily served two purposes. First, participants' written answers sometimes required clarification, and new information was often gleaned from questions that were triggered by the written responses. In a number of cases, item-specific questions also were asked during the discussion session. These questions tended to deal either with the meaning of item phrasing or with participant experience with the activity or situation described by the item. For example, one of the dominance items dealt with buying a car, and participants were asked whether they had experienced buying a car before and how that might have affected their answers. As mentioned previously, the conditional reasoning methodology rests on the premise that implicit assumptions guide which response option is most attractive. If extraneous factors such as past experience, logical inconsistencies, or cultural biases cause one option to appear more attractive than another, then item scores will reflect these confounding factors rather than implicit assumptions. Thus, the group discussions

presented a forum in which the potential operation of such extraneous factors could be identified and items reworded accordingly.

Results and Discussion of the Cognitive Labs

We described the CR measure as simply a "reasoning test" to participants, and two phenomena indicated that participants accepted this framing of the measure. First, on several occasions during the labs, participants argued with each other about the relative correctness of each of the two logical responses—this tended to involve attempts to explain to the other party why he or she was wrong. Second, during the debriefing session that followed each lab, participants generally expressed considerable surprise when they were informed that the test was designed to assess team-oriented personality traits.

On the basis of the results garnered during the cognitive labs, we revised approximately 71% of the test items. Table 1 specifies the precise nature of these revisions. As the table indicates, we primarily revised the item stems and the "logical" options. When an item stem required revision, it was typically because the cognitive lab participants had identified material that was distracting and/or irrelevant to the item's central premise, or because the idea or situation described in the stem was not as clearly expressed as we had intended. For example, one of the items described a coach who had to make a number of decisions concerning whether to field his first- or second-string players. However, it was unclear to several participants that first-string players are the best players. Thus, we substituted the terms "varsity" and "junior varsity" in place of "first-" and "second-string" to enhance the likelihood that test takers would understand the item.

Table 1
Frequency and Percentage of Item Revisions Based on Cognitive Lab Results

Revision Content	Frequency	% of Test Items
Number of Item Stem Revisions	28	47%
Number of "Logical" Option Revisions	24	41%
Number of Distractor Revisions	11	19%
Total Number of Items Revised	42	71%

Revision efforts that targeted one of the "logical" response options were generally guided by the realization that a logical path other than the targeted implicit assumption led a participant to view the response as correct. In other cases, inconsistencies between two "logical" responses were identified for a given item. As an example of both of the above problems, one of the dominance items required respondents to indicate which of several statements most contradicts the idea that all men are created equal. We had originally created the response "People sometimes do not achieve all they could" as the non-dominant choice and "People are born to be leaders or followers" as the dominant response. The former response is meant to weaken the premise expressed in the stem, while the latter is meant to invalidate the premise. However, several of our cognitive lab participants selected the latter response—not for dominance-oriented

reasons—but because they correctly noted that the former statement does not actually contradict the idea that all men are created equal at all. People can still be "created equal" and exhibit differences because some people do not live up to their innate potential. To create a better "weakening" option, we developed the response "People are born with different talents."

Revision of distractors occurred on a relatively infrequent basis, with approximately 19% of test items needing revision of their distractors. The primary characteristic of an effective distractor in a conditional reasoning test is that it is easily identified as illogical. Thus, the need to revise a distractor occurred when cognitive lab participants identified logical reasons as to why illogical responses could be correct. For example, one of the items noted that a swimmer named Brian was more proud of a medal won in a team relay than one earned in an a more individually-oriented race. The item required respondents to determine why Brian was proud, and one of the distractors stated, "The medals from the team events weigh more than the medals for solo events." Initially, we were surprised that a number of cognitive lab participants selected this distractor; however, it soon became apparent that their interpretation of the word "weigh" was different than our intended meaning. Whereas we had intended to convey the idea that the team-oriented medals were physically heavier, several respondents interpreted "weigh more" to mean that Brian had accumulated more points by winning a team-oriented event. Given this confusion, we revised the distractor to "The medals for team events are ordered from a company in Canada."

STUDIES OF THE PSYCHOMETRIC PROPERTIES OF THE TEAM ORIENTATION MEASURE (VERSION 1)

After the items were developed and initially reviewed through the cognitive labs, we created a first version of a CR measure to assess team orientation. Then, we conducted two studies to gather more information on the psychometric properties of the items and test. Analyses were conducted at the item, facet, and test level. Further, convergent and discriminant validity were examined by analyzing correlations between the 12 facets of the CR measure and the same facets as measured by scales derived from the International Personality Item Pool (IPIP, Goldberg, 1999). As discussed later, the IPIP is a pool of public domain personality items developed to prove a free source for assessing personality traits in a way that mirrors other commercially available self-report personality tests (e.g., NEO-PI-R; HPI, 16PF).

This section reports the method and results of the two studies conducted to examine the psychometric properties of Version 1 of the CR measure. A discussion of both studies is presented at the end of this section, followed by a section describing revision of the CR measure.

Study 1

Sample

One-hundred-and-twenty-one undergraduate students from introductory social science courses at a large southeastern university participated in Study 1. They were compensated for their time with research participation credits, which are used for extra-credit in their courses. Ninety-two participants were female and 29 were male, with most in their junior year (56, 46.3%) and the remainder in their senior (23, 19.0%), sophomore (30, 24.8%), freshman (10, 8.3%) or postgraduate years (2, 1.6%). Most participants were white (83, 68.8%), Hispanic (17, 14.0%), or Black (11, 9.1%), with the remainder reporting that they were Asian (5, 4.1%) or some other race (3, 2.5%). Two individuals declined to report their race. The mean age was 21.3 years (*SD* = 3.79) with a range of 17 to 42 years of age. Approximately 90% reported their age to be between 18 and 22 years.

Procedure

Participants were asked to attend a one-hour session for the purpose of assisting in the development of a new test. They were informed that they would complete two tests, one of which was in development and would deal with particular aspects of reasoning, while the other assessed normal personality. Participants were then given packets containing the CR measure, the personality measure containing the IPIP items, a demographics questionnaire, and a scannable form to record their responses.

Due to administration difficulties, Thirty-five individuals[2] in the sample were permitted to complete the measures at home and return them to the researcher later in the day. These participants' data were identified and compared to the remainder of the sample in terms of variability of responses, endorsement of distractors on the CR items, and scores on cognitive ability indices (i.e., grade point average, SAT scores). These 35 participants did not differ significantly from the remainder of the sample on these indices, and were included in all subsequent analyses.

Measures

Conditional Reasoning Measure

The CR measure was composed of 59 items designed to tap the following team orientation facets: Dominance (4 items), Rigidity (5 items), Competitiveness (6 items), Trust (4 items), Empathy / Social Perceptiveness (5 items), Altruism (5 items), Affiliation (5 items), Expressivity (5 items), Adjustment (6 items), Self-Esteem (5 items), Dependability (4 items), and Dutifulness (5 items). A sample Altruism item is presented below:

> When they are in college, many people volunteer their time to help others. Once they graduate, they tend to spend less time volunteering than they did in college.
>
> What is the most likely reason for this change?
>
> A. Many more college students major in English literature than in History.
> B. Once they start a job, most people are too busy to do volunteer work.
> C. Most college students do volunteer work mainly as a way to socialize.
> D. College costs have increased dramatically in the last decade.

For the sample item presented above, responses "A" and "D" are distractors. Option "C" reflects the choice that should **not** be attractive to altruists, as it presents a self-serving reason for why college students volunteer. Option "B," the response hypothesized to be attractive to altruists, presents an alternative reason for why people volunteer less after college: they no longer have the time (i.e., they "would if they could".) Thus, option "B" does not contradict the view that people volunteer for selfless reason, while option "C" directly goes against this premise.

If respondents selected a trait-keyed response, they received a score of 1. If they selected a non-trait-keyed response, they were assigned a –1. If a distractor was selected, a 0 was assigned. Facet scores were created by summing item scores within a given facet, and test scores were computed by summing scores across the 59 items. Therefore, the potential range of test scores was from –59 to 59.

[2] The researchers did not record what the return rate was for students who took study materials home.

Personality Measure

Self-report personality measures for each of the 12 facets identified in the team orientation model were included. Rather than using commercially available self-report measures, such as the HPI (Hogan, 1986) or NEO-PI-R (Costa & McCrae, 1992), we used items from the IPIP hosted online at http://ipip.ori.org. IPIP was developed by Goldberg (1999) and funded by the National Institute for Mental Health (NIMH) for the primary purpose of being available in the public domain and used for research purposes. The IPIP has parallel scales that were developed to measure the same constructs as the HPI, NEO, 16PF, and other proprietary inventories. The IPIP is psychometrically comparable to other popular personality tests, and the average correlation between existing scales and the IPIP corresponding scales is high. For example, the corrected correlation between the NEO facets and the corresponding IPIP facets is .94.

Participants indicated how much they believed each item described them by using a 5-point scale ranging from Very Inaccurate (1) to Very Accurate (5). Six items were included for each facet, resulting in 72 items on the personality inventory. Facet scores were computed by averaging across items for those facets.

Demographic Questionnaire

In addition to the CR and self-report personality measures, participants were asked to complete a short demographics questionnaire. This questionnaire included questions on gender, race, age, academic year in college, math and verbal scores from the SAT, and cumulative college grade point average (GPA).

Results

The analyses were focused on two primary goals: (1) generating information used to review item functioning and revise items and (2) gathering preliminary construct validity evidence for the CR measure. We initially report some basic analysis of the IPIP facet measures for the purpose of reviewing their suitability as an external referent measure for the CR measure. We then present CR item analyses and an analysis of the CR measure.

IPIP Analyses

In general, reliability estimates for IPIP facet scales were acceptable, although not high. In four of the 12 scales, reliability was less than .70 (see Table 2), suggesting that items for these facets lacked a high degree of internal consistency.

The intercorrelations of the IPIP facets also were examined for consistency with other published reports of personality constructs (See Table 3). Overall, the pattern of intercorrelations among the facets is consistent with other research, though there are a few notable exceptions. One exception is the relatively strong negative correlation between dominance and rigidity, which was expected to be a relatively strong correlation in the positive direction. Similarly, the non-significant correlations between competitiveness and both

dominance and rigidity were not expected. These exceptions point to a potential misspecification of dominance, rigidity, and competitiveness as jointly composing the dominance factor of team orientation. The intercorrelations among the facets composing the affiliation factor of team orientation are fully consistent with both our expectations for these relationships and previous research regarding these facets.

Table 2
Descriptive Statistics and Reliability Estimates for IPIP Scales

	Mean	***SD***	**α**
Dominance	3.25	0.74	.75
Rigidity	2.86	0.61	.52
Competitiveness	2.63	0.65	.52
Trust	3.04	0.70	.74
Social Perceptiveness	3.56	0.78	.76
Altruism	3.88	0.80	.79
Affiliation	3.42	0.77	.75
Expressivity	3.60	0.70	.69
Adjustment	3.18	0.75	.79
Self-Esteem	3.71	0.79	.81
Dependability	3.40	0.60	.56
Dutifulness	3.80	0.76	.74

Note. N = 91-102.

Table 3
Intercorrelations between Facets as Measured by the IPIP Scales

	Dom	Rigid	Comp	Trust	Percept	Altru	Affil	Express	Esteem	Depend	Duty	Adjust
Dom	(.75)											
Rigid	-.41**	(.52)										
Compete	.02	-.10	(.52)									
Trust	-.16	.06	-.32**	(.74)								
Percept	.35**	-.16	-.51**	.07	(.76)							
Altruism	.30**	-.19*	-.56**	.33**	.76**	(.79)						
Affiliation	.41**	-.24**	-.29**	.47**	.45**	.60**	(.75)					
Express	.20*	-.17	-.18*	.27**	.42**	.50**	.61**	(.69)				
Esteem	.61**	-.33**	-.19*	.07	.51**	.51**	.43**	.30**	(.81)			
Depend	.20*	.07	-.35**	.15	.41**	.40**	.25**	.26**	.43**	(.56)		
Duty	.35**	-.12	-.47**	.14	.68**	.69**	.38**	.38**	.64**	.59**	(.74)	
Adjust	.03	.01	-.19*	.33**	.22*	.25**	.31**	.13	.31**	.32**	.25**	(.79)

Note. N = 121. * = p < .05. ** p < .01. Reliability estimates appear in the diagonal (coefficient alpha). Dom = Dominance, Rigid = Rigidity, Comp = Competitiveness, Percept = Social Perceptiveness, Altru = Altruism, Affil = Affiliation, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment.

CR Item Analyses

Item-level analyses of the CR measure were conducted to identify problems with specific items so that such items could be revised. The distribution of item responses, inter-item correlations for each facet, and the relationship between item responses and measures of reasoning skills were examined.

Several individuals endorsed an extremely high number of distractors. Although it was expected that a few respondents might endorse *some* distractors, the endorsement of a large number of distractors across the set of 59 items was viewed as problematic. Distractors were written to be easily identified as illogical, and—even among items still in the developmental stage—were clearly not related to the item stem content. Moreover, a likely reason that a respondent might select a substantive number of distractors is because he or she did not read items completely or responded randomly. Consequently, it was decided to remove these individuals from all analyses. A criterion of a 20% distractor endorsement rate was used to identify these individuals. This criterion is consistent with practices James follows when scoring the CR measure of aggression (L. R. James, personal communication, November 10, 1999). Forty-four individuals were excluded from analyses on the basis of this criterion.

The frequency with which each of the four response options was endorsed was examined for each item. Ideally, the frequency of endorsement for distractors should be zero. However, due to random error it might be anticipated that some distractors occasionally would be endorsed, and thus a 0% endorsement rate might be an unrealistic standard. A 5% endorsement rate for distractors was set as the criterion for determining whether endorsement of a distractor on an item was high, because an endorsement rate of 5% or higher would likely reflect a systemic problem with the item rather than a problem with random error. Further, we set a criterion of endorsement for each of the two logical response options such that endorsement rates should be no less than 30% and no more than 70%. This 30-70 criterion was selected because it allows for maximum item variance and maximum discrimination. Nine items had an over-endorsement of distractors and 33 items failed to achieve the 30-70 standard on logical response options. A total of 38 items were identified that had one or both of these problems. Table 4 indicates how many items for each facet had either of these problems.

Intercorrelations among items were examined for the extent to which items covaried within each facet. Because the score for each item was categorical (1, 0, or –1), polychoric correlations were used. The average item intercorrelation across facets was .18, with a range of .12 for the rigidity and self-esteem facets to .23 for the altruism, affiliation, and adjustment facets (see Table 5). These results indicated that, even within a given facet, the CR items tended not to covary.

It is important to note that we did not expect all items to covary at a high level because each facet was represented by several different implicit assumptions. Previous research has found that, while items assessing the same implicit assumption tend to covary, items assessing multiple implicit assumptions may not covary strongly even though they assess the same latent construct. This lack of covariance among items occurs because an individual may possess a particular trait without demonstrating the variety of implicit beliefs, assumptions, and biases

underlying that trait. An individual does not necessarily need to endorse all of those views in order to be classified as 'high' on that construct. However, individuals who are 'high' on the underlying personality construct would be expected to endorse a particular implicit assumption across different situations.

Table 4
CR Items Identified with Problems by Facet

Facet	***Problem # 1*: High Distractor Endorsement**	***Problem # 2*: Disproportionate Logical Endorsement**	**Number of Problem Items**
Dominance (4)	1	2	3
Rigidity (5)	1	2	2
Competitiveness (6)	0	2	2
Trust (4)	1	2	2
Empathy (5)	1	2	3
Altruism (5)	1	4	4
Affiliation (5)	0	4	4
Expressivity (5)	0	4	4
Self Esteem (5)	2	2	4
Dependability (4)	1	1	2
Duty (5)	1	3	3
Adjustment (6)	0	5	5
Total	9	33	38

Note. Rows do not sum across Problems 1 and 2 because of overlap in the items identified as problematic The number in parentheses next to each facet name denotes the number of items written to assess that particular facet.

Finally, items were examined for a potential confounding with verbal reasoning ability. Because administering a direct assessment of verbal reasoning ability was impractical given constraints on time and resources, respondents were asked to self-report their component SAT scores (verbal and mathematics) and overall college GPA. The SAT-Verbal score was used as a proxy for verbal reasoning ability. Of the 59 CR items, 20 items had response options that correlated significantly with verbal reasoning as indicated by SAT-verbal scores. Of these 20, nine items had logical response options that correlated with verbal reasoning and 13 had distractors that correlated with verbal reasoning. The 20 items were randomly distributed across the 12 facets.

Facet Analysis

Table 6 presents intercorrelations among the 12 facet scales of the CR measure. In general, the facet scales shared little variance. However, several significant relations did emerge:

Competitiveness and Trust were negatively related (r = -.28), and Social Perceptiveness and Dutifulness and Self-Esteem and Adjustment were positively related (r = .28 and r = .26, respectively).

Table 5
Mean Polychoric Correlations among CR Items within Facets

	Mean Polychoric Correlation
Dominance	0.148
Rigidity	0.126
Competitiveness	0.220
Trust	0.215
Empathy	0.181
Altruism	0.231
Affiliation	0.233
Expressivity	0.141
Self Esteem	0.120
Dependability	0.139
Dutifulness	0.216
Adjustment	0.234

Note. N = 119-121. Individuals who selected distractors for more than 20% of the items were not included in analyses.

Table 6
Intercorrelations between Facets as Assessed by the CR Measure

	Dom	Rigid	Compete	Trust	Percept	Altru	Affil	Express	Esteem	Depend	Duty	Adjust
Dominance	--											
Rigidity	.04	--										
Competitiveness	-.01	.01	--									
Trust	.06	-.03	-.28*	--								
Social Perceptiveness	-.17	.03	.12	.04	--							
Altruism	.05	.01	.06	.07	-.14	--						
Affiliation	.02	.07	-.09	-.07	-.04	.17	--					
Expressivity	-.17	.15	-.10	.04	.05	.16	.08	--				
Self Esteem	.07	.11	.01	-.10	-.07	-.02	-.03	.04	--			
Dependability	.08	.19	.09	.17	-.05	-.07	.01	.06	.02	--		
Dutifulness	.06	.09	.07	.03	.28*	.12	-.04	.05	-.12	-.18	--	
Adjustment	.18	.07	-.13	.01	-.06	.02	.06	-.01	.26*	.03	.02	--

Note. * = p < .05. N = 76. Dom = Dominance, Rigid = Rigidity, Comp = Competitiveness, Percept = Social Perceptiveness, Altru = Altruism, Affil = Affiliation, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment.

We also examined the relationships between the IPIP scales and the CR scales. To the extent that the IPIP and CR measures of the same facet correlate, convergent validity is demonstrated. Conversely, to the extent that IPIP and CR measures of different facets do not correlate, discriminant validity is evidenced. One caveat should be made prior to this examination. Prior research on the development of CR measures of other personality constructs has shown that CR measures tend to correlate weakly, albeit significantly, with self-report measures of the same construct (Burroughs et al., 2000; James, 1998). This is believed to occur because CR measures assess the latent assumptions underlying the expression of a particular personality construct, whereas self-report measures assess the individual's perception of their own expressed tendencies and behavior. Furthermore, the construct and criterion-related validity of self-report personality measures may be negatively impacted by individuals' attempts to distort their scores (Schmitt & Ryan, 1993).

The convergent and discriminant validity indices are presented in Table 7. Of the 12 convergent validity indices none were significant, though the facets that tapped the higher-order dominance factor tended to demonstrate slightly more convergence than those that that tapped affiliation. Several of the IPIP-CR scales correlated significantly albeit weakly: the CR altruism facet scale and the IPIP adjustment facet scale correlated positively (r = .27), as did the CR affiliation facet scale and the IPIP self-esteem facet scale (r = .26). In addition, the CR Expressivity facet scale correlated negatively with the IPIP competitiveness facet scale (r = -.28).

Table 7
Convergent and Discriminant Validity Indices for the CR Measure

		IPIP Items											
		Dom	Rigid	Compete	Trust	Percept	Altru	Affil	Express	Esteem	Depend	Duty	Adjust
CR Items	Dom	0.10	-0.17	0.16	0.04	-0.04	-0.06	0.02	-0.06	-0.09	-0.01	-0.18	-0.12
	Rigid	-0.01	0.17	0.01	0.00	-0.01	-0.04	-0.08	-0.11	0.00	0.06	0.00	0.08
	Compete	0.04	-0.07	0.12	0.03	-0.14	0.05	0.17	0.01	0.04	-0.01	0.00	0.07
	Trust	0.15	-0.19	-0.09	0.11	0.18	0.13	0.03	0.06	0.16	0.14	0.17	-0.07
	Percept	-0.01	-0.16	0.04	-0.04	0.03	-0.02	0.08	0.14	0.16	0.07	0.21	0.05
	Altruism	-0.01	0.07	-0.02	0.15	0.13	0.18	0.12	0.16	0.07	-0.01	0.03	0.27*
	Affiliation	0.18	0.08	-0.11	0.05	0.15	0.13	0.10	-0.01	0.26*	0.13	0.07	0.09
	Express	-0.16	-0.09	-0.28*	0.00	0.04	0.04	-0.16	-0.01	-0.01	0.17	0.15	0.08
	Esteem	0.08	-0.05	-0.01	0.13	0.08	0.15	0.18	0.13	0.19	0.18	0.15	0.13
	Depend	-0.01	-0.16	-0.09	0.15	0.10	0.11	0.16	0.02	0.17	0.08	0.10	0.22
	Duty	-0.05	-0.05	-0.07	0.05	0.10	0.13	0.16	0.20	-0.08	0.11	0.09	-0.02
	Adjust	0.03	0.09	-0.03	0.18	0.07	0.09	0.01	-0.09	-0.05	0.09	0.03	0.07

Note. * = p < .05. N = 76. Convergent validity indices are in the diagonal; these cells are shaded gray. Discriminant validity indices are in the off-diagonal; these cells are not shaded. CR = Conditional Reasoning; Dom = Dominance, Rigid = Rigidity, Compete = Competitiveness, Percept = Social Perceptiveness, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment.

Discussion

Overall, the results associated with Study 1 illuminated several problems with the CR measure. Perhaps most importantly, the 4 to 6 items that comprise each facet shared little covariance: the average inter-item polychoric correlation ranged from .13 to .23. As the 1, -1, 0 scoring rubric produced ordinal level data, we decided that polychoric correlations were more appropriate than coefficient alpha estimates. However, coefficient alpha reliability estimates were no more encouraging, and in many cases were lower than the average polychoric correlation for each facet.

The small and non-significant correlations among the IPIP self-report personality measures and the CR facet scores are somewhat consistent with prior CR research (Burroughs et al., 2000; James, 1998) and theory, given that the former assess self-perceptions and self-presentations and the latter tap latent motives. For example, James (2004) noted that individuals identified as aggressive using a CR measure often do not report themselves as aggressive because they do not see themselves as behaving in a hostile manner. Rather, they frame their hostile actions as rational, justified responses to provocation from others. In much the same way, individuals identified as rigid or inflexible through implicit measurement tools such as CR may not describe themselves as rigid in self-reports, particularly if the self-report items clearly have a negative connotation. Instead, they may frame their behavior as dependable, predictable, steady, and moral (though the correlations presented in Table 7 argue against this perspective somewhat). These justification mechanisms (James, 1998) may not be required for behaviors that have a more positive connotation, and this may be why the CR and self-report measures of affiliation, altruism, social perceptiveness, and dutifulness demonstrated some evidence of convergent validity.

Prior to administering the CR measure in Study 2, we revised 38 of the 59 CR items. Most of these revisions were minor and focused on rectifying the unequal endorsement rates observed between two logical response options. These revisions generally entailed removing logical inconsistencies that were inadvertently built into "logical" responses or softening the sentiment expressed by the response. Moreover, we revised distractors that were selected by a substantive number of respondents. In these cases, we rewrote distractors to appear less logical than the original versions, and this was typically achieved by further divorcing the distractor theme from the content of the item stem.

Study 2

Sample

Two-hundred-and twenty-six Soldiers from Fort Stewart, Georgia participated; 81% were male and 19% were female. These Soldiers were targeted to be first and second tour enlisted personnel. Approximately 50% reported having a high school diploma or GED, with another 36% reporting some college education. Approximately 10% reported having completed either an Associates or Bachelors degree. Approximately 49% were White, 26% were Black, and 17% were Hispanic. The full breakdown of ethnic background is reported in Table 8. The sample

was approximately equally distributed among Combat Arms (CA), Combat Support (CS), and Combat Service Support (CSS) as shown in Table 9. The sample covered a wide variety of military occupational specialties (MOS) with concentrations in the Armor, Signals, and Maintenance career management fields (CMF). The breakdown of MOS by CMF is also shown in Table 9.

Procedure and Measures

In general, the same measures and procedures were employed in both Studies 1 and 2. However, the demographics measure used in Study 2 was modified slightly to align it more closely with the standard demographics measure utilized by the Army Research Institute.

Results

Analyses were focused on two goals: gathering useful information for reviewing the item functioning and revising items as necessary, and gathering preliminary construct validity evidence for the CR measure. We followed the same general structure adopted for reporting the results of Study 1. First, a parallel analysis of the IPIP facet measures is reviewed. We then review CR item analyses and examine the CR measure for the purpose of gathering construct validity evidence. In addition to the convergent/discriminant validity information, we also report an exploratory factor analysis of the CR facet measures.

IPIP Analyses

Descriptive statistics and reliability estimates for IPIP scales are reported in Table 10. The means and standard deviations for IPIP scales are similar to those reported in Study 1. However, the reliabilities are slightly lower than those reported previously; in fact, six of the twelve reliability estimates are lower than .70, the commonly accepted lower-bound estimate for acceptable coefficient alpha estimates for measures used in basic research (Nunnally, 1978).

The intercorrelations of the IPIP facets, presented in Table 11, were examined for consistency with published reports of personality constructs and the comparable analysis from Study 1 (See Table 3 for Study 1 results). In general, the pattern of intercorrelations is consistent with both reported research and the results of Study 1. Once again, however, rigidity and dominance were found to have a significant negative correlation, which was contrary to our original expectations. Also of note is that the rigidity facet is consistently and negatively correlated with all of the facets underlying the affiliation factor (e.g., trust, social perceptiveness, altruism, etc.). The same set of relations holds, albeit to a lesser degree, for the competitiveness facet. However, the converse is true for the dominance facet. This pattern indicates that the three facets believed to underlie the dominance factor may not covary in the manner we had anticipated. Moreover, this pattern of relationships is consistent with the results of Study 1. This indicates that the proposed structure for the dominance factor should be revisited to better understand its composition, particularly if this pattern of relationships among facets is replicated when using the CR instrument.

Table 8
Ethnic Background of Study 2 Participants

Race / Ethnicity	Frequency	%
Hispanic	38	16.8
American Indian	7	3.1
Asian	5	2.2
African American	59	26.1
White	110	48.7
Missing	7	3.1
Total	226	100.0

Table 9
Frequency of Military Occupational Specialty (MOS)-Career Management Fields (CMF) and Combat Unit Type Participating in Study 2

	Unit Assignment					
CMF – MOS Family	CA	CS	CSS	Missing	Total	%
Infantry	3	1	0	0	4	1.8
Combat Engineering	5	3	0	1	9	4
Field Artillery	7	1	0	9	17	7.5
Air Defense Artillery	7	0	0	0	7	3.1
Armor	25	0	4	5	34	15
Paralegal	0	0	2	0	2	0.9
Signal Operations	1	13	2	10	26	11.5
Electronic Maintenance & Calibration	0	2	3	0	5	2.2
Chemical	1	2	1	2	6	2.7
Ammunition	0	0	1	0	1	0.4
Religious Support	0	1	0	0	1	0.4
Mechanical Maintenance	6	9	10	7	32	14.1
Administration	1	2	0	0	3	1.3
Record Information Operations	0	0	0	2	2	0.9
Petroleum & Water	0	0	1	2	3	1.3
Transportation	1	3	3	0	7	3.1
Medical	1	3	4	3	11	4.9
Supply & Services	3	5	2	5	15	6.6
Military Police	0	8	3	1	12	5.3
Military Intelligence	0	9	6	1	16	7.1
Bands	0	0	4	0	4	1.8
Signals/Intel/ELWAR OPS	2	3	1	0	6	2.7
Missing	0	0	0	3	3	1.3
Total	63	65	47	51	226	100

Note. CA = Combat Arms, CS = Combat Support, CSS = Combat Service Support.

Table 10
Descriptive Statistics and Reliability Coefficients for IPIP Scales

	Mean	***SD***	**α**
Dominance	3.61	0.64	0.67
Rigidity	2.70	0.57	0.56
Competitiveness	2.64	0.65	0.54
Trust	2.92	0.67	0.74
Social Perceptiveness	3.57	0.59	0.70
Altruism	3.85	0.69	0.81
Affiliation	3.42	0.80	0.77
Expressivity	3.36	0.64	0.62
Adjustment	3.30	0.82	0.78
Self-Esteem	4.02	0.70	0.76
Dependability	3.64	0.61	0.59
Dutifulness	4.16	0.59	0.63

Note. $N = 226$. α = coefficient alpha reliability estimate.

Table 11
Intercorrelations Among IPIP Scales

	Dom	Rigid	Comp	Trust	Percept	Altruism	Affil	Express	Esteem	Depend	Duty	Adjust
Dom	(.67)											
Rigid	-.29**	(.56)										
Compete	.24**	.04	(.54)									
Trust	.05	-.20**	-.26**	(.74)								
Percept	.28**	-.21**	-.15**	.10	(.70)							
Altruism	.33**	-.30**	-.26**	.22**	.68**	(.81)						
Affiliation	.42**	-.35**	-.15**	.42**	.34**	.49**	(.77)					
Express	.13*	-.10	-.20**	.20**	.29**	.39**	.37**	(.62)				
Esteem	.57**	-.36**	.09	.15*	.35**	.43**	.47**	.23**	(.76)			
Depend	.33**	-.27**	-.12	.21**	.28**	.34**	.35**	.05	.53**	(.59)		
Duty	.28**	-.34**	-.17**	.20**	.43**	.51**	.28**	.15*	.48**	.61**	(.63)	
Adjust	.18**	-.32**	-.14*	.32**	.27**	.28**	.44**	.08	.43**	.41**	.28**	(.78)

Note. * = $p < .05$. ** = $p < .01$. $N = 226$. Convergent validity indices are in the diagonal; these cells are shaded gray. Discriminant validity indices are in the off diagonal; these cells are not shaded. Dom = Dominance, Rigid = Rigidity, Comp = Competitiveness, Percept = Social Perceptiveness, Altru = Altruism, Affil = Affiliation, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment.

CR Item Analysis

Analyses of the CR measure again focused on gathering information that would help with identifying potential problems with specific items, which could then inform revision and selection of items for a final version of the measure. This information included both the distribution of responses to each item and inter-correlations among items within each facet.

Similar to Study 1, we identified individuals who endorsed an extremely high number of distractors using a 20% criterion of unacceptable distractor endorsement. Twenty-seven respondents endorsed more than 20% of the distractors and were eliminated from subsequent analyses. This left 199 respondents in the sample.

For each item, the frequency with which the four responses were endorsed was examined. As previously noted, ideally we would expect to see the frequency of endorsement for the two distractors to be close to zero. We again used the criterion of a 5% endorsement rate to determine whether distractors for each item were endorsed too frequently. In addition, we added a new criterion for the endorsement of the "logical" response options. For each item, we computed a point-biserial correlation between the response options and the CR facet score. We then examined these point-biserial correlations for the two 'logical' response options. Correlations were expected to be high because the facet score included the item with which it was being correlated. Thus, items were viewed as "problematic" if they correlated less than .40 with the relevant facet score. Further, we expected that the endorsement rate of the two logical response options would fall within the 30% to 70% range. Results are summarized in Table 12.

Notably, more items indicated a need for revision than was the case in Study 1. Furthermore, this was the case whether or not the additional point-biserial criterion was employed. Using the endorsement of distractors as one type of criterion, we identified 28 items with responses needing revision, whereas only 9 items were identified using this criterion in Study 1. We also identified 29 items that exceeded the criteria established for the percentage endorsement breakdown for the two 'logical' response options, slightly less than we found in the Study 1 analysis. These 29 items were also identified in Study 1 as being problematic. Additionally, we identified four problematic items in this study that were not identified in Study 1. Overall, we identified 42 items that were in need of revision.

Polychoric correlations among CR items within each of the 12 facets also were examined. The average value of the correlations among items within each facet is reported in Table 13. The average item intercorrelation across all facets was .14, slightly lower than the corresponding results in Study 1. The average within-facet item intercorrelation was substantially lower for the dominance, competitiveness, and dependability facets (.15 vs. .07, .22 vs. .09, and .14 vs. .05 respectively). In general, results for the remaining facets were comparable to results found in Study 1. Differences between Study 1 and Study 2 results were localized to apparent problems with items 2 (dominance), 37 (dependability), 44 (competitiveness), and 45 (competitiveness). These items correlated reasonably well with other items within their respective facets in Study 1, but not in Study 2.

Table 12
Number of CR Items Identified with Problems within Each Facet

Facet	*Problem # 1*: High Distractor Endorsement	*Problem # 2*: Disproportionate Logical Endorsement	Number of Problem Items
Dominance (4)	3	2	3
Rigidity (5)	3	3	4
Comp (6)	4	2	4
Trust (4)	2	3	3
Empathy (5)	3	3	4
Altruism (5)	4	2	4
Affiliation (5)	3	2	3
Express (5)	2	3	3
Esteem (5)	5	1	5
Depend (4)	0	0	0
Duty (5)	4	3	4
Adjust (6)	4	5	5
Total	37	29	42

Notes. Rows do not sum across Columns 1 and 2 because of overlap in the items identified as problematic The number in parentheses next to each facet name denotes the number of items written to assess that particular facet.

Table 13
Mean Polychoric Correlations among CR Items within Each Facet

	Mean Polychoric *r*
Dominance	0.069
Rigidity	0.108
Competitiveness	0.087
Trust	0.223
Empathy	0.116
Altruism	0.139
Affiliation	0.153
Expressivity	0.130
Self Esteem	0.114
Dependability	0.054
Dutifulness	0.213
Adjustment	0.257

Note. $N = 226$.

Correlations among facet scores are presented in Table 14. In comparison to Study 1, more significant relations among the CR facets emerged, though this may simply reflect the larger sample size of Study 2. Several of the significant relations were among conceptually similar facets, such as dutifulness and altruism (r = .15) and dominance and competitiveness (r = .24). However, others were not, such as the links among dominance and social perceptiveness (r = .16) and rigidity and competitiveness (r = -.14).

In addition to examining the correlations among the facets as measured by the CR measure, we also examined the relationship between the IPIP measure and CR measure across all facets. In general, neither the correlations between the IPIP measure and the CR measure assessing the same facet nor the correlations between the two measures assessing different facets support for the construct validity of the CR measure (see Table 15). However, some interesting findings did emerge. First, the CR and self-report measures of dutifulness exhibited a significant convergent relation (r = .28). In addition, the CR trust facet scale correlated negatively with the IPIP dominance scale (r = -.19) and positively with the IPIP expressivity, self-esteem, and adjustment scales (r = .15, .15, and .14, respectively). However, the significant findings consistently reflected weak relations among the various scales. Overall, these findings do not support the basic notion that these two measures are assessing the same underlying constructs. This may be due to either or both of these measures not functioning as expected, although the specific reasons for these finding are unknown at present.

Table 14
Intercorrelations among CR Facet Scales

	Dom	Rigid	Compete	Trust	Percept	Altru	Affil	Express	Esteem	Depend	Duty	Adjust
Dom												
Rigid	-.08											
Compete	.24**	-.14*										
Trust	-.09	.04	.08									
Percept	.16*	-.02	.12	.05								
Altruism	.11	.02	.01	-.02	-.03							
Affiliation	-.04	-.15*	-.04	.05	.03	-.01						
Express	-.03	-.02	-.08	.05	-.02	.07	-.11					
Esteem	-.01	.12	-.05	.13	.01	.01	-.09	.09				
Depend	-.04	.04	.03	.01	.05	-.05	-.05	.02	.02			
Duty	.10	.00	-.08	-.11	.00	.15*	.03	.02	.11	-.12		
Adjust	.03	.10	-.03	-.01	.00	.01	.07	.14*	.01	-.07	-.07	

Notes. * = p < .05. ** = p < .01. N = 199. Dom = Dominance, Rigid = Rigidity, Compete = Competitiveness, Percept = Social Perceptiveness, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment

Table 15
Convergent and Discriminant Validities with CR and IPIP Facet Scales

	IPIP Scale											
CR Scale	Dom	Rigid	Compete	Trust	Percept	Altru	Affil	Express	Esteem	Depend	Duty	Adjust
Dom	.08	-.03	.11	-.19**	.10	.03	-.06	.04	-.03	-.09	-01	-.12
Rigid	-.01	-.02	.03	.03	-.09	-.12	-.06	.03	.04	.01	.05	.07
Compete	.03	.00	.11	-.02	.05	-.03	.03	-.08	-.01	.07	-.11	.09
Trust	-.03	.05	-.06	.10	-.02	-.06	-.06	-.17	.05	.14	-.04	.07
Percept	-.06	-.01	-.11	-.01	-.03	-.03	-.03	.00	-.18*	-.05	-.10	.02
Altruism	.05	.02	-.02	-.02	.06	.11	-.10	.08	.06	.03	.11	-.08
Affiliation	.06	-.01	-.08	.03	.03	.09	.06	.05	-.00	-.09	-.02	-.01
Express	-.06	-.03	-.07	.15*	.02	.05	-.01	-.07	.07	.02	.04	.08
Esteem	.04	.01	.01	.15*	.02	.02	-.07	-.02	.01	.05	.05	.04
Depend	-.08	.06	.08	-.12	-.04	-.11	-.09	.01	-.17*	-.09	-.13	-.03
Duty	-.03	.04	-.10	.07	.06	.09	.03	-.01	.12	.14*	.28**	.08
Adjust	-.09	-.01	-.16*	.14*	.03	.01	-.02	-.10	-.13	.00	-.03	.05

Note. * = p < .05. ** = p < .01. N= 199. Convergent validity indices are in the diagonal; these cells are shaded gray. Discriminant validity indices are in the off-diagonal; these cells are not shaded. Dom = Dominance, Rigid = Rigidity, Compete = Competitiveness, Percept = Social Perceptiveness, Express = Expressivity, Esteem = Self-Esteem, Depend = Dependability, Duty = Dutifulness, Adjust = Adjustment.

To further explore the psychometric characteristics of the CR measure, we conducted an exploratory factor analysis. Given that we employed a 1, 0, -1 scoring scheme, we factor analyzed the polychoric correlation matrix. Factor analyses of polychoric correlation matrices also are recommended when rather extreme splits (e.g., 85% / 15%) are observed across item response options. The factor analysis employed an unweighted least squares extraction method along with oblique rotation, which allowed factors to correlate. Examination of the variance accounted for by each factor, the scree plot, and the eigenvalues associated with each factor suggested a seven-factor solution. Essentially, the factor analytic results were consistent with the disappointing results observed using other methods: the items evidenced little covariance, and therefore the factor loadings—even those associated with items and their "primary" factor—were low. Among the items that comprised a factor, opposing poles of each factor (i.e., those items with positive vs. negative loadings) tended to consist either of items with a positive connotation (e.g., affiliation, empathy, etc.) or those with a negative flavor (e.g., dominance). When we created empirically derived scales using items for a common pole, however, the average polychoric correlation among items comprising these scales were generally no better than the low internal consistencies associated with the theoretically derived facet scales.

Discussion

Study 2 indicated that many problems with the CR team orientation remain. First, efforts to revise the measure between Studies 1 and 2 did not rectify two central psychometric problems—the drastically unequal endorsement rates associated with the two logical response

options for many items and the high endorsement rates associated with a number of distractors. Second, similar to Study 1, both internal consistency estimates of the facets and factor analysis indicated that most items within a facet share little covariance. Thus, revisions to the CR test in Study 2 did not appear to adequately address the psychometric concerns revealed in Study 1. In addition, concerns about the reliability of IPIP scales suggest that the IPIP scales likely serve as a poor metric upon which to judge the quality of the CR items. Though prior research indicates that self-report and CR items of the same construct typically demonstrate small positive correlations (Burroughs et al., 2000), even these modest associations were not observed here. Finally, as the item level factor analyses clearly demonstrated, little covariance existed among items from within a given facet. Thus, our development of facet level scores cannot be confidently justified, as these scores contained a considerable amount of error variance.

General Discussion of Studies 1 and 2

Despite the problems outlined in Studies 1 and 2, several encouraging findings emerged. For a number of items, distractors were chosen on a relatively infrequent basis. Additionally, both of the logical response options were commonly selected by a non-trivial percentage of respondents. For traits thought to vary in accordance with a normal distribution among the U.S. adult population—as many of the facts of team orientation presumably do—CR measure developers often strive to achieve close to a 50/50 split for the two logical response options. Several more practical concerns also support this goal: if one of the logical responses is almost never selected, a subtle logical flaw may be present in the reasoning structure supporting the response option. Furthermore, the reduced item variance that this situation engenders makes it nearly impossible for internal consistency reliability estimates to reach acceptable levels. Despite its advantages, however, the "50/50 split" strategy is not routinely employed in the development of *all* CR measures. For example, CR response options designed to tap aberrant-self promotion (Gustafson, 2000a) and aggressive hostility (James, 1998) were written to appeal to a relatively small percentage of respondents (i.e., five to ten percent), because prior empirical work indicated that such traits are encountered on a relatively infrequent basis in the population (Gustafson & Ritzer, 1995). However, given that we were not attempting to assess traits presumed to have a low base rate in the population and in light of the psychometric issues noted above, we were aiming for an endorsement breakdown that closely approximated 50/50.

Although factor analyses of the inter-*item* correlation matrix did not reproduce the hypothesized team orientation structure, similar analyses conducted using the facet *scale* scores did provide some support for a two-dimensional Affiliation/Dominance structure. In addition to these encouraging findings, qualitative results from the cognitive laboratories indicated that the implicit assumptions thought to drive item responses were, in fact, evoked by participants when they were asked to explain why they had chosen a particular item. To briefly review, cognitive laboratory participants are required to verbally report the processes they engage in as they decide how they will respond to a given item. This exercise allows test developers to ascertain whether respondents interpret and respond to test items in the intended manner, and is particularly useful when attempting to identify subtle logical flaws in CR items. Thus, cognitive labs provide construct validity evidence for test items because they allow for an explication of the cognitive processes thought to underlie responses to those items.

The lack of item covariance revealed in both studies was troubling. This item independence was evident even at the subscale level: coefficient alpha reliabilities for the total scale and the facet scales were considerably below acceptable levels, and the inter-item correlation matrix revealed few significant relations. Given these findings, we decided to revise both the team orientation model and the associated test items in order to improve the psychometric qualities of the measure.

Our revision efforts involving the theoretical model of team orientation centered on identifying the general construct's cardinal elements. By focusing on a smaller number of facets, we hoped to create a more parsimonious set of implicit assumptions *across* the various facets so that the essence of team orientation was consistently captured. Furthermore, by dealing with fewer facets, we were able to increase the number of items written for each facet from four or five to ten or eleven. After revisiting the theoretical and empirical literature related to team orientation, we decided to focus on the explication and measurement of five key facets of team orientation: Cooperative Work Ethic, Responsibility to Others, Sociability, Controlling Entitlement, and Negative World View. Using this revised model as a guide, we created a new series of implicit assumptions for each of the five facets, revised existing items in light of the updated model, and developed additional items as necessary. Moreover, an additional round of cognitive laboratories was conducted at Ft. Leonard Wood in November of 2002. The next section discusses revision of the CR measure.

REVISION OF THE CONDITIONAL REASONING MEASURE

Our decision to focus on a reduced number of facets was driven by measurement-oriented concerns. Primarily, our goal was to increase the number of items written for each implicit assumption. With the CR measure used in the first two studies, a facet was represented by many implicit assumptions, and many implicit assumptions were represented by only one item. Consequently, the items for a given facet tended not to covary. For the studies that follow (Studies 3 through 5), we decided to focus on a reduced number of key facets and revise the implicit assumptions associated with each facet. To determine how the 12 facets could best be synthesized into a smaller number of team orientation's "essential elements," we used both empirical and theoretical information. Specifically, the correlation matrices associated with the first two studies helped us identify these essential elements, and we also reviewed the theoretical framework of team orientation to ascertain which facets define the core of the construct.

For the revised CR measure, we targeted five central themes that we think underlie the 12 team orientation facets previously identified; these five themes are defined in detail in Appendix B. In brief, these themes involve feelings of responsibility toward others, the proclivity to be sociable, a cooperative work ethic, an attitude that it is correct to control others (i.e., controlling entitlement), and a negative view of the world. We then revisited the original implicit assumptions for the 12 facets and targeted those assumptions that centrally defined the above noted themes. If an implicit assumption did not map onto one of the five themes, it was removed from further consideration for the revised instrument. Moreover, additional implicit assumptions were added to address the most central aspect of each of the five key themes.

Using the "controlling entitlement" theme as an example, we targeted the extreme aspects of domineering behavior. As is evident by examining the correlation matrices from the first two studies, the dominance facet of the CR measure tended to correlate positively with the other "positive" facets such as affiliation and altruism. However, during our original item development we had cast this facet in a negative light and assumed that overly dominant individuals would detract from team-oriented processes. As such, we revised the dominance items to tap a more "domineering" attitude, or a worldview expressed by implicit assumptions such as "I am in charge and you are not" and "I don't need to listen to the opinions of others." By effecting these revisions, we sought to avoid tapping the prosocial-assertive elements of dominance associated with successful leadership (House & Howell, 1992). Rather, we tried to focus on trait elements that would be most detrimental during situations that required equal-status individuals to work together.

Through the processes described above, we developed a set of five revised team orientation facets: Responsibility to Others, Cooperative Work Ethic, Sociable Tendency, Negative World View, and Controlling Entitlement. Detailed definitions and the implicit assumptions associated with these five facets are presented in Appendix B. In specifying these new facets and implicit assumptions, we targeted the core aspects of team-orientation. These revised themes and implicit assumptions then served as the building blocks for new items. Existing items also were revised to better reflect the new theme structure. The specific procedures employed during the item development and revision process are detailed in the next section.

Item Development

The third author and several research assistants reviewed items from the original conditional reasoning test to ascertain the extent to which they were consistent with the new focus. Several items were eliminated from consideration for the revised measure because their content was distally related to the newly derived central themes. Other items were revised to better reflect our revised conceptualization of team orientation. This resulted in retaining 35 items from the original CR test, although some of those items were revised. We then wrote 15 new items, resulting in each facet being represented by 10 items.

An additional round of item revision was conducted using the cognitive lab procedures described earlier in this paper. Specifically, we conducted one set of cognitive laboratories at Fort Leonard Wood with first and second term Soldiers. We conducted three focus groups, each with eight to nine Soldiers. To the extent possible—particularly for the new or substantially revised items —we had at least two of the groups provide feedback. The type of feedback received during these cognitive labs is described briefly in the next section.

Item Revision

In general, the cognitive labs illuminated a number of persistent "problem areas" across multiple items. At times, these problems were relatively straightforward to fix. Respondents indicated that they were unfamiliar with the terminology (e.g., "document manager") used in some items. In these cases, the unfamiliar term was replaced with a more generic or less confusing descriptor, such as "secretary." On other occasions, details embedded in the items triggered comments from test takers. For example, one item described a car accident where one of the drivers worried that the engine would explode. During the cognitive labs, several of the Soldiers noted that engines themselves don't really explode, but that a gasoline tank might. In that instance, the item was revised to depict a driver concerned about a gas tank exploding.

For some items, respondents focused on the content of the item stem rather than on the values or motives characteristic of the relevant facet and implicit assumption(s). For example, one of the Negative World View (NWV) items tapped a cynical, hostile attitude by asking respondents why enrolment in do-it-yourself home repairs had increased in recent years: the NWV keyed-option expressed the view that contractors often scam people so it is better to do the work oneself, while the alternative response noted that people have discovered that it is fun to do home repairs. Responses to this item appeared to be driven almost exclusively by respondents' personal experience with contractors and other idiosyncratic factors (e.g., such as whether they knew any contractors). When respondents appeared to consistently draw upon personal experiences or idiosyncratic factors in their responses, we revised the item stem to serve as a better "trigger" to activate reasoning strategies associated with the focal trait; often, this meant pulling extraneous detail out of the stem and presenting the situation as simply as possible. At the same time, we revised response options to better reflect the reasoning strategies associated with particular implicit assumptions.

Cognitive labs also were helpful in identifying items that were likely to generate little variance. For instance, an item presented a situation in which a passerby had to decide whether to help a victim in need. When presented with this dilemma, almost none of the Soldiers selected the response option supportive of the decision not to help the victim. In defense of their choice, many Soldiers stated that military training reinforces the message that Soldiers must help people who are injured. Items with low endorsement of logical response options were revised to make the rejected responses more appealing.

Some items appeared to elicit assumptions unrelated to the focal trait. For example, one Controlling Entitlement item described a situation in which a number of meetings with the same participants resulted in considerable bickering and indecision, but little progress. Respondents were asked to infer why this was the case. Though written to trigger implicit assumptions about whether it is right to "take charge" and control peers or whether disputes can be resolved in a more participative manner, respondents verbalized many different assumptions. Specifically, a number of respondents stated that because there was so much dissention and so little progress in the meetings, they assumed that no one important was involved. To address this extraneous assumption, the item was revised so that it was clear that many important organizational members were involved in the meetings.

The cognitive labs were useful in identifying items that were unlikely to function as intended. As a result of the cognitive lab and item development efforts, a revised CR measure was constructed that consisted of 51 items that tapped five facets of team orientation. The next section discusses three studies that examined the psychometric properties of the revised measure.

STUDIES OF THE PSYCHOMETRIC PROPERTIES OF THE REVISED CR MEASURE (VERSION 2)

Three studies were conducted using the revised five-facet CR measure. Like the first two studies, these studies were conducted to examine the psychometric structure of the test. Unlike the first two studies, however, this series of studies also included criterion measures, which allowed for an evaluation of the CR measure's concurrent and predictive validity.

Study 3

Sample

Three-hundred-and-twenty-one Soldiers from Fort Lewis participated; Soldiers were primarily first- and second-tour enlisted personnel. The sample was approximately 90% male. Soldiers ranged in age from 18 to 38, with an average age of 22.58. Most reported having earned either a high school diploma or a GED (98%), while 42% reported having at least some college education. Approximately 60% were White, 13% were Black, and 18% were Hispanic. The frequencies of ethnic and racial backgrounds are in Table 16. Approximately 68% of the Soldiers were Combat Arms (CA), with the others in Combat Services (CS; approximately 16%) and Combat Service Support (CSS; approximately 8%). Over 90% of the Soldiers were working on their MOS, and a wide variety of MOS concentrations were represented. The average tenure among solders was 31.30 months and ranged from less than one month to 136 months.

Table 16
Racial/Ethnic Background of Sample

Race/Ethnicity	Frequency	Percent
American Indian or Alaska Native	6	1.9
Asian	8	2.5
Black or African American	42	13.2
Native Hawaiian or other Pacific Islander	4	1.2
White	191	59.5
Multiple Races	14	4.3
Did Not Respond	56	17.4
Total	321	100.0

Procedure

Participants and their immediate supervisors (typically Sergeants or Staff Sergeants) were asked to report to the testing room at the same time. Once they arrived, Soldiers and supervisors were sent to different rooms. Once Soldiers had signed in, sign-in sheets were brought to the

supervisors, who identified the Soldiers that he or she supervised. While Soldiers completed the CR measure, supervisors rated their Soldier's performance. It was explained to participants and their direct supervisors that all data were collected for research purposes only, and that the research team alone would have access to information that they provided. We also stressed that we would be presenting group-level, aggregated data to the Army, and that their anonymity would be respected at all times.

Concurrent to the focal data collection, we also conducted several cognitive labs at Ft. Lewis. The cognitive labs were conducted in a room that was isolated from the main testing session so that the test-takers were unable to hear the cognitive lab participants' vocalizations.

Measures

Conditional Reasoning Measure

The CR measure administered at Ft. Lewis consisted of 51 items that tapped five facets of team orientation: Responsibility to Others, Cooperative Work Ethic, Sociable Tendency, Negative World View, and Controlling Entitlement. When scoring the measure, a 1 was assigned to all facet-keyed responses, a –1 was assigned to all facet-inconsistent responses, and a 0 was assigned when distractors were endorsed. Each facet scale consisted of 10 items, except for Negative World View, which consisted of 11 items. A sample item from each facet scale is presented.

Cooperative Work Ethic. Brad is one of the fastest members of his school swimming team. At this year's regional meet, he won two medals. One medal was for the solo 50-meter freestyle, and the other was for the 200-meter backstroke team relay. When he called his parents to tell them how he had done, he spent almost all of the phone call talking about the relay race.

What is the most likely reason that Brad spent so much time talking about the team relay?

a) Each team member had built on the lead established by the others.
b) The medals for team events are ordered from a company in Canada.
c) Along with winning a medal, he had set a personal best time in his leg of the relay.
d) Brad really didn't like swimming in pools when he could swim in a lake.

The item presented above describes a situation in which a swimmer won two medals, and notes that he spoke to his parents more about the team-based relay win rather than the more individualistic freestyle race. Given that individuals with a cooperative work ethic hold implicit assumptions such as "Cooperation brings out the best in people," such individuals may assume that the swimmer had talked about the team relay more because he was proud of working as part of a team, or that he believed that swimming as part of a team had pushed him to perform particularly well (Option A reflects the latter sort of reasoning). Option C presents a reason for why the swimmer spent so much time describing the team win that is more individually focused.

Responsibility to Others. Laura recently started working as a reporter at a local newspaper. The office gets very hectic in the late afternoon around the 4:00 p.m. press deadline. Laura will always proofread other reporters' work if they ask her, even if her own stories are not done yet.

What is the most likely result of this?

a) Laura misses deadlines because she is not focused enough on her own work. (-)
b) The sports section starts running more stories about baseball.
c) Laura convinces the other reporters that they can all do better if they help each other out. (+)
d) The newspaper hires more reporters who have red hair and brown eyes.

This item presents a situation where a worker named Laura places more importance on helping others and getting articles proofread for the paper than on finishing her own work. Option C, the facet keyed response, presents a positive outcome flowing from this type of behavior, and was written to reflect implicit assumptions such as "Good people accept the responsibility for their obligations to others." Presumably, individuals who are high on this trait would view Laura's behavior in a positive light and would assume that a good outcome would result from it. Alternatively, Option A presents a negative outcome, which is more in line with implicit assumptions such as "People only have a responsibility to look out for themselves."

Sociable Tendency. These days an increasing number of people are 'telecommuting.' In many cases, companies buy employees laptop computers so they can work from home.

What is the strongest argument against the telecommuting trend?

a) People who don't have full-time jobs own most of the minivans on the market.
b) Many new homes are built with attached garages.
c) It is too costly for companies to spend extra money on laptop computers for people who work at home. (-)
d) Telecommuting prevents the natural communication that most jobs require from occurring. (+)

Given that individuals who have a tendency to be sociable likely hold implicit assumptions such as "People are social by nature," the idea of telecommuting and missing out on contact with others would likely be at least somewhat distasteful to such individuals. Option D taps the assumption that most jobs require social interaction, even if it is not an explicit part of the job description. Alternatively, Option D presents a reason concerning why telecommuting may not be a good idea that is focused on finances rather than a lack of personal interaction. Thus, Option C would probably be more appealing to non-sociable individuals (characterized by implicit assumptions such as "People are forced to interact with each other because society operates that way") than would Option D.

Negative World View. Acme Business Products selected the Tucson Division to be the focus of a job enrichment program. In a job enrichment program, jobs are made more challenging by giving workers greater responsibility and more varied job duties. After twelve months, the company was surprised to find that turnover in this division had increased by a third.

What is the most likely reason for the division's high turnover?

a) Employees realized that the "job enrichment" program was really just a way to get people to work harder for the same amount of money. (+)
b) Employees are very happy with the health insurance benefits that Acme Business Products offers.
c) Acme Business Products has locations in ten different locations across the country and in Europe.
d) The increased challenges allowed employees to develop many new skills, resulting in their being promoted out of the division. (-)

This item requires the test-taker to draw inferences concerning why companies implement job enrichment programs, and what results are associated with such interventions are. Individuals with a negative world view would likely view an effort to have employees more responsibility and a greater variety of job duties as a manipulative ploy to get more work out of them (which is reflected in Option A). This type of reasoning reflects implicit assumptions such as "The world is out to get you" and "If you let your guard down, people will take advantage of you." In contrast, Option D casts the job enrichment program in a positive light: rather than causing employees to leave the company, it led to the development of new skills and associated promotions. This more trusting view of management reflects implicit assumptions such as "People can generally be trusted to do the right thing."

Controlling Entitlement. After a long and successful career in government, a famous individual wrote a book called "First Among Equals." The book describes his opinions about how to work with other people to get things done effectively and also explains how he used the methods described in the book to solve many social and political problems during his career.

What is the most likely meaning of the book's title?

a) Staff must "first" obtain a photo-ID card in order to enter the Senate office building.
b) Construction on the Washington Monument "first" started in 1800.
c) When dealing with important issues, the "first" rule is to always treat others as your equal. (-)
d) Even among people of equal status, someone needs to be "first" and to take control. (+)

This item taps implicit attitudes about control and hierarchical structure in groups, even when there is no assigned leader. Individuals who have an attitude of controlling entitlement are not likely to believe that people are really "equal" within a team or group, even if the team members share a common level or rank. Because they are guided by implicit assumptions such as "In group settings, effective people take control" and "People need to be controlled," Option D should appeal to them. Furthermore, because less controlling individuals are likely to hold more egalitarian and participative views, Option C should be more attractive to them than Option D.

Background Information Questionnaire

Participants were asked to complete a short background questionnaire that included questions about age, gender, race, MOS, unit type, tenure, rank, and level of education.

Behavioral Criterion Measure

Supervisors used a five-point BARS scale created for the purposes of this research in order to rate Soldiers who completed the CR test. Each BARS scale (presented in Appendix C) assessed behaviors consistent with the five personality facets measured by the CR measure. Specifically, representative behaviors anchored the first (low), third (middle), and fifth (high) scale points. In each case, higher ratings described behaviors that were consistent with the general nature of the focal facet. For example, the behaviors listed under the fifth scale point for the Negative World View scale are "Is often stressed or worried about daily hassles," "Often seems stern or in a bad mood," "Regularly blames others for own mistakes," and "Seeks to point out flaws or errors in others' work."

Results

Prior to conducting further analyses, we removed participants who endorsed more than 20 percent (i.e., 11) of distractors. As noted earlier, we assumed that anyone who endorsed a considerable number of the distractors was not attempting to answer the test honestly. Forty-five respondents were removed from the sample on the basis of this exclusion criterion.

Endorsement percentages for each item are presented in Appendix D. In most cases, low endorsement rates for either logical response reflected one of two response patterns: the inclination *not* to endorse a response reflective of either a negative world view or entitlement-related beliefs, or the tendency to endorse responses reflective of cooperation, responsibility to others, and sociability.

Internal consistency reliability estimates for each facet scale was as follows: Responsibility to Others = -.04, Cooperative Work Ethic = .16, Sociable Tendency = .23, Negative World View = .19, Controlling Entitlement = .11. These low values suggest that aggregation of items to facet-level scale scores is not merited. To further examine the dimensional structure of the revised CR measure, we conducted an exploratory factor analysis of the inter-item correlation matrix (see Appendix E). For the most part, the factors that emerged from this analysis tended to be defined by a positive and negative pole: for example, the positive pole of the first factor consisted of Controlling Entitlement and Negative World View items, while the negative pole consisted of a mix of Sociable Tendency, Cooperative Work Ethic, and Responsibility to Others items; these two distinct item clusters of positive attributes versus negative attributes reappeared somewhat consistently across the various factors. However, our attempts to produce empirically derived subscales were generally not successful. Even when we were able to generate scales with internal consistency estimates in the .40 to .50 range, such scales contained only two to three items and did not correlate meaningfully with any criteria. Given this, we examined the relation of each item with the criteria in addition to examining facet-criterion correlations; the former are presented in Table 18 while the latter appear in Table

17. In Table 17, rows represent CR facet scores, while columns represent supervisor ratings of behaviors that are consistent with each facet.

At the facet level, only the Negative World View scale correlated with the corresponding supervisor rating scale in a theoretically predicted manner; the other four facet scores were unrelated to supervisor ratings of facet-consistent behaviors. The Negative World View facet was also negatively related to supervisor Cooperative Work Ethic ratings. The remaining significant relationships were not expected: Sociable Tendency facet scores were negatively related to supervisor ratings of responsibility and cooperation, and Cooperative Work Ethic scores were negatively related to supervisor ratings of Responsibility to Others.

Table 17
Correlations Among Facet Scale Scores and Supervisor Ratings

			CR Scale				
Supervisor Rating	*M*	*SD*	*Responsibility to Others*	*Cooperative Work Ethic*	*Sociable Tendency*	*Negative World View*	*Controlling Entitlement*
Responsibility to Others	3.58	1.28	-.07	-.20*	-.25*	-.13	.07
Cooperative Work Ethic	3.71	1.17	-.03	-.09	-.20*	-.17*	.04
Sociable Tendency	3.55	1.13	-.03	-.11	-.09	-.10	.07
Negative World View	2.35	1.27	-.02	.06	.05	.24*	-.13
Controlling Entitlement	2.19	1.25	-.02	-.04	.12	.15	-.03

Note. * = p < .05

Although a number of significant relations emerged in the item-level analysis (see Table 18), most were not theoretically interpretable and might reflect spurious correlations. For example, item 29, which belonged to the Cooperative Work Ethic facet, correlated negatively with supervisor ratings of sociability and cooperation. Consistent with the facet-level results, the most encouraging findings tended to be associated with the Negative World View items: item 37 correlated significantly with its theoretically relevant criterion (r = .19), item 11 correlated with the Controlling Entitlement supervisor rating (r = .29), and item 41 correlated positively with both the Negative World View (r = .17) and Controlling Entitlement (r = .20) supervisor ratings and negatively with the Responsibility to Others (r = -.17) and Sociable Tendency (r = -.17) supervisor ratings.

Cognitive Labs

Cognitive labs consisted of two groups of approximately eight to ten Soldiers. In general, cognitive lab feedback was similar to the feedback obtained at Fort Leonard Wood. Feedback was used to revise items that the cognitive lab participants found confusing. However, we also dropped one item from the test in response to cognitive lab feedback: the item described different strategies that could be taken when playing the card game bridge, and respondents found both the content and the description of the strategies confusing. In contrast to other items that were perceived as confusing, we were unable to revise the bridge item in a way that described its "essential elements" in a more straightforward manner.

Table 18

Item–Criteria Correlations (Ft. Lewis Data)

CR Scale	Item	Supervisor Ratings				
		Responsibility to Others	*Cooperative Work Ethic*	*Sociable Tendency*	*Negative World View*	*Controlling Entitlement*
Responsibility to Others	10	-.07	-.16	-.16	.12	.14
	16	.09	.07	.20	-.06	-.03
	20	-.03	.02	.04	-.15	-.12
	26	-.17	-.09	-.07	.14	.06
	30	-.03	.11	.05	.00	-.05
	33	-.05	-.11	-.06	-.03	-.01
	34	.05	.13	.00	-.06	-.03
	42	.07	.01	.01	-.01	-.09
	43	-.03	-.05	-.01	.03	.09
	45	.02	.00	.04	-.01	.13
Cooperative Work Ethic	1	-.05	.00	-.15	-.04	-.05
	8	-.10	-.01	-.01	-.02	.00
	15	-.09	-.01	.07	.02	-.03
	18	-.22*	-.20*	-.06	.21*	.14
	21	.01	.07	.02	-.01	-.06
	28	.22*	.12	.03	-.10	-.11
	29	-.22*	-.07	-.22*	.11	.01
	32	-.02	.00	.00	.06	.02
	39	-.08	-.07	-.01	-.09	.05
	50	-.09	-.12	-.06	.10	.06
Sociable Tendency	2	-.07	-.02	-.02	-.04	-.10
	4	-.07	.01	-.03	.06	.06
	9	-.02	.02	.06	-.16	-.08
	12	-.08	-.11	-.18*	.07	.07
	13	.08	-.03	.06	-.07	-.04
	23	-.16	-.18*	-.02	.10	.09
	25	-.09	-.07	-.03	.02	.06
	46	-.07	-.05	-.04	.03	.17*
	48	-.13	-.09	.02	.09	.06
	49	-.20*	-.16	-.06	.07	.12

CR Scale	Item	Supervisor Ratings				
		Responsibility to Others	*Cooperative Work Ethic*	*Sociable Tendency*	*Negative World View*	*Controlling Entitlement*
Negative World View	3	-.05	.07	-.07	.06	-.09
	5	-.02	-.06	.03	.09	.06
	7	-.01	-.10	.00	.05	-.05
	11	-.09	-.10	-.02	.11	.29*
	22	.10	.10	.06	-.01	.05
	27	-.06	-.16	-.06	.04	-.05
	31	-.12	-.17*	-.08	.11	.04
	37	-.02	-.11	-.08	.19*	.08
	41	-.17*	-.14	-.17*	.17*	.20*
	47	-.03	-.10	-.10	.05	-.02
	51	-.11	.03	.08	.09	.03
Controlling Entitlement	6	-.02	.08	.08	-.03	.00
	14	-.10	-.18*	.00	.06	.10
	17	.09	.10	.21*	-.14	-.10
	19	.07	.04	.11	-.16	-.19
	24	.00	-.04	-.02	.04	.00
	35	-.02	-.06	-.09	.05	.14
	36	.02	-.02	-.02	-.03	.06
	38	.05	.10	-.01	-.06	.01
	40	.02	-.04	-.10	.04	-.12
	44	.05	.07	.00	-.13	-.01

Note. N = 128 to 132. * = $p < .05$

Discussion

When judged in reference to reasonable standards of test quality, it is clear that the CR measure still leaves much to be desired. The internal consistency reliability estimates associated with each facet scale remain well below acceptable levels, and several exploratory factor analyses indicated that it was not possible to create homogenous item clusters using strictly empirical means. However, in a relative sense, the Negative World View items as a collective tended to perform better than items associated with other facets. Although the magnitude of the positive correlation was modest, the Negative Word View facet scale was the only such scale to correlate in the theoretically predicted manner with its associated BARS criterion scale. Several Negative World View items also correlated positively with the Controlling Entitlement facet scale and negatively with several of the more "positive" (e.g., Cooperative Work Ethic) facet scales. Furthermore, while well below commonly acceptable levels, the internal consistency estimate of the Negative World View facet scale was higher than three other facet scales.

Given the brief time span (approximately two months) between the Study 3 and Study 4 data collections, only minor changes were made to the CR measure prior to the Study 4 administration. As discussed in the previous section, some of these revisions were driven by the cognitive lab results and focused on the simplification of item wording, the clarification of unclear terms, and efforts to bolster the level of fidelity between response options and implicit assumptions. We also noticed that a number of the facet-keyed responses for the Negative World View and the Controlling Entitlement items were endorsed infrequently. The tendency to endorse positive qualities rather than negative qualities could reflect either socially desirable responding or a low base-rate of these negative qualities in the population. As such, we revised several of these options to make them less "extreme" (e.g., slightly less cynical and undesirable) so that they might be selected more frequently. By engaging in these efforts, we hoped that we would be able to increase the variability associated with the items, which then might positively impact the reliability and validity of the measure. However, as we note in the overall discussion section, these actions may have come with an unanticipated cost.

Study 4

Sample

The sample consisted of 193 Soldiers from Fort Drum who were primarily first- and second-tour enlisted personnel. The sample was approximately 89% male. Soldiers ranged in age from 18 to 38, with an average age of 22 years. More than 50% reported earning either a high school diploma or a GED, while another 36% reported having some college education. Approximately 68% were White, 11% were Black, and 18% were Hispanic. Table 19 contains the breakdown of ethnic and racial backgrounds. Approximately 52% of the Soldiers were Combat Arms (CA), while the others Soldiers were divided among Combat Services (CS: approximately 20%); and Combat Service Support (CSS: approximately 25%). Over 90% of the Soldiers were working on their MOS covering a wide variety of MOS concentrations.

Table 19
Racial/Ethnic Background

Race/Ethnicity	Frequency	Percent
American Indian or Alaska Native	1	0.5
Asian	6	3.1
Black or African American	22	11.4
Native Hawaiian or other Pacific Islander	1	0.5
White	132	68.4
Multiple Races	7	3.7
Did Not Respond	24	12.4
Total	193	100.0

Procedure and Measures

The procedure employed during Study 4 is equivalent to that described in Study 3, although an expanded set of measures was administered to participants.

Conditional Reasoning Measure

The CR measure administered at Ft. Drum consisted of 50 items that tapped five facets of team orientation: Responsibility to Others, Cooperative Work Ethic, Sociable Tendency, Negative World View, and Controlling Entitlement.

Background Information Questionnaire

In addition to the CR measure, participants were asked to complete a short background questionnaire, which included questions about age, gender, race, MOS, unit type, tenure, rank, and level of education.

Commitment Ratings

Soldier commitment to the team and the military were assessed with respect to affective, normative, and continuance commitment. *Affective commitment* refers to an emotional or affective bond that exists between an employee and an organization. Employees are committed to an organization because they want to identify with the organization, and are proud to associate themselves with the organizational entity and company mission or vision. *Normative commitment* exists when employees are committed to an organization because they believe it is the right or morally correct course of action. *Continuance commitment*, however, is rooted in need rather than a desire to remain with an organization. This type of commitment may develop when employees perceive a low level of alternative potential jobs, or they believe that the skills they have developed are not applicable or transferable to work done in other organizations.

Allen and Meyer (1990) developed three six-item scales to assess each commitment base. While the full set of six items (modified slightly to reflect a given foci) was used to measure normative commitment, we employed a reduced set of four items to measure each of the remaining commitment bases. Factor analyses have indicated that the reduced item set used to operationalize affective and continuance commitment tend to have the highest loading on their respective factors, and they have been used by ARI in prior research efforts (T. Heffner, personal communication, February, 2003). The full set of items was presented in random order to participants and appears in Appendix F. In addition, each item was rated on a five point-scale ranging from "strongly disagree" to "strongly agree."

Behavioral Criterion Measure

Supervisors provided behavioral ratings for participants on the five-point BARS scales. In response to feedback received during Study 3, we modified the rating scales for Study 4. To allow supervisors to have a clear frame of reference to guide the rating process, we added a dimension label and definition to each rating scale. In addition, we added a larger number of behavioral anchors to each rating scale and attempted to increase the homogeneity of the behaviors listed below each scale point. The revised rating form appears in Appendix H.

Contextual Performance

Supervisors rated participants' contextual performance using items (Appendix G) developed by Van Scotter and Motowidlo (1996). Using a five-point scale, supervisors rated the degree to which Soldiers engaged in interpersonal behaviors that contributed to organizational goals.

Results

Because the Study 4 sample was considerably smaller than the Study 3 sample, we adopted a more lenient criterion related to the endorsement of distractors. Therefore, we removed from the sample any participant who had endorsed more than 20 distractors. This action resulted in the elimination of six participants.

The endorsement percentages for each item are presented in Appendix H. In general, distractor responses were endorsed relatively infrequently. However, as was the case in Study 3, distractor endorsement increased linearly (to nearly 10-15%) for items located at the end of the measure. Because we reversed the presentation of the test items for Study 4, it is likely that this trend reflects either carelessness or fatigue on the part of test takers. Also as in Study 3, low endorsement rates for either of the logical responses reflected almost exclusively one of two response patterns: the inclination *not* to endorse a response reflective of either a negative world view or entitlement-related beliefs, or the tendency to endorse responses reflective of cooperation, responsibility to others, and sociability.

Internal consistency reliability estimates for Study 4 were higher than the corresponding values for Study 3 for four of the facet scales. However, no reliability estimates reached acceptable levels: Responsibility to Others = .42, Cooperative Work Ethic = .35, Sociable

Tendency = .06, Negative World View = .26, Controlling Entitlement = .13. To further examine the dimensional structure of the CR team orientation measure, we again conducted an exploratory factor analysis of the inter-item correlation matrix (see Appendix I). Rather than factoring into the five theoretically derived facet scales, the item clusters tended to form on the basis of whether the item reflected a "positive" trait, such as Cooperative Work Ethic, or a "negative" trait, such as Controlling Entitlement. As was the case with Study 3, the factors that emerged tended to be defined by opposing positive and negative poles: for example, the positive pole of the first factor consisted of a mixture of Responsibility to Other, Cooperative Work Ethic, and Sociable Tendency items. Conversely, the negative pole consisted almost entirely of Negative World View items. Attempts to produce empirically derived subscales were generally not successful. When we were able to generate scales with internal consistency estimates in the .40 to .50 range (e.g., Negative World View items 40, 60, and 24) these scales did not correlate meaningfully with any criteria. We therefore examined the relation of each item with the criteria in addition to examining facet-criterion correlations. The facet scale correlations with criteria are presented in Tables 20 and 21, while the item-criterion linkages appear in Table 22.

In the attitudinal realm, the Negative World View facet displayed a consistent negative relation with all but one type of commitment (military continuance commitment). Furthermore, the Cooperative Work Ethic facet of team orientation correlated positively with ratings of team-oriented affective commitment. For the performance ratings, only Controlling Entitlement predicted significant variance in the form of a negative relation with supervisor ratings of Responsibility to Others.

Table 20
Relations Among the Five Facet Scales and Soldier Commitment Ratings

	Commitment Ratings				
Facet	*M-AC*	*M-CC*	*M-NC*	*T-AC*	*T-NC*
RTO	.00	-.04	-.02	.08	.15
CWE	.15	-.05	.13	.17*	.11
ST	.01	-.03	.07	.04	.04
NWV	-.16*	.01	-.17*	-.18*	-.17*
CE	-.09	.03	-.05	-.11	-.11

Note. N = 173-179. * = p < .05. RTO = Responsibility to Others; CWE = Cooperative Work Ethic; ST = Sociable Tendency; NWV = Negative World View; CE = Controlling Entitlement; T-AC = Team Affective Commitment; T-NC = Team Normative Commitment; M-AC = Military Affective Commitment; M-NC = Military Normative Commitment; M-CC = Military Continuance Commitment.

Table 21
Relations Among the Five Facet Scales and Supervisor Performance Ratings

	Supervisor Ratings					
CR Scale	*RTO*	*CWE*	*ST*	*NWV*	*CE*	*CP*
RTO	.08	.10	.12	-.09	-.07	.05
CWE	.00	-.02	-.07	.09	.11	-.05
ST	-.04	-.04	.03	.07	-.01	-.09
NWV	.04	-.03	-.02	.07	.04	-.04
CE	-.18*	-.12	-.14	.09	.03	-.14

Note. N = 152-157. * = p < .05. RTO = Responsibility to Others; CWE = Cooperative Work Ethic; ST = Sociable Tendency; NWV = Negative World View; CE = Controlling Entitlement CP = Supervisor Ratings of Contextual Performance. Rows represent CR facet scores, while columns represent supervisor ratings of behaviors that are consistent with each facet.

As a group, the Negative World View and Responsibility to Others items performed best, at least in a relative sense (see Table 22). Mirroring the scale-level data, several Negative World View items correlated negatively with team-oriented affective commitment (14, 48) and with various types of military-oriented commitment (10, 24). Additionally, one item from this scale also correlated negatively with supervisor ratings of contextual performance and behaviors reflecting a sociable temperament (5). Of the nine Responsibility to Others items, five correlated in the expected direction with one or more criteria. Two items from this scale correlated positively with supervisor ratings of sociability, cooperativeness, or contextual performance (7, 9, 18), while another (21) correlated negatively with supervisor ratings of entitlement-oriented behaviors. However, one of the Responsibility to Others items correlated negatively with contextual performance (18). Items from the remaining three facets correlated in an inconsistent and variable manner with the attitudinal and performance criteria.

We also examined relations among the various criteria (see Table 23). The positive correlations among the three "positive" dimensions rated by supervisors (Cooperative Work Ethic, Responsibility to Others, and Sociable Tendency) and the contextual performance ratings ranged from .49 to .73. In turn, these four criteria were negatively related to supervisor ratings of Controlling Entitlement and Negative World View behaviors. The various types of commitment tended to be positively correlated, with the strongest correlations observed between affective and normative commitment within particular foci.

Table 22
Item–Criterion Correlations (Ft. Drum Data)

		Attitudinal Criteria					**Supervisor Ratings**					
CR Scale	**Item**	*A-COMM (Team)*	*N-COMM (Team)*	*A-COMM (Military)*	N-COMM *(Military)*	*C-COMM (Military)*	*Context*	*RTO*	*CWE*	*ST*	*NWV*	*CE*
RTO	7	.07	.12	.00	-.01	-.06	.05	.09	.02	.19*	-.08	.01
	9	.16	.13	-.02	.03	-.01	.14	.13	.17*	.25*	-.15	.03
	17	-.02	.14	-.12	-.13	-.19*	-.03	-.07	-.02	-.11	-.02	-.15
	18	-.09	.02	-.10	-.13	-.08	.18*	.11	.09	.03	.02	-.07
	21	-.01	-.08	.01	-.01	-.07	-.04	-.08	-.04	-.05	.01	-.23*
	25	.08	.13	.04	.04	-.05	.03	.05	.08	.01	-.05	.01
	31	.00	.02	-.06	-.04	-.05	-.17*	.00	-.05	.00	-.10	.03
	35	.05	.00	.04	-.02	.00	.02	.01	-.02	.03	.02	-.05
	41	.07	.14	.16	.18*	.14	.01	.01	.11	.03	.00	-.01
CWE	2	.15	.08	-.03	-.09	-.05	-.03	.04	.02	.01	.06	.10
	12	.14	.10	.13	.17*	.06	.03	-.03	-.06	.07	.00	.01
	19	.05	.04	.05	.02	.05	.05	.11	.11	.05	.00	.07
	22	.09	.03	.05	.01	-.15	.13	.09	.06	-.03	.00	.01
	23	.00	-.06	.03	.09	-.08	.01	.02	.05	-.03	.10	-.14
	30	-.07	.01	-.01	.03	-.08	-.12	-.03	-.10	-.04	-.04	.01
	33	.01	-.07	.05	.05	.03	-.21*	-.08	-.04	-.03	-.01	.17*
	36	.17*	.15	.13	.01	.03	-.07	-.06	-.11	-.10	.10	.02
	43	.12	.00	.02	.00	.05	-.15	-.11	-.12	-.13	.19*	.11
	50	.08	.07	.12	.12	.05	.06	-.04	-.08	-.11	.05	.08
ST	3	.00	.06	.08	.07	.20*	-.04	.08	.03	-.01	.01	-.03
	4	-.06	-.08	.05	.05	.00	-.08	-.05	-.09	.09	.03	-.06
	6	.05	.12	-.04	.07	.11	-.07	-.09	-.12	-.11	.10	.03
	26	-.02	.00	-.06	-.09	-.06	.08	.07	.04	.05	-.17*	-.20*
	28	.11	-.02	.04	.03	.04	.04	.09	.10	-.03	.11	.03
	38	.02	.10	-.07	.04	-.02	.01	.03	.04	.11	-.03	-.04
	39	.05	.00	-.01	.01	.05	.09	.15	.15	.09	.01	-.05
	42	.03	.06	-.08	-.05	-.18*	-.05	-.07	-.09	-.03	-.02	.06
	47	.10	.00	.12	.10	.02	-.16*	-.15	-.14	-.14	.05	.19*
	49	-.16	-.16	.04	-.02	-.09	-.13	-.12	-.06	.03	.05	.03

		Attitudinal Criteria					Supervisor Ratings					
CR Scale	**Item**	*A-COMM (Team)*	*N-COMM (Team)*	*A-COMM (Military)*	N-COMM *(Military)*	*C-COMM (Military)*	*Context*	*RTO*	*CWE*	*ST*	*NWV*	*CE*
NWV	1	.03	-.04	-.01	-.07	.05	-.04	-.06	-.16	-.01	.09	.08
	5	-.15	-.07	-.07	.06	.00	-.17*	-.12	-.04	-.17*	-.01	.00
	10	-.04	.00	-.17*	-.10	-.18*	.05	.05	.11	.05	-.04	-.02
	14	-.22*	-.16	-.11	-.16	-.11	.04	.12	.06	.07	.01	-.03
	20	-.10	-.08	-.01	-.06	.06	-.07	.03	.06	-.07	-.01	.00
	24	-.05	-.03	-.18*	-.17*	-.03	.01	.02	.01	-.04	.02	.01
	29	.00	.04	-.07	-.05	.01	.04	.08	.07	.06	.03	.03
	40	.01	-.03	.00	-.01	.02	-.02	.06	.01	-.05	.08	.15
	44	.11	.00	-.01	.00	.02	-.06	-.13	-.12	.01	.12	-.05
	46	-.12	-.07	-.03	.00	.04	-.06	-.01	.02	-.10	.06	.04
	48	-.18*	-.11	-.14	-.08	.10	.06	.07	.08	.04	-.04	.04
CE	8	-.01	-.02	.07	.11	.02	-.05	-.09	-.08	-.04	-.04	.02
	11	-.14	-.17*	-.11	-.10	-.16	-.05	-.06	.03	-.12	.00	-.16
	13	.07	.00	.15	.17*	.18*	-.16	-.13	-.08	-.17*	-.03	.03
	15	-.02	-.08	-.11	-.10	-.13	.00	-.02	.00	.00	-.06	.02
	16	.06	.08	.03	-.05	-.03	-.03	-.09	-.14	-.13	.10	.10
	27	-.18*	-.05	-.05	-.03	.06	-.01	-.03	.03	.09	-.02	-.07
	32	.14	-.02	.05	.00	.05	-.05	-.07	-.06	-.09	.08	-.03
	34	.06	.11	-.09	.02	.08	-.15*	-.03	-.06	.00	.21*	.22*
	37	-.11	-.04	-.12	-.06	-.08	-.13	-.12	-.04	-.16	.03	.06
	45	-.11	-.09	.04	.04	.00	.10	.07	.05	.01	-.04	-.11

Note. N = 143. * = p < .05

Table 23

Correlations among Supervisor Team-Oriented Performance Ratings, Team- and Military-Focused Commitment, and Tenure

Scale	RTO	CWE	ST	NWV	CE	Context	T-AC	T-NC	M-AC	M-NC	M-CC	Tenure
1. RTO	--											
2. CWE	.73 **	--										
3. ST	.49 **	.54 **	--									
4. NWV	-.43 **	-.43 **	-.50 **	--								
5. CE	-.22 **	-.27 **	-.33 **	.34 **	--							
6. Context	.73 **	.71 **	.61 **	-.40 **	-.38 **	--						
7. T-AC	.19 *	.23 **	.17 *	-.18 *	.04	.20 *	(.87)					
8. T-NC	.15	.18 *	.17 *	-.20 **	.04	.19 *	.77 **	(.79)				
9. M-AC	.14	.07	.06	-.21 **	-.04	.05	.38 **	.42 **	(.91)			
10. M-NC	.13	.11	.07	-.18 **	-.03	.09	.35 **	.52 **	.81 **	(.83)		
11. M-CC	.04	.02	.02	-.07	-.02	-.05	.20 **	.26 **	.56 **	.63 **	(.79)	
12. Tenure	-.09	-.04	.02	.08	.14	.07	-.09	-.15 *	-.12	-.17 *	-.09	--

Notes. N = 148 to 185. RTO = Supervisor Ratings for the "Responsibility to Others" Dimension; CWE = Supervisor Ratings for the "Cooperative Work Ethic" Dimension; ST = Supervisor Ratings for the "Sociable Tendency" Dimension; NWV = Supervisor Rating for the "Negative World View" Dimension; CE = Supervisor Ratings for the "Controlling Entitlement" Dimension; CP = Supervisor Contextual Performance Ratings; T-AC = Team Affective Commitment; T-NC = Team Normative Commitment; M-AC = Military Affective Commitment; M-NC = Military Normative Commitment; M-CC = Military Continuance Commitment; * = $p < .05$; ** = $p < .01$. Coefficient alpha reliability estimates appear on the diagonal for the five commitment scales.

Discussion

Item revisions undertaken prior to Study 4 appeared to have a positive impact on the CR measure's psychometric qualities: the internal consistency of the Responsibility to Others and the Cooperative Work Ethic scales increased considerably, while similar estimates for the Negative Word View and the Controlling Entitlement scales improved slightly relative to the Study 3 results. However, reliabilities remain well below what is commonly considered acceptable.

One of the primary benefits of Study 4 over Study 3 is the expanded set of criterion measures. In general, the Soldier commitment and supervisor performance ratings appeared to be a suitable standard against which to judge the quality of the CR items: the commitment measures all exhibited considerable variance and acceptable reliabilities, and the performance ratings also demonstrated a moderate amount of variation and correlated with each other in the expected manner (e.g., the "positive" BARS scales such as Cooperative Work Ethic and Sociable Tendency correlated positively with each other and negatively with the "negative" BARS scales such as Controlling Entitlement). Furthermore, the relations among the commitment scales and the supervisor performance ratings were consistent with meta-analytic findings (Mathieu & Zajac, 1990). For example, higher levels of team-oriented affective commitment among Soldiers—reflecting a strong emotional bond between a Soldier and his or her comrades—was associated with elevated supervisor ratings of cooperation-, responsibility-, and sociability-oriented behaviors.

The CR facet scales exhibited few significant relations with the supervisor performance ratings. However, the Negative World View facet scale did correlate negatively with all of the commitment bases and foci save military-oriented continuance commitment. At the item level, the Negative World View items again exhibited relatively more consistent relations with several of the criterion measures. In addition, the psychometric gains associated with the Responsibility to Others items also carried over into the realm of item-criterion linkages: of the nine items associated with this facet, five exhibited relations with one or more criteria in a theoretically consistent manner.

Study 5

Sample

Eighty-four students enrolled in undergraduate or graduate level courses at the University of Central Florida (UCF) participated. The graduate students were enrolled in one of three courses: Human Factors and Industrial Engineering, Business Management, and Modeling and Simulation. The undergraduate students were from two classes: Psychological Testing and Measurement and Introduction to Industrial/Organizational Psychology. The mean respondent age was 25.56 (minimum = 19, maximum = 51), and the sample was approximately 37 percent male. Slightly less than 40 percent of the sample consisted of graduate students, while the remainder was comprised largely of junior- and senior-level undergraduates. The racial/ethnic background of the sample is detailed in Table 24.

Classes were identified for inclusion in the study based upon whether or not they were working on team-based projects, and potential participants were identified via their professors. Data were collected from 16 undergraduate teams and 8 graduate teams, with the size of each team ranging from 2 to 6 members. The graduate student teams were formed at the discretion of the students and their preference for teammates, whereas professors determined undergraduate team membership.

Table 24
Racial/Ethnic Background

Race/Ethnicity	Frequency	Percent
Asian/Pacific Islander	9	10.7
Black or African American	9	10.7
Hispanic	10	11.9
Indian	1	1.2
White	48	57.1
Other	1	1.2
Did Not Respond	6	7.1
Total	84	100

Procedure and Measures

Data were collected in four waves over the course of a college semester. The first administration took place at the beginning of the semester. At the first administration, participants were asked to complete an informed consent form, a demographics questionnaire, and the CR measure. Participants were given one week to complete the CR measure and return it to the experimenter. At the second administration, which corresponded to the midpoint of the semester, the CR measure was again administered in order to assess test-retest reliability. Participants also were asked to rate their team members using the BARS format employed in Study 3. Participants were given one week to complete the CR measure and peer ratings. Third, at the end of the semester, participants were again asked to complete peer ratings for their teammates. Finally, project team grades, as assigned by the class professor, were collected.

The teams from the graduate HF/IE class were charged with developing multiple studies to evaluate the usability of various products, which involved conducting background research, developing a research plan, collecting data, analyzing data and writing a report for each product. The teams in the graduate Modeling and Simulation course were charged with researching, integrating and composing a paper on various assigned topics. Less information is available about the precise nature of the team-based work assigned in the Business Management Course.

The undergraduate Psychological Testing and Measurement class included teams of 2-3 students who reviewed, synthesized and wrote a report critiquing a published test. In the Introduction to Industrial/Organizational Psychology class, student teams of 2-3 members

worked to diagnose the future research needs in a chosen area of study and proposed an original field or lab experiment to address these future research needs.

The CR measure consisted of the 51 items administered at Fort Lewis because data from the Fort Lewis cognitive labs had not been collected at the time of the study. In addition to the CR measure, participants completed a demographics form, which included questions about age, gender, race, and educational level.

Peers provided behavioral ratings for participants on five-point scales designed to assess behaviors consistent with the five personality facets measured by the CR measure; this scale was identical to the supervisor criterion measures employed during Study 3.

Results

Given the low rate of distractor endorsement, we did not remove any participants' data as we did in other studies. Endorsement percentages for each item are presented in Appendix D.

Internal consistency reliability estimates for each of the facet scales were as follows: Responsibility to Others = .29, Cooperative Work Ethic = .13, Sociable Tendency = .29, Negative World View = .27, Controlling Entitlement = .13. In light of the general independence of the test items, results are presented at both the facet scale and individual item levels. The test-retest reliability estimates were consistently higher than the estimates of internal consistency for each facet scale (Responsibility to Others = .59, Cooperative Work Ethic = .39, Sociable Tendency = .38, Negative World View = .56, Controlling Entitlement = .46.)

In Table 25, six peer rating scores are presented for each dimension. For example, the first column presents the correlations among the CR Responsibility to Others facet and the six peer BARS ratings of behavior reflecting Responsibility to Others. Therefore, we have only presented relations among the five facet scores and the BARS scales that tap behavior that is directly relevant to each facet. As noted in the procedure section, peers were able to rate participants on two occasions: at mid-course (Time 1) and at the end of the semester (Time 2). The first, second, and third peer rating scores noted in Table 26 were collected at these two intervals for any participants who received ratings from at least one peer. For the mid-semester (Time 1) rating point, most individuals received BARS ratings from two peers, though very few received ratings from three peers. This same trend existed at Time 2, though less than 15 respondents to the CR measure received Time 2 ratings from their peers.

Ideally, rather than listing six different peer rating scores, we would have created a composite peer rating score that reflected the concordant perceptions of several team members. However, even when they rated participants on the same dimension, peers did not evidence consistent perceptions for a team member. For example, the correlations among the six ratings for the Responsibility to Others dimension ranged from -.65 to .35. This lack of interrater agreement indicated that aggregation of peer ratings was not justified, so they are presented separately.

Table 25
Relations Among CR Facet Scale Scores and Facet-Consistent Peer BARS Ratings

CR Facet	*First Peer Rating, Time 1 (N=43-44)*	*Second Peer Rating, Time 1 (N=43-44)*	*Third Peer Rating, Time 1 (N=9)*	*First Peer Rating, Time 2 (N=14)*	*Second Peer Rating, Time 2 (N=14)*	*Third Peer Rating, Time 2 (N=10)*
Responsibility to Others	.12	.01	-.25	.35	-.17	.07
Cooperative Work Ethic	.22	-.08	-.20	-.25	-.36	.13
Sociable Tendency	-.38*	.04	-.27	-.10	.23	.21
Negative World View	.13	.08	.14	-.31	.18	.36
Controlling Entitlement	.04	.35*	-.42	-.27	.68*	.31

Note. To receive six separate peer ratings, a participant would need to have been rated by three peers at both Time 1 and Time 2. Also, the peers who provided ratings at Time were often the same peers who provided Time 2 ratings, though the degree of overlap between the Time 1 and Time 2 peer samples was not able to be assessed definitively. * p = < .05.

At the facet scale level, the Sociable Tendency CR facet correlated with peer ratings of sociable behavior in a direction opposite to what would be predicted. However, the Controlling Entitlement CR facet correlated positively with peer ratings of the degree to which the respondent engaged in controlling, domineering behavior. Given the sample size of 14, the latter result may be spurious in nature. Table 26 depicts the relationship between CR facets and other criteria; no significant relationships were evidenced. However, the temporal stability of each facet scale exceeded the internal consistency reliability of those scales, suggesting that internal consistency estimates might underestimate the reliability of the facets (see Cortina, 1993, for a discussion of some of the limitations of alpha as an indicator of reliability).

Table 26
Facet Scale Test-Reliability Estimates and Criterion Correlations

	Test-Retest Reliability	**Course Grade**	**GPA**	**GRE—Verbal**	**GRE—Math**	**GRE—Total**
Responsibility to Others	**.59***	.03	.03	-.29	.02	-.14
Cooperative Work Ethic	**.39***	-.12	-.14	-.03	.06	-.30
Sociable Tendency	**.38***	-.01	.17	.19	.13	.24
Negative World View	**.56***	-.02	.11	-.25	-.04	-.18
Controlling Entitlement	**.46***	-.13	-.01	.00	.14	.08

Note. For the test-retest reliability estimates, N = 40. For correlations involving GRE scores, N = 20-31. For correlations involving Course Grades, N = 50; For correlations involving GPA, N = 65. * p = < .05.

Table 27 indicates that 26 of the 50 CR items had significant estimates of test-retest reliability. When compared with other items, the Controlling Entitlement items had lower test-retest reliabilities; only three items from this facet demonstrated significant correlations. Very

few items correlated significantly with peer ratings that had non-trivial sample sizes (Peer Ratings 1 and 2), though two Negative World View (11 and 47) items did correlate positively with their associated criterion. Finally, there were few significant correlations among CR items and the various grade and test-related criteria, though the small sample sizes associated with these variables may have mitigated the detection of such relations.

Discussion

The most notable finding associated with Study 5 is evidence of at least a modicum of temporal stability at both the item and scale levels. Without exception, the test-retest reliability estimates associated with each facet scale were considerably higher than internal consistency reliability estimates. Thus, it may be unwise to speak of "the" reliability of the team orientation CR measure without specifying a particular type of reliability as a referent. When internal consistency is considered, the results appear quite dismal: only in Study 4 (reflecting the most recent version of the scale) did the coefficient alpha estimates for a few of the scales rise above .30. In contrast, though still below the commonly accepted standard of .70, the test-retest estimates for the five facet scales were much higher. Indeed, two of the scales' (Negative World View and Responsibility to Others) test-retest values were not far below this standard.

It is instructive to note that, as a general rule, the implicit assumptions associated with a given facet tend only to be captured by a single item. Therefore, while related, each item taps a different element of the trait it was designed to measure. This heterogeneity of item content may be the primary reason why internal consistency estimates are so low. In short, what the Study 5 results indicate is that, even though items do not "hang together" well within a given facet, they do appear to assess somewhat stable dispositional tendencies/implicit assumptions over time. We will revisit our decision to measure each implicit assumption with a single item in the general cross –study discussion that follows.

Though discouraging, it is perhaps not surprising that the CR items and facets did not correlate in any meaningful fashion with the peer ratings, given the lack of concordance among the ratings from different peers. Even for relatively large groups of raters (e.g., forty raters), peers disagreed concerning whether respondents had engaged in facet-relevant behavior. Though the reason for this perceptual divergence is not clear, it may be due to peers' limited opportunity to observe the target's behavior or a lack of understanding about how to use BARS anchors to provide ratings. Moreover, as the ratings were completed at the rater's discretion, the peers may not have taken the task seriously and most likely completed the ratings under a variety of different conditions.

Table 27

Test-Retest Reliability Estimates and Criterion Correlations (University of Central Florida Data)

			GRADES AND TEST SCORES					PEER RATINGS					
CR Scale	**Item**	*Test-Retest Reliability (N=40)*	*Course Grade (N=50)*	*GPA (N=65)*	*GRE – V (N=30)*	*GRE – M (N=31)*	*GRE – T (N=20)*	*First Peer Rating, Time 1 (N=43)*	*Second Peer Rating, Time 1 (N=43)*	*Third Peer Rating, Time 1 (N=9)*	*First Peer Rating, Time 2 (N=14)*	*Second Peer Rating, Time 2 (N=14)*	*Third Peer Rating, Time 2 (N=10)*
CE	14 (37)	.37*	-.28*	-.03	-.09	.11	.00	-.14	.10	-.13	-.11	.89*	-.16
	17 (34)	.49*	.07	.11	.04	-.03	.29	.22	.03	-.13	-.11	.10	.55
	19 (32)	.22	.30*	.07	-.17	.23	.07	.00	.19	-.66	-.32	.37	.38
	24 (27)	.16	-.24	.04	-.18	.32	-.11	-.09	.15	-.19	-.18	.32	-.23
	35 (16)	n/a	-.25	-.03	-.07	-.16	-.23	-.08	-.07	n/a	n/a	n/a	n/a
	36 (15)	.68*	-.04	-.07	.06	.06	.03	.28	.11	.32	-.28	.38	.38
	38 (13)	.07	-.15	-.04	.32	-.23	-.05	.10	.25	-.32	-.32	.33	.06
	40 (11)	-.09	-.11	.09	n/a	n/a	n/a	-.16	.29	n/a	-.08	-.11	n/a
	44 (8)	.29	.06	-.22	-.01	-.07	.04	-.03	.09	n/a	n/a	n/a	n/a
	6 (45)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CWE	1 (50)	.31	-.22	-.12	.01	-.02	-.23	-.18	-.07	-.11	.09	.09	-.41
	15 (36)	.14	.20	.00	.32	.13	.45*	.23	.09	n/a	n/a	n/a	n/a
	18 (33)	.41*	.08	-.28*	-.07	.10	-.10	.24	-.18	-.29	-.34	-.44	.00
	21 (30)	.03	.12	.14	-.09	.17	-.01	-.11	.05	-.07	-.04	-.20	.00
	28 (23)	.26	.14	-.05	.08	.11	.03	.18	-.27	n/a	-.23	n/a	n/a
	29 (22)	.39*	-.07	.03	-.15	-.30	-.54*	.24	.15	.23	-.14	-.20	.47
	32 (19)	.32*	-.21	-.01	.18	.04	.10	.34*	.28	.51	-.11	-.08	.32
	39 (12)	.50*	-.20	.01	-.31	.15	-.37	-.34*	-.24	-.23	-.19	-.19	.41
	50 (2)	.14	.01	-.20	-.06	-.21	-.02	.02	-.12	-.43	.30	.09	-.50
	8 (43)	.44*	-.15	-.06	-.01	.12	-.17	.09	-.04	-.15	.05	.05	.11

			GRADES AND TEST SCORES					PEER RATINGS					
CR Scale	**Item**	*Test-Retest Reliability (N=40)*	*Course Grade (N=50)*	*GPA (N=65)*	*GRE – V (N=30)*	*GRE – M (N=31)*	*GRE – T (N=20)*	*First Peer Rating, Time 1 (N=43)*	*Second Peer Rating, Time 1 (N=43)*	*Third Peer Rating, Time 1 (N=9)*	*First Peer Rating, Time 2 (N=14)*	*Second Peer Rating, Time 2 (N=14)*	*Third Peer Rating, Time 2 (N=10)*
NWV	11 (40)	.28	-.03	-.02	-.41*	.08	-.32	.03	.34*	-.09	-.30	.33	.67*
NWV	22 (29)	.37*	-.05	-.05	-.11	-.19	-.37	.10	.07	.09	.05	.23	.67*
NWV	27 (24)	-.06	.08	-.10	.03	-.37*	-.36	-.08	-.11	n/a	-.13	-.13	-.11
NWV	3 (48)	.41*	.08	.07	.08	.05	.34	-.14	-.05	.71*	-.25	.26	-.17
NWV	31 (20)	.54*	-.03	-.07	.10	-.29	-.14	.03	.07	-.16	.05	-.30	.51
NWV	37 (14)	.39*	.00	.36*	-.28	.05	-.23	.09	-.07	-.22	.30	.13	-.51
NWV	41 (10)	.44*	.10	.06	-.08	-.06	-.10	.28	.00	-.47	.46	-.36	-.04
NWV	47 (5)	-.04	-.09	-.13	n/a	n/a	n/a	.47*	.08	.13	-.19	-.19	.67*
NWV	5 (46)	.32*	-.27	.03	-.30	.30	.01	-.07	-.02	.09	-.19	.26	-.11
NWV	51 (1)	.45*	.13	.20	.02	.13	.40	-.10	.08	-.69*	.13	.39	-.41
NWV	7 (44)	.10	-.03	-.11	.09	.00	-.01	-.01	-.09	n/a	.48	-.13	n/a
RTO	10 (41)	.75*	.17	.00	-.22	.20	.12	.04	.04	.55	.06	-.44	.41
RTO	16 (35)	.23	.03	-.02	.14	-.17	.26	.01	.16	.40	-.17	-.24	-.33
RTO	20 (31)	.64*	-.02	.13	-.13	.15	-.02	.19	.00	-.16	.00	.23	.00
RTO	26 (25)	.29	-.05	.00	-.03	-.11	-.21	.11	-.04	-.32	-.02	-.29	-.33
RTO	30 (21)	.48*	.10	-.04	.00	-.18	-.16	.05	.02	.56	-.31	-.35	-.47
RTO	33 (18)	.21	.01	-.04	-.15	.12	-.10	.15	-.36*	.48	-.55*	-.23	.33
RTO	34 (17)	.59*	.16	-.04	-.07	-.05	.07	.01	.20	.10	-.18	.06	.00
RTO	42 (9)	.42*	-.15	-.24	-.13	.06	-.15	-.15	-.10	-.03	.21	.21	.60
RTO	43	-.03	n/a	.19	-.02	-.15	.16	-.10	.06	n/a	n/a	n/a	n/a
RTO	45 (7)	.39*	-.17	.18	-.17	-.05	-.23	.03	.08	-.32	-.11	.33	-.22
ST	12 (39)	.39*	-.04	.04	.00	.24	.08	-.36*	.01	.24	-.15	.03	-.23
ST	13 (38)	-.05	-.14	.25*	-.27	.32	n/a	-.11	.03	n/a	-.40	.19	.06
ST	2 (49)	.17	-.21	-.12	.22	-.26	-.01	-.09	.10	.63	-.05	.08	-.30
ST	23 (28)	.35*	.04	.22	.24	-.13	-.02	-.12	.06	-.72*	-.24	.15	.56
ST	25 (26)	.56*	-.14	-.01	-.02	.26	.02	-.28	-.20	-.14	.28	-.33	-.14
ST	4 (47)	.29	-.07	.05	.14	.23	.39	-.16	-.06	-.14	.13	.29	.26
ST	46 (6)	.26	-.05	.10	.09	.13	.21	.20	-.14	-.36	.29	-.20	-.06
ST	48 (4)	.71*	.23	.10	-.07	.09	.12	-.24	.05	-.18	-.41	.09	.45
ST	49 (3)	.17	.11	.06	.11	.01	.30	-.11	.02	n/a	-.34	n/a	n/a
ST	9 (42)	.43*	.18	-.03	.11	-.17	-.11	-.07	.32*	.24	-.09	.33	-.07

Note. * = $p < .05$. Item numbers in parentheses reflect the item numbering scheme used during Study 4.

General Discussion

In the summary of our work that follows, we focus on the key findings that emerged across the five studies contained in this research note. Furthermore, we highlight a number of key lessons we have learned as a result of our efforts, and provide suggestions for researchers who decide to develop conditional reasoning tests in the future. Where practical, "lessons learned" have been set apart in the text, with a focused elaboration of the lesson's central points.

Key Findings

Across the five data collections summarized in this report, we were able to obtain only limited validation evidence for the CR team orientation measure. The consistently low coefficient alpha reliability estimates argued against considering our theoretically derived facet scales as effective construct indicators, though revisions to the measure did improve the facet scales' reliabilities somewhat. Moreover, the test-retest reliability estimates garnered in Study 5 indicate that the CR items do tap temperaments or traits with at least some degree of temporal stability. However, both the reliability estimates and the criterion correlations suggest that the level of quality varies considerably across test items.

As noted in the introduction, we conceptualize team-oriented individuals as responsible to others, cooperative, and sociable. Furthermore, such individuals do not hold a negative view of the world and their interpersonal interactions, and do not constantly try to control and dominate others. Thus, in terms of the five facets that together constitute team orientation, one would expect a team-oriented individual to have a high standing on the three positive facets (Responsibility to Others, Cooperative Work Ethic, and Sociable Tendency) and a low standing on the two negative facets (Negative World View and Controlling Entitlement). In a validation context, what might be considered "strong" validation evidence would consist of a significant correlation between an item and the corresponding supervisor-rated performance dimension (e.g., a significant relation between a Cooperative Work Ethic item and a supervisor's rating of cooperative behaviors). However, a significant relation between a positive (or negative) item and one of the positive (or negative) criteria might also be thought of as another (albeit weaker and certainly indirect) form of validation evidence. For example, one might expect a Cooperative Work Ethic item to correlate significantly with a supervisor's rating of behavior that reflects responsibility to others. However, one would not expect the item to correlate with supervisor ratings of behaviors reflecting entitlement. In general, the validation evidence reported here was of the weaker, indirect variety.

As we revised the CR measure over the course of the project, we succeeded in minimizing the degree to which participants chose distractors. However, as is clear from even a cursory examination of the item endorsement percentages, several of the logical response options were chosen quite infrequently. From a psychometric perspective, this limited variance is undesirable because it places a ceiling on the degree to which items are able to correlate with 1) other items from the same team orientation facet, and 2) validation criteria. Low endorsement rates were frequently associated with the Negative World View items, as respondents typically did not select the facet-keyed response. As noted in the discussion section for Study 3, although we tried to revise such items to effect a more equal response distribution, this effort may have

come at a cost: in terms of both criterion correlations and temporal stability estimates, the Negative World View items tended to perform better than the items associated with other facets. Furthermore, it was precisely the items with some of the most unequal percentage endorsement splits (i.e., 95/5) that performed relatively well in the validation analyses: Negative World View items with splits closer to 60/40 or 70/30 did not correlate significantly with any of the criteria. These results indicate that, to develop Negative World View items that are optimally effective, the facet-keyed response may need to reflect the sort of paranoid, cynical, and neurotic thinking styles that would only appear reasonable to participants who hold extreme views.

The decision to use the CR methodology rather than self-reports was grounded in concerns about socially desirable responding. Given the emphasis on working in teams within the modern military structure, we expected respondents to claim more team-oriented qualities as self-descriptive than were actually the case. Conversely, we thought that respondents would be less likely to endorse negative traits such as Controlling Entitlement or Negative World View. These self-enhancement strategies can occur at both the conscious and unconscious/automatic level: *impression management* refers to the use of consciously tailored strategies designed to make a positive impression, while *self-deception* refers to unconscious self-promotion strategies. In other words, individuals engaging in self-deception believe that their overly positive self-perceptions are in fact valid (Paulhus, 1984; Robins & Paulhus, 2001).

Lessons Learned and Points to Consider

> ***Lesson One*: Focus the implicit assumptions on several key ideas, and develop multiple items for each implicit assumption.**

In many ways, lesson one is perhaps the primary "lesson learned" as a result of our work. To alleviate the low internal consistencies observed with the CR measures developed in this project, researchers should focus on a smaller, more homogenous group of implicit assumptions. When possible, linking these implicit assumptions to well-studied cognitive biases would help theoretically ground them in an established research base. For example, James (1998) cited the *hostile attribution bias* as one of several justification mechanisms (i.e., implicit assumptions) that support aggressive behavior. In short, this bias reflects a tendency to infuse seemingly benign behaviors with hostile intent. The prototypical study examining this bias presents participants (often young children) with a video that presents two children running together; subsequently, one child falls to the ground, though the video does not clearly portray how this occurs. When asked why the child fell, participants labeled as aggressive frequently reasoned that the child must have been pushed. By implicitly framing others' actions as motivated by hostility, aggressive individuals are "cognitively prepared" to respond aggressively. However, the perception that the child had tripped was more common among non-aggressive participants. Factor analytic work indicates that CR items written to tap a common construct may not be unidimensional; rather, the items may factor into groups that assess a common implicit assumption (James, McIntyre, Glisson, Green, Patton, Mitchell, & Williams, under review). Thus, to achieve acceptable levels of internal consistency, numerous items may need to be written for each implicit assumption.

***Lesson Two*: Cognitive labs can be a useful component of the CR item development process.**

Our use of cognitive labs represents one potentially fruitful means by which to obtain construct validity evidence for CR items. Given the indirect, implicit nature of personality assessment via conditional reasoning, future work should continue along this path, where the cognitive processes (i.e., implicit assumptions) cast as drivers of item responses are identified and studied. As we described in the introduction, the mechanism through which CR items are thought to work is as follows: the item stem activates one or more implicit assumptions associated with the focal trait; once activated, these implicit assumptions impact which response is viewed as the most reasonable. However, simply because a CR item/scale correlates with a criterion does not mean that relevant implicit assumptions have necessarily been activated. Rather, if the item is not well-crafted, the correlation may be driven by intelligence-related skills or abilities, respondents' idiosyncratic experiences, or any number of other non-temperament factors. Once significant criterion-related validity evidence is garnered for CR items, it would therefore be wise to commence with process-oriented investigations that attempt to determine why such items work (Guion, 1993). Several recent investigations have applied this strategy in the context of generating construct validity evidence for James's (1998) aggression measure (O'Shea, 2001; Palmer, 2003).

One might question why our extensive item development process, which consisted of a series of cognitive labs conducted with civilians and military personnel plus multiple rounds of item review and revision, still failed to result in a test with sound psychometric characteristics. Indeed, as we reviewed the feedback generated from the cognitive labs, our collective impression was that participants seemed to be using reasoning strategies that were at least somewhat akin to the implicit assumptions we had been trying to target. However, the fact that different items tapped different implicit assumptions provides one reasonable explanation for the lack of shared variance among items, particularly when one considers the heterogeneous nature of the implicit assumptions that constituted most of the team orientation facets. In our effort to be comprehensive, it is clear that we failed to focus on a set of clear, central implicit assumptions for each facet that could be used to develop multiple items for each assumption. Given this high level of content heterogeneity, coefficient alpha may not, in fact, be the most appropriate mean by which to assess the reliability of the measure as it currently exists (Cortina, 1993); the considerably higher test-retest reliability estimates provide support for this conjecture.

It also is possible that many of the items simply failed to evoke the intended implicit assumptions among respondents, resulting in their relying on either idiosyncratic personal experience or tangential aspects of the items when forming a response. It is difficult to tease apart these two alternative explanations with empirical data, as they would both produce the same result—a set of items with little to no internal consistency. However, the generally encouraging results that emerged from the cognitive labs would argue that items possessed some construct validity.

***Lesson Three*: Use descriptions of general, well-known, and easily understood phenomena as the basis for item content rather than descriptions of hypothetical people.**

The issue of responding on the basis of personal experience is related to another one of the lessons we learned in the process or writing CR items. After we had completed the item writing process, we noticed that we had written several items about hypothetical people (e.g., the item talked about "Jim" and "Alice"). While this type of item might be easier to write than items that focus on more general phenomena (e.g., events that don't involve specific people, such as political or social phenomena), we think the "hypothetical people" items could be problematic because that type of item seems less objective to respondents. As a result, respondents may be more likely to rely on idiosyncratic personal experiences when forming responses to these items, and may perceive that there is not really an objectively "correct" response to the question (O'Shea, Gustafson, Hense, Hawes, & Lowe, 2004). This is problematic, as prior research indicates that test takers must perceive CR items as logic problems with objectively correct answers in order for the test to work as intended. In short, we would argue that items that focus on more general phenomena are more likely to evoke the social heuristics or "rules of thumb" that CR measures are designed to tap than would items focused on hypothetical people.

***Lesson Four*: Ensure that implicit assumptions truly capture the motives that underlie behavior associated with the trait or construct of interest.**

As detailed in the introduction, the team orientation model used to develop CR items is firmly grounded in trait theory. However, CR measures are designed to tap implicit motives, and the considerable gap between traits and implicit motives might have hampered our item development efforts. Historically, traits have been defined via references to behavioral consistency, while motives—particularly implicit motives—evoke references to non-conscious wishes, desires, and goals. For example, McClelland, Koestner, and Weinberger (1989) noted that "implicit motives are like semantic memory…they are like rules that guide behavior that have been acquired on the basis of repeated affective experiences" (p. 698-699). In contrast, more explicit motives and self-reports of behavior are filtered through analytic thought and people's self-concepts and their views of others. Recent work by David Winter and his colleagues has clarified the distinctions between and relations among traits and motives (Winter, John, Stewart, Klohnen, & Duncan, 1998). These authors argue that traits and motives interact in the prediction of behavior: traits channel the ways in which motives are expressed through particular patterns of behavior throughout the lifespan. Furthermore, traits provide the particular "structures and resources" to implement or put into action the goals that are specified by motives.

If it is true that personality traits channel motives, then using trait models to identify implicit assumptions and justification mechanisms is problematic: motives can be expressed in a variety of different ways, and the same trait-consistent behavior could reflect multiple motives. Therefore, simply focusing on traits misses what Winter et al. (1998) refer to as the "why" of behavior—the motives that underlie and support that observed behavior. In the context of our

model, it is easy to imagine many different motives that could lead to affiliation-oriented behavior: a need to belong and be liked by others, an attempt to stave off loneliness, an instrumental desire to win favors from others or a motive to bolster perceptions of self worth by expanding one's pool of friends. Obviously, some of these motives are consistent with the concept of team orientation, while others are not. As we initiated the CR item development stage of the project, the processes of creating implicit assumptions helped us focus on the motives that were most relevant to the sort of social-cognitive processes and framing proclivities we wanted to capture. However, starting with a trait model required us to "drill down" and specify precisely which motives we wanted to focus on. As we have noted before, it was often quite difficult to pin down the motivational implications of a given trait. In retrospect, we realize that a more expeditious process might have involved commencing the process by focusing on a well-articulated motive such as the need for affiliation. This might have allowed us to better articulate the implicit assumptions associated with the motive by referring to an established literature base, as James (1998) did when he focused on the motive to aggress.

In addition to being largely trait- rather than motive-focused, another central way that our efforts differ from earlier CR-based work is that we attempted to measure a cluster of positive traits. Since its inception, the CR approach has been used almost exclusively to develop measures of negative traits such as aggression (James, 1998) and aberrant self-promotion (Gustafson, 2000). Given the cumulative results of our work, it is therefore reasonable to question the degree to which the CR methodology is amenable to the assessment of socially acceptable traits. The etiology of justification mechanisms, as noted by James (2004), is relevant to this point. Essentially, James views justification mechanisms as a means by which people alleviate the cognitive tension that arises when people engage in negative behavior while simultaneously carrying a favorable view of the self. In short, justification mechanisms allow people to act in ways that society considers "bad" while protecting their self-concept as a good person. For example, by "justifying" violent behavior as a natural and reasonable response to being victimized by an authority figure, aggressive individuals are able to retain a positive self-view. However, as James (2204) has noted, prosocial behavior generally does not need to be justified. This may explain why the Negative World View items often worked better than the items associated with other facets. To review, Gustafson (2000) adopted the term implicit assumption when describing the unarticulated cognitive biases and framing proclivities that drive overt behavior, whether positive or negative in character. Given the results of our work, however, it is unclear whether the CR methodology is a useful tool by which to measure implicit assumptions when they reflect positive, socially acceptable cognitions.

> ***Lesson Five*: Don't allow distractors to become distracting in their own right.**

Lesson five focuses on the development of useful distractor responses. In general, we underestimated the amount of time and effort required to create workable distractors. At first, our criterion for defining an effective distractor was that it was easily recognizable as incorrect. However, when we conducted our set of cognitive labs, we noticed that several respondents laughed or chuckled as they read through certain items. When asked about this, they told us that they were laughing at the distractors, as many of them were so blatantly incorrect that they were

funny. In retrospect, we realized that we had in a sense relied on using outlandish propositions for distractors so that they could be read and rejected immediately. As we progressed through our item development work, we revised many of the distractors so that they did not evoke what we began to call the "chuckle response." However, care also must be taken to ensure that distractor endorsement does not dramatically increase because revision might make the distractor an overly appealing response option.

***Lesson Six*: Have an outside party review and comment on CR items.**

Lesson six highlights the benefits associated with having others provide a critical review of item writing efforts. We noted earlier that during the item writing process, we circulated the items among the team members for review and comment. In large measure, the feedback received from this exercise was similar to the output from the cognitive labs: other team members were able to identify unclear wording, cases where one of the "logical" response options was less reasonable than its alternative, and situations where the item stem either provided too much or too little detail.

Conclusion

Conditional reasoning is by no means the only avenue through which to measure team orientation. Other indirect methods, such as differential framing (LeBreton & James, 2003), also might be useful. If team orientation is assessed using self-reports, contextualizing such items in a military setting might help increase the inventory's validity (Schmitt, Ryan, & Stierwalt, 1995). However, if socially desirable responding is a concern, forced-choice self-report scales might be better than traditional personality inventories (Jackson, Wroblewski, & Ashton, 2000).

The impetus for this work was rooted in the need to better understand the role of temperament in team-related phenomena, and several aspects of this project have narrowed this void. First, we articulated a hierarchical model of team orientation that delineated the facets of this construct and their inter-relations. Second, using a novel approach to test development, we created fifty items to tap the various facets of team orientation. To improve the psychometric characteristics of the team orientation scale, future research could build upon our development process using the strategies noted earlier. Such effort might best be directed toward Negative World View and Responsibility to Others, as these items appear to be the most promising from both a test-retest reliability and validity perspective. More importantly, the interpersonally destructive tendencies captured by these facets—a paranoid, distrustful view of the world in the case of the former and a lack of regard for others for the latter— might be difficult to assess using traditional self-report measures.

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APPENDIX A:
DEFINITIONS AND IMPLICIT ASSUMPTIONS FOR THE ORIGINAL 12-FACET MODEL OF TEAM ORIENTATION

Dominance

Dominance reflects striving for superiority, control, and influence over others. Others have referred to this trait as ascendance, assertiveness, or dominance (Watson & Clark, 1997; Costa & McCrae, 1992). Altman and Haythorn (1967) found that teams composed of highly authoritarian members performed more poorly than low authoritarian teams on Navy decision-making and combat tasks. To the extent that interdependent team tasks often require an exchange of information among team members who all hold valuable task information, the tendency to be authoritative, controlling, and unreceptive to other peer's opinions can be damaging to team interaction.

Key Points: Dominance is seen as one of the primary dimensions of personality, although we are only interested in one specific facet of what is generally viewed as a broad general dimension. Dominance (as we are defining the specific facet here) reflects the individual's desire to dominate, control, and influence others. High dominant people prefer hierarchical relationships (ordered along a superordinate-subordinate or superior-inferior dimension) over equal relations. There is some relationship of this facet to authoritarianism, although most see authoritarianism as a multi-faceted construct that includes not only dominance but also conservatism, conventionalism, punitiveness, and other sub-traits. There is also a relationship of this trait to social dominance (see Pratto, Sidanius, Stallworth, & Malle, 1994), although this term reflects an individual's preference for inequality among social groups (the desire that one's in-group dominate and be superior to out-groups) rather than individual relationships.

There is certainly a relationship between dominance and competitiveness/cooperation, in that dominant people see interaction as a zero-sum game in which they should be in control. However, I believe the difference is that competitive people want to maximize personal gain relative to others, whereas dominant people what to lord it over others regardless. This distinction is similar to that made by Van Lange, De Bruin, Otten, & Joireman, (1997) who distinguished between those who are competitive (who maximize outcomes for self relative to others) and those who are individualists (who maximize outcomes for self with no regard for others). Dominant people may not necessarily want to compete with others, but they certainly want to manage or control them.

In the HPI, the most relevant facet is termed status-seeking ("I want people to look up to me."). A cognate factor in the 16PF is termed dominance, one facet being the desire for control of situations and other people. In the NEO-PIR, the facet of compliance seems to be most directly related to our dominance facet (in a negative sense) in that compliant people defer to others in interpersonal situations; whereas dominant people behaviors are attempts to evoke deference from others. In the IPIP, the most relevant facet is assertiveness (Automatically take charge. Come up with a solution right away. Impose my will on others).

In my work on collective orientation and team performance, I found that highly dominant people tended not to listen to other's opinions and tended to stick to their own opinions when others disagreed, not simply because they were rigid (which they were), but because they thought their opinion or answer should prevail. Items such as "It is important to stick to your own decisions, even when others around you are trying to get you to change", "When others disagree, it is important to hold one's ground and not give in" and "It is important to make your own decision and stick with it" reflect this feeling that I am superordinate and others should defer to me.

Key Words and Phrases: 'Desire to be in control'

***Core Assumptions**:*

It's better to be wrong than not to make a decision.

Effective decision makers don't need to seek out a great deal of information before they make a decision.

In unstructured groups, it's best to figure out who should be in charge right up front.

Experts have an obligation to direct those who are less skilled, rather than letting them figure things out by themselves.

The most effective way for a group to solve a problem is to let those who know the most about it lead/direct those who are less knowledgeable.

When teams fail, it's often because someone didn't take the lead and get the team moving in the right direction.

Most people need to be told what to do because letting them figure things out by themselves usually causes errors to be made and time to be wasted.

All opinions are not created equal.

It is best to take charge, even if others are unsure.

People who are weak or compliant often prefer to have someone take charge.

Sometimes you need to take a stand even if others disagree.

It is better to have those who are in charge and those who are to do the work clearly identified.

Rigidity

Rigid, or non-adaptable, people tend to approach a problem with one set solution that does not vary. Rigid people tend to be stubborn and headstrong, view uncertainty as a threat, and generally have a low tolerance for ambiguity. Rigid team members are less likely to adapt to others' opinions in case of disagreements or conflict. Moreover, rigidity hinders the flexibility and adaptability required for ill-defined tasks that are characteristic of military team task environments (Mumford, Baughman, Threlfall, Uhlman, & Costanza, 1993).

Key Points: We have covered a number of key points regarding adaptability/rigidity at our November meeting. These are summarized in the meeting notes.

Key Words and Phrases: 'What has worked in the past will work again.'

Core Assumptions:

Just because a few pieces of information seem at first not to support a decision doesn't mean that the decision is wrong.

Once one has developed an approach to the world that generally "works," the approach is good for most situations.

More often than not change makes situations worse.

People get along best if everyone sticks to his or her role.

Spontaneity and variety for their own sake aren't worthwhile.

Using the same proven method is the quickest way to achieve one's goals.

Not sticking to a routine causes people to forget to do important things.

There is generally one best way to solve a problem.

The old ways of doing things are always the best.

What has worked in the past will work again.

Competitiveness/Cooperation

Competitive people tend to engage in interaction to maximize personal gain relative to others (Graziano et al., 1997). Kelley and Staahelski (1970) examined the dispositional trait of competitiveness vs. cooperativeness, and found that competitive people are more likely to see others as competitive and to elicit competitive behavior from others. Thus, even prior to task performance, dispositionally competitive people have a tendency to view interaction to be competitive. Competitive team members may be more oriented to win than to cooperate with other team members.

Key Points: Van Lange et al. (1997) noted that cooperative people approach interactions in a prosocial or cooperative manner, whereas competitive people tend to approach others assuming a competitive situation. Graziano et al. (1997) describe the competitive person thusly: "Before any interaction, some individuals *expect* social relations to be competitive." Graziano et al. further note that competitive people are consistently competitive across situations, whereas cooperative people are more variable (that is, they may approach a social situation in a cooperative manner, but be drawn into competitive behavior by a competitive partner). I think this is an important point: cooperative people are not *compliant*, but they approach social situations expecting interdependent and cooperative behavior. If their cooperative intentions are not reciprocated, they can adjust their behavior accordingly.

Key Words and Phrases: 'Life is a game that you need to win.'

Core Assumptions*:*

When people in a group are called "equal," it almost always masks true skill and ability differences.

People who are always looking to get "their piece of the pie" lose in the end because people wind up not liking them.

(R) Teamwork allows common people to achieve uncommon results.

(R) Working together with others is the best way to accomplish a task.

Competing with others can drive the team to greater heights.

In this world, some people will win and some will lose.

(R) A person can best achieve his goals if others around him achieve theirs too.

No matter what, someone will always come out on top.

Competition brings out the best in people.

(R) = Assumptions reflecting Cooperation

Trust

Trust reflects the belief in the dependability of other team members and that they care about the teams' interests. Jarvenpaa and Leidner (1999) found that lower levels of trust were associated with lower team performance. Dirks (1999) found that high-trust groups channeled motivation into increased team efforts versus increased individual efforts. Closely aligned to trust is the concept of shared identity or shared vision, the perception that one is similar to other team members and distinct from outside people. Trust increases the ability of team members to work together and enhances cooperation and joint effort.

Key Points: Gurtman (1992) defines trust as an individual's belief that the sincerity, benevolence, and truthfulness of others can generally be relied upon. Dirks (1999) and others have noted that trust is a hallmark of effective groups.

Trust is said to include three components (Holmes & Rempel, 1989): (a) predictability, or belief that the partner's behavior is consistent; (b) dependability, or belief that the partner can be counted on to be honest, reliable, and benevolent; and (c) faith, or conviction that the partner is intrinsically motivated to be responsive and caring–belief that the partner's motives go beyond instrumental bases for benevolence. Each component is argued to be a necessary feature of trust. Some have used the term "disposition to trust." The disposition to trust has two facets: (a) faith in humanity: the assumption that others are well-meaning and dependable, and (b) trusting stance: the assumption that one will achieve a better outcome by dealing with people as though they were trustworthy.

Yamagishi (2001) defines trust as a type of social intelligence. He notes that trust is not the indiscriminate belief in the goodness of others, which may lead to gullibility. He defines general trust as a default expectation of the trustworthiness of others: Those high on general trust assume that other people are trustworthy *until evidence is provided indicating otherwise.*

Rempel, Ross, and Holmes (2001) note that trust acts as a filter through which social events are interpreted. He notes that a low trust people tend to view a negative event (a partner's negative behavior) in broad negative terms ("people can't be trusted") whereas high trust people tend to interpret a partner's negative behavior in more positive and less global terms ("he had a bad day"). It is worthwhile to distinguish between trust (or disposition to trust) and trustworthiness or reliability, which is captured by our dependability facet. Those with dispositionally high trust believe that others are honest and well intentioned; those with low trust are suspicious and doubt the sincerity, motives or intentions of others

Key Words and Phrases: 'People can be trusted to do the right thing.'

Core Assumptions:

It is best to treat people as trustworthy until they prove themselves otherwise.

Most people will 'do the right thing' if given the opportunity.

If you give people the benefit of the doubt, you will rarely go wrong.

People can be trusted to do the right thing.

(R) If you let your guard down, people will take advantage of you.

(R) You have to watch people carefully, or you will be hurt.

(R) = Assumptions reflecting low Trust

Social Perceptiveness

Collectively oriented team members are more likely to be socially perceptive and sensitive to the moods, motivations, and intentions of other team members. Empathy involves both the willingness to take the perspective of the other and accuracy in judging others' perspectives (Stinson & Ickes, 1992). Social perceptiveness has been viewed as a primary component of social competence (Zaccaro, Foti, & Kenny, 1991).

Key Points: Zaccaro et al (1991) describe two components of social intelligence: (a) a perceptual component that they term social perceptiveness, and (b) a behavioral component that they term behavioral flexibility (which is relevant to our rigidity facet). Social perceptiveness is related to social insight, social understanding, or empathy, and is defined as the awareness of motives, needs, and intentions of other group members and awareness of relations among group members. Jones and Day (1997) also describe social intelligence as including social perception (the ability to decode others verbal and nonverbal behaviors) and social insight (the ability to comprehend and interpret others' behavior in a social context).

Stinson and Ickes (1992) define empathic accuracy as the ability to take another's perspective. Rosnow et al., (1994) view social intelligence as the capacity to infer the motivation behind another's social behavior, and note that perspective-taking is a key component. Marlowe (1986) has described social intelligence as the ability to understand the feelings, thoughts, and behaviors of others in interpersonal situations, and found empathy to be one factor comprising this construct.

Key Words and Phrases: Empathy; Social perceptiveness, Social insight; Recognition of social cues and individual perspectives

Core Assumptions:

It is important to make others feel good about themselves.

People need to listen to the needs of others.

It is important to recognize that everyone has their own perspective on things.

It's best not to judge another person's behavior without first trying to understand where they are coming from.

It is important to be sensitive to both sides of the story.

In order to keep criticism from being unnecessarily destructive, it is important to imagine how the person that you are criticizing will feel.

It is important to be sensitive to others' feelings and concerns.

The key to predicting what others are going to do is to understand their thoughts and feelings.

(R) Trying to understand people's emotions is a waste of time.

(R) It's not important to recognize what other people are feeling.

(R) = Assumptions reflecting a lack of Social Perceptiveness

Altruism

Altruism refers to concern with others versus a concern with self. Collectively oriented team members are likely to be considerate, concerned with others, helpful, and supportive versus being selfish and intolerant. Although some have viewed altruism as other-oriented actions taken to achieve a common (vs. self) interest (Batson et al., 1995), others (e.g., Cialdini et al., 1997) have argued that altruistic behavior reflects the individual pursuing self-interest in circumstances in which the self is perceived to be merged with the other (e.g., the team). Prapavessis and Carron (1997) found that the extent to which team members took actions for the sake of the group relative to self-interests enhanced cohesiveness in sports teams.

Key Points: I am not sure at this point whether we should collapse altruism and empathy into one facet. The HPI contains a Caring facet ("I enjoy helping others"), and the NEO=PIR contains an Altruism facet (concern for other's welfare). However, Batson describes the altruistic motivation as being derived from or based on empathy for the other, suggesting they are closely related. On the other hand, our Empathy facet is more closely related to social perceptiveness than to caring; in this case a construct related to helping or assisting others (a helpful/selfish dimension) is somewhat distinct.

Key Words and Phrases: Willingness to put other-interest over self-interest

Core Assumptions:

It is more important to give to others than to receive.

People should demonstrate a concern for others even at their own expense.

Helping others is important, even if you don't get anything out of it.

You should always help people who are in need, even if it is an inconvenience.

(R) The best way to help others is to help yourself.

(R) People should pull themselves up by their own bootstraps.

(R) People will try to get the most they can out of a situation.

(R) = Assumptions reflecting a lack of Altruism

Affiliation

Affiliation refers to the individual's desire to engage in activities with other people versus working alone. Lucas et al., (2000) define this factor (which they term sociability) as the enjoyment of social activities and preference for being with others over being alone. Davis (1969) found that teams composed of members who preferred to work in a group interacted more and solved problems faster than teams composed of members who preferred to work alone. Individuals high in Affiliation are sociable, friendly, and interested in others, whereas those low in Affiliation are shy, withdrawn, aloof, and uninterested in social activities.

Key Points: This facet reflects the affiliative aspect of sociability (minus the exhibitionist, assertiveness, or ascendant tendencies that are also evident in the broader extraversion trait). Hogan (1986) describes one sub-facet of the HPI trait Sociability as "liking being part of a larger group"; we would also see as relevant several sub-facets of the HPI trait Likeability, including "works well with other people" and "enjoy meeting new people." In fact, Hogan views the HPI trait Sociability as capturing more of the exhibitionist aspects of sociability (being the center of attention) and views the trait Likeability as related to interpersonal competence. Costa & McCrae's NEO-PIR includes the trait of Extraversion. Two facets of Extraversion include Warmth (affectionate and friendly, cordial and hearty) and Gregariousness (preference for other's company).

Facets in the IPIP related to affiliation include Friendliness (makes friends easily, warms up to others vs. avoids contact with others), Sociability (enjoy being part of a group vs. like to be alone), and Warmth (am interested in people and others' well-being vs. not really interested in others).

Some researchers have distinguished between low sociability (or in our terms, low affiliation), which is a non-fearful preference for not affiliating with others or preference for being alone, and shyness, which reflects a social anxiety from affiliating with others. In other words, low affiliation reflects a disinterest in affiliating or socializing with others, whereas shyness reflects a fear or distress of affiliating with others. Therefore, a low affiliative person may not necessarily be shy, but is likely to be cool, aloof, and withdrawn.

Key Words and Phrases: Sociable; Friendly; Social interest; People are fun and interesting

Core Assumptions*:*

It is fun to spend time with people.

(R) When relaxing, it is best to spend time alone.

It's fun to find out what people are like and what they are thinking.

Working with other people is better than working alone.

Experiences are more meaningful when you have other people to share them with.

Getting to know people better typically involves learning that you like them more than you first thought that you might.

Getting to know co-workers personally in the context of working together in a group is rewarding in its own right.

People who enjoy spending time with other people are generally more well-adjusted than those who would rather spend time alone.

Doing things with other people is more fun than doing them alone.

People are enjoyable to be around.

(R) Being around other people is draining.

I am interested in what other people are like.

(R) = Assumptions reflecting a lack of Affiliation

Expressivity

Expressivity reflects the extent to which individuals outwardly display emotions (Gross & John, 1998). Individuals high in Expressivity are emotionally expressive, talkative, and communicative, whereas those low in Expressivity are quiet, reserved, closed, and tend to keep feelings and opinions to themselves. Those low in Expressivity are more difficult to read by other team members and are less likely to articulate their attitudes or intentions.

Key Points: Emotional expressivity reflects differences in the extent to which people outwardly express their emotions (some people rarely show any emotion at all; some are more emotionally expressive). Gross & John note that this broad construct has several facets; however the core component of the construct of emotional expressivity is the spontaneous expression of emotion in social interactions. They further note that core emotional expressivity can reflect separately either positive emotionality or negative emotionality. Those high on positive expressivity "spontaneously display positive emotions (happiness, enthusiasm, etc.) in psychologically adaptive ways". They claim that positive expressivity plays a key role in interpersonal contexts as well as in intellectual pursuits.

Key Words and Phrases: Tendency to express feelings and beliefs openly.

Core Assumptions:

It's better to say what you feel, even if you upset others.

"Wearing your feelings on your sleeve" isn't a fault.

It's important to let people know how you feel about them personally.

Hiding your emotions is unhealthy.

Emotion is the wellspring of creativity.

Emotional intensity underlies intellectual excellence.

People who don't express their feelings can't form strong bonds with others.

When other people share personal information, it is important to reciprocate and share information about yourself in order to make the other person feel comfortable.

The simple act of talking to someone about a problem makes the problem seem less of a big deal, regardless of whom you are talking to.

It is always better to let others know how you feel.

(R) Emotions should be best kept hidden.

Adjustment

Individuals high on Adjustment are emotionally well adjusted, free from anxiety, calm, and stable. Those low on Adjustment are anxious, insecure, moody, depressed, and somatic. Individuals that are anxious, complaining, irritable, and temperamental are not likely to engender positive interpersonal relations within a team. Adjustment predicts performance on almost any task that requires mutually coordinated behavior (see Driskell, Hogan, and Salas, 1987).

Key Points: There is considerable research on what has been termed adjustment (HPI), emotional stability (CPI) or neuroticism (NEO-PIR). Hogan defines adjustment in the HPI as freedom from anxiety, depression, guilt, and somatic complaints. Costa and McCrae describe neuroticism as the general tendency to experience negative affect. Neuroticism in the NEO-PIR is comprised of the facets of Anxiety (anxious, nervous), Angry Hostility (irritable, moody, tense), Self-Consciousness (defensive), Depression (worrying, pessimistic), Vulnerability, and Impulsiveness. Neuroticism relates strongly to Negative Affect (Watson, Clark, & Tellegen, 1988), which is comprised of several facets, including distressed/upset, hostile, irritable/angry, afraid/fearful, angry, and nervous/jittery.

Key Words and Phrases: Life isn't fair.

Core Assumptions:

(R) The world is generally a distressing and unpleasant place.

(R) Life is not fair.

(R) No matter how bad things are, they can always get worse.

(R) = Reflects a lack of Adjustment

Self-Esteem

Self-esteem reflects a sense of security, ego strength, self-assurance, and self-efficacy. Individuals high on Self-esteem are confident and assured, whereas those low in Self-esteem are insecure, envious, jealous, hostile, and intolerant of others. Vancouver and Ilgen (1989) found that individuals who were confident in their abilities were more likely to prefer working in a team versus working alone.

Key Points: Self-esteem is generally defined as a global assessment of self-worth or of one's value as a person. Those with high self esteem view themselves in a positive light as good, worthy and successful, whereas those with low self-esteem view themselves in a more negative light as bad, unworthy, and a failure.

Self-esteem is related to generalized self-efficacy (one's estimate of one's capabilities). Brown and Marshall (2001) make an interesting point in distinguishing self-esteem from the more general construct of negative affect. People can be happy or positive standing outside on a nice day; but they do not feel confident or proud or successful. They note that self-esteem always involves a self-referent evaluative factor; thus feelings of self-esteem always involve the self as a referent point. Thus, a person can be negative, irritable, moody, and poorly adjusted (low adjustment) but not necessarily have low self-esteem.

It may be reasonable to eliminate locus-of-control as a separate facet and incorporate this concept of self-control into the self-esteem facet. Judge and Bono (2001) view self-esteem (positive self-image), generalized self-efficacy (belief in one's capacities) and locus-of-control (belief in ability to control outcomes) as closely related traits.

Key Words and Phrases: Positive valuation of ones self and effectiveness; 'I can do things; I am in control of my life.'

Core Assumptions*:*

Challenging opportunities can also provide an opportunity to fail.

Challenging opportunities can give one the opportunity to excel.

Failure is often a sign that you are just not good enough.

Failure can often be overcome by applying oneself.

If people have the necessary skills, they can overcome obstacles if they try.

One person's success does not necessarily imply that others failed.

Dependability

Dependability refers to a tendency toward planfulness and discipline in carrying out tasks to completion. Borman, White, Pulakos, and Oppler (1991) defined dependability as being disciplined, organized, planful, respectful of rules, honest and trustworthy. Borman et al. found that dependability had a strong impact on supervisor ratings of military personnel and on number of infractions received. Good team players are likely to be dependable, thorough, and organized versus lazy, irresponsible, and disordered.

Key Points: The trait of Conscientiousness has several facets; the NEO-PIR includes sub-facets of Order (careful, planful), Dutifulness, and Achievement-Striving (high aspiration to achieve goals). Some researchers have discussed whether the Conscientiousness trait is more closely related to the achievement orientation component (that conscientious people persevere and are motivated to achieve) or more closely related to a dependability or planfulness component (that conscientious people are dependable, reliable, responsible, and trustworthy). Our Dependability facet reflects the dependability component of Conscientiousness.

The HPI uses the term Prudence to describe the Conscientiousness trait. Subfacets of this trait relevant to Dependability include Planfulness and Not Spontaneous (careful vs. impulsive).
According to the CPI, subscales of the Conscientiousness factor include Responsibility (those scoring low are described as being careless and impulsive) and Socialization, which assesses integrity and conformance to rules (those scoring low are described as risk-taking). Borman et al. (1991) describe dependable people as "disciplined, well-organized, and planful; respecting laws and regulations; and being honest, trustworthy, and accepting of authority." Dependable people are also described as conscientious, good planners, fastidious, methodical, detail oriented, follows through with commitments, and keeps promises.

Key Words and Phrases: Dependability, Responsibility, Reliability, Trustworthiness; Planfulness over impulsivity; Following through on commitments

Core Assumptions:

It's important not to break promises.

Most people do what they say they are going to do.

Part of being successful involves controlling your impulses.

It is important to develop a plan of action before tackling a problem.

(R) Acting on a whim usually gets people in trouble.

It is important to be punctual.

Keeping one's word is important.

Setting a goal and keeping to the task is the way to success.

(R) Doing things on the spur of the moment can be constructive.

(R) = Assumptions reflecting a lack of Dependability

Dutifulness

Dutifulness refers to the tendency to adhere to obligations and duties that are held within the team. Good team players are likely to hold duty and obligations to the team as highly valued. In a classic series of studies conducted in World Wart I, Stouffer et al., (1949) reported that men did not fight for political ideals or hatred of the enemy, but because of the primary group obligations and duty to teammates. A sense of duty may be especially important for military teams.

Key Points: The trait Conscientiousness is composed of several facets. Costa and McCrae, in the NEO-PIR, decompose conscientiousness into several facets, including order, achievement-striving, and duty. Here, we focus on the duty facet. Moon (2001) defines duty as a sense of duty, obligation, or responsibility to others. Moon uses an "escalation of commitment" dilemma scenario in his paper that may be adaptable for use as an item.

Costa and McCrae (1992) define duty as behavior evidences by individual adherence to ethical principles and moral obligations. If we extend this definition to a team context, then we view duty as adhering to group principles and group obligations. Although we want our overall scale to have general application, the facet of duty seems to be especially relevant to military teams, where they often speak of a sense of duty or loyalty as a significant component of effective military teamwork. Grinker and Spiegel (1945) provide a lucid quote: Men seem to fight more *for* someone than *against* someone.

Key Words and Phrases: Adherence to group norms, obligations, and commitments

Core Assumptions*:*

Good people adhere to their obligations and commitments.

Meeting one's obligations is more important than almost everything else.

People have an obligation to do their duty.

Once a person has made a commitment, it should take a lot for him or her to abandon it.

Fulfilling ones duty is very satisfying.

Adhering to the group obligations and commitments builds character.

People should be prepared to do additional work for the benefit of their group.

Individual needs should be secondary to the benefit of the group.

Each team member gains through the successes of the team.

APPENDIX B:
DEFINITIONS AND IMPLICIT ASSUMPTIONS FOR THE REVISED 5-FACET MODEL OF TEAM ORIENTATION

TEAM ORIENTATION

Team orientation is a general disposition inclining some individuals toward working in groups or teams. The overall structure of personality characteristics described previously provides a theoretical basis for the description and understanding of team orientation. To this point we have dealt solely with the 12 personality facets described in that model.

After the significant work that we have done, both theoretically and empirically, we have decided that it is best to take a metaphoric step back and evaluate where we are and where we have been. Through this evaluation process, we discovered that we have lost sight of the team orientation construct itself and found only the 12 facets—a kind of "missing the forest for the trees" discovery. After rediscovering the forest, we are now attempting to focus on the forest itself, rather than the trees.

Our remedy is to focus on the assumptions that good team players make about the world. To do this, we have examined the 12 personality facets we believe to underlie team orientation and the implicit assumptions associated with them. This examination has been primarily theoretical, but has had some empirical input as well.

In this examination, we have reached the conclusion that there are five major belief structures that are common to all very team-oriented individuals. Each of these belief structures can be characterized by a small number of central assumptions.

Team oriented individuals have the following belief structures.

- ➔ A belief that one should be responsible and responsive to others (***Responsibility to Others***).

- ➔ A belief that team members should work hard to work together, not against one another ***(Cooperative Work Ethic).***

- ➔ A belief that people are social creatures and as a result inherently prefer to spend more time in the company of others than we do alone ***(Sociable Tendency)***.

Team oriented individuals do NOT have the following belief structures.

- ➔ A belief that oneself is entitled to control situations and people ***(Controlling Entitlement).***

- ➔ A belief that the world is a threatening place ***(Negative World View).***

Responsibility to Others

Responsibility includes a general tendency or inclination toward being responsive and responsible to others. This concept is a central concept in both the dependability and dutifulness facets. Responsibility includes the basic behaviors of keeping promises, being dependable, and keeping and upholding commitments. Responsibility is a central concept underlying the conscientiousness Big 5 factor.

Implicit Assumptions:

(+) Good people keep their promises. / There is no excuse for not keeping a promise.
(–) There are good reasons why people don't keep their promises.

(+) Good team members are able depend on each other.
(–) The only person you truly are able depend on is yourself.

(+) Good people accept the responsibility for their obligations to others.
(–) People only have a responsibility to look out for themselves.

Cooperative Work Ethic

The Cooperative Work Ethic is, in essence, a belief that working with others is more effective than working or competing against them, particularly in a team setting. It is a belief in the synergy that comes from working cooperatively, and that cooperation brings out the best work in people. This is the converse of the previous competitiveness facet. It is critical to specify the team as the appropriate referent for measurement here. We are focused on the extent to which individuals are inclined to cooperate with their teammates. We are not concerned with the extent to which individuals are inclined to cooperate or compete with entities (individuals or teams) outside their team. These inclinations are quite distinct, and it is the former that is of interest here.

Previously, we were attempting to screen out overly competitive individuals. However, after further consideration we concluded that it was possible for an individual to be both very competitive and cooperative at the same time. For example, athletes on professional sports teams, particularly those that excel in their sport, are likely to be both hyper-competitive and very willing to work cooperatively. This is possible because these traits draw their meaning from the referent to which they refer. In the case of these athletes, they are highly cooperative with their teammates, but hyper-competitive with other teams. As a result of this insight, we concluded that it was in fact the endorsement of cooperation that we were originally intending, not the exclusion of competitiveness. Regardless of the relationship between competitiveness and cooperativeness, we are actually most focused on whether individuals will be willing to cooperate with one another when working on team.

Implicit Assumptions:

(+) Effective people know how to work well with others.
(–) Effective people know that the best work is done alone.

(+) The synergy created by working together drives the team to greater heights.
(–) Working in groups saps one's energy and kills any good ideas.

(+) Cooperation brings out the best in people.
(–) Working with others only distracts from the goal.

Sociable Tendency

This belief structure involves the central tenet that people are social beings. As a result, people need to have other people around. This is one of the central themes underlying the previous affiliation, social perception, and altruism facets. From this tenet a core set of beliefs arise that being around others is generally a good and enjoyable thing, interacting with others is inherently rewarding, and that acting in ways to continue relationships with others is a positive way to live. This set of beliefs is central to the previous facets of affiliation, social perceptiveness, and altruism.

Implicit Assumptions:

(+) People are enjoyable to be around.
(–) Being around other people is draining.

(+) It is rewarding to make people feel good.
(–) Other people's feelings are not really anyone's concern but theirs.

(+) People are social by nature.
(–) People are forced to interact with each other because society operates that way.

Controlling Entitlement

Some individuals believe they have a basic entitlement to control other people and the situations in which they encounter them. These individuals believe in and prefer to operate within hierarchical relationships rather than relationships of equals. They believe that they ought to be in charge of situations, or if not in charge, ought to be able to appoint or designate a 'leader' for the group. This is the expression of the basic belief of entitlement to control others. This belief structure is a core concept underlying the dominance and rigidity facets. Particularly the aspects of those facets that relate to the preference to be in charge of situations and to ignore the opinions of others in favor of their own.

Implicit Assumptions:

(+) People in charge get to make the decisions.
(–) Everyone in the group should be involved in making important decisions.

(+) In group settings, effective people take control.
(–) Effective groups let the leader emerge rather than be appointed.

(+) People need to be controlled.
(–) People are capable of deciding what is best to do.

Negative World View

The negative world view is related to a number of personality characteristics that have variously been described as emotional stability, adjustment, neuroticism, and anxiousness. The overwhelmingly central belief here is that the world is a hostile, dangerous, and threatening place as are the people in it. Individuals with this negative world view are distrustful of others, view the actions of others in an untrustworthy way, and generally interpret their environments in a negative fashion. These individuals focus on the bad things that can happen to them in any given context. In a team context, they will tend to focus on the perceived untrustworthiness of the other team members, and are more inclined to see malicious intent where there is none or feel slighted when no actual threat exists. This belief structure is central to the adjustment, trust, and self-esteem facets.

Implicit Assumptions:

(+) The world is out to get you.
(–) Life is generally benign.

(+) It is normal for people to get their feelings hurt all the time.
(–) It is atypical for people to hurt each other's feelings.

(+) If you let your guard down, people will take advantage of you.
(–) People can generally be trusted to do the right thing.

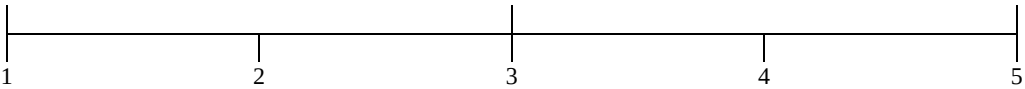
APPENDIX C:
TEAM-ORIENTED BEHAVIORALLY-ANCHORED RATING SCALES: VERSION DATE JANUARY 2003

Assessment of Soldier Behavior

Please rate each Soldier you supervise (that is participating in this research) using the following scales. Each scale assesses a group of behaviors related to interacting and working with others. When making your ratings, please focus on the Soldier's actual behavior during the last 60 days.

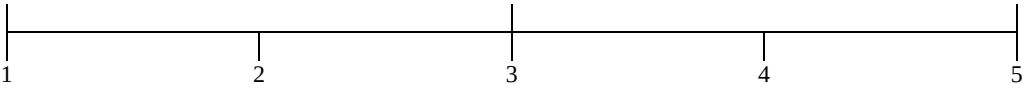
On the scan sheet, please fill in the SSN of the Soldier you are rating in the space marked "ID NUMBER." Fill in your ratings for each Soldier in the spaces numbered 1 through 6 on each answer sheet. If you are rating more than one Soldier, please fill in a separate scan sheet for each Soldier you are rating. [NOTE (not on original rating form): D1 = Responsibility to Others, D2 = Cooperative Work Ethic, D3 = Sociable Tendency, D4 = Negative World View, D5 = Controlling Entitlement]

1. Dimension 1



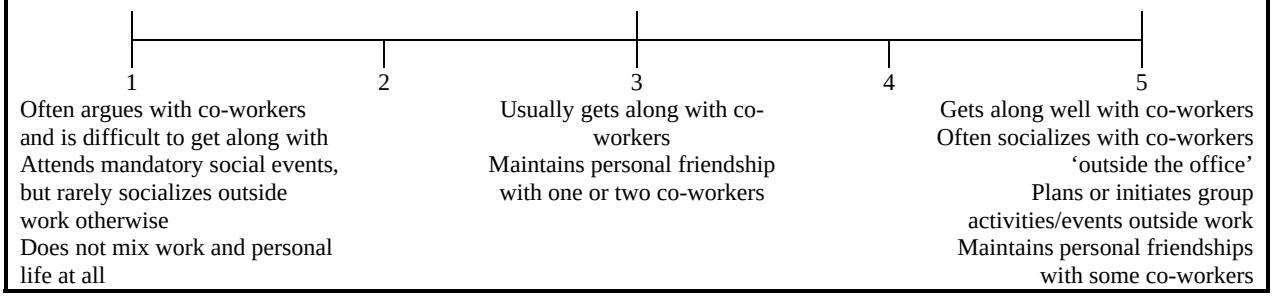
1	2	3	4	5
Often lets others do most of the work Focuses on getting task done, but not necessarily done right Performs own duties/responsibilities when monitored		Usually does own share of work Gets most details right on group work Occasionally fails to fulfill responsibilities		Does appropriate share of work Cares about quality of group work Regularly fulfills own responsibilities

2. Dimension 2

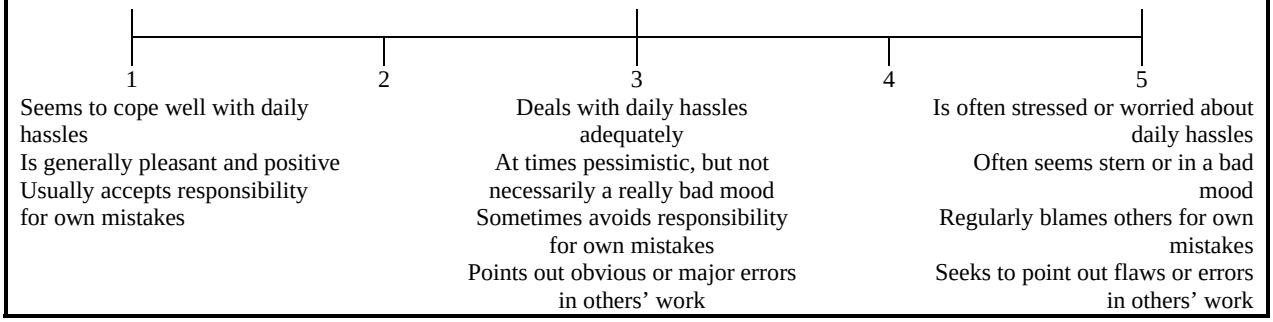


1	2	3	4	5
Rarely helps co-workers, and may try to undermine their work More concerned with own work than helping others Usually tries to isolate own work from co-workers Rarely provides information to co-workers, even if requested		Helps co-workers when asked Will try to coordinate work with co-workers if someone else initiates it Usually cooperates with co-workers on group tasks Provides information to co-workers when prompted		Cooperates well with others; helps and assists others to get the job done Works 'in sync' with co-workers on group tasks Regularly provides needed information or assistance to co-workers

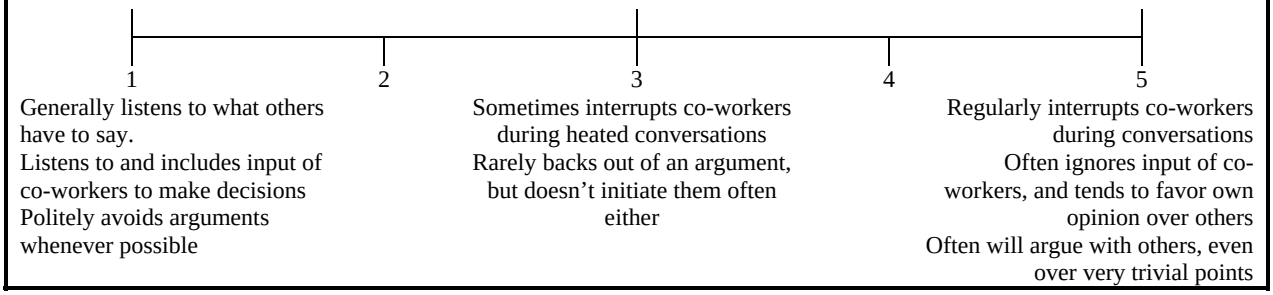
3. Dimension 3



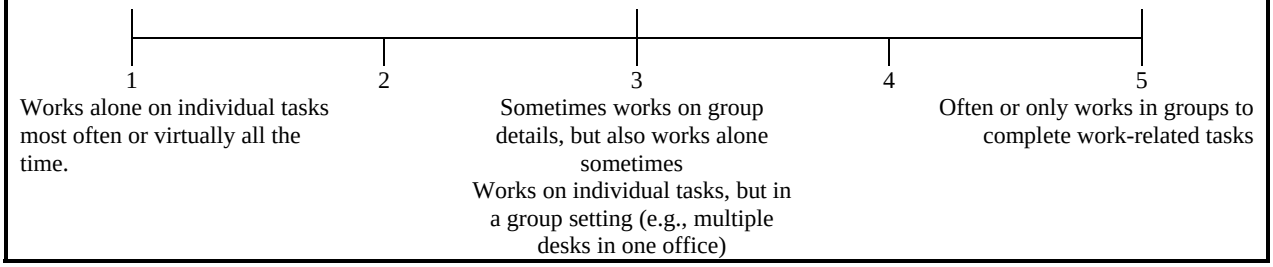
4. Dimension 4



5. Dimension 5



6. Extent of Group Work



APPENDIX D:
PERCENT ENDORSEMENT RATES:
FT. LEWIS AND UCF ADMINISTRATIONS

Percent Endorsement Rates for The Ft. Lewis and UCF Data Collections:

1 = Facet-Keyed Response, -1 = Non-Facet-Keyed Response, 0 = Distractor.

		Ft. Lewis			***UCF***		
Item	**Subscale**	**-1**	**0**	**1**	**-1**	**0**	**1**
1	CWE	17.2	2.5	80.3	52.8	4.2	43.1
2	ST	9.2	.4	90.3	18.1	1.4	80.6
3	NWV	78.2	1.7	20.1	80.6	1.4	18.1
4	ST	34.7	2.9	62.3	19.4	0	80.6
5	NWV	46.4	1.7	51.9	69.4	1.4	29.2
6	CE	13.4	1.3	85.4	1.4	0	98.6
7	NWV	43.1	7.1	49.4	75.0	4.2	20.8
8	CWE	10.6	10.2	78.8	18.1	6.9	75.0
9	ST	48.3	2.9	48.7	43.1	0	56.9
10	RTO	48.3	2.1	49.6	52.8	0	47.2
11	NWV	79.3	0	20.7	81.9	0	18.1
12	ST	53.2	0	46.8	54.2	1.4	44.4
13	ST	94.1	1.3	4.6	91.7	1.4	6.9
14	CE	68.6	3.0	28.4	79.2	4.2	16.7
15	CWE	5.5	2.1	92.4	6.9	2.8	90.3
16	RTO	8.4	1.3	90.3	2.8	1.4	95.8
17	CE	60.8	4.6	34.6	80.3	1.4	18.3
18	CWE	15.7	3.0	81.4	20.8	1.4	77.8
19	CE	59.3	2.5	38.1	50.0	1.4	48.6
20	RTO	52.1	3.0	44.9	47.2	1.4	51.4
21	CWE	70.8	3.0	26.3	61.1	1.4	37.5
22	NWV	70.0	3.8	26.2	76.4	0	23.6
23	ST	44.9	7.2	47.9	47.2	4.2	48.6
24	CE	77.5	6.4	16.1	83.3	0	16.7
25	ST	46.4	2.1	51.5	31.9	0	68.1
26	RTO	28.7	1.7	69.6	18.1	4.2	77.8
27	NWV	93.2	3.8	3.0	94.4	2.8	2.8
28	CWE	19.4	4.2	76.4	16.7	0	83.3
29	CWE	26.6	4.6	68.8	30.6	2.8	66.7
30	RTO	19.1	0	81.0	16.7	1.4	81.9
31	NWV	73.7	5.5	20.8	81.9	1.4	16.7
32	CWE	57.6	2.1	40.3	56.9	2.8	40.3
33	RTO	86.8	3.4	9.8	80.6	2.8	16.7
34	RTO	52.3	1.3	46.4	43.1	1.4	55.6
35	CE	93.6	2.5	3.8	95.8	1.4	2.8
36	CE	56.4	5.5	38.1	48.6	1.4	50.0

		Ft. Lewis			*UCF*		
Item	**Subscale**	**-1**	**0**	**1**	**-1**	**0**	**1**
37	NWV	32.2	4.2	63.6	26.4	2.8	70.8
38	CE	62.3	3.4	34.3	55.6	0	44.4
39	CWE	11.4	8.9	79.7	13.9	1.4	84.7
40	CE	89.4	3.8	6.8	93.1	2.8	4.2
41	NWV	60.6	10.6	28.8	61.1	2.8	34.7
42	RTO	27.1	11.0	61.9	20.8	13.9	65.3
43	RTO	10.2	5.5	84.3	5.6	2.8	91.7
44	CE	82.6	6.0	11.5	93.1	0	6.9
45	RTO	52.1	4.7	43.2	59.7	2.8	37.5
46	ST	19.9	10.2	69.9	6.9	1.4	91.7
47	NWV	79.2	8.1	12.7	95.8	0	4.2
48	ST	23.7	5.9	70.3	27.8	2.8	69.4
49	ST	18.6	7.2	74.2	6.9	1.4	91.7
50	CWE	9.3	14.0	76.7	8.3	6.9	84.7
51	NWV	32.5	15.2	52.4	35.3	4.4	60.3

APPENDIX E:
FACTOR PATTERN MATRIX (FT. LEWIS)

Study 3 - Reference Structure (Semipartial Correlations)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
40 – CE	**0.82**	-0.04	-0.01	-0.04	-0.11
47 – NWV	**0.48**	-0.12	0.30	0.30	-0.01
35 – CE	**0.46**	-0.15	0.26	-0.33	0.01
44 – CE	**0.36**	-0.01	0.32	0.34	-0.02
51 – NWV	**-0.26**	-0.05	-0.19	-0.15	-0.14
49 – ST	**-0.28**	0.18	0.24	-0.22	0.07
43 – RTO	**-0.36**	0.26	-0.03	-0.12	-0.10
50 – CWE	**-0.39**	0.07	-0.02	-0.18	-0.22
6 – CE	**-0.57**	0.20	0.03	-0.15	-0.05
15 – CWE	-0.18	**0.97**	0.05	0.13	0.04
16 – RTO	0.17	**0.77**	0.00	-0.24	-0.19
30 – RTO	0.22	**0.28**	-0.20	-0.01	0.14
45 – RTO	-0.09	**-0.17**	-0.11	0.06	-0.12
3 – NWV	-0.01	**-0.20**	0.07	0.04	-0.06
24 – CE	0.07	**-0.21**	0.20	-0.20	0.03
41 – NWV	0.15	**-0.25**	-0.03	0.02	-0.21
11 – NWV	-0.22	**-0.34**	0.16	0.15	-0.25
27 – NWV	0.12	0.18	**0.68**	0.03	-0.01
31 – NWV	-0.08	0.02	**0.55**	-0.05	0.03
17 – CE	-0.07	-0.14	**0.37**	0.05	0.02
22 – NWV	-0.21	-0.14	**0.36**	0.19	0.01
18 – CWE	0.11	0.23	**0.31**	-0.29	0.03
38 – CE	0.10	-0.18	**0.19**	-0.11	-0.14
23 – ST	-0.03	0.00	**-0.20**	-0.09	-0.18
21 – CWE	0.18	0.14	**-0.24**	-0.07	-0.01
33 – RTO	0.17	-0.19	**-0.25**	0.16	-0.04
39 – CWE	-0.12	0.05	**-0.28**	0.19	-0.04
7 – NWV	0.12	0.09	0.00	**0.50**	0.11
19 – CE	0.07	0.14	-0.07	**0.36**	0.01
37 – NWV	-0.19	-0.04	-0.25	**0.25**	0.05
5 – NWV	-0.04	0.10	0.09	**0.25**	-0.09
9 – ST	0.02	-0.01	-0.05	**-0.16**	-0.02
20 – RTO	-0.03	-0.14	0.00	**-0.20**	-0.08
29 – CWE	-0.25	0.04	-0.06	**-0.27**	0.16
4 – ST	-0.08	-0.10	-0.06	**-0.30**	0.11
46 – ST	-0.10	0.22	-0.33	**-0.33**	0.03
48 – ST	0.04	0.02	-0.17	**-0.35**	-0.21
10 – RTO	-0.14	-0.10	0.00	0.08	**0.58**
32 – CWE	0.00	-0.16	-0.03	-0.25	**0.40**
12 – ST	0.23	-0.01	-0.14	-0.02	**0.36**
8 – CWE	-0.19	0.13	-0.02	0.00	**0.35**
1 – CWE	0.08	0.10	-0.12	-0.05	**0.27**
42 – RTO	-0.12	-0.06	-0.02	-0.02	**0.26**
26 – RTO	0.08	0.13	0.10	-0.17	**0.23**
28 – CWE	0.07	0.07	-0.16	-0.17	**0.19**
25 – ST	0.14	0.05	-0.07	-0.15	**-0.17**
14 – CE	-0.15	-0.17	-0.07	-0.01	**-0.28**
36 - CE	0.07	0.17	-0.15	-0.12	**-0.44**

Note. SAS's "reorder" function was used to display the factor analysis output, which groups items loading on a common factor together to allow for easier interpretation of the results. Note that some items had loadings that were similar in magnitude across several factors. The bold numbers indicate which factor each item had the highest loading on.

APPENDIX F:
COMMITMENT ITEMS

Team-Oriented Affective Commitment
I feel like “part of the family” in my work team.
My work team has a great deal of personal meaning to me.
I feel a strong sense of belonging to my work team.
I feel “emotionally attached” to my work team.

Military-Oriented Affective Commitment
I feel like “part of the family” in the military.
The military has a great deal of personal meaning to me.
I feel a strong sense of belonging to the military.
I feel “emotionally attached” to the military.

Team-Oriented Normative Commitment
I owe a great deal to my work team.
I would not leave my work team right now because I have a sense of obligation to the people in it.
I do not feel any obligation to remain with my current work team.
I would feel guilty if I left my work team now.
Even if it were to my advantage, I do not feel it would be right to leave my work team now.
My work team deserves my loyalty.

Military-Oriented Normative Commitment
I do not feel any obligation to remain with the military.
Even if it were to my advantage, I do not feel it would be right to leave the military now.
I would feel guilty if I left the military now.
The military deserves my loyalty.
I would not leave the military right now because I have a sense of obligation to the people in it.
I owe a great deal to the military.

Military-Oriented Continuance Commitment
Too much of my life would be interrupted if I decided to leave the military now.
It would be too costly for me to leave the military in the near future.
I am afraid of what might happen if I quit the military without having another job lined up.
One of the problems of leaving the military would be the lack of available alternatives.

APPENDIX G:
TEAM-ORIENTED BEHAVIORALLY-ANCHORED RATING SCALES:
VERSION DATE MARCH 2003

Assessment of Soldier Behavior

PART ONE

Instructions

Please rate each Soldier you supervise (and that is participating in this research) using the scales that appear on the next several pages. Each scale measures the degree to which Soldiers engage in behaviors related to interacting and working with others. These behaviors have been classified into five dimensions: Responsibility to Others, Cooperation, Sociability, Negativity, and Dominance. You will also be asked to rate how frequently the Soldiers you are assessing work within group settings.

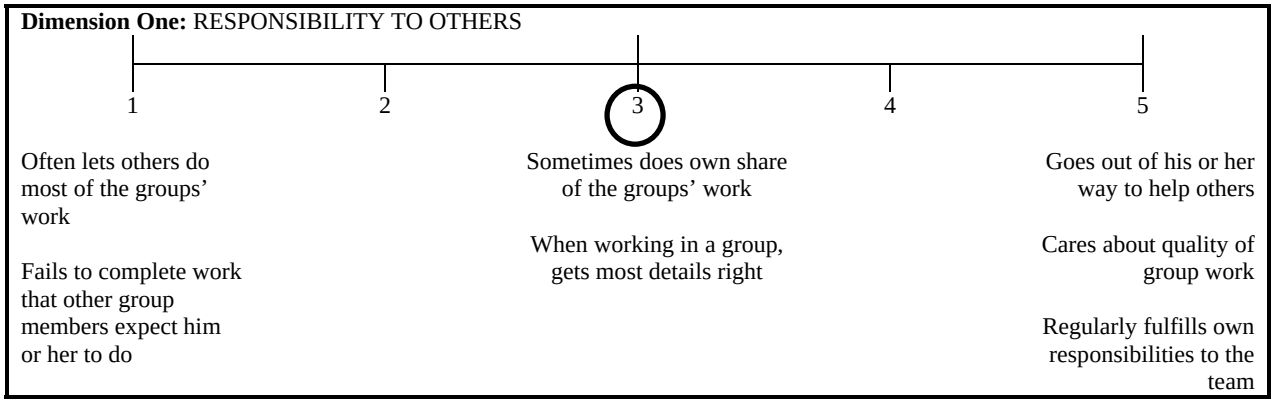
The scale values for each of the five dimensions range from 1 to 5; in each case, greater numbers represent "more" of the dimension being rated. Sample behaviors associated with the low, middle, and high points on each scale have been provided to help you rate the Soldiers you supervise as accurately as possible. For example, if you assigned a Soldier a 5 on the Sociability dimension you would be indicating that he or she is very sociable. On the other hand, a rating of "1" would indicate that the Soldier you are rating is not sociable. Please note that the first three dimensions are generally considered positive (e.g., Sociability), while the latter two dimensions are typically viewed in a more negative light (e.g., Controlling Others).

When making your ratings, please focus on the Soldier's actual behavior during the last 60 days.

Example

SSG Smith is rating SPC Carter on the 'Responsibility to Others' dimension. SPC Carter usually performed his own share of the groups' work but does not pay much attention to details on group tasks. Occasionally other members of his squad say something about his failure to contribute. Recently, SSG Smith has seen SPC Carter spend extra time to help one of his squad-mates finish up paperwork that had to be done, however.

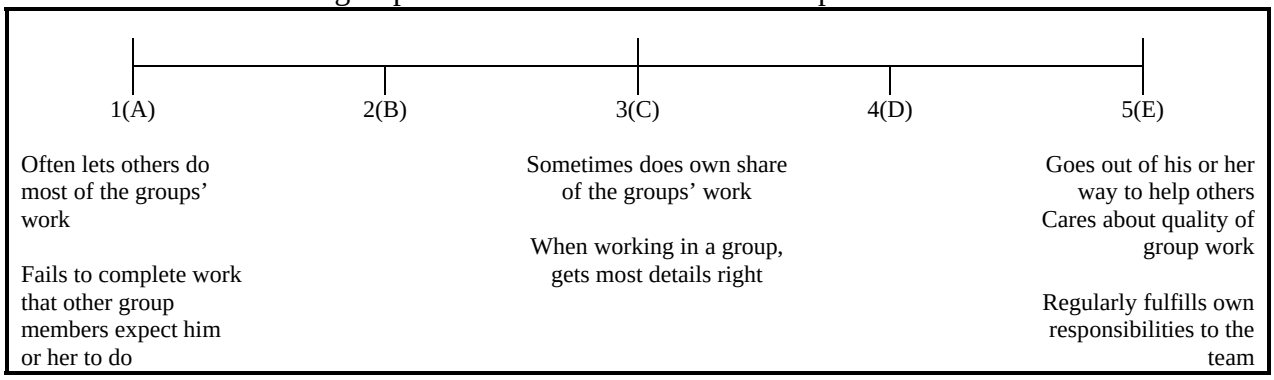
Because SSG Smith feels that SPC Carter typically does his own share of the work, and that the comments by his squad-mates and his own recent observation of SPC Carter helping out are less typical, SSG Smith feels that he must choose between the "2," "3," and "4" ratings on this dimension. In the end, SSG Smith chooses the rating of a "3."



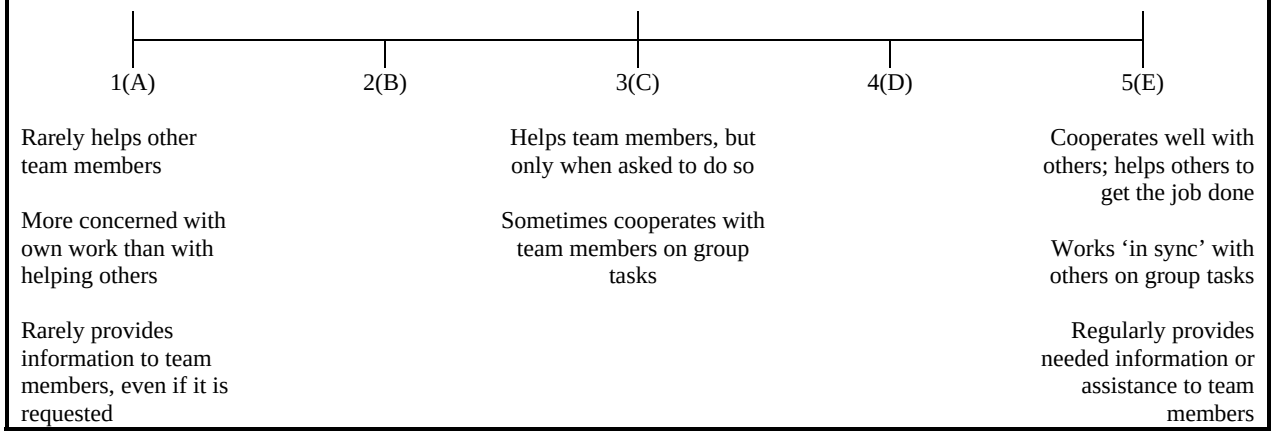
Instructions

On the scan sheet, please fill in the SSN of the Soldier you are rating in the space marked "ID NUMBER." Fill in your ratings for each Soldier in the spaces lettered A through E on each answer sheet (1=A, 2=B, 3=C, 4=D, 5=E). If you are rating more than one Soldier, please fill in a separate scan sheet for each Soldier you are rating.

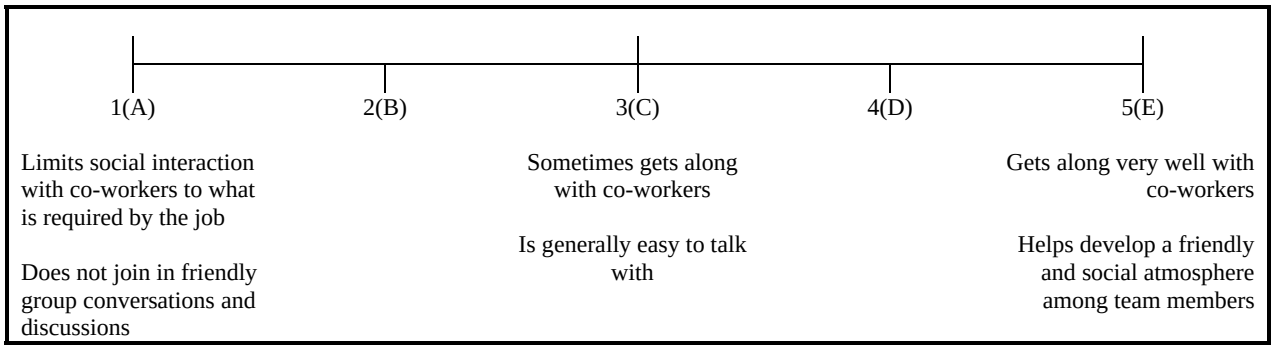
1. RESPONSIBILITY TO OTHERS: The degree to which a Soldier fulfills his or her duties to other individuals or to a group and assists others who need help.



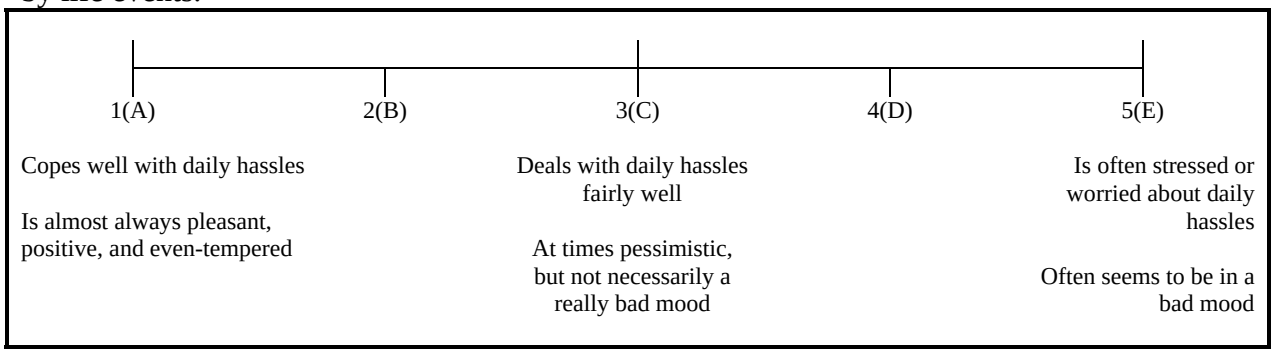
2. COOPERATION: The degree to which Soldiers work cooperatively with others to meet a goal.



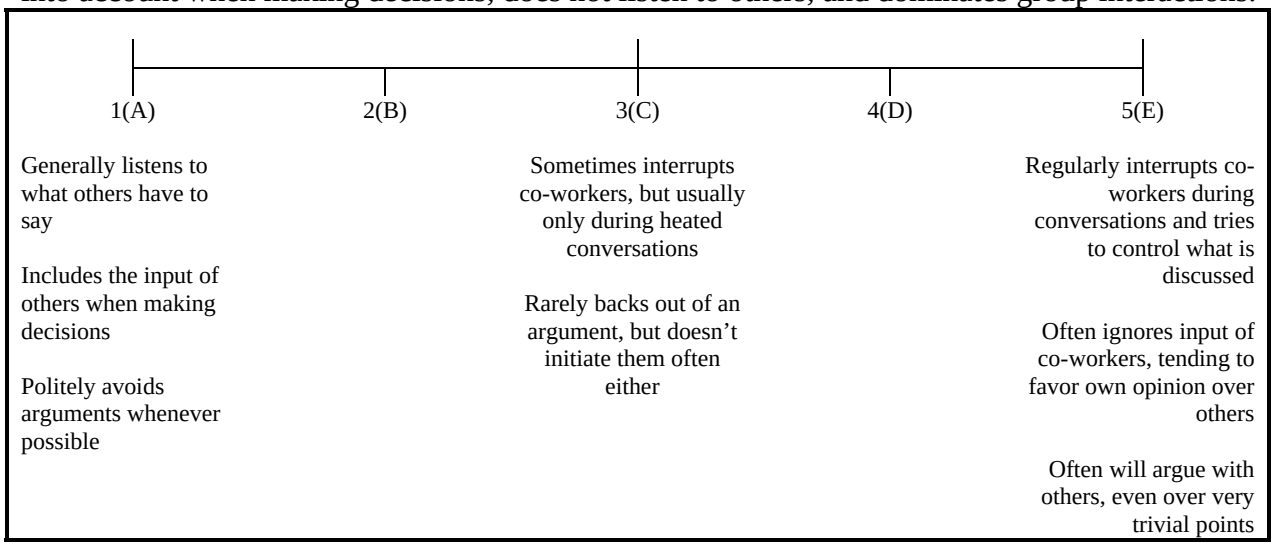
3. SOCIABILITY: The degree to which Soldiers are friendly and pleasant during their interactions with others.



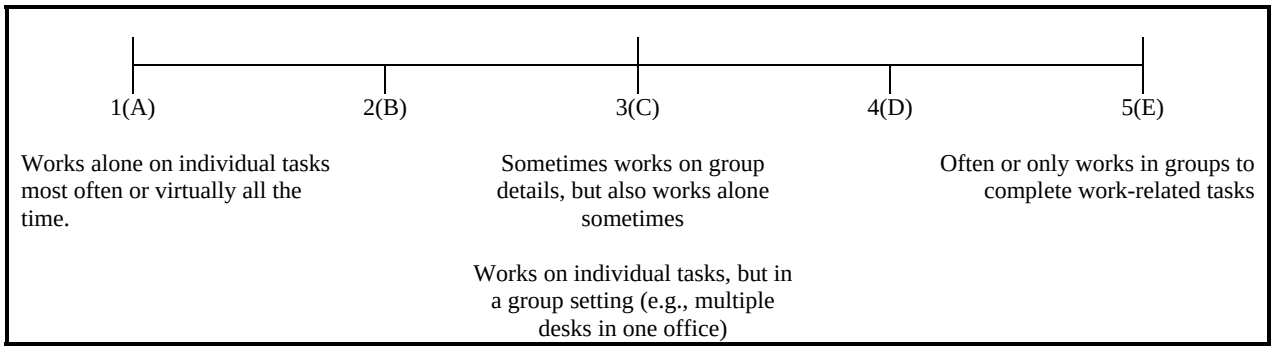
4. NEGATIVITY: The degree to which a Soldier is worried, moody, irritable, or easily stressed by life events.



5. DOMINANCE: The degree to which a Soldier fails to take others' suggestions and feelings into account when making decisions, does not listen to others, and dominates group interactions.



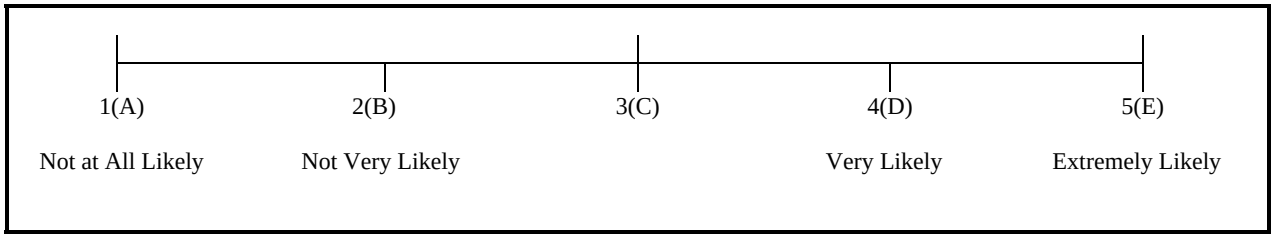
6. ***Extent of Group Work***



PART TWO

Instructions

Using the following scale, please indicate how likely the Soldier you are rating would be to engage in the seven behaviors listed below.



7. Praise team members when they are successful.
8. Support or encourage a team member with a personal problem.
9. Talk to other team members before taking actions that might affect them.
10. Say things to make people feel good about themselves or the work group.
11. Encourage others to overcome their differences and get along.
12. Treat others fairly.
13. Help someone without being asked.

APPENDIX H:
PERCENT ENDORSEMENT RATES:
FT. DRUM ADMINISTRATION

Percent Endorsement Rates for the Ft. Drum Data Collection

1 = Facet-Keyed Response, -1 = Non-Facet-Keyed Response, 0 = Distractor.

		Percent Endorsement		
	Item	***-1***	***0***	***1***
Controlling Entitlement	8	91.2	3.3	5.5
	11	92.3	2.2	5.5
	13	72.9	5.0	22.1
	15	48.6	5.5	45.3
	16	93.9	2.2	3.9
	27	79.4	6.1	14.4
	32	54.1	6.6	39.2
	34	72.4	8.8	18.8
	37	54.4	11.1	34.4
	45	53.3	12.2	34.4
Cooperative Work Ethic	2	8.8	4.4	86.8
	12	7.2	6.6	86.2
	19	55.2	5.5	39.2
	22	30.4	5.5	64.1
	23	18.2	4.4	77.3
	30	67.4	7.2	25.4
	33	43.6	7.7	48.6
	36	5.6	7.2	87.2
	43	23.3	10.0	66.7
	50	33.3	9.4	57.2
Negative World View	1	29.1	5.6	65.4
	5	92.3	3.8	3.8
	10	69.2	7.1	23.6
	14	26.5	3.9	69.6
	20	70.2	3.9	26.0
	24	93.9	2.8	3.3
	29	70.7	3.9	25.4
	40	67.8	8.9	23.3
	44	47.2	13.3	39.4
	46	44.4	16.1	39.4
	48	68.3	15.0	16.7

		Percent Endorsement		
CR Scale	**Item**	***-1***	***0***	***1***
Responsibility to Others	7	61.5	2.2	36.3
	9	38.9	2.8	58.3
	17	69.6	9.4	21.0
	18	49.2	6.1	44.8
	21	13.8	3.3	82.9
	25	20.4	5.0	74.6
	31	46.4	8.3	45.3
	35	6.6	7.7	85.6
	41	36.1	5.0	58.9
Sociable Tendency	3	32.4	1.6	65.9
	4	17.7	1.1	81.2
	6	22.5	7.1	70.3
	26	44.8	3.3	51.9
	28	32.6	7.7	59.7
	38	63.3	6.1	30.6
	39	48.6	9.5	41.9
	42	42.8	11.1	46.1
	47	30.6	16.1	52.8
	49	18.3	13.9	67.8

APPENDIX I:
FACTOR PATTERN MATRIX (FT. DRUM)

Study 4 - Reference Structure (Semipartial Correlations)

CR Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
21 – RTO	**0.76**	0.04	0.03	-0.02	0.01
35 – RTO	**0.58**	-0.18	-0.17	-0.14	0.01
36 – CWE	**0.44**	-0.36	-0.24	-0.23	-0.10
42 – ST	**0.42**	-0.02	0.10	0.26	0.15
22 – CWE	**0.42**	-0.26	0.22	0.13	0.11
6 – ST	**0.33**	-0.19	0.24	-0.10	0.18
32 – CE	**0.23**	-0.01	0.16	-0.04	0.13
10 – NWV	**-0.18**	0.16	0.18	-0.07	-0.09
29 – NWV	**-0.33**	-0.04	0.26	0.15	0.04
20 – NWV	**-0.38**	0.10	0.15	0.00	-0.05
24 – NWV	**-0.45**	0.39	0.35	-0.11	0.26
16 – CE	**-0.50**	-0.12	0.20	-0.11	0.33
40 – NWV	**-0.61**	-0.17	0.04	-0.33	-0.05
5 – NWV	-0.03	**0.98**	0.04	0.02	0.02
3 – ST	-0.04	**-0.23**	-0.12	0.08	-0.01
28 – ST	-0.12	**-0.34**	0.18	0.30	0.03
43 – CWE	0.18	**-0.34**	-0.13	-0.17	0.31
49 – ST	0.09	**-0.35**	-0.16	-0.29	0.19
23 – CWE	0.28	**-0.40**	0.07	0.23	0.05
2 – CWE	-0.38	**-0.55**	-0.08	0.34	0.00
11 – CE	-0.03	0.15	**0.76**	-0.03	0.03
27 – CE	-0.12	-0.07	**0.53**	0.02	0.02
45 – CE	-0.09	-0.03	**0.41**	0.08	-0.16
46 – NWV	-0.10	0.10	**0.21**	-0.16	-0.10
37- CE	-0.04	-0.03	**0.20**	-0.05	0.06
50 – CWE	0.05	0.10	**-0.24**	-0.12	0.16
34 – CE	-0.21	0.07	**-0.24**	0.01	-0.07
19 – CWE	0.12	-0.04	**-0.25**	0.19	-0.11
1 – NWV	0.14	0.02	**-0.25**	0.03	-0.15
33 – CWE	-0.20	-0.08	**-0.44**	0.23	0.18
12 – CWE	0.25	-0.11	**-0.46**	-0.02	0.10
25 – RTO	0.32	-0.10	-0.20	**0.53**	-0.02
18 – RTO	-0.04	-0.21	-0.06	**0.51**	-0.15
17 – RTO	0.09	0.37	0.23	**0.43**	0.03
38 – ST	-0.20	-0.08	0.19	**0.37**	0.29
9 – ST	-0.07	0.10	-0.29	**0.35**	0.12
41 – RTO	0.14	0.08	-0.07	**0.34**	0.33
39 – ST	0.12	0.21	-0.21	**0.25**	-0.01
26 – ST	0.02	0.19	-0.12	**0.23**	0.09
15 – CE	0.10	-0.02	0.11	**0.19**	-0.12
30 – CWE	-0.03	0.14	-0.04	0.24	**0.50**
8 – CE	-0.35	0.24	0.15	-0.23	**0.42**
4 – ST	0.25	-0.30	-0.10	-0.16	**0.35**
13 – CE	-0.07	0.34	-0.05	0.01	**0.34**
31 – RTO	0.10	0.11	-0.01	0.10	**0.28**
47 – ST	0.15	0.00	0.01	-0.09	**0.23**
44 – NWV	-0.15	0.02	-0.11	-0.05	**0.19**
7 – RTO	0.10	0.12	0.01	-0.08	**0.14**
14 – NWV	0.08	0.00	-0.03	0.12	**-0.37**
48 – NWV	-0.28	0.17	0.10	-0.07	**-0.39**

Note. SAS's "reorder" function was used to display the factor analysis output, which groups items loading on a common factor together to allow for easier interpretation of the results. Note that some items had loadings that were similar in magnitude across several factors. The bold numbers indicate which factor each item had the highest loading on.