

# Assessing the trait theory of leadership using self and observer ratings of personality: The mediating role of contributions to group success<sup>☆</sup>

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## ABSTRACT

The trait theory of leadership suggests that personality traits influence leader emergence and effectiveness. While initial empirical evidence supports this perspective, the majority of studies have examined the relationship between personality and leadership using self ratings of personality. We believe that this research may underestimate the relationship between personality and leadership. We propose that personality assessed using both self and observer ratings explains more variance in leadership than self ratings of personality alone. Results from 155 participants in leaderless group discussions supported this hypothesis. Further, relative weight analysis revealed that observer ratings of extraversion explained the largest percentage of variance in leadership, followed by self ratings of openness to experience and observer ratings of openness to experience. Results of two-stage least squares regression analysis showed that the relationship between personality and leadership was mediated by contributions to group success. The implications of these results and directions for future research are discussed.

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## 1. Introduction

The trait theory of leadership proposes that certain traits differentiate leaders from other individuals. Tests of trait theory, searching for the traits of effective leaders, dominated leadership research during the first half of the twentieth century. However, the results of these studies were often inconsistent. Reviews by Stogdill (1948) and Mann (1959) expressed skepticism regarding the trait theory of leadership and consequently the theory fell out of favor with many leadership researchers. House and Aditya (1997) noted, “There developed among the community of leadership scholars near consensus that the search for universal traits was futile” (p. 410). In part, the inconsistent results that led to this skepticism were due to the numerous traits that had been considered in this research. In a comparison of reviews of the literature, Bass (1990) noted 43 separate characteristics that were examined in these studies. With this large number of leadership traits, the lack of an organizing personality framework made it difficult to compare results across studies. House and Aditya (1997) noted, “One problem with early trait research was that there was little empirically substantiated personality theory to guide the search for leadership traits” (p. 410).

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Recently, however, a consensus on the structure of personality has emerged around the five-factor model of personality (Digman, 1990). Factor analysis of both trait adjectives and personality inventories has revealed that personality traits can be categorized into five main factors: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The Big Five personality traits have been shown to be predictors of diverse criteria of interest in the field of industrial and organizational psychology, including job performance (e.g., Barrick & Mount, 1991). Using the five-factor model of personality as an organizing framework, Judge, Bono, Ilies, and Gerhardt (2002) meta-analyzed studies examining the relationship between personality and leadership and found that extraversion, conscientiousness, emotional stability, and openness were positively related to leadership. As a group, the Big Five personality traits predicted both leadership emergence ( $R = .53$ ) and leadership effectiveness ( $R = .39$ ).

Despite the abundance of research testing the trait theory of leadership and the promise offered by the five-factor model, questions still remain regarding the relationship between personality and leadership. The true-score correlations between the Big Five personality traits and leadership range from .08 to .31 and can be considered, at best, moderate in magnitude. Morgeson et al. (2007) suggested that modest relationships between personality and outcomes may be due, in part, to the near exclusive use of self reports of personality. Self reports of personality may be biased due to faking or self-deception (Hooper & Sackett, 2008; Paulhus & Reid, 1984), and the relationship between personality and outcomes may be higher when other means of assessing personality are used. For example, Oh, Wang, and Mount (2011) recently compared the validity of self and observer ratings of personality in predicting job performance and found that the validities of the Big Five are higher when observer ratings of personality are used. Chang, Connelly, and Geeza (2012) recommended using a multirater approach in personality research, noting that “trait ratings from a single rater are not solely an indication of true standing of the target’s personality traits, but also bias from the rater’s response tendencies” (p. 423). Thus, the first purpose of our research is to extend these findings into the leadership domain by examining the relationship between personality and leadership using both self and observer ratings of personality. Following Lord, De Vader, and Alliger’s (1986) meta-analysis, we include both leader emergence, or the degree to which an individual is perceived as leaderlike (Hogan, Curphy, & Hogan, 1994), and perceived effectiveness, or the degree to which an individual is seen as effective in influencing and guiding the activities of the group (Stogdill, 1950), in the leadership criterion in this study.

In addition to examining the effect of self and observer ratings of personality on leadership, more research is also needed on the mechanisms by which personality traits affect leadership (Judge, Bono et al., 2002). A small body of research has begun to shed light on the mediators of the relationship between personality and overall performance. For example, Barrick, Stewart, and Piotrowski (2002) found that three cognitive motivational work orientations (i.e., communion, achievement, and status striving) mediate the personality–performance relationship. However, very little is known about why personality traits are related to leadership emergence and effectiveness. Given the growing body of research that supports a link between personality and leadership, an important next step is to shed light on the mechanisms by which personality influences leadership. Understanding what leaders do when interacting with others that causes them to emerge as leaders and be more effective as leaders will help to illuminate the “black box” through which personality traits affect leadership. In addition to contributing to an improved theoretical understanding of the personality–leadership relationship, a clearer understanding of mediating mechanisms may be useful in leadership development. If we can isolate the trait-consistent behaviors that influence leadership ratings, these behaviors may be integrated into leadership development programs to increase the use of the behaviors even for those individuals with low levels of the traits that have been linked to leadership. Because we test the relationships between personality and leadership in the context of a leaderless group discussion, we focus on one potential mediator that is especially relevant in this context – contributions to group success.

## 2. A process model of the relationship between personality and leadership

### 2.1. Self versus observer ratings of personality

As defined by Cervone and Pervin (2008), personality traits refer to “psychological qualities that contribute to an individual’s enduring and distinctive patterns of feeling, thinking, and behaving” (p. 8). Most personality research has relied on self reports to assess personality, and self ratings of personality have been linked to a number of important work-related outcomes, including job performance (Barrick, Mount, & Judge, 2001), job satisfaction (Judge, Heller, & Mount, 2002), and leadership (Judge, Bono et al., 2002). However, as noted earlier, the magnitude of the relationship between self-rated personality traits and work-related outcomes is moderate at best (Oh et al., 2011). Because of this, there is debate about the validity of self-report measures of personality in the literature, with some scholars questioning the validity of self-report personality measures (e.g., Morgeson et al., 2007) and others suggesting a more favorable view (e.g., Ones, Dilchert, Viswesvaran, & Judge, 2007).

However, modest relationships between self-report personality and work-related outcomes do not necessarily mean that personality itself is irrelevant for predicting work-related outcomes. Rather, these results may be due to problems with self reports of personality (Morgeson et al., 2007). When individuals provide perceptions of their own personality traits, these ratings may differ from actual psychological tendencies due to self-deception. In other words, individuals may not have the self-insight necessary to accurately report their traits (Paulhus, 1991; Paulhus & Reid, 1984). Accurate self-assessment may also be hindered by a lack of perspective. Because individuals become accustomed to their own personality traits, they may not perceive them accurately. Funder (1995) refers to this as the *fish and water effect* – just as fish may not notice the water in which they are swimming, individuals may not attend to their own personality traits. Even if individuals do possess an accurate view of their own personality traits, they may intentionally skew their responses, especially when they believe that the personality ratings will be used for

decision-making purposes (Hooper & Sackett, 2008). Thus, self-deception, a lack of perspective, and faking may reduce the accuracy of self ratings of personality.

An alternative to self ratings of personality that is commonly used in personality and social psychology research is observer ratings. According to the Realistic Accuracy Model, observer ratings of personality are based on overt trait expressions or behavioral cues (Funder, 1995; Tett & Burnett, 2003). The accuracy of observer ratings of personality is judged by a wide range of criteria, including consensus between observers, target-observer agreement, and prediction of criteria (Kenny, 1994). The Realistic Accuracy Model suggests that observer ratings are more accurate when cues relevant to the trait are expressed, when these cues are available to be observed, when the cues are detected by the observer, and when the cues are used appropriately to make personality inferences (Funder, 1995). Although the process of rating another person's personality is imperfect, observer ratings of personality have been shown to have reasonable levels of accuracy based on both interjudge agreement and behavioral prediction (e.g., Connelly & Ones, 2010; Kenrick & Funder, 1988; Kolar, Funder, & Colvin, 1996).

Given the growing body of evidence on the accuracy and validity of observer ratings of personality, it is perhaps not surprising that organizational psychologists have become interested in the potential of observer ratings of personality for predicting work-related outcomes. There are two primary reasons that observer ratings of personality may be expected to contribute to the prediction of work-related outcomes beyond self reports of personality. First, self and observer ratings of personality likely capture unique information about an individual. According to socioanalytic theory (Hogan, 1991), self ratings of personality assess an individual's identity (i.e., an individual's perceptions of himself), while observer ratings of personality capture reputation (i.e., others' perceptions of the individual). While self and observer ratings of personality are moderately correlated (Neuroticism:  $\rho = .51$ ,  $k = 55$ ,  $N = 8000$ ; Extraversion:  $\rho = .62$ ,  $k = 50$ ,  $N = 7725$ ; Openness to Experience:  $\rho = .59$ ,  $k = 38$ ,  $N = 5333$ ; Agreeableness:  $\rho = .46$ ,  $k = 53$ ,  $N = 6359$ ; Conscientiousness:  $\rho = .56$ ,  $k = 58$ ,  $N = 6454$ ; Connolly, Kavanagh, & Viswesvaran, 2007), outward expressions of personality may differ from an individual's inward perceptions for a number of reasons. For example, the traits expressed in a given context – referred to as free traits by Little (2000) – may be influenced by cultural norms. According to trait activation theory (Tett & Burnett, 2003; Tett & Guterman, 2000), situational cues may also be required to trigger the expression of a given trait. Thus, self ratings of personality, based on intrapersonal processes and inward expressions of traits, and observer ratings of personality, based on behavioral cues and outward expressions of traits, reflect unique information about an individual.

Building on the idea that self and observer ratings of personality capture unique information about individuals, we also propose that self and observer ratings predict unique variance in work-related outcomes. When outcomes are based on external perceptions, observer ratings of personality likely predict unique variance in the outcomes because both personality and outcomes are based on observer perceptions of trait expressions. Leadership is certainly an outcome that meets the criterion of being based on others' perceptions. Leadership is ultimately a relational process (e.g., Liden, Bauer, & Erdogan, 2004; Uhl-Bien, 2006). Leaders emerge from a group and effectively influence that group based on their ability to attract followers, with leadership being granted by other individuals (DeRue & Ashford, 2010). According to research on implicit leadership theories (Lord, Foti, & De Vader, 1984), the formation of leadership perceptions is influenced by the individuals' implicit theories or prototypes of the traits, behaviors, and outcomes associated with leadership. Leaders emerge or are perceived as effective when their traits and behaviors match the leadership prototype held by the assessor. It is only when trait expression and behavioral cues are noticed by the assessor and are perceived to match the assessors' leader prototype that an individual is judged to emerge as a leader or is perceived as an effective leader. Thus, as Judge, Piccolo, and Kosalka (2009) summarized, "Because leadership is inherently collectivistic and therefore dependent on the construal of others, one might well make the argument that reputation is at least as important to leadership as identity" (p. 861).

However, it is important to note that although we are suggesting that observer ratings of personality may explain variance in leadership perceptions beyond that explained by self ratings, observer ratings are not without problems (Oh et al., 2011). As shown in tests of Funder's (1995) Realistic Accuracy Model, observer ratings of personality are more accurate when the target is observed in an environment in which the target is allowed to express the trait and in which the observer has the opportunity to observe the trait expression. Even then, observer ratings of personality may be influenced by response distortion or rater error (Oh et al., 2011). Further, self ratings of personality may play an important role in predicting leadership because self ratings may reflect tendencies that are less observable, such as rumination or planning, but that still influence leadership perceptions. This is especially true for traits that have few external cues and are harder for external observers to rate (e.g., neuroticism, openness to experience).

Further, as Chang et al. (2012) noted, personality ratings from a single rater are influenced by bias from response tendencies. Assessing personality from the perspective of multiple raters allows researchers to parcel out variance that is idiosyncratic to individual raters. Thus, considering that self and observer ratings of personality likely explain unique variance in leadership and that utilizing multiple raters reduces error in personality ratings, we expect that personality as assessed by self and observer ratings explains more variance in leadership than self ratings alone. In the next section, we briefly discuss the theoretical basis for the relationship of each of the Big Five personality factors with leadership. Based on the above reasoning, we also propose using both self and observer ratings of personality will increase the validity of personality in predicting leadership.

## 2.2. Personality and leadership

### 2.2.1. Neuroticism

Individuals high in neuroticism tend to be anxious, insecure, and self-conscious. Neuroticism is also associated with irritability, hostility, and anger. Individuals high in neuroticism may be more likely to experience depression and vulnerability to stress than

individuals low in this trait (Chernyshenko, Stark, & Drasgow, 2011; McCrae & Costa, 1985). Individuals high in neuroticism may be less likely to emerge as leaders or be effective as leaders for several reasons. First, when individuals high in neuroticism express anger and hostility, others in the group may react negatively to them. Frequent expressions of anger and hostility may make it difficult for such individuals to form relationships and have influence over others in the group (Weisband & Atwater, 1999). Additionally, individuals high in neuroticism may be inconsistent with their behaviors and emotional reactions because of tendencies toward insecurity and depression. If others in the group have difficulty predicting the behaviors and reactions of individuals high in neuroticism, they may not trust them, resulting in low perceptions of leadership. Finally, neuroticism has been associated with a tendency to be ruminative, a thought pattern that focuses on negative affect (Roelofs, Huijbers, Peeters, Arntz, & van Os, 2008). Rumination may distract individuals high in neuroticism from making the contributions that are expected of a leader. Consistent with the theoretical link between neuroticism and leadership, Judge, Bono, and colleagues (2002) found support for the negative relationship between neuroticism and leadership in their meta-analysis ( $\rho = -.24$ ,  $k = 48$ ,  $N = 8025$ ).

Based on theory and past empirical research, we expect neuroticism to be negatively related to leadership. However, as we detailed above, we expect this relationship to be stronger when both self and observer ratings are used to assess neuroticism than when self ratings alone are used. The outward expressions of neuroticism (e.g., expressing anger and hostility toward others, exhibiting behavioral and emotional inconsistencies to other group members) likely influence others' perceptions of leadership. However, internal tendencies, such as rumination, may be reflected in self ratings of neuroticism, but may not be observed by others. Thus, we expect that neuroticism assessed using both self and observer ratings explains more variance in perceptions of leadership than self ratings alone.

**H1a.** Neuroticism is negatively related to perceptions of leadership.

**H1b.** Neuroticism assessed using self and observer ratings explains more variance in perceptions of leadership than neuroticism assessed using only self ratings.

### 2.2.2. Extraversion

The two classical indicators of extraversion are sociability and dominance (Watson & Clark, 1997). Individuals high in extraversion are described as friendly, gregarious, and warm (Chernyshenko et al., 2011; McCrae & Costa, 1985). They enjoy social interaction and gain energy from it. Extraverts are also more assertive than introverts, exhibiting dominance in groups (McCrae & Costa, 1985). Both sociability and dominance may influence others' perceptions of leadership. Individuals who are perceived as leaders take charge of situations and are talkative rather than withdrawn. Research on implicit theories of leadership show that individuals associate leadership with being strong, bold, and forceful (Offermann, Kennedy, & Wirtz, 1994), and thus it seems likely that individuals with a propensity toward dominance would be seen as more leader-like. In fact, Gough (1990) found that these two facets – sociability and dominance – were related to self and peer ratings of leadership. Extraverts also tend to be higher in positive affectivity and activity level than introverts (McCrae & Costa, 1985; Watson, 2000). Because leadership often involves expressing optimism and positive emotions (Connelly & Ruark, 2010), it may be the positivity and energy that result in extraverts being perceived as leaders.

Given these theoretical links between extraversion and leadership, it is perhaps not surprising that research has shown that the broad trait of extraversion is related to being perceived as more leaderlike (Hogan et al., 1994; Watson & Clark, 1997), and to assessments of leader effectiveness (Costa & McCrae, 1988). In their meta-analysis examining the relationship between the Big Five personality traits and leadership, Judge, Bono et al. (2002) found that extraversion was the Big Five trait that most strongly related to leadership ( $\rho = .31$ ,  $k = 60$ ,  $N = 11,705$ ). Again, we expect that trait expressions that are consistent with the trait of extraversion (e.g., taking charge, controlling the conversation) influence perceptions of leadership beyond individuals' own assessments of their extraverted tendencies. This is because perceptions of leadership are based on others' observations of individuals' behaviors and influence attempts within the group. These outward expressions are also the cues that observers use when rating personality. Thus, self and observer ratings of extraversion are expected to predict more variance in leadership than self ratings of extraversion alone. This leads to the following hypotheses:

**H2a.** Extraversion is positively related to perceptions of leadership.

**H2b.** Extraversion assessed using self and observer ratings explains more variance in perceptions of leadership than extraversion assessed using only self ratings.

### 2.2.3. Openness to experience

Individuals high in openness to experience tend to be imaginative, adventurous, and unconventional (Chernyshenko et al., 2011; McCrae & Costa, 1985). Openness to experience is associated with divergent thinking (McCrae, 1987) and creativity (Feist, 1998). In several reviews, creativity has been identified as an important skill of an effective leader (e.g., Bass, 1990). This suggests that openness to experience may be associated with leadership ratings. Individuals high in openness to experience are also tolerant of ambiguity and have a preference for complexity (McCrae & Costa, 1997). These characteristics are important in enabling leaders to guide followers toward the achievement of their goals. Consistent with the theoretical link between openness to experience and leadership, Judge, Bono et al. (2002) found a positive relationship between openness to experience and leadership ( $\rho = .24$ ,  $k = 37$ ,  $N = 7221$ ).



As we have argued for the preceding hypotheses, self and observer perceptions of openness to experience are likely based on slightly different information. While self perceptions of openness to experience capture an individual's internal assessment of their own tolerance for ambiguity and curiosity, observers will rate the target as high on openness to experience only if these tendencies are expressed through observable behaviors. Because it is these observable behaviors that also influence perceptions of leadership, we suggest that when openness to experience is assessed using both self and observer ratings, it will explain more variance in leadership than when only self assessments are used. Therefore, we propose the following:

**H3a.** Openness to experience is positively related to perceptions of leadership.

**H3b.** Openness to experience assessed using self and observer ratings explains more variance in perceptions of leadership than openness to experience assessed using only self ratings.

#### 2.2.4. *Conscientiousness*

Two main facets make up the trait of conscientiousness: achievement orientation and dependability. Conscientious individuals are often described as thorough, responsible, organized, hardworking, persevering, and achievement-striving (Chernyshenko et al., 2011; McCrae & Costa, 1985). Conscientiousness is the Big Five personality trait that has the strongest relationship with job performance (Barrick & Mount, 1991). Conscientiousness is also expected to be related to leader emergence and effectiveness. Bass (1990) commented, "Task competence results in attempts to lead that are more likely to result in success for the leader, effectiveness for the group, and reinforcement of the tendencies" (p. 109). Because conscientiousness has been shown to predict task competence, it is also expected to be related to perceptions of leadership. Further, effective leaders serve as role models for desirable behaviors (Bass, 1985). As leaders attempt to motivate others to exert effort toward achieving a common goal, their own goal-striving can serve to encourage others to exhibit similar behaviors. Consistent with this theorizing, Judge, Bono et al. (2002) found that conscientiousness was the Big Five personality trait with the second highest relationship to leadership ( $\rho = .28$ ,  $k = 35$ ,  $N = 7510$ ).

While planning and goal-striving may be internal processes that are primarily reflected in self ratings of conscientiousness, outward expressions of conscientiousness (e.g., keeping the group on task, reminding the group of deadlines) are likely reflected in observer ratings of conscientiousness. Both internal processes and outward expressions of conscientiousness are likely to influence perceptions of leadership. Thus, we propose:

**H4a.** Conscientiousness is positively related to perceptions of leadership.

**H4b.** Conscientiousness assessed using self and observer ratings explains more variance in perceptions of leadership than conscientiousness assessed using only self ratings.

#### 2.2.5. *Agreeableness*

Agreeableness is the tendency to be trusting, cooperative, caring, and tolerant (Chernyshenko et al., 2011; McCrae & Costa, 1985). The relationship of agreeableness with leadership is somewhat ambiguous. Agreeable individuals are cooperative, sometimes to the point of placing getting along (communion) in front of getting ahead (agency) (Graziano & Eisenberg, 1997). In group situations, this may prevent agreeable individuals from emerging as leaders. However, agreeable individuals are also viewed as being warm and sensitive to others. These traits are positively related to leadership (Bass, 1990; Zaccaro, Foti, & Kenny, 1991). The foregoing may support differential validity for facets of agreeableness.

With regard to the broad trait of agreeableness, Judge, Bono et al. (2002) found a corrected correlation of .08 between agreeableness and leadership ( $k = 42$ ,  $N = 9801$ ). Despite the small size of the correlation, the 95% confidence interval did not include zero (.02, .13) suggesting that the mean population correlation is nonzero. However, the 80% credibility interval did include zero (-.14, .29), suggesting variability among the individual correlations in the population. Given the lack of clear theoretical or empirical support for the relationship between agreeableness and leadership, we do not hypothesize a relationship between agreeableness and leadership. However, we did assess agreeableness as a part of our study and will examine this relationship on an exploratory basis.

### 2.3. *A mediator of the relationship between personality and leadership*

Many of the theoretical arguments for the relationship between personality and leadership suggest that individuals with certain personality traits emerge as leaders and are more effective as leaders because their trait-consistent behaviors contribute to the goal accomplishment of the group. As Marks, Mathieu, and Zaccaro (2001) noted, goal accomplishment in teams is dependent on a number of distinct processes that can be broadly classified as transition phase processes (e.g., mission analysis, strategy formulation and planning), action phase processes (e.g., monitoring progress toward goals, coordination), and interpersonal processes (e.g., conflict management, motivation and confidence building). However, in the short-term leaderless groups that were used to test our hypotheses, we saw little evidence of transition phase processes or interpersonal processes. The groups generally worked together less than one hour on a specific, unambiguous task. Thus, in this context, we propose that action phase processes, such as idea generation, idea integration, and process facilitation, contributed most to the success of the group and mediated the relationship between personality and leadership perceptions.

As we noted in the previous section, individuals high in neuroticism are more self-conscious and anxious than individuals low in neuroticism. We propose that these tendencies may restrain their contributions to group success. Self-conscious individuals may be less likely to contribute to the group through sharing original ideas, integrating ideas into a common solution, or keeping the group on task. Such contributions to group success are likely to influence leadership assessments. For example, Fisher (1980) noted that the quantity of ideas generated was related to emergent leadership with the emergent leader generating more themes during group interaction than nonleaders. Individuals who use integrative strategies, such as identifying commonalities among group members' ideas, are also more likely to be viewed as leaders in leaderless group discussions (Ketrow, 1991). Further, using videotaped group discussions in which procedural, task, and social behaviors were exhibited, Ketrow (1991) found that the individual who exhibited the procedural behaviors was most likely to be named the leader of the group. Thus, we propose that the negative relationship between neuroticism and leadership is at least partially mediated by contributions to group success.

Similarly, trait expressions that are typical of extraverts may also help to explain how extraverts influence the success of their groups and thus emerge as leaders and are seen as more effective leaders. Because extraverts are more dominant in groups than introverted group members (Watson & Clark, 1997), they are likely to try to take control of the group. In leaderless group discussions, this may take the form of influencing the final recommended solution or managing the group's process. The sociability and talkativeness that are associated with extraversion (McCrae & Costa, 1985) may result in extraverts being more willing to share ideas with the group. Therefore, it is expected that extraverts are more likely to be perceived as contributing to the group's success and thus receive higher leadership ratings.

Trait expressions of openness to experience are also expected to contribute to the group's success. As a result of their creativity and divergent thinking (McCrae, 1987), individuals high in openness to experience likely generate both a larger number of ideas and a higher quality of ideas during group tasks. Both the quantity and quality of ideas generated are expected to contribute to the group's success and influence perceptions of leadership (Fisher, 1980; Kabanoff & O'Brien, 1979). Based on this, openness to experience is also expected to be related to ratings of leadership through contributions to group success.

Finally, individuals high in conscientiousness are also expected to contribute to the group's success, likely due in part to the procedural behaviors exhibited by conscientious individuals. Procedural behavior is any behavior that moves the group toward its goal. Procedural behaviors are described by Ketrow (1991) as "often directive in nature and include comments focused on the mechanics of group functioning, participation, or use of time" (p. 494). Examples of procedural behaviors include maintaining the agenda, expediting work, coordinating ideas, and curbing tangential talk (Wood, 1977). Procedural behaviors are characteristic of individuals high in conscientiousness because of their propensity for orderliness. Further, because of their propensity for goal achievement (McCrae & Costa, 1985), individuals high in conscientiousness may also be expected to contribute to the group's success through contributing ideas and integrating the ideas of others. Thus, we expect that individuals higher in conscientiousness will contribute to the group's success, and that these contributions to the group's success mediate the relationship between conscientiousness and leadership.

Based on the above discussion, we propose the following hypotheses:

- H5a.** The relationship between neuroticism and leadership perceptions is mediated by contributions to group success.
- H5b.** The relationship between extraversion and leadership perceptions is mediated by contributions to group success.
- H5c.** The relationship between openness to experience and leadership perceptions is mediated by contributions to group success.
- H5d.** The relationship between conscientiousness and leadership perceptions is mediated by contributions to group success.

### 3. Method

#### 3.1. Participants and procedure

Data from participants in leaderless group discussions were used to test the hypothesized relationships between the Big Five personality traits, contributions to group success, and leadership. Leaderless group discussions were used in this study because our interest was in understanding the display and emergence of leadership when no single individual has been designated as the leader. In this controlled setting, ratings of contributions to group success and leadership were based on interactions during the completion of a decision-making task. Thus, the type of interaction was held constant across participants. This design allowed us to control the type of interaction on which ratings were based and thus eliminate potential confounding variables.

The participants in this study were 178 students (80 MBA students enrolled in a leadership and personal development course and 98 undergraduate students enrolled in an introduction to management course) at a large midwestern university. Participants received course credit or extra credit toward their course grade for their participation in the study. Participants were randomly assigned to groups of three to seven members. MBA and undergraduate students were not mixed within groups. Participants completed informed consent forms allowing the use of their data in this study.

Participants were first asked to complete a personality inventory that measured the Big Five personality traits. Participants also were instructed to have two other people who knew them well (e.g., friends, family members) complete the same inventory describing their personality. The observer-rated surveys were returned directly to the authors in a sealed envelope. Students were then randomly assigned to groups to complete a decision-making task. Group members were given four short cases that

described human resource problems that were not directly addressed by company policy or that might merit a policy exception. For example, participants were asked what they would do in a situation in which a sales representative had grown a long and ragged beard or had deliberately reported a sales call in the month following the actual call. These situations were developed by an industrial psychologist for use in a professional assessment center. Each group member was given a few minutes to review these problems independently and to develop recommendations for the solution of each. The group then met for up to one hour to reach a consensus on both the best solution to each problem and the supporting rationale for each solution. Group members were instructed that management was interested in a consensus decision and not a majority opinion achieved by voting. One of the authors monitored each group as the task was completed and rated each group member's contributions to group success. Although an attempt was made to videotape each group so that multiple raters would assess contributions to group success, only about half of the videotapes had acceptable audio levels. Contributions to group success for participants in those groups ( $N = 91$ ; 67 MBAs, 24 undergraduates) were rated by another author. After each task was completed, group members rated the leadership exhibited by the other members of their groups.

### 3.2. Measures

#### 3.2.1. Personality traits

The Big Five personality traits were assessed using the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992), a 60-item inventory that includes both a self-rating and an observer-rating form. Participants and two observers (e.g., friends, family members) completed twelve-item scales to assess neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Responses were made using a five-point response scale (0 = *strongly disagree*, 4 = *strongly agree*). The internal consistency reliabilities of the self ratings ranged from .69 to .84 (neuroticism:  $\alpha = .84$ , extraversion:  $\alpha = .83$ , openness to experience:  $\alpha = .69$ , agreeableness:  $\alpha = .74$ , conscientiousness:  $\alpha = .80$ ).

To determine the proportion of the variance in the observer ratings that could be explained by the fact that the two observers were rating the same target, we calculated ICC(1). Aggregation is generally deemed appropriate when ICC(1) is greater than .20 (Bliese, 2000; Ostroff & Schmitt, 1993). The ICC(1) values for the Big Five traits all exceeded that threshold (neuroticism: ICC(1) = .39, extraversion: ICC(1) = .35, openness to experience: ICC(1) = .41, agreeableness: ICC(1) = .47, conscientiousness: ICC(1) = .40). Thus, for some analysis, the two observer ratings for each participant were averaged to form the observer rating of personality. We also calculated ICC(2) values, which provide an estimate of the reliability of the aggregated rating (neuroticism: ICC(2) = .56, extraversion: ICC(2) = .52, openness to experience: ICC(2) = .58, agreeableness: ICC(2) = .64, conscientiousness: ICC(2) = .57). Because four of these values are lower than the cutoff value of .60 suggested by Ostroff and Schmitt (1993), the relationships between observer ratings of personality and leadership may be attenuated. However, the interrater reliabilities in this study are similar to interrater reliabilities found in other studies. Connelly and Ones (2010) meta-analytically examined the interrater reliability of observer ratings of personality and reported the mean observed single-rater reliabilities by family and friends in Table 3 (p. 1102). Using this value and the Spearman–Brown formula, we calculated the mean interrater reliability for two raters and found that four of our five reliabilities exceeded the mean values from the literature. Only the ICC(2) value for extraversion (.52) was lower than the mean value based on the meta-analysis (.63).

#### 3.2.2. Contributions to group success

Three indicators of contributions to group success were included in this study – idea generation, idea integration, and process facilitation. All items were rated using a five-point response scale (1 = *strongly disagree*, 5 = *strongly agree*). A three-item idea generation scale was designed for this study to capture ratings of both the quantity of ideas generated and the quality of ideas generated. Idea quality is defined as the originality of the ideas as well as the feasibility of implementing the ideas (Diehl & Stroebe, 1987; Gallupe et al., 1992). This is consistent with definitions of creativity that emphasize both the novelty and the usefulness of creative ideas (Amabile, 1988). The three items used to assess idea generation were, “This individual generated a large number of ideas,” “This individual's ideas were unique,” and “This individual's ideas were practical for solving the problem.” The internal consistency reliability for this scale was .89.

Idea integration was assessed using three items focused on integrative problem-solving behaviors and two items measuring openness to, and interest in, others' ideas. The three integrative problem solving items, based on descriptions of integrative problem solving styles given by Ketrow (1991), Wall, Galanes, and Love (1987), and Wall and Nolan (1986), were “This individual attempted to incorporate the suggestions of all parties into the solution,” “This individual contributed by clarifying ideas and evaluating potential solutions,” and “This individual searched for mutually acceptable solutions.” The two items assessing openness to others' ideas were, “This individual solicited ideas from other team members,” and “This individual was interested in hearing what others had to say.” These five items were combined to form an overall measure of integration of others' ideas ( $\alpha = .95$ ).

A four-item measure was developed for this study to measure the extent to which each group member assumed a process facilitation role designed to move the group toward its goal. These four items were, “This individual kept the group focused on the task,” “This individual took notes to track the group's discussion,” “This individual reminded the group of the amount of time that was left to complete the task,” and “This individual periodically summarized the discussion to determine what remained to be decided.” The internal consistency reliability of this scale was .70.

For 91 of the participants, the first two authors independently assessed idea generation, integration of others' ideas, and process facilitation based on their observations of the leaderless group discussions. At the time these ratings were made, the authors were not aware of the participants' personality or leadership ratings. Intraclass correlations for these ratings were computed (idea

generation: ICC(1) = .50, ICC(2) = .67; integration of others' ideas: ICC(1) = .68, ICC(2) = .81; process facilitation: ICC(1) = .60, ICC(2) = .75). Based on the ICC values, ratings were averaged to create a score for the 91 participants with two ratings. For the remaining 87 participants, contributions to group success were rated by the first author.

Confirmatory factor analysis was used to test a three-factor measurement model of the contributions to group success. Two of the process facilitation items – “This individual took notes to track the group’s discussion,” and “This individual reminded the group of the amount of time that was left to complete the task” – had low loadings on the process facilitation factor. Further, a review of the group interactions revealed that these behaviors were infrequently observed in the groups. Thus, these two items were dropped from further analysis to improve the internal consistency of the scale; however, it should be noted that removing items based on a single data collection risks capitalization on chance. Results of the confirmatory factor analysis revealed high correlations between idea generation, idea integration, and process facilitation ( $\phi$ s ranged from .89 to .95). A second-order factor analysis revealed that the three indicators of contributions to group success loaded strongly on a second order factor ( $\gamma$ s ranged from .92 to .98), and this second-order factor structure fit the data relatively well ( $\chi^2 = 208.33$ ,  $df = 32$ ; comparative fit index [CFI] = .95, Tucker–Lewis index [TLI] = .94, standardized root-mean-square residual [SRMR] = .04). Thus, we combined the three indicators into a single higher-order assessment of contributions to group success.

### 3.2.3. Leadership

Each participant was rated on scales designed to measure leader emergence and leadership effectiveness by all other members of their groups. Leader emergence was assessed using the five-item General Leadership Impressions scale (GLI; Lord et al., 1984). Perceived leader effectiveness was measured using a seven-item scale developed for this study. The scale assessed the level of influence that each group member had on group performance and the extent to which the individual contributed to the effectiveness of the group. The leadership effectiveness items were, “The group performed better as a result of this person’s participation,” “This individual influenced the outcome of the group,” “This individual influenced the process by which the group reached its outcome,” “This individual was effective in the group,” “This individual was effective as the leader of the group,” “This individual contributed to the effectiveness of the group,” and “This individual had influence over the group.”

Although in concept leader emergence and leadership effectiveness are distinct (Hogan et al., 1994; Lord et al., 1986), in practice they are likely to be highly related (Hogan et al., 1994). Confirmatory factor analysis was used to estimate a two-factor measurement model, which fit the data relatively well ( $\chi^2 = 264.18$ ,  $df = 53$ ; CFI = .97, TLI = .97, SRMR = .05). However, the correlation between leader emergence and leadership effectiveness in our sample was .89. Thus, the twelve items were combined to form the leadership criterion. Intraclass correlations supported aggregation across raters (ICC(1) = .49) and indicated that the mean leadership rating had acceptable reliability (ICC(2) = .85).

### 3.2.4. Control variables

Because the sample was drawn from undergraduate and MBA leadership classes, education level (0 = MBA, 1 = undergraduate) was included as a control variable. Additionally, we controlled for the sex of the participants (0 = male, 1 = female) and the team size. Because of missing values among the control variables, the final sample size for the analysis was 155.

## 4. Results

Descriptive statistics and correlations among the personality, mediator, and leadership variables are provided in Table 1. The correlations between self and observer ratings of the Big Five personality traits ranged from .48 to .60. Both self and observer

**Table 1**  
Descriptive statistics and correlations among study variables.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Education	0.52	0.50														
2. Sex	0.39	0.49	.18*													
3. Team size	4.59	0.99	-.19*	.13												
4. Neuroticism – S	1.51	0.63	.25*	.30*	.03											
5. Neuroticism – O	1.29	0.53	.25*	.37*	.09	.48*										
6. Extraversion – S	2.67	0.54	.11	.00	.00	-.37*	-.24*									
7. Extraversion – O	2.73	0.43	.04	.07	-.11	-.21*	-.39*	.60*								
8. Openness – S	2.28	0.51	-.11	-.08	-.07	-.12	-.05	.06	.01							
9. Openness – O	2.10	0.35	-.05	.04	-.04	-.01	-.08	-.05	.03	.55*						
10. Agreeableness – S	2.64	0.50	.04	.06	-.01	-.25*	-.18*	.34*	.30*	.05	.07					
11. Agreeableness – O	2.78	0.54	-.09	.01	-.04	-.08	-.48*	.18*	.44*	-.03	.04	.49*				
12. Conscientiousness – S	2.78	0.50	-.06	.12	.11	-.23*	-.08	.10	.08	.01	.04	.03	.05			
13. Conscientiousness – O	3.01	0.53	-.30*	.12	.17*	-.15+	-.40*	-.08	.14+	-.02	.18*	.06	.35*	.51*		
14. Contributions to Group Success	3.55	0.80	-.32*	-.04	.01	-.16*	-.18*	.09	.15+	.33*	.26*	.18*	.14+	.06	.14+	
15. Leadership	3.70	0.51	-.01	-.02	-.01	-.15	-.14+	.16*	.26*	.24*	.22*	.19*	.18*	.10	.14+	.63*

N = 155. S = self; O = observer.

\*  $p < .05$  (two-tailed tests).

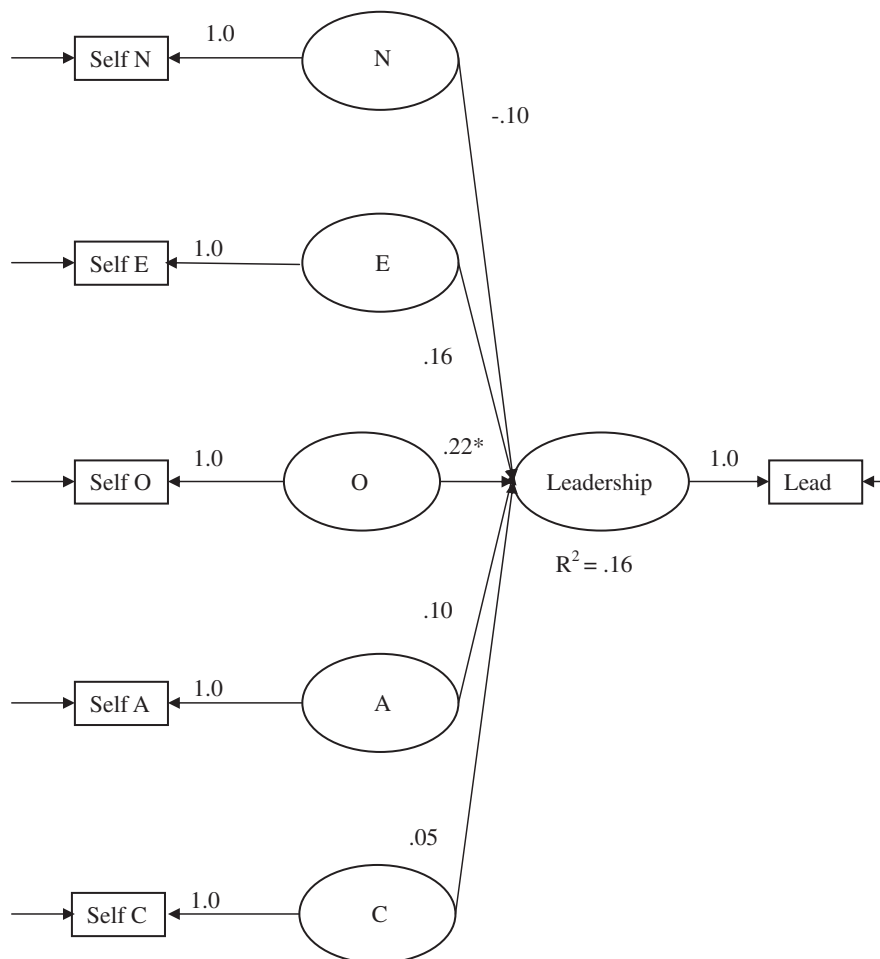
+  $p < .10$  (two-tailed tests).



ratings of extraversion, openness to experience, and agreeableness were significantly correlated with leadership. Observer ratings of neuroticism and conscientiousness were marginally significantly correlated with leadership.

We tested Hypotheses 1 through 4 using structural equation modeling (Muthén & Muthén, 1998–2010). We first estimated the relationship between the five self-rated personality factors and leadership. Due to the modest sample size, each of the latent variables was indicated by a single scale score. We corrected for measurement error by constraining the error variance to  $(1 - r_{xx})$  times the variance of the scale (Bollen, 1989). Because the model was fully saturated, the fit of the model to the data was perfect. As shown in the path model in Fig. 1, the control variables and the five self-rated personality factors explained 16% of the variance in leadership. Of that, 14% was attributable to the personality factors. However, only openness to experience was significantly related to leadership. Using self ratings of personality, only openness to experience was significantly related to leadership.

We then estimated the relationship between personality and leadership using both self and observer ratings of personality as indicators of the latent personality variables. This is consistent with the multitrait–multimethod approach to modeling personality suggested by Chang et al. (2012). Each of the five personality factors was modeled as a latent variable with three indicators – self ratings, observer 1 ratings, and observer 2 ratings. The model also included three method factors (self ratings, observer 1 ratings, and observer 2 ratings). As Chang and colleagues note, “trait ratings from a single rater are not solely an indication of true standing of the target’s personality traits, but also bias from the rater’s response tendencies” (p. 16). By including method factors in the model, trait intercorrelations and correlations between the latent personality traits and the outcome are not contaminated by these idiosyncratic errors. Also consistent with the approach used by Chang et al. (2012), unstandardized loadings of observer 1 and observer 2 ratings of each personality trait were constrained to be equal. This is consistent with the arbitrary assignment of the two observers to observer 1 or observer 2. This model is illustrated in Fig. 2. It should be noted that the standardized factor

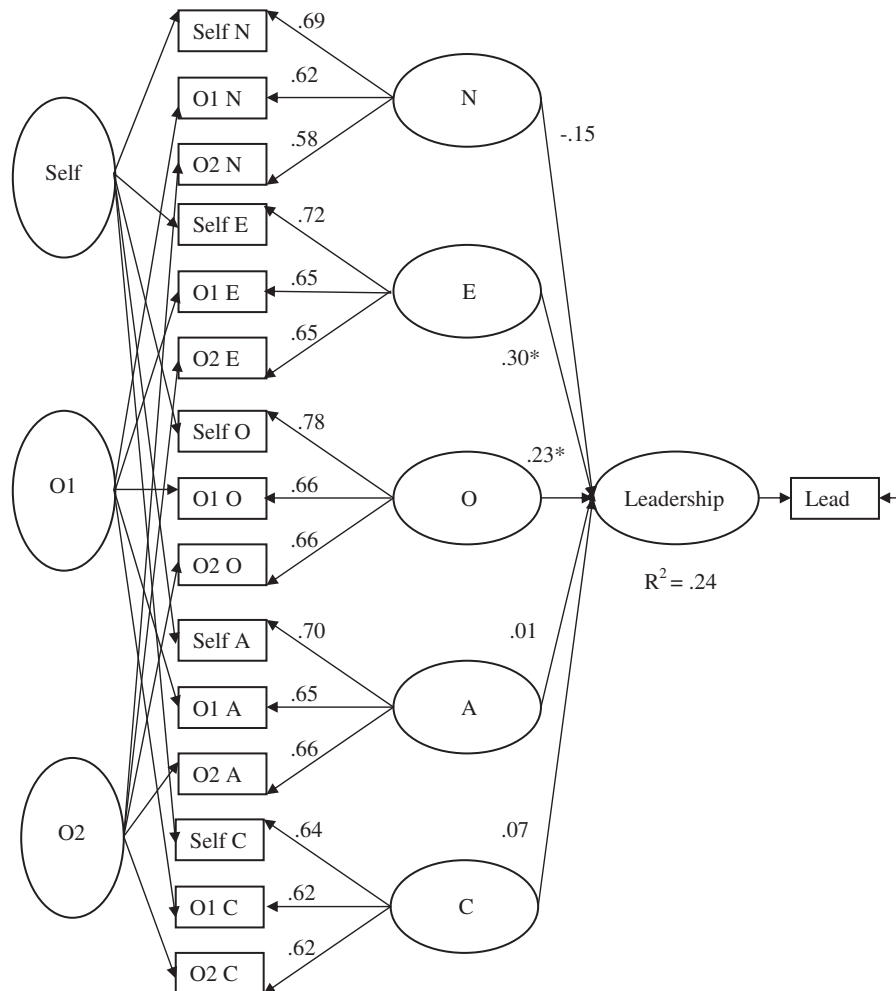


**Fig. 1.** Personality (self ratings) and leadership. Note.  $N = 155$ , \*  $p < .05$ ; education, sex, and team size were included as control variables. N = neuroticism, E = extraversion, O = openness to experience, A = agreeableness, C = conscientiousness. Standardized path coefficients are reported.

loadings for observer 1 and observer 2 shown in Fig. 2 are not equal because the variances of the two indicators are different, and the equality constraints were set on the unstandardized factor loadings (Kline, 2010).

This model fit the data well ( $\chi^2 = 90.53$ ,  $df = 105$ ,  $p = .84$ ;  $CFI = 1.0$ ,  $TLI = 1.0$ ,  $SRMR = .05$ ). The control variables and personality factors indicated by both self and other ratings explained 24% of the variance in leadership. Of that 22% was attributable to the personality factors (an increase of 57% as compared to the variance attributable to the five personality factors indicated only by self ratings of personality). Thus, personality assessed using both self and observer ratings of personality explains more variance in leadership than personality assessed using only self ratings of personality. In examining the relationship of the specific personality traits and leadership, extraversion assessed using self and observer ratings was significantly related to leadership in this model ( $\beta = .30$ ), supporting H2a. This relationship was not significant when only self ratings were used, supporting H2b. Further, openness to experience, as indicated by both self and other ratings, remained significantly related to leadership ( $\beta = .23$ ).

To further explore the relative importance of self and observer ratings of personality as predictors of leadership, we used relative weight analysis (Johnson, 2000). Relative weight analysis is useful in our study because the relative weights can be interpreted as the proportionate contribution of each personality rating in explaining the total variance of leadership. Furthermore, relative weight analysis is especially appropriate when the predictor variables are correlated making comparisons of standardized regression coefficients difficult. As shown in Table 2, relative weight analysis was conducted using both observed correlations and correlations that were corrected for internal consistency measurement error. Observer ratings of extraversion had the largest relative weight, accounting for 34.3% of the variance explained in leadership in the analysis of corrected correlations (33.1% in the analysis of observed correlations). Self and observer ratings of openness to experience had the next largest relative weights, respectively accounting for 18.6% and 13.4% of the variance explained in leadership using corrected correlations (19.1% and 12.7% in the analysis of observed correlations). Thus, conclusions drawn from the relative weight analysis are consistent with conclusions



**Fig. 2.** Personality (self and observer ratings) and leadership. Note.  $N = 155$ ,  $* p < .05$ ; education, sex, and team size were included as control variables. N = neuroticism, E = extraversion, O = openness to experience, A = agreeableness, C = conscientiousness. O1 = observer 1, O2 = observer 2. Unstandardized loadings of O1 and O2 indicators were constrained to be equal. Standardized path coefficients are reported.

**Table 2**  
Regression of leadership on self and observer ratings of personality.

Variable	$\beta$	Relative weights (observed correlations) <sup>a</sup>		Relative weights (corrected correlations) <sup>b</sup>	
		RW	%RW	RW	%RW
Neuroticism (Self)	-.12	0.016	10.1	0.019	9.4
Neuroticism (Observer)	.00	0.006	3.7	0.007	3.5
Extraversion (Self)	-.00	0.015	9.8	0.019	9.5
Extraversion (Observer)	.25*	0.051	33.1	0.069	34.3
Openness (Self)	.13	0.030	19.1	0.038	18.6
Openness (Observer)	.09	0.020	12.7	0.027	13.4
Agreeableness (Self)	.06	0.007	4.5	0.009	4.4
Agreeableness (Observer)	.01	0.007	4.7	0.009	4.4
Conscientiousness (Self)	.06	0.003	1.7	0.004	1.7
Conscientiousness (Observer)	-.04	0.001	0.6	0.002	0.8
R <sup>2</sup>		0.156		0.203	

Note.  $\beta$  = standardized regression weights;  $R$  = multiple correlation;  $\beta$  s are calculated after controlling for education, sex, and team size ( $\beta$ s for education, sex, and team size are -.020, -.014, and -.071); RW = relative weight (Johnson, 2000), which add up to  $R^2$ ; %RW = relative weights in percentage form (calculated by dividing individual relative weights by their sum and multiplying by 100), which add up to 100% (Johnson, 2000).  $N = 155$ , \* $p < .05$ .

<sup>a</sup> Relative weight analysis was performed with an observed correlation matrix among the 10 FFM traits and leadership.

<sup>b</sup> Relative weight analysis was performed with a corrected correlation matrix (using alpha coefficients) among the 10 FFM traits and leadership.

drawn from structural equation modeling. Observer ratings explain variance in leadership beyond the effects of self ratings, with observer ratings of extraversion being the most significant predictor of leadership.

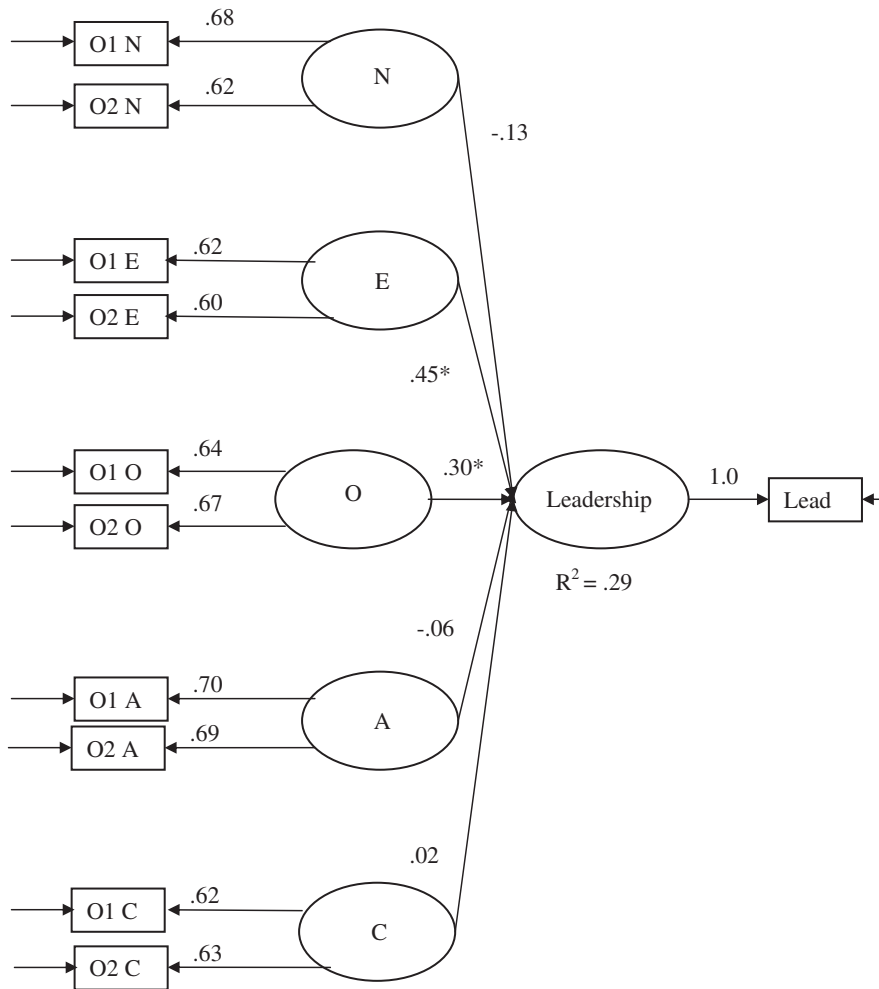
Although Chang and colleagues (2012) recommended assessing personality as a latent factor indicated by both self and observer ratings of personality, research on the relationship between personality and job performance has examined the effects of observer ratings of personality alone (e.g., Oh et al., 2011). Thus, we also assessed the relationship between personality as assessed only by observer ratings and leadership as exploratory analysis. These results are presented in Fig. 3. Interestingly, personality and the control variables explained 29% of the variance in leadership in this model, more than either of the other two models. Further, the relationships of extraversion ( $\beta = .45$ ) and openness to experience ( $\beta = .30$ ) with leadership are stronger in this model than in the models in which personality is assessed with self ratings only or with self and observer ratings together.

We also proposed that contributions to group success mediates the relationship between personality and leadership. A common problem in testing mediated models is that most analytical techniques assume that the error terms in the equations that are used to predict the mediator and outcome variables are unrelated. However, these error terms are often related due to the omission of common causes of both variables. This results in an estimate of the relationship between the mediator and outcome variable that is inconsistent (Antonakis, Bendahan, Jacquart, & Lalive, 2010). However, this problem can be avoided by using two-stage least squares (2SLS) regression. Using 2SLS, a consistent estimate of the relationship between the mediator and outcome variables that can be interpreted causally can be derived by first identifying instrumental variables, or exogenous variables that predict the mediator variable and are related to the outcome variable only through the mediator (Antonakis et al., 2010). The relationship between the instrumental variables and the mediator variable is first estimated, providing predicted values of the mediator. These predicted values of the mediator are then used to determine an estimate of the relationship between the mediator and outcome variable. This estimate is less efficient than the ordinary least squares estimate, but the estimate is consistent.

Demographic and personality variables are appropriate instrumental variables because they are exogenous and theoretically associated with the mediator variable, contributions to group success (Antonakis et al., 2010). Thus, we first regressed contributions to group success on the three control variables (sex, education, and group size) and the ten personality variables (self and observer ratings of the Big Five personality factors). The results of this analysis, along with relative weight analysis of the importance of these predictors is reported in Table 3. Similar to the analysis in which we examined the relative importance of predictors of leadership, self-rated openness to experience, observer-rated extraversion, and observer-rated openness to experience accounted for the largest percentage of the variance explained in contributions to group success. In the second stage of 2SLS regression analysis, we regressed leadership on the predicted values of contributions to group success. Contributions to group success was significantly related to leadership ( $\beta = .57$ ,  $p < .01$ ). Thus, H5b and H5c were supported.

## 5. Discussion

In their review of the leadership literature, House and Aditya (1997) concluded, “There has recently emerged a modest body of trait theory and evidence relevant to leadership” (p. 412). Consistent with this conclusion, Judge, Bono, and colleagues (2002) used meta-analysis to aggregate estimates of the effects of personality on leadership and found that self ratings of four of the Big Five personality traits – neuroticism, extraversion, openness to experience, and conscientiousness – were significantly related to leadership. With this increasing support for the trait theory of leadership, it becomes important to gain a clearer understanding of the possible processes that may explain the effects. However, given the problems with self reports of personality, it is also



**Fig. 3.** Personality (observer ratings) and leadership. Note.  $N = 155$ , \*  $p < .05$ ; education, sex, and team size were included as control variables. N = neuroticism, E = extraversion, O = openness to experience, A = agreeableness, C = conscientiousness. O1 = observer 1, O2 = observer 2. Unstandardized loadings of O1 and O2 indicators were constrained to be equal. Standardized path coefficients are reported.

important to investigate the possibility that personality may have even stronger effects on leadership than have been previously found in studies using self reports of personality.

Results of the present study suggested that the five-factor model, assessed using both self and observer ratings, is a useful framework for the prediction of leadership. In reviewing the trait approach, [Kenny and Zaccaro \(1983\)](#) observed that many purportedly different traits were investigated across studies. One benefit of the five-factor model is that it provides a taxonomic structure for organizing traits and, in so doing, may reveal more consistent relations between traits and various outcomes. We believe that is the case in the present study. At the same time, all of the five traits were not equally useful in predicting leadership. Of the Big Five, extraversion was mostly strongly related to leadership. However, extraversion was significantly related to leadership only when observer ratings or both self and observer ratings were used to assess extraversion. Self ratings of extraversion alone were not significantly related to leadership in our study. Further, relative weight analysis showed that observer ratings of extraversion contributed the most to the explanation of leadership. This finding is consistent with the finding by [Oh and colleagues \(2011\)](#) that observer ratings of extraversion are more strongly related to performance than self ratings. It is also consistent with the conclusion that the modest relationship of personality with outcomes may be due to the use of self report measures to assess personality rather than due to a lack of predictive validity of personality traits.

In contrast, openness to experience was significantly related to leadership when it was assessed using self or observer ratings or when it was assessed using both self and observer ratings. Based on relative weight analysis both self and observer ratings of openness contributed to the prediction of leadership. Self and observer ratings of openness had the second and third highest relative weights, following observer-rated extraversion. These results contrast with those reported by [Oh et al. \(2011\)](#), who found that the relationship of personality and performance was higher for observer ratings than for self ratings for all of the Big Five personality traits. One explanation for this difference may be the source of the observer ratings used in this study. In the studies of the relationship between personality and performance summarized by Oh and colleagues, the observer ratings of personality

**Table 3**  
Regression of contributions to group success on self and observer ratings of personality.

Variable	$\beta$	Relative weights (observed correlations) <sup>a</sup>		Relative weights (corrected correlations) <sup>b</sup>	
		RW	%RW	RW	%RW
Neuroticism (Self)	-.02	0.025	13.5	0.027	9.4
Neuroticism (Observer)	-.06	0.008	4.5	0.010	3.4
Extraversion (Self)	.02	0.007	3.9	0.012	4.2
Extraversion (Observer)	.19+	0.028	15.1	0.044	15.4
Openness (Self)	.23*	0.063	33.5	0.104	36.7
Openness (Observer)	.07	0.025	13.4	0.045	15.9
Agreeableness (Self)	.11	0.010	5.4	0.016	5.5
Agreeableness (Observer)	-.08	0.005	2.6	0.006	2.2
Conscientiousness (Self)	.10	0.004	2.2	0.006	2.0
Conscientiousness (Observer)	-.07	0.011	5.9	0.015	5.1
R <sup>2</sup>		0.186		0.285	

Note.  $\beta$  = standardized regression weights; R = multiple correlation;  $\beta$ s are calculated after controlling for education, sex, and team size ( $\beta$ s for education, sex, and team size are -.335, .010, and .012); RW = relative weight (Johnson, 2000), which add up to R<sup>2</sup>; %RW = relative weights in percentage form (calculated by dividing individual relative weights by their sum and multiplying by 100), which add up to 100% (Johnson, 2000). N = 155, \* $p$  < .05, + $p$  < .10.

<sup>a</sup> Relative weight analysis was performed with an observed correlation matrix among the 10 FFM traits and leadership.

<sup>b</sup> Relative weight analysis was performed with a corrected correlation matrix (using alpha coefficients) among the 10 FFM traits and leadership.

were most often provided by coworkers. For studies that use coworker ratings of personality, the higher relationships between observer ratings of personality and performance may be due not only to the removal of faking and self-deception biases inherent in self ratings, but also to the situational consistency between observer-rated personality and the outcome. That is, coworker personality ratings are likely based on perceptions of behavioral tendencies at work, while self ratings of personality may be assessments of behavioral tendencies across settings. Research on the contextual nature of personality (e.g., Heller, Ferris, Brown, & Watson, 2009; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997; Wood & Roberts, 2006) suggests that personality varies systematically across roles and that contextualized personality ratings (e.g., personality at work) predict outcomes in that context over and above global personality ratings. Thus, the finding that self ratings of openness to experience had a higher relative weight than observer ratings of openness to experience may be due to the use of observer ratings of personality from friends or family members who observed the participants in a context that differs from the context in which leadership was assessed.

Our results may also have differed from those found by Oh et al. (2011) due to the dependent variable used in our study. Leadership was rated by group members who had interacted for a relatively short period of time. Thus, their ratings may have been affected by first impressions. Connelly and Ones (2010, Study 3) recently reported that other ratings of personality have stronger validities than self ratings in predicting academic achievement and job performance, but not in predicting first impressions. They speculated that “when predicting job performance, other-raters generally knew the target primarily in a work context (work colleagues). Thus, this contextualized knowledge basis may enhance validity beyond self-reports for these others, whereas self impressions are likely formed from a variety of contexts” (p. 1115).

Another possible explanation lies in the nature of the traits themselves. The trait of extraversion produces a number of observable cues and has been found to be rated with reasonable accuracy even by strangers (Borkenau & Liebler, 1993). These observable cues (e.g., talking, sharing ideas, taking charge) may influence extraverts' likelihood of emerging as leaders and being more effective as leaders. Thus, observer ratings of extraversion predict leadership perceptions relatively well, even when there are differences in the contexts in which the personality and leadership ratings are made. On the other hand, openness to experience may manifest through its impact on internal thought processes (Oh et al., 2011). As Chang et al. (2012) noted, self raters may have advantages when rating traits that do not produce as many observable cues. Thus, with hindsight, it may not be surprising that self ratings of openness to experience, which are informed by individuals' awareness of their own internal processes, have a higher relative weight than observer ratings of openness to experience. What is notable is that self and observer ratings of personality seem to complement one another. When the multitrait-multimethod approach was used to model the relationship between personality and leadership, personality traits explained 57% more variance in leadership than when self ratings alone were used.

A second key contribution of our research involves our examination of one mediating mechanism that partially explains the relationship between personality and leadership. We found a similar pattern of effects when examining the indirect relationships of self and observer ratings of personality with leadership through contributions to group success. Self ratings of openness to experience had the highest relative weight in predicting contributions to group success, followed by observer ratings of extraversion and observer ratings of openness to experience. This provides insight into the mechanisms by which personality impacts leadership. When behaviors that are consistent with personality tendencies, such as generating ideas, integrating ideas, or managing the group's process, contribute to group success, these behaviors influence leadership perceptions. This is consistent with the functional leadership claim that in a team context, “the leader's job is to monitor the team and then take whatever action is necessary to ensure team effectiveness” (Kogler-Hill, 2009, p. 243).

Last but not least, the results of our study show the importance of the use of observer ratings as an alternative method of measuring personality in the field of leadership research. The small and inconsistent results in previous studies examining the validity



of leadership personality traits may be due to the use of self reports of personality. Our findings suggest that using a multitrait-multimethod approach to assess personality increases the variance explained in leadership. However, exploratory analysis also showed that when personality was assessed by observer ratings alone, personality explained more variance in leadership than when personality was assessed using both self and observer ratings. Further, the relationships of extraversion and openness to experience with leadership were stronger when observer ratings alone were used to assess personality. This suggests the need for future research to explore whether self and observer ratings of a personality trait are most appropriately treated as indicators of a single latent variable or whether self and observer ratings should be treated as separate latent variables.

### 5.1. Limitations and future research

Several limitations of the present investigation merit discussion. First, as noted above, participants were instructed to obtain observer ratings of personality from two individuals who knew them well. These observers may have been friends or family members. We did not collect information on the context in which the observer knew the participant. Because of this, our study provides an important contrast to other studies of observer ratings of personality, which have primarily used coworkers as observers. However, future research is needed that compares the validity of observer ratings gathered from raters whose observations were made within the same context as the outcome variable and observer ratings provided by raters from another context. Further, it would be useful to compare the validity of observer ratings of personality with the validity of contextualized self ratings (e.g., personality at work). Using these designs will help us begin to understand the causes of differences in validity across self and observer ratings. It should also be noted that the interrater reliability of the mean personality ratings ranged from .52 to .64, slightly lower than the .60 cutoff suggested by [Ostroff and Schmitt \(1993\)](#). This is partially due to the fact that ratings from only two observers were collected. Future research using ratings from more than two observers is needed to increase the reliability of the mean observer personality ratings.

A second limitation of our study is that although we assessed three behaviors as mediators of the personality–leadership relationship, all three of these behaviors loaded on a single higher-order factor and represented general contributions to group success. Thus, future research is needed to shed more light into the black box between personality and leadership. Within the context of a one-time leaderless group discussion, we found that behaviors that contributed to group success, such as idea generation, idea integration, and process facilitation, mediated the personality–leadership relationship. These behaviors are similar to the action phase processes in [Marks et al.'s \(2001\)](#) taxonomy of team processes. However, in groups that have more flexibility in how to accomplish their work and more time to develop interpersonal bonds, transition phase processes (e.g., strategy formulation and planning) and interpersonal processes (e.g., conflict management) may also influence leadership perceptions and mediate the personality–leadership relationship. In addition, drawing from socioanalytic theory ([Hogan, 1996](#)), [Judge et al. \(2009\)](#) proposed that the relationship between personality and leadership may be mediated by leaders' motives toward getting along, getting ahead, and providing meaning ([Hogan, 1996](#)). Finally, personality traits may influence emotional states or cognitive processes that, in turn, impact perceptions of leadership. Future research is needed to more fully explore these potential mediators. It is also important to note that the participants in this study were enrolled in leadership or management courses. The leadership behaviors that they exhibited and the ways in which they assessed the leadership of others may have been influenced by course concepts. Thus, future research using samples of participants who have not been exposed to specific leadership theories may reveal additional ways in which leadership is displayed and assessed.

Third, our assessment of leadership was based on the perceptions of the other group members. Thus, it might be asked why we did not study objective measures of leadership effectiveness. There are two possible objective measures: (a) group performance, and (b) job level or career success. The problem, as [Hogan et al. \(1994\)](#) noted, is that such objective measures are “difficult to obtain or badly contaminated by external factors” (p. 496). For example, group performance is contaminated by the individual abilities of the group members as well as any group processes affecting group performance that have nothing to do with leadership. Measures such as salary, promotions, and other indicators of career success are similarly contaminated by both organizational and individual factors that are independent of an individual's leadership. Because of these problems, we followed [Hogan et al.'s](#) recommendation to use peer ratings. Nevertheless, future research relating leader personality to objective measures of group performance is needed.

Finally, this study is not a causal study of the interrelationship of personality and leadership. We are aware of no strictly causal studies in the literature, though numerous studies both assume and are consistent with the assumption that personality leads to leadership and not the reverse. In specific reference to this study, several factors argue against the possibility that leadership affects personality. First, personality was measured before the leadership ratings were collected. Thus, the temporal ordering of the measurement of the variables is consistent with the presumed causal ordering. Second, the research was conducted in a controlled situation, where the particular context in which leadership was observed had not unfolded at the time personality data were collected. Third, the nature of personality – that 40–60% of the variance in the Big Five traits is heritable ([Jang, Livesley, & Vernon, 1996](#)) and that the Big Five traits are quite stable over short time periods ([Costa & McCrae, 1992](#)) – fits with our presumed causal ordering. Finally, if the Big Five traits are endogenous, this is a limitation that would affect virtually all personality research in applied psychology, including the job satisfaction and job performance literatures.

Though the limitations of this study are not to be dismissed, they are accompanied by a number of strengths. One clear strength of this study is the use of both self and observer ratings of personality to test the role of personality in predicting leadership. The use of both self and observer ratings answers the recent call to examine alternatives to self assessments of personality ([Sackett & Lievens, 2008](#)). Further, ratings of leadership and contributions to group success were obtained from distinct sources.

Thus, it is not possible that common method variance explains the association between the mediating variable and leadership. (It should be noted that all raters of the contributions to group success and leadership were blind to the personality ratings at the time that the ratings were completed.) Clearly, future research is needed to extend our understanding of the relative validities of self and observer ratings of personality in predicting leadership, as well as the mechanisms that explain these relationships. However, this study represents a first step toward moving beyond solely using self ratings of personality to assess the trait theory of leadership.

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