Individual Differences as Predictors of Leader Emergence

by

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Abstract

Virtual teams are fast becoming a normal part of organizational operations. In an effort to obtain a clearer understanding of how virtual teams differ from traditional face-to-face teams, researchers have begun to examine the nature of a variety of team related constructs in virtual teams and how virtuality affects them. This study sought to examine whether individual differences in personality and cognitive ability differentially predict leader emergence in virtual and face-to-face teams. Results and implications are discussed.

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Individual Differences, Leader Emergence, and Virtual Teams

Technology, globalization, and the increasing complexity of organizations have led many organizations to place emphasis on distributed or "virtual teams" as organizing units of work (Bell & Kozlowski, 2002). A 2002 survey found that more than 60% of professional employees work in virtual teams (Martins, Gilson, & Maynard, 2004). Although virtual teams exist along a continuum of varying degrees of virtuality (Kirkman, Rosen, Tesluk, & Gibson, 2004; Griffith & Neal, 2001) they are nevertheless distinguished from face-to-face teams by characteristics that affect the nature of team communication (Kirkman & Mathieu, 2005; Bell & Kozlowski, 2002). These characteristics include co-locality (or lack of) of team members, level of visual and aural information, and temporality (i.e. the length of time between communication being sent and received). A growing body of research has focused on how these differences in virtual and face-to-face teams effect a number of constructs such as team task performance, cohesiveness, and leadership (Driskell, Radtke, & Salas, 2003; Martins et al., 2004).

Much of the research on leadership in virtual teams has focused on leader effectiveness and there is little research examining how leaders emerge in virtual teams. In contrast, there is ample research on how leaders emerge in traditional face-to-face teams. Several individual difference variables have been identified by researchers as some of the more significant and meaningful predictors of leader emergence in face-to-face teams (Judge et al., 2002; Foti & Hauenstein, 2007; Rubin et al., 2002). For example, research on individual differences in leader emergence has revealed positive relationships between leader emergence and several of the Big-five personality traits, self-monitoring, and cognitive ability in face-to-face teams (see Smith &

Foti, 1998; Lord et al., 1986; Foti &Hauenstein, 2007; Taggar, Hackett, & Saha, 1999). However, one cannot assume that the results found in face-to-face (FtF) team research would necessarily be mirrored in virtual team research on individual differences and leader emergence because virtual teams differ from face-to-face teams fundamentally, in how group members communicate and interact. The technological mediation of virtual teams effects how team members communicate with, and interpret communication from other team members. Due to technological mediation, virtual teams often lack the richness and temporality of communication that face-to-face teams have. This includes communication details such as facial expression, voice inflection and the context of language (Bell & Kozlowski, 2002; Cohen & Gibson, 2003; Martins et al., 2004). Leader emergence is affected by how group members perceive and interact with each other. It follows then, that if there are differences in how teams communicate, perceive and interact with each other; then there should be differences in the process of leader emergence in these teams. Therefore, I posit that behaviors typically associated with leadership in face-to-face teams are not manifested or perceived by others in the same fashion as in virtual teams because of differences in communication media. The current study seeks to extend the body of literature on individual differences and leader emergence and test the extent to which these same individual differences that have been found to be the most predictive of leader emergence in face-to-face teams are predictive of leader emergence in virtual teams.

Leader Emergence

Leader emergence refers to the phenomenon that when no leader is assigned to a group or no formal leader is present (e.g. in autonomous work teams), a leader emerges from within the group as a function of being perceived by his or her peers as the most leader-like of the group (Judge et al., 2002). Individuals are perceived as being leader-like when they engage in behavior, display traits, or perform well at tasks that fit the perceivers' schema of a leader. Schneider and

Goetkpe (1983) defined emergent leaders as group members who exert significant influence over other group members, although no formal authority has been vested in them. The key parts of this definition that separate leader emergence from leader effectiveness are: (a) the lack of formally appointed authority and (b) the focus on group processes instead of outcomes. How an individual gains influence outside of formal means (leader emergence) is a function of group members' perceptions of whether or not an individual possesses the traits and abilities consistent with what they expect from a leader. Gaining influence is also a function of individuals' ability to display the traits and behaviors group members expect from a leader. For example, a team may have a formally appointed leader; however, an individual may still *emerge* from the group as a leader in the eyes of his/her teammates by engaging in behaviors and demonstrating abilities, the other teammates associate with leadership, especially if the appointed leader does not or cannot do so. The likelihood of an individual emerging as a leader is very much dependent on the composition of the group and the demands of the situation (i.e. an individual may emerge as leader in one group and in some situations but not others). Researchers have argued, however, that there are specific individual differences that predispose some group members to be viewed as leaders in the eyes of other group members or that specific individual attributes may predispose certain individuals to behave in a manner that fits group members' expectations of a leader (Taggar et al.,1999).

Virtual Teams

The body of work on virtual teams in I/O psychology and related fields is a recently burgeoning area. Of the 93 empirical articles Martins et al., (2004) identified in their review of the virtual teams literature, only 23 were published prior to 1995. Although virtual team researchers have proposed a number of definitions, Martins et al., (2004) identified two key

features in the definition of virtual teams that overlapped in the literature; (a) virtual teams are functioning teams similar to face-to-face teams except that they rely on technologically-mediated communication to cross boundaries; (b) the boundaries crossed by virtual teams are geographic, temporal, and in some cases, organizational. Although early conceptualizations viewed virtual and face-to-face teams as a dichotomy (e.g. Bouas & Komorita, 1996), more recent work has suggested that team "virtualness" is a continuum ranging from exclusively face-to-face teams to virtual teams that communicate and interact solely through some form of technology (Bell & Kozlowski, 2002; Griffith & Neale, 2001). Furthermore, the extent and type of technology used and the degree to which that technology helps members cross boundaries determines where a particular team falls on this continuum. Martins et al., (2004) defined virtual teams as "teams whose members use technology to varying degrees in working across locational, temporal, and relational boundaries to accomplish an interdependent task." (p.808). The locational boundary refers to any physical dispersion of team members, such as different geographic locations or different workplaces at the same geographic location (e.g. different departments or offices). The temporal boundary encompasses team lifecycle and synchronicity. Team lifecycle captures the extent to which a team is temporary or ongoing, while synchronicity refers to the timing of member interaction on the group's task. The relational boundary refers to the differences in relational networks of virtual team members, such as their affiliations with other teams, departments, organizations, and cultural sub-groups.

Although there is a substantial body of literature on virtual teams, there has been little research on leader emergence in virtual teams. Furthermore, research on differences between face-to-face and virtual teams has produced conflicting results in a variety of areas. Driskell et al., (2003), in their review of the research on virtual teams, pointed out that some studies found

differences in virtual and face-to-face team processes such as status, role development, while other studies found no differences. If virtual and face-to-face teams differ in how team members behave and interact with each other; it is possible that they differ in other team processes such as leader emergence.

Computer-mediated (CM) teams communicate with each other primarily or exclusively using computers. This is accomplished by sending emails back and forth, sending and receiving typed messages in real time, known as "chatting" or instant messaging, or using video conferencing software to see, hear, and talk to team members in real time. Again, the degree of virtuality affects team processes and outcomes as the degree of communication richness changes (Bell & Koslowski, 2002). Bearing in mind that the different types of virtual teams will have different levels of communication richness (Driskell et al, 2003), the focus of this study will be on CM teams that communicate through real time electronic text, otherwise known as chat or instant messaging, as these are the most common forms of virtual teams in the workplace (Martins et al., 2004). CM teams have inherently low communication richness. Individuals in many CM teams are unable to see or hear team members, limiting the quantity and quality of communication. Communication richness is important in team interaction for a number of reasons. It affects the communication of roles, status, and contextual information. Driskell et al., (2003) pointed out that contextual information about others during communication may not be readily available in CM teams with low communication richness.

Contextual information may include team members' affective states during communication, such as facial expressions and voice intonation. Without this contextual information, it is difficult for team members to interpret the full meaning of a particular communication, or to gauge an individual's response to a communication. For example, a

sarcastic statement may lose its meaning in a typed response, whereas in spoken form one would be able to detect the sarcasm through voice inflection. Individuals may also unintentionally communicate or perceive contextual information in other ways. A long pause before replying to a question in face-to-face communication may be perceived as hesitance, or a lack of self-confidence, whereas in CM communication a long pause could be interpreted as one's ability to manipulate or use the technology, limitations or technical issues with the technology itself. Contextual information plays an important role in how team members are able to evaluate each other. Traits such as enthusiasm and sociability are more difficult to convey or gauge through communication with the absence of contextual information such as facial expressions, voice pitch, tone of voice, and body language (Martins et al., 2004). Often times, unless team members explicitly seek out contextual information from each other; the full meaning of communication can be unclear or inaccurate (Martins et al., 2004). This lack of accurate information may lead to miscommunication, and inaccurate assessments of group members' behavior and character. With sociability, enthusiasm and other interpersonally oriented traits difficult to verify, CM team members may focus more heavily on task-oriented traits such as reliability, consistency and actual performance ability to evaluate teammates. For example, Weisban and Atwater (1998) found that actual performance contributions to team task performance accounted for significant variance in ratings of teammates' contributions in electronic (CM) groups, but not in face-to-face groups. Conversely, liking accounted for significant variance in ratings of teammates contributions in face-to-face groups but not electronic (CM) groups.

Differences in communication richness between face-to-face and CM teams leads to differences in the nature and quality of information team members communicate to each other. Differences in information quality may, in turn, lead to differences in how individuals are

perceived in face-to-face and CM teams. How group members perceive an individual's behavior and affect is instrumental to that individual being perceived as a leader. For example, the information individuals use to determine roles and status in CM teams differs from face-to-face teams. Individuating information that group members may use to form attitudes and beliefs is more difficult to come by, thus group members may form biased attitudes or stereotypes about other group members based on what little information they may have, such as race, sex , or nationality. For example, Postmes, Spears, and Lea (2002) conducted a study involving discussion groups of Dutch business students and English psychology students. Postmes et al. manipulated the degree of individuation by controlling how much information was available to discussants regarding their counterparts' identities. Specifically, in the depersonalized discussion groups, participants only knew the nationality of the cohorts (names were either A for Amsterdam or E England followed by the participants' initials). In the individuated discussion groups, participants were identified by the same group defining A or E, but followed by their actual names and a picture of them taken prior to the study. The researchers found that participants in the depersonalized condition held more stereotypes about participants of a different nationality and opinions were more likely to be polarized by nationality over the discussion topics than in the individuated groups. Even more revealing was a second experiment in the same study using only psychology students at one university. The manipulation in this study involved whether the participant believed they were communicating with a fellow psychology student, a business student, or a sociology student. Again, pictures were provided for the individuated condition and only group labels for the depersonalized condition (BUS for business SOC for sociology). The results were similar to the first experiment in that there was a significant main effect of depersonalization on in-group/out-group stereotyping and participants

were more salient of intergroup differences. In addition, when asked to recall whether certain statements were made by other discussion members, participants in the depersonalized condition were significantly less accurate in recalling the statements of out-group members than in-group members, whereas there were no significant differences in recall of statements in the individuated condition. Finding similar results across both experiments suggests that the less individuating information one has available, the more susceptible one's judgment of others may be to bias and stereotypes, and can lead to inaccuracies in the evaluation of other group members.

There has been some research on leader emergence in virtual teams. Little of this research has focused on leader emergence in face-to-face and virtual teams simultaneously. Therefore, as a starting point to understanding how the type of CM environment affects leader emergence, I compared two types of teams on either extreme of the communication continuum, investigating differences between face-to-face teams and text-only CM teams. Starting with these two team types seemed appropriate because one would expect that, if there are differences in how leaders emerge in face-to-face and virtual teams, that one would most likely find them between the extreme ends of the continuum.

The Present Study

Leadership and the Big-five

The Big-five model of personality has received a great deal of attention in leadership and personality research, and evidence has supported the link between several of the Big-five traits and leader emergence (Bass, 1990; Judge et al., 2002). Among the five broad factors, evidence has consistently shown a link between conscientiousness, extraversion and leader emergence (Judge et al., 2002). CM teams have a high need for clearly defined goals and task structure because of a high level of uncertainty due to a less rich communication medium (Gibson & Cohen, 2003). In addition, CM team members are more likely to seek out task-related information (Gibson & Cohen, 2003; Lebi et al., 1996). Similarly, Martins et al., (2004) found that in CM teams, trust was directly related to the predictability or reliability of an individual. Because other characteristics such as enthusiasm and sociability are more difficult to gauge in a virtual environment, compared to FtF teams CM team members may rely more heavily on task performance-related criteria such as consistency and accuracy of task-related information and effectiveness to evaluate peers.

Because they tend to be more tenacious and persistent when engaging in tasks, conscientious individuals perform better overall at tasks than individuals low in conscientiousness (Goldberg, 1990; Hurtz & Donovan, 2000). Team members may perceive conscientious individuals as more effective and capable than other members. In addition, achievement-striving and self-efficacy, facets of conscientiousness are related to an individual's motivation to accomplish goals and self-confidence, respectively. These facets of

conscientiousness are also among the traits most associated with leadership and may play a role in perceived effectiveness (Judge et al., 2002). Individuals high in conscientiousness are more likely to engage in behaviors and display characteristics that are seen as leader-like, such as self-efficacy and task focus (Goldberg, 1990; Judge et al., 2002; Foti & Hauenstein, 2007). In CM teams, where individuals are more likely to be evaluated based on task-oriented behavior than on relationship-oriented behavior, individuals high in conscientiousness may fit team members' schema of leadership more than those individuals low in conscientiousness. Whereas in face-to-face teams, individuals may give more or equal consideration to relationship-oriented behaviors and traits in addition to considering task-oriented behaviors in their evaluation of leadership qualities. In essence, it is possible that task-oriented behavior receives more weight in CM teams when evaluating leadership qualities, than in face-to-face teams. Therefore, because individuals high in conscientiousness should engage in task-oriented behavior more frequently than others should, conscientiousness should also receive more weight in CM teams when evaluating leadership.

Kirkpatrick and Locke's (1991) analysis of leadership and personality traits found that leaders were more likely than non-leaders to be active, energetic, and assertive; components of extraversion. In addition, Hogan, Curphy, & Hogan (1994) found extraversion to be an important factor in individuals being perceived as having leadership qualities. In face-to-face teams, extraverts may be seen as more leader-like by dominating conversation and group interactions through more assertive non-verbal behavior such as making direct eye contact and using hand gestures while speaking (Tagger et al.,1999). However, eye contact and other non-verbal behaviors are not available to individuals in CM teams. In addition, for CM teams using email or chat, all verbal communication is written and voice characteristics (pitch tone, rate of speech) are unavailable for evaluation. Facets of

extraversion, such as dominance (Judge et al., 2002; Lord & de Vader, 1986; Foti & Hauenstein, 2007) high activity and energy levels (Judge et al., 2002; Hogan et al., 1994) are positively related to leader effectiveness and perceptions of leadership in face-to-face teams. Individuals possessing these traits appear more leader-like because they are more likely to be active and expressive than other team members are, and more likely to take control of a situation and influence others. However, in CM teams it is difficult to establish clear dominance among team members. An individual may in fact be high in trait dominance, but the nature of the communication medium may limit their ability to express their dominance. The relative anonymity of a CM environment may provide individuals who are normally shy and reserved with a safe environment to lose their inhibitions and be more bold and assertive. For example, researchers have found that individuals in CM virtual teams are more likely to engage in uninhibited behavior (such as swearing or using inflammatory speech) than in face-to-face teams (e.g. Martins et al., 2004). In addition, the level of participation in virtual teams becomes more equalized than in face-to-face teams, likely due to reduced salience of individual status (Hollingshead, 1996).

H_1: The relationship between conscientiousness and leader emergence will be stronger in CM teams than in FtF teams.

H_2: The relationship between extraversion and leader emergence will be stronger in FtF than in CM teams

Self-Monitoring and Leadership

Although the Big-five are perhaps the most well known and oft studied personality constructs when it comes to leadership, recent research has uncovered relationships between leadership and some other personality constructs. Among these, self-monitoring has been linked to leader emergence in a number of studies. Day and Schleicher (2006) lamented the apparent lack of personality and leadership research involving self-monitoring, asserting that the field of I-

O psychology has neglected this construct by focusing almost exclusively on the Big-five in any personality-related research. Self-monitoring of public image is an affective and behavioral presentation that the individual deems appropriate based on his or her perception of the social situation (Snyder, 1974). Self-monitoring behavior can be expressed in a variety of ways and result in a number of different social outcomes depending on the motives of the individual. As Snyder (1974) stated:

> "Perhaps some individuals have learned that their affective experience moreover, expression is either socially inappropriate or lacking. Such people may *monitor* (observe and control) their self-presentation and expressive behavior. The goals of self-monitoring may be (a) to communicate accurately one's true emotional state by means of an intensified expressive presentation; (b) to communicate accurately an arbitrary emotional state, which need not be congruent with actual emotional experience;(c) to conceal adaptively an inappropriate emotional state and appear unresponsive and unexpressive; (d) to conceal adaptively an inappropriate emotional state and appear to be experiencing an appropriate one; (e) to appear to be experiencing some emotion when one experiences nothing and a non response is inappropriate." (pg. 527)

High self-monitors are not only adept at the control and selective presentation of their behavior, but also at assessing social interactions and determining what expressive behaviors are appropriate (Dobbins, Long, Dedrick, & Clemons, 1990; Ellis & Cronshaw, 1992). What is appropriate however, depends on the goals of the self-monitor. Self-monitoring is positively related to group members' perceptions of leadership and to leader emergence specifically (Garland & Beard, 1979; Day & Schleicher, 2006; Zaccaro, Foti, & Kenny, 1991: Foti & Hauenstein, 2007). Garland & Beard (1979) found partial support for the hypothesis that high self-monitors emerge as leaders more often than low self-monitors. High self- monitors emerging more often as leaders is likely due to their ability to recognize what behaviors are viewed by group members as being leader-like and then effectively tailor their behavior patterns to meet these expectations.

In Garland and Beard (1979), male and female groups engaged in a problem solving task involving anagrams and a brainstorming task. The results showed that high self-monitors emerged more often in the brainstorming task but not the anagram task. Day, Schleicher, Unkless, & Hiller's (2002) meta-analysis of self-monitoring studies revealed that self-monitoring was significantly related to leadership. Included in the analysis were 23 leadership studies with a total sample size of 2,777 that rendered a mean effect size of .37. Results were significant in both field and laboratory studies using both group member and self-ratings of leadership. High self-monitors are rated higher and nominated more frequently as leaders than low-self-monitoring individuals (Dobbins et al., 1990; Ellis & Cronshaw, 1992). Zaccaro et al., (1991) also found that self-monitoring was correlated with emergent leadership across situation or task type. The limitations of CM team communication would make it difficult for self-monitors to gauge teammates' reactions to their behavior, and to express their behavior in a desired fashion. Individuals in virtual teams may not have access to vital cues such as facial expression, voice inflection, or body language. In addition, the limitation in communication ability limits how a high self monitor can tailor his or her behavior to suit the social situation. Thus while self-monitoring is positively related to leadership, its effects will be reduced or nullified in a computer mediated environment.

H_3: The relationship between self-monitoring and leader emergence will be stronger in FtF teams than in CM teams.

Need for Closure and Leadership

Individuals high in need for closure are likely to quickly come to solutions or make decisions by relying on early cues and the first answer they come across (Chirumbolo, et al., 2004). High need for closure is also thought to lead to a very narrow information search and a higher tendency to use cognitive heuristics in problem solving (Van Hiel and Mervielde, 2003).

Conversely, low need for closure is associated with the production of novel solutions and ideas to problems. In a team setting, team members low in need for closure are usually more productive and were rated by teammates as more creative, motivating, and inspiring than their counterparts high in need for closure (Chirumbolo et al., 2004). Richter and Kruglanski (1997) found that individuals with a high need for closure were less effective at communicating their ideas to others. In addition, individuals high in need for closure tend to focus own perspectives and are less likely to consider alternate points of view. Webster-Nelson, Klein, and Irvin (2003) found that individuals with a high need closure tend to focus rigidly on their own perspectives; because of this they were less able to empathize with their interaction partners. Similarly, Richter and Kruglanski (1999) found that individuals with a high need for closure were less effective at tailoring their communications to suit their audience. In turn, recipients had more difficulty understanding communication from individuals with a high need for closure.

Richter and Kruglanski (1999) found that individuals high in need for closure also tend to use vague and abstract language when asking group members questions which in turn prompted vague responses. The low level of intimacy in communication contributed to greater interpersonal distance between individuals and lessened their liking for each other. The communication difficulties experienced by persons with a high need for closure would be exacerbated in a virtual communication environment. The ability to use detailed, explicit language is more vital to effective communication and interpersonal interaction in CM teams. Vague communication is more problematic when contextual information such as tone of voice, inflection, hand gestures and facial expressions are lacking. As previously discussed, the ability to communicate and interact with team members is pivotal to perceptions of leadership. In FtF teams, the differences in communication style between high need for closure and low need for

closure individuals can lead to the former being viewed as less leader like than the latter. A CM environment exacerbates the differences in communication style between low and high need for closure individuals. with a high need for closure at further disadvantage when communicating, one would expect that the individuals with a high need for closure would be even less likely to be perceived as leader-liker in CM teams.

H_4: The relationship between need for closure and leader emergence will be stronger in CM teams than in FtF teams.

Cognitive Ability

General cognitive ability or *g* is one of the most commonly studied individual differences and a robust predictor of many outcomes, such as job performance and skill acquisition in training (Gottfredson, 1997; Schmidt & Hunter, 2000). As Judge and his colleagues (2004) stated: "It is not surprising, then, that intelligence is a trait that is commonly believed to be important to leadership." (p. 547). Cognitive ability is positively related to both leader effectiveness and leader emergence in face-to-face teams (Judge et al., 2004; Taggar et al., 1999; Lord et al., 1986). Cognitive ability is also associated with overall task performance (Hurtz & Donovan, 2000), and team members' perceptions of individuals as being leader-like (Taggar et al., 2002). Perceptions of ability are important to virtual team members when familiarity is low (Martins et al., 2004). CM teams operate with a greater degree of uncertainty about their cohorts than face-to-face teams (Martins et al., 2004). Due to uncertainty, individuals in CM teams are more likely to rely on objective, task-related behavior when forming perceptions of other team members because the ability to evaluate team members based on interpersonal and relationship-oriented behavior is limited (Gibson & Cohen, 2003). Individuals high in cognitive ability are better at solving problems and performing tasks, which is more readily associated with leadership in CM teams than non-verbal behavior and interpersonal behaviors. CM team

members may give more weight to teammates' ability to perform well on tasks than to social or relationship-oriented behavior when making attributions of leader-like behavior. For example, Weisban & Atwater (1998) found that the actual task contribution of team members was more influential than liking in peer ratings of task contribution in CM teams than in face-to-face teams.

H_5: The relationship between cognitive ability and leader emergence will be stronger in CM teams than in FtF teams.

Participation

The degree to which a team member communicates with his or her team may be just as important as having cognitive ability because active participation signals influence in group settings (Bonito, 2000; Bottger, 1984; Robey et al., 1989). Past research has found that individuals perceive leaders as being highly active in team functions (Bass and Avolio, 1994). Taking an active role in team activities through high participation should be consistent with follower perceptions of leadership because it provides information indicating assertiveness, influence, and competence.

H_6: The relationship between participation in group discussion and leader emergence will be stronger in CM teams than in FtF teams.

Method

Participants

Four hundred and fifty undergraduate students from a large southeastern university completed an online questionnaire of personality measures. From this pool, 115 participants were recruited to participate in the team exercise. The mean age of the sample was 20 years with a standard deviation of 1.53 years. Forty-three participants were male and 66 were female. Six participants did not report their sex. Ninety-three participants were White, 12 participants were Black, 2 participants were Hispanic, and 2 participants were Asian. Participants were randomly assigned to 3-5 person teams in one of two conditions: face-to-face (FtF) or computer mediated communication (CM). There were 32 teams, with 19 teams in the FtF condition and 13 teams in the CM condition.

Measures

Personality

Big-five traits were measured using Goldberg's (1999) 50-item IPIP Big-five markers scale. The IPIP (International Personality Item Pool) is a public domain inventory of items that measure various constructs of trait personality, including the Big-five. The items are comprised of statements that describe behavior or affect associated with a particular broad domain. The 50-items were divided into five subscales with 10 items in each subscale: Openness (α =.85), Agreeableness (α =.88), Conscientiousness (α =.87), Extraversion (α =.91) and Neuroticism (α =.88). The respondents rated the degree to which each statement was an accurate reflection of his or herself on a 5-point Likert-type rating scale (1 = does not reflect the respondent at all, 5 = very

accurate reflection of the respondent). It should be noted that while only the 50-item Big Five Marker scale was analyzed for this study, participants actually completed the 120-item short form of the IPIP-NEO scale. In addition to five broad domains, the IPIP-NEO measures the 30 facets within the broad domains. The 50-item scale is a subset if the larger 120-item IPIP-NEO scale.

Self-monitoring was measured using Gangestead and Snyder's (1974) revised self-monitoring scale. The scale consists of 18 items with a dichotomous (true or false) response format. The items consist of statements about behavioral expression and communication in a variety of social situations, e.g., "When I am uncertain how to act in a social situation, I look to the behavior of others for cues." Snyder (1974) provided the responses to each item that would be given by a "high" self-monitor. Scoring the self-monitoring scale is accomplished by matching participants' responses to the expected responses of a high self- monitor. Item responses matching the expected high self-monitor response were scored as 1 while items with non-matching responses were scored as 0. For example, if a participant answered an item with "true" and the expected response was "true" then the respondent receives a score of 1 for that item. If the expected response was "false" then the respondent receives a score of 0 for that item. A scale score was obtained by summing all item scores. The internal consistency estimate for this sample, (KR20 = .73) was identical to the estimate obtained by Day et al., (2002).

Need for closure was measured using a revised version of Kruglanski, Webster, and Klem's (1993) NFCS. The NFCS is a 42-item measure that includes statements such as "I think that having clear rules and order at work is essential to success." and "I do not like situations that are uncertain". Participants rate the extent to which they agree with these statements on a 6-point Likert-type scale (1 = strongly disagree, 6= strongly agree). Summing

the responses to all 42 items to produces a single need for closure score. Reliability for the NFCS in this sample was (α = .81).

Cognitive ability

Cognitive ability was measured using the Raven's Advanced Progressive Matrices (APM) Short Form (Arthur & Day, 1998; Raven, Raven, & Court, 1994) which consists of 12 matrix or design problems arranged in an ascending order of difficulty. Administration time was 15 minutes. Items are scored by a score of 1 when the correct response is chosen for an item and assigning 0 when an incorrect response is chosen for an item. Summing these scores yields a single value that can range from 0 to 12. The APM short form demonstrates psychometric properties similar to that of the long form. The Spearman-Brown corrected odd-even split half reliability was 67.

Participation

Participation was defined as frequency of participation in team discussions during the team tasks. Participation was the proportion of words spoken or typed by each team member out of the total number of words uttered by the team (Purvanova & Bono, 2009; Mullen, Salas, & Driskell, 1989). The total number of words spoken for the team was obtained by first counting the number of words spoken by each team member and then summing those values to obtain a team total. Proportion of words spoken by each individual was chosen to measure participation rather than the sum of words spoken because in the virtual communication medium there is no production blocking. That is, participants can submit their communication simultaneously without being interrupted or interrupting others (George et al., 1990). Therefore, a proportion of words spoken allows for comparison of participation across the FtF and CM conditions. In the FtF condition, voice activated audio recorders were used to record all communication between

team members during the tasks. Participants were instructed to identify themselves by saying their participant ID aloud at the beginning of the discussion for each task. In this way, research assistants were able to identify and attribute speech to the correct team member during transcription. These audio recordings were then independently transcribed by the researcher and a research assistant. We compared transcriptions, and any discrepancies were resolved by listening to the recordings together and reaching agreement on the correct transcription. In the CM condition, transcripts of all communication during the task were automatically logged and stored by the chat room software.

Tasks

All teams worked on two problem-solving tasks presented sequentially. Both tasks were hypothetical scenarios within an organizational/business setting, with multiple factors to be considered and in both cases, participants were asked to imagine themselves and their teammates as a team of consultants. Neither task had a "correct" solution per se, as multiple approaches to solving each problem were plausible. The goals of the tasks were to present conditions where individuals were required to work together on a complex task as a team and thus provide an opportunity for a leader to emerge in the group.

The first task was a policy analysis task. Teams were presented with a hypothetical scenario where managers at a manufacturing plant were having difficulty getting employees to follow safety rules. In the scenario, it is company policy that employees wear hard hats while on the production floor; however, compliance with this policy is below acceptable levels. The team is tasked with devising a plan of action to increase compliance with this safety policy. There were two requirements that had to be met. First, the action plan had to be incentive-based. Second, the team had to reach unanimous agreement on the solution. Teams had approximately

35 minutes to discuss the scenario and devise a solution.

The second task was a resource allocation task. Teams were again presented with a hypothetical scenario. In this scenario a cosmetics company wanted to improve the quality of transportation for its sales people in a particular region; however, the only resources available are one new vehicle and $1000 that can be used for vehicle repairs. The teams were required to decide who should receive the company vehicle and/or the $1000 in vehicle repair money from a list of sales representatives. Personal and professional information about each sales representative was provided. This information included the sales representatives' age, marital status, family size, years with the company, size of sales territory, previous year earnings, and condition of current work transportation. The team had to choose one person to receive the new company vehicle, but no restrictions were placed on how the money could be allocated (e.g. it could be given to one person or split between several persons). Similar to the first task, teams had to reach unanimous agreement and had approximately 35 minutes to complete the task.

Leader Emergence

All participants rated themselves and each of their team members on a five-item scale measuring leader emergence. The items were: "How much influence did team member ___ have on team decisions?" How much leadership did team member___ display?", "To what degree would you consider having team member___ as a leader in the future?" and "How much did team member___ contribute to the task?" The items had a five-point Likert-type response format (1 = none/not at all, 5 = very much/a great amount). Scores on each item were computed by averaging the ratings participant received from teammates. The mean scores for each item where then summed to yield a single leadership score. Inter-rater agreement for team member ratings of leadership measure was calculated using the $r_{wg\,(j)}$ statistic (James, Demaree, & Wolf, 1984) for

each team. The $r_{wg\,(j)}$ statistic is a variance-based inter-rater agreement index. The $r_{wg\,(j)}$ is a measure of the extent to which different raters within the same setting agree on their ratings of each participant's performance. $r_{wg\,(j)}$ compares the observed variance within a group to an expected variance from random responding. The $r_{wg\,(j)}$ scores indicate whether the mean value of individuals over a scale represents the aggregate group that these individuals form (Bliese, 2000; Cohen, Doveh, & Eick, 2001). The formula for $r_{wg\,(j)}$ follows:

$$r_{wg(j)} = 1 - (S_{Xj}^2/\sigma_{EU}^2);$$

$$\sigma_{EU}^2 = (A^2 - 1)/12$$

where $r_{wg\,(j)}$ is the within-group inter-rater reliability for a group of *k* judges on *j* items. S^2_{Xj} is the observed variance on X_j and σ^2_{EU} is the variance on X_j if all judgments were due exclusively to random measurement error, and *A* equals the number of alternatives for the items.

Thus, calculating r_{wg} for the 5-item leadership scale was:

$$r_{wg(5)} = 1 - (S_{Xj}^2/\sigma_{EU}^2);$$

$$\sigma_{EU}^2 = (5^2 - 1)/12$$

r_{wg} indices were acceptable and approximately identical for both FtF (*M* = .96, *SD* = .03) and CM teams (*M* = .92, *SD* = .06).

Design & Procedure

The study consisted of two phases. In the first phase of the study, participants completed all the personality measures. In the second phase of the study, participants engaged in the team tasks, provided leadership ratings and completed the Ravens APM.

During phase 1, all three of the personality scales were administered as an online survey

through the psychology department's web-based experiment management system. Participants logged on to the system and self-selected into the study by clicking on a link for it. After clicking on the study link, participants were presented with a brief message indicating that they were about to complete a survey that was part 1 of a two-part study. After reading the information, participants proceeded on with the survey by clicking "next". The survey was divided into 12 sections. The self-monitoring scale comprised one section, as did the NFCS. The IPIP scale was divided into 10 sections of 5 to 15 items each. All 12 sections were presented in random order and participants completed the entire survey in an average time of 30 minutes. After completing the survey, participants were presented with a message indicating that they were now eligible to participate in the second phase of the study for additional course credit and would be given an access code to sign up for the second phase of the study. These participants were contacted through email and invited to participate in either phase 2 "A" (FtF condition) or phase 2 "B" (CM condition) and given a corresponding access code to sign up for the study. Similar to phase1, participants signed up for phase two of the study by logging in to the experiment management system and clicking on a link for the study. After clicking on the link, participants were prompted to enter the access code they received upon completing phase 1. Only after entering the access code were participants allowed to sign up for phase 2.

Upon arriving at the study location, participants were randomly assigned to teams by a research assistant. Teams consisted of 3 to 5 members depending on the number of individuals participating in the session. The maximum number of participants for any one session was 20 (four teams of 5) and the minimum number of participants was 3 (one team). In each condition, teams were identified by four character alpha –numeric ID e.g. 104A. The first number identified the team type, the next two numbers identified the team, and the letter identified the team

member. For example, participant 104A was member A of team 4 in the FtF condition, and participant 204A was member A of team 4 in the CM condition. These ID were paired with participants email addresses in order to match their data from phase 1 with their data from phase 2.

In the FtF condition, the teams met in a large classroom, and were seated at one of several Tables upon entering the room. Participants were instructed not to speak to one another until the team session begins. Prior to the start of the team session, an assistant passed out written descriptions and directions for each of the team tasks. After completing the task, participants completed the leadership questionnaire individually followed by the Ravens APM.

In the CM condition participants interacted with each other solely through computer-mediated communication and all efforts were made to ensure that participants did not interact with each other outside of the designated communication medium throughout the experiment. Participants were randomly assigned to a team and then assigned to a workstation in a 30-seat computer lab in such a fashion that teammates were never seated near each other and participants could not discern which other participants were on their team. Participants navigated to a webpage where written directions for completing the tasks and logging into the chat interface were provided. Links on the webpage lead to written descriptions of each task and detailed instructions. In addition, researchers acted as chat room moderators to clarify any questions participants may have had in the process of working on the tasks, thus after initial instructions were given, no oral communication was necessary throughout the experiment. After completing all team tasks, the participants logged out of the chat room and completed paper and pencil versions of the leadership questionnaire and the Ravens APM.

Data Analysis

Confirmatory factor analyses were conducted on the IPIP, Need for closure, and Self-monitoring Scales to determine whether each scale fit established theoretical measurement models. CFAs were conducted using SAS 9.1 software and were tested using maximum likelihood estimation of the sample covariance matrices for each scale. Model fits were assessed with the chi–square statistic and several practical fit indices. The Tucker Lewis Index (TLI; Tucker & Lewis, 1973) and the comparative fit index (CFI; Bentler, 1990) were used to assess the relative improvement in fit compared to the independence model. Both fit indices are robust against errors due to sample size. Satisfactory models yield TLI and CFI values of .90 or greater respectively (Hu & Bentler, 1999).

A five factor model was tested for the IPIP, with the items loading on to one of five factors. All five factors were allowed to co vary. While the overall model fit was rather poor $\chi^2_{(1171)} = 2115$; CFI = .69 TLI = .67; RMSEA = .08; 90%CI = .07-.09, factor loadings for the items were all above the minimum acceptable value of .40 (Comrey & Lee, 1992).

A single factor model for self-monitoring was tested. Again, the fit statistics indicate sub optimal model fit $\chi^2_{(274)} = 484$; CFI = .49 TLI = .44; RMSEA = .08; 90%CI = .07-.09.

Finally, a five-factor model with one, second order factor (Webster & Kruglanski, 1994) was tested for the NFCS. Once again the fit statistics were not good despite acceptable item factor loadings $\chi^2_{(814)} = 1617$; CFI = .51; TLI = .48; RMSEA = .09; 90% CI = .08-.10.

While we are interested in individual level relationships, the data are also nested within groups. Therefore, the emergence of an individual as leader is not dependent on his/her degree of ability or trait manifestation relative to the entire sample, but only relative to other members of their team. High levels of traits and abilities in one team may be considered low relative to

participants' abilities in another team. This is akin to the frog pond effect (Davis, 1966). Given that group dependence is an issue; all variables were group mean centered. Group mean centering removes all between-group variation from the predictor and yields a cleaner estimate of the within-group or individual level variance (Raudenbush & Bryk, 2002)

Results

Means, standard deviations and Cohen's *d* for the un-centered variables are reported in Table 1. There were statistically significant differences between the FtF and CM conditions in mean leadership ratings, cognitive ability and extraversion. Specifically the average score on the Raven's APM was higher in the CM condition than in the FtF condition (d = -.44); while the mean leadership rating (d =.42) and extraversion score (d =.35) were larger in the FtF condition than in the CM condition. There were no statistically significant differences between FtF and CM means in any of the other predictor variables. Leadership ratings in FtF and CM teams were significantly different. This is consistent with previous research suggesting that individuals in FtF teams tend to receive higher ratings on leadership measures from team members than individuals in virtual teams (Purvanova & Bono, 2009; Balthazard et al., 2009).

All hypotheses were tested by first computing bivariate correlations between the personality variables, cognitive ability, participation and leadership ratings separately for FtF and CM teams. The correlations may be found in Table 2. The upper diagonal contains the correlations for FtF teams while the lower diagonal contains the correlations for CM teams. After calculating correlations, the Fisher (1921) procedure for testing for differences between two correlations from independent samples was used in order to test whether the relationships between the individual difference variables and leader emergence differed between FtF and CM teams. Specifically, differences between correlations from the FtF teams and correlations from the CM teams were estimated using z-scores.

Hypothesis1 predicted that conscientiousness would be a stronger predictor of leader

emergence in CM teams than in FtF teams. As can be seen in Table 2, the correlation between leader emergence and conscientiousness in the FtF teams was not statistically significant (r = -.12, *n.s.*) whereas the same relationship in CM teams was statistically significant (r = -.32, p<.05). However, despite the fact that the correlation between conscientiousness and leader emergence was statistically significant for CM teams, it was not a statistically significant difference between it and the same correlation for FtF teams (z = 1.05, *n.s.*). Thus, hypothesis 1 was not supported.

I predicted that extraversion would be a stronger predictor of leader emergence in FtF than in CM teams. However, the correlation between leader emergence and extraversion in FtF teams (r = -.12, *n.s.*) and the same correlation in CM teams (r = -.13, *n.s.*) were both not statistically significant. In addition, these correlations not significantly different from each other (z = 0.46, *n.s.*). These results indicate that extraversion was not a significant predictor of leader emergence in either FtF or CM teams, thus hypotheses 2 was not supported.

Both need for closure and self-monitoring were expected to be stronger, positive predictors of leader emergence in FtF teams than in CM teams. The correlation between need for closure and leadership in the FtF condition (r = -.20, *n.s.*) was not significantly different from the same correlation in the CM condition (r = -.30, *n.s.*), z = 0.53, *n.s.* Similarly, the correlation between Self-monitoring and leader emergence in the FtF teams (r = .20, *n.s.*) was not statistically different from the same correlation in CM teams (r = .26, *n.s.*), z = 0.32, *n.s.* The results did not support hypothesis 3 or hypothesis 4. Need for closure and self-monitoring were not stronger predictors of leader emergence in FtF teams compared to CM teams.

Cognitive ability was expected to have a stronger relationship with leader emergence in CM teams than in FtF teams. Specifically, participants high in cognitive ability should be more

likely to emerge as leaders in CM teams than in FtF teams. The data only partially bear out this statement. Although the correlation between scores on the Ravens Matrices and leader emergence in CM teams was statistically significant (r = .39, p, < *.05*) and the same correlation in FtF teams was not statistically significant (r = .21, *n.s.*), the two correlations were not significantly different, z = 1.05, *n.s.*

Finally, the relationship between participation and leader emergence was expected to be stronger in CM teams than in FtF teams. Indeed Participation was stronger predictor of leader emergence in CM teams (r =.72, p < .05) than in FtF teams (r =.05, *n.s.*), z = 4.27, p < .05.

There was a statistically significant correlation between cognitive ability and participation level in the CM condition (r = .56, p <.05). Given that both variables were significantly correlated with leader emergence, it seemed important to determine whether they explained variance in leader emergence independently of each other. We examined the data further by conducting separate multiple regressions of leader emergence on all of the independent variables for the CM teams and the FtF teams. The beta weights and model R^2 for the CM and FtF conditions are reported in Table 3. The model explained a larger amount of variance in the CM condition (R^2= .16) than in the FtF condition (R^2=.09). None of the coefficient slopes were significant in the FtF regression model. The majority of the variance explained in the CM condition was due to participation level. In fact, participation level was the only significant predictor in the CM regression model (β = .20, p <.05). Cognitive ability, despite having a significant and large correlation with leader emergence in the CM condition, was not statistically significant in the CM regression model. Thus, while results provided further support to hypothesis 6, they did not support hypotheses 1 through 5.

Discussion

The goal of this paper was to examine whether the relationship between leader emergence and personality, cognitive ability, and participation level differed based on communication media type. There were no statistically significant differences in the relationship between extraversion and leader emergence or consciousness and leader emergence across CM and FtF teams. In addition, need for closure and self-monitoring were not predictors of leader emergence in either FtF or CM teams. Thus, hypotheses 1 through 5 were not supported.

Finally, strong evidence supported Hypothesis 6. The degree to which team members participate in group discussions is a much stronger predictor of leader emergence in CM teams than in FtF teams. The results, particularly the regression analysis, suggested that quantity of communication in CM teams influences perceptions more than personality or cognitive ability. Sheer volume of communication may be more indicative of who emerged as a leader in CM teams than in FtF teams because of the nature of communication. CM team communication lacked contextual information and features typically accessed to convey personality characteristics. For example, it may be difficult to appear extraverted to others only through text because behaviors such as smiling, physical proximity and eye contact that may be associated with extraversion are not possible in text only communication. Thus, it may not be possible to express certain personality traits, making it difficult to discriminate between those persons who display high levels of a trait from those who do not.

The results regarding the Big-five personality traits are consistent with the findings in Balthazard, Waldman and Warren's (2009) paper on transformational leadership in virtual teams.

Balthazard et al., (2009) also found that none of the Big Five personality variables predicted leadership in a virtual context. In addition, Balthazard et al., (2009) also found participation level to be a significant predictor of leader emergence in virtual teams. The assertion by Balthazard et al., (2009) that items typically used to measure big five personality constructs do not take into account how people react in virtual environments is another plausible explanation for the lack relationship between the Big-Five and leadership in CM teams. Some results in the present study were inconsistent with Balthazard et al., (2009). Although Balthazard et al. found that extraversion and conscientiousness were statistically significant predictors of leadership in FtF teams, no statistically significant relationships between leadership and any Big Five traits in FtF teams were found in the current study. The modest correlation between leader emergence and self-monitoring was consistent with what Day et al., (2002) found in their meta-analysis. In the studies Day et al. examined, the average correlation between self-monitoring and leadership for FtF lab studies was .20.

The results of the regression analyses indicated that participation level accounts for more variance in leader emergence than personality or cognitive ability. At first glance, one may arrive at the conclusion that personality and cognitive ability are not useful predictors of leader emergence in virtual teams. However, there may be other reasons that participation accounts for more variance than any other variables. In purely virtual teams that interact only through text-based communication, the words typed are the only source of information that team members can use to form impressions of that individual. Participation level was measured as a team member's proportion of typed communication relative to all group communication. It should make sense then, that any evaluations based on other ratings would be strongly related to this measure of participation. A more nuanced operationalization of participation such as Balthazard

et al.'s supports the possibility that other characteristics and abilities may manifest themselves if given the opportunity. For example, Balthazard et al (2009) analyzed the quality of communication and divided it into categories such as expression of ideas and grammatical complexity. One would expect that perhaps cognitive ability is related to these two specific aspects of communication rather than simply quantity of communication. In the present study, perhaps one or more of these relationships between cognitive ability and communication would have explained why cognitive ability was not significant in the regression model despite a strong correlation with leadership.

Future research exploring the relationship between cognitive ability and leadership in different "types" of virtual teams while incorporating some of the measurements of communication used by Balthazard et al (2009) would serve to clarify the relationship between communication and cognitive ability.

Implications

There are some implications that can be drawn from the results of the present study. As asserted at the beginning of this paper virtual teams in general and computer-mediated teams specifically are becoming an increasingly common workplace and organizational unit. Many of these teams would be formed based on organizational needs and would likely be leaderless. It is important to understand how leadership perceptions are formed and what influences their formation. In computer-mediated teams communication and participation in the group dialogue is a crucial factor in influencing perceptions of leadership. So, although team members to be perceived as having leader-like qualities in a virtual environment based on personality, this short coming can be substituted with frequent communication and active participation in group tasks. Therefore, virtual teams may provide opportunities for managers who have deficiencies in face-

to-face communication to become more comfortable with assuming leadership roles. For example, a manager with a speech impediment or social anxiety might be a stronger leader in a virtual environment, compared to a face-to-face environment. Conversely, managers who typically take a more *lassiez faire* or "hands off" approach to leadership may have difficulty being viewed as leader like by subordinates in virtual teams because their participation level may be lower than other managers who are more "hands on."

Limitations

The concerns in this study echo those addressed by Balthazard et al., (2009). The authors were concerned that the use of ad hoc teams did not provide sufficient time for participants to interact with one another. One may argue that the use of ad hoc teams with a relatively short life span may be in appropriate for studying leadership; they may not allow participants adequate time to express leadership qualities or make evaluations of whether other team members are leader-like. In addition, it may be possible that personality characteristics gain importance over time as team members develop interpersonal relationships. Finally, this study only examined one type of virtual team, computer mediated teams. As discussed earlier, virtual teams exist along a continuum of communication richness with completely computer mediated teams being at the extreme end. However, virtual teams that use other communication interfaces such as teleconferencing, video conferencing or computer programs such as Skype (voice and video chat) are very different from CM teams that communicate through text only. It is likely there would be very different outcomes with teams that had access to audio and/or visual communication with their team members. Virtual teams with audio and visual communication share some characteristics with FtF teams, whereas they would be still classified as virtual teams by definition because the team could still function without being co-located. This study has

contributed to understanding differences between opposite ends of the virtual team spectrum in regards to leader emergence. The next step for leadership research in virtual teams is to explore the relationships between leadership and the traits expected to predict leadership in different types of virtual teams.

Conclusion

The present study sought to investigate whether the relationships between personality and leadership differed in face-to- face and computer-mediated teams. Overall, the results only supported one of the six hypotheses. Hypothesis six, that participation level would be a stronger predictor of leader emergence in CM teams was supported. The research findings suggest that how much a person communicates through written media plays an important role in individuals' perceptions of leadership in teams that interact solely in a virtual environment. In addition, personality may not be a necessary consideration when evaluating leadership ability in a virtual environment. For the most part, these results were consistent with other research that tested similar hypotheses. Future research on leader emergence in virtual teams should incorporate a variety of degrees of virtualness as well as the role of different predictor constructs. Measure of relevant phenomena (e.g. personality) designed to capture behavior in face-to-face situations may be inappropriate to use in virtual team research. Research investigating the best way to measure personality and other variables in a virtual context would be helpful in refining methodology for future virtual team research and clarifying the role of predictors such as cognitive ability in predicting leadership in virtual contexts In addition, future research should further investigate the role of cognitive ability in perceptions of leadership.

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Appendix A

Tables

Table 1. Descriptive Statistics for Non-Centered Variables

	FTF		CMC		
	M	SD	M	SD	d
Leadership	19.52	2.64	18.17	3.63	0.42
Cognitive Ability	6.42	2.39	7.41	2.00	-0.44
Need for closure	158.31	18.83	157.85	17.74	0.03
Extraversion	41.38	6.30	38.71	8.72	0.35
Conscientiousness	35.49	8.51	37.20	6.91	-0.22
Self-monitoring	6.28	2.96	5.92	3.07	0.12
Participation	0.26	0.07	0.32	0.10	-0.07

Note: d= Cohen's D, CM condition (N =41) FtF condition (N=74).

Table 2. Pearson Correlations of Centered Variables by Team Type

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Leadership		**.39**	-.29	-.13	**-.32**	.26	**.72**
2. Cognitive Ability	.21		-.30	-.02	.12	.14	**.56**
3. Need for closure	-.20	.09		-.04	.22	-.16	-.18
4. Extraversion	-.22	-.22	.02		**.31**	.21	.04
5. Conscientiousness	-.12	.04	**.48**	-.04		-.04	-.16
6. Self-monitoring	.20	**.24**	.02	.04	-.19		**.38**
7. Participation	.05	**.27**	.09	-.19	.21	-.09	

Note: Correlations significant at the .05 level in bold. Upper diagonal correlations are for the CM condition (N =41) and lower diagonal correlations are for the FtF condition (N=74).

Table 3. Multiple Regression of Leader Emergence on Centered Variables

	CM		FtF	
Variable	□	SE β	□	SE β
Intercept	0.00	0.30	0.00	0.24
Cognitive Ability	-0.03	0.23	0.16	0.13
Need for closure	-0.05	0.05	-0.03	0.02
Extraversion	-0.06	0.06	-0.08	0.05
Conscientiousness	-0.02	0.02	0.00	0.04
Self-monitoring	0.01	0.14	0.15	0.10
Participation	0.20	0.04	0.01	0.05

Note: in the CM condition (N =41) model R^2= .16. In the FtF condition (N=74) model R^2 = .09.

Appendix B

Tasks

Instructions

You are a member of a team of consultants asked to give recommendations to a client concerning their management problems. Your team is to discuss the problem and come to an agreement on the most appropriate solution. You are to make your recommendations as specific as possible. Try to anticipate all probable consequences of your recommendations when they are implemented and suggest responses to each consequence.

Your team has decided that:

Members should each take 5 minutes to review the problem, and then type their recommendations into the worksheet.

The group will then discuss the proposed recommendations for 20 minutes and concur on the most appropriate course of action for the problem.

The team's recommendations will be transcribed and submitted to your client. It is very important that the team members show their concurrence with the team's decision. The client has indicated that they will not pay for your services unless a full consensus is reached on the most appropriate course of action. You will have to create a written summary or outline of the recommendations. When your recommendations have been finalized, please select a member of your team to write up the final recommendation worksheet. Once this information is written, copy and paste the completed worksheet into the chat window. It should be the last text written the chat room.

PROBLEM- SAFTEY RULE COMPLIANCE

The personnel and accounting offices of a manufacturing company are located on the south side of its factory complex. The offices of the plant manager and production control are located on the north side of the complex. Between these offices lies a major part of the production area. On a regular basis, office employees must walk through the production area for meetings and other work-related reasons. Safety rules require all employees to wear safety hats whenever they enter the production area. Traversing the area with a safety hat makes it perfectly safe.

An ample supply of safety hats is located at the door that leads into the production area. Large signs warn employees of the safety rules and hazards. It is estimated that 70% of all office supervisors and employees disregard the rule and walk through the assembly area without wearing safety hats. Emphasis on this rule during safety classes and on safety bulletin boards has had no impact. Recently, a near accident involving an office employee not wearing a safety hat increased the use of safety hats for about five weeks. Now the rate has gone back to a 30% compliance rate.

On a recent visit, an Occupational Safety and Health Administration (OSHA) inspector noted employee noncompliance with this safety rule. He advised the company to devise some means to increase compliance or build an overpass between offices. The estimated cost of the overpass is $950,000.

The plant manager wants you to suggest a motivational or educational technique to increase compliance with this safety rule. In addition, the plant manager seeks your recommendation concerning appropriate disciplinary actions to handle noncompliance.

WORKSHEET

Participant ID# _

SAFTEY RULE COMPLIANCE

1. What motivational or educational technique should be used to increase compliance with the safety rule?

2. What disciplinary action should be used to handle noncompliance?

Team Task

Instructions

The consulting team has been called in again to help another client. Once again your team is to discuss the problem and come to an agreement on the most appropriate solution. Your team has again decided that members should take 10 minutes to study the problem and place their recommendations along with a rationale on a worksheet. The group will then discuss the proposed recommendations for 20 minutes during which you must concur on the most appropriate course of action for the problem.

The team's recommendations will be transcribed and submitted to your client. It is very important that the team members show their concurrence with the team's decision. The client has indicated that they will not pay for your services unless a full consensus is reached on the most appropriate course of action. You will have to submit a written summary or outline of the recommendations. When your recommendations have been finalized, please select a member of your team to write up the final recommendations worksheet.

RESOURCE ALLOCATION PROBLEM

Your new client is a cosmetics firm that needs help with a transportation situation in a number of regional sales divisions. Due to the downturn in the economy, the company can only provide one new car per region. It is to the company's advantage to eliminate older vehicles that have been depreciated. Today, you will be making a decision about how to best manage the vehicles in Region 1. The only new resource that you can give Region 1 is one 2008 Ford Windstar mini-van and $1000 in repair money. Each representative has been asked to make a case for why she should be provided with a new van.

Erica is 47 years old, divorced with one adult daughter, and has been with the company 17 years. She has a 2-year old Ford Van with 24,000 miles. She earned $105,000 last year and has the smallest territory. She believes that when a new Chevrolet becomes available that she should get it because she has the most seniority and she doesn't like her present van. She prefers a Chevrolet as she had before the company supplied her with her present Ford.

Jill is 33 years old, married, has two children ages 2 and 5, and has been with the company 11 years. Jill has a small territory and earned $75,000 last year. She has a 4-year old Dodge Van with 52,000 miles. Jill believes that she deserves a new van because her van is older and the person with the most seniority has a fairly new vehicle. She has taken excellent care of her Dodge van and has kept it looking new. It has never had a mechanical problem. She believes that a person deserves to be rewarded for keeping a vehicle in good condition. She prefers not to drive a Ford.

Elaine is 35 years old, divorced, has a 5 year-old daughter, and has been with the company 6 years. She has an extremely large territory and made $103,000 last year. She has a 5-year old Ford Van with 90,000 miles. Elaine believes that she deserves a new van because she has to cover the largest territory with a fairly old van. She feels that she should have a new one because she doesn't want to be stranded so far from home, as she once was on a particularly long trip to Minneapolis. She doesn't like Ford or Chevy vans.

Charlene is 28, single, and has been with the company 5 years. She has the second largest territory and made $79,000 last year. She has a 3-year old Ford Van with 60,000 miles. Charlene believes that she deserves a new van because hers has inadequate heating and cooling. The cold air is very bad at times because a previous repair on a door was not done correctly. She thinks this is one reason that she gets so many colds. She does not care about the make of the vehicle, but insists on good tires, good breaks, and reasonable comfort.

Beth is 25, divorced, no children, and has been with the company 3 years. She has a small territory and earned $39,000 last year. She has a 5-year old Chevrolet Van with 120,000 miles. Beth believes that she deserves a new van because the aggravation that she has had with her van over the past 3 years. Beth has the poorest vehicle in the crew. It was in a wreck before she got it. She has had several breakdowns over the past 3 years. She doesn't care about the make of the vehicle that she drives.

Appendix C

Questionnaires

50-Item Set of IPIP Big-Five Factor Markers

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Indicate for each statement whether it is 1. Very Inaccurate, 2. Moderately Inaccurate, 3. Neither Accurate Nor Inaccurate, 4. Moderately Accurate, or 5. Very Accurate as a description of you.

		Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
1.	**Am** the life of the party.	O	O	O	O	O
2.	Feel little concern for others.	O	O	O	O	O
3.	Am always prepared.	O	O	O	O	O
4.	Get stressed out easily.	O	O	O	O	O
5.	Have a rich vocabulary.	O	O	O	O	O
6.	Don't talk a lot.	O	O	O	O	O
7.	Am interested in people.	O	O	O	O	O
8.	Leave my belongings around.	O	O	O	O	O
9.	Am relaxed most of the time.	O	O	O	O	O
10.	Have difficulty understanding abstract ideas.	O	O	O	O	O
11.	Feel comfortable around people.	O	O	O	O	O
12.	Insult people.	O	O	O	O	O
13.	Pay attention to	O	O	O	O	O

	details.					
14.	Worry about things.	O	O	O	O	O
15.	Have a vivid imagination.	O	O	O	O	O
16.	Keep in the background.	O	O	O	O	O
17.	Sympathize with others' feelings.	O	O	O	O	O
18.	Make a mess of things.	O	O	O	O	O
19.	Seldom feel blue.	O	O	O	O	O
20.	Am not interested in abstract ideas.	O	O	O	O	O
21.	Start conversations.	O	O	O	O	O
22.	Am not interested in other people's problems.	O	O	O	O	O
23.	Get chores done right away.	O	O	O	O	O
24.	Am easily disturbed.	O	O	O	O	O
25.	Have excellent ideas.	O	O	O	O	O
26.	Have little to say.	O	O	O	O	O
27.	Have a soft heart	O	O	O	O	O
28.	Often forget to put things back in their proper place.	O	O	O	O	O
29.	Get upset easily.	O	O	O	O	O
30.	Do not have a good imagination.	O	O	O	O	O
31.	Talk to a lot of different people at parties.	O	O	O	O	O
32.	Am not really interested in others.	O	O	O	O	O
33.	Like order.	O	O	O	O	O
34.	Change my mood a lot.	O	O	O	O	O
35	Am quick to understand things.	O	O	O	O	O
36.	Don't like to draw attention to myself.	O	O	O	O	O
37.	Take time out for others.	O	O	O	O	O

38.	Shirk my duties.	O	O	O	O	O
39.	Have frequent mood swings.	O	O	O	O	O
40.	Use difficult words.	O	O	O	O	O
41.	Don't mind being the center of attention.	O	O	O	O	O
42.	Feel others' emotions.	O	O	O	O	O
43.	Follow a schedule.	O	O	O	O	O
44.	Get irritated easily.	O	O	O	O	O
45.	Spend time reflecting on things.	O	O	O	O	O
46.	Am quiet around strangers.	O	O	O	O	O
47.	Make people feel at ease.	O	O	O	O	O
48.	Am exacting in my work.	O	O	O	O	O
49.	Often feel blue.	O	O	O	O	O
50.	Am full of ideas.	O	O	O	O	O

SELF-MONITORING SCALE

Developed by Mark Snyder (1974)

DIRECTIONS: The statements below concern your personal reactions to a number of different situations. No two statements are exactly alike, so consider each statement carefully before answering. IF a statement is TRUE or MOSTLY TRUE as applied to you, **circle the "T"** next to the question. If a statement is FALSE or NOT USUALLY TRUE as applied to you, **circle the "F"** next to the question.

(T) (F) 1. I find it hard to imitate the behavior of other people.

(T) (F) 2. My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.

(T) (F) 3. At parties and social gatherings, I do not attempt to do or say things that others will like.

(T) (F) 4. I can only argue for ideas which I already believe.

(T) (F) 5. I can make impromptu speeches even on topics about which I have almost no information.

(T) (F) 6. I guess I put on a show to impress or entertain people.

(T) (F) 7. When I am uncertain how to act in a social situation, I look to the behavior of others for cues.

(T) (F) 8. I would probably make a good actor.

(T) (F) 9. I rarely seek the advice of my friends to choose movies, books, or music.

(T) (F) 10. I sometimes appear to others to be experiencing deeper emotions than I actually am.

(T) (F) 11. I laugh more when I watch a comedy with others than when alone.

(T) (F) 12. In groups of people, I am rarely the center of attention.

(T) (F) 13. In different situations and with different people, I often act like very different persons.

(T) (F) 14. I am not particularly good at making other people like me.

(T) (F) 15. Even if I am not enjoying myself, I often pretend to be having a good time.

(T) (F) 16. I'm not always the person I appear to be.

(T) (F) 17. I would not change my opinions (or the way I do things) in order to please someone else or win their favor.

(T) (F) 18. I have considered being an entertainer.

(T) (F) 19. In order to get along and be liked, I tend to be what people expect me to be rather than anything else.

(T) (F) 20. I have never been good at games like charades or improvisational acting.

(T) (F) 21. I have trouble changing my behavior to suit different people and different situations.

(T) (F) 22. At a party, I let others keep the jokes and stories going.

(T) (F) 23. I feel a bit awkward in company and do not show up quite as well as I should.

(T) (F) 24. I can look anyone in the eye and tell a lie with a straight face (if for a right end).

(T) (F) 25. I may deceive people by being friendly when I really dislike them.

The Need for Closure Scale

INSTRUCTIONS: Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. Please respond according to the following scale.

1.....strongly disagree

2....moderately disagree

3.....slightly disagree

4.....slightly agree

5.....moderately agree

6.....strongly agree

1.I think that having clear rules and order at work is essential for success.

2.Even after I've made up my mind about something, I am always eager to consider a different opinion.

3.I don't like situations that are uncertain.

4.I dislike questions which could be answered in many different ways.

5.I like to have friends who are unpredictable.

6.I find that a well ordered life with regular hours suits my temperament.

7.I enjoy the uncertainty of going into a new situation without knowing what might happen.

8.When dining out, I like to go to places where I have been before so that I know what to expect.

9.I feel uncomfortable when I don't understand the reason why an event occurred in my life.

10. I feel irritated when one person disagrees with what everyone else in a group believes.

11.I hate to change my plans at the last minute.

12.I would describe myself as indecisive.

13.When I go shopping, I have difficulty deciding exactly what it is I want.

14.When faced with a problem I usually see the one best solution very quickly

15.When I am confused about an important issue, I feel very upset.

16.I tend to put off making important decisions until the last possible moment.

17.I usually make important decisions quickly and confidently.

18.I have never been late for an appointment or work.

19.I think it is fun to change my plans at the last moment.

20.My personal space is usually messy and disorganized.

21.In most social conflicts, I can easily see which side is right and which is wrong.

22.I have never known someone I did not like.

23.I tend to struggle with most decisions.

24.I believe orderliness and organization are among the most important characteristics of a good student.

25.When considering most conflict situations, I can usually see how both sides could be right.

26.I don't like to be with people who are capable of unexpected actions.

27.I prefer to socialize with familiar friends because I know what to expect from them.

28.I think that I would learn best in a class that lacks clearly stated objectives and requirements.

29.When thinking about a problem, I consider as many different opinions on the issue as possible.

30.I don't like to go into a situation without knowing what I can expect from it.

31.I like to know what people are thinking all the time.

32.I dislike it when a person's statement could mean many different things.

33.It's annoying to listen to someone who cannot seem to make up his or her mind.

34.I find that establishing a consistent routine enables me to enjoy life more.

35.I enjoy having a clear and structured mode of life.

36.I prefer interacting with people whose opinions are very different from my own.

37.I like to have a plan for everything and a place for everything.

38.I feel uncomfortable when someone's meaning or intention is unclear to me.

39.I believe that one should never engage in leisure activities.

40.When trying to solve a problem I often see so many possible options that it's confusing.

41.I always see many possible solutions to problems I face.

42.I'd rather know bad news than stay in a state of uncertainty.

43.I feel that there is no such thing as an honest mistake.

44.I do not usually consult many different options before forming my own view.

45.I dislike unpredictable situations.

46.I have never hurt another person's feelings.

47.I dislike the routine aspects of my work (studies).