INVESTIGATING THE VALIDITY OF THE CONDITIONAL REASONING TEST FOR LEADERSHIP

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INVESTIGATING THE VALIDITY OF THE CONDITIONAL REASONING TEST FOR LEADERSHIP

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SUMMARY

Several decades of leadership research have failed to yield a personality measure that accurately predicts successful leaders (Bernus & Manis, 1985; Stogdill, 1974; Vroom & Yago, 2007; Yukl, 1989). A new implicit measure of personality, the Conditional Reasoning Test for Leadership (CRT-L), shows promise in this endeavor. This project investigated the construct and criterion-related validities of this measure. Previous research on implicit personality measures, and specifically conditional reasoning measures, has demonstrated that their relationship to their explicit measure counterparts tends to be modest or nonexistent. This was the case for the CRT-L, which had no relationship to the NEO Hostility Scale or the Motivation to Lead (MTL) Scale. As expected, the two explicit measures did have a significant and positive relationship (r = .42). The CRT-L was also effective at predicting leadership and power criteria. It had positive and significant relationships with Leadership Peer Nominations (r = .25) and Power Peer Nominations (r = .21) and was more successful in these predictions than either of the explicit measures. The results of this research provide evidence for the effectiveness of the CRT-L as a leadership measure and further validation work is encouraged.

CHAPTER 1

INTRODUCTION

The topic of leadership is a lightning rod for speculation, theory, and debate in both academic and lay communities. Evidence, both anecdotal and empirical, abounds across many industries and domains of the overwhelming costs of incompetent and ineffective leadership. Leaders who are poorly suited for their positions diminish productivity, miss valuable opportunities, and reduce stakeholder confidence in organizations (Zaccaro & Klimoski, 2001). For instance, Csoka's 1998 survey of Fortune 400 companies found that forty percent of employees rated leadership as fair or poor in their organizations, while merely eight percent rated their leadership as excellent. Leaders have a substantial impact on individuals' daily work lives as well. Hogan, Raskin, and Fazzini's (1990) review of organizational climate studies from the mid-1950's to the 1990's showed that across organizations and occupations, sixty to seventy percent of employees consistently reported that the most stressful aspect of their job is their immediate supervisor.

Furthermore, incompetent leadership has been associated with turnover, insubordination, industrial sabotage, and malingering (Hogan, 2004). Compensation costs associated with executive turnover may result in considerable loss from the company's bottom line. According to Zaccaro and Klimoski (2001), the turnover of a senior executive within four years costs a company between one million and 10 million dollars in compensation alone. In addition to the compensation costs, each executive who leaves takes with him or her crucial insider knowledge of the company, often to its direct competitors. Thus, ineffective leadership has a powerful impact on a variety of critical organizational outcomes. Unfortunately, the risk is great that many organizations will bear these costs due to the high failure rate of leaders.

Predicting Effective Leaders

Estimates of failure rates of those in leadership positions across multiple industries range from fifty to seventy-five percent (DeVries, 1992; Hogan, 1994; Hogan et al., 1990; Millikin-Davies, 1992; Shipper & Wilson, 1991). Considering this dismal statistic, there is a pressing need to identify those individuals who will be effective, and *ineffective*, leaders early in the selection process. It appears that the academic study of leadership has thus far yielded no reliable methods toward this end. In fact, for several years there has been a growing discontent with leadership research. Yukl (1989) notes that across several thousand studies on leadership the results have been, at best, contradictory and inconclusive. Stogdill (1974) laments that 40 years of research has resulted in "a bewildering mass of findings.... the endless accumulation of empirical data has not produced an integrated understanding of leadership" (p. vii). Bernis and Manus (1985) add that "no clear and unequivocal understanding exists as to what distinguishes leaders from nonleaders, and perhaps more important, what distinguishes effective leaders from ineffective leaders" (quoted in Vroom & Jago, 2007, p. 17).

Why has there been such conflicting information on how to identify effective leaders? One explanation is that many of the theories of leadership focus on leader strategies and behavior. For example, Hershey and Blanchard's (1977) contingency theory holds that an effective leader should craft strategy based on the maturity of the followers. This theory has had little direct support (Landy & Conte, 2010). House and Mitchell's (1974) path-goal theory states that an effective leader helps subordinates find a successful path to accomplish their goals. Support for this theory has been sparse and often contradictory (House, 1971; Landy & Conte, 2007; Yukl, 2006). There are a number of theories that emphasize leadership style. These theories typically attempt to identify explicit influence attempts and include leader-member exchange (LMX), transformational leadership, authentic leadership, and charismatic leadership (Bass &

Steidlmeier, 1999; Burns, 1978; Dansereau, Grean, & Haga, 1975; Yukl, 1989). These theories, too, have limited success in predicting effective leaders.

Other theories focus on situational explanations for leadership success. Theories of situational leadership suggest effective leadership involves adapting leadership strategies to the context; however, these too have yielded little empirical support (Yukl, 2006). This is likely because successful leadership is not principally explained by strategy or situation. There are many ways to be a successful leader. Perhaps effective leaders possess individual qualities that motivate them to pursue and effectively perform leadership responsibilities. These individuals' strategies and behaviors may vary because the strategies are adapted to the situations they self-select into. The situations chosen allow them to express their motives in the ways in which they prefer to express them and in ways in which they are most effective, hence the varying strategies. The specific adaptations in strategy and behavior also vary due to different strengths and weaknesses in their personalities and abilities. For example, if a leader has a strong leadership motive, but poor public speaking skills, that person may use a less charismatic style, but still be an effective leader through the use of persuasive writing, or by compensating with more one-on-one interactions. If this were the case, attempting to predict successful leaders by the strategies they utilize would be a futile endeavor, and focusing instead on individual differences in personality would be a more fruitful course of study.

Individual Differences and Leadership Success

A review of the leadership literature reveals that there has been limited research exploring the relationship between individual differences and leadership success (James & Meyer, 2011; Overbeck, 2010). Early theories on the traits of leaders, commonly know as the "Great Man" theories, attempted to discern the characteristics effective leaders posses by studying prominent and successful leaders and cataloging the qualities they shared (Yukl, 2006). Despite several attempts, this approach was a resounding failure (Landy & Conte, 2010; Zaccoro & Klimoski, 2001). Many other more recent approaches

involve using self-reports to assess a characteristic and then testing the relationship of that characteristic with leadership effectiveness. This has produced mixed results. Judge et al. (2002), for instance, conducted a meta-analysis, which showed that, of the Big 5 traits, extraversion is the most consistent correlate of both leader emergence and leader effectiveness. However, Bono and Judge (2004) later found only weak support that the any of the Big 5 predict leadership behavior. Therefore, individual differences research has had no greater success than other areas of leadership research thus far.

This may be, in part, due to the approach taken to studying individual differences. While observing current successful leaders and recording commonalities has a nice intuitive feel to it, the underlying problem with this approach is equifinality. There are many different ways to become a successful leader, and it is difficult to sort out which ones most matter when only observing the final product. A more productive approach is to study psychological traits that are theoretically related to leadership and determine if they predict the expected behaviors. This approach tends to yield much more useful information, however, measurement becomes an even more important issue. The types of tests used and their validities are a crucial part of predicting behavior from psychological traits.

CHAPTER 2

EXPLICT AND IMPLICT MEASURES OF PERSONALITY

Explicit Personality Measures

One concern in personality trait measurement is that the explicit measures being used to assess these qualities may not be capturing the characteristics most likely to influence leader behavior. Explicit personality measures typically rely on self-report questionnaires to assess a personality characteristic. Tafarodi and Ho (2006) describe explicit measures as "direct measurement that captures a person's conscious act of self-judgment" (p. 197). These measures do tend to predict behaviors with moderate success when there is a high degree of correspondence between the attitude and the behavior measured, when both the explicit measure and the behavior are similar in specificity, and when both are assessed closely in time (McClelland, Koestner, & Weinberger, 1989). They also have been shown to predict focused, goal-oriented behavior and self-reported outcomes (Bornstein, 2002; Bosson, 2000). Additionally, they have the practical advantage of being immediate and relatively easy to construct. However, these measures have noteworthy shortcomings in accurately assessing personality traits.

One of the most-cited concerns about explicit measures is the risk of misrepresentation by participants on the tests (Farnham, Greenwald, & Banaji, 1999; Tafarodi & Ho, 2006). Farnham et al. (1999) pose that explicit measures are "not based on honest appraisal" (p. 231), and may be capturing a "motive to present a positive attitude," "impression management," or "self-enhancing self-presentation strategies" (p. 231). Indeed, Tafarodi and Ho (2006) found that self-report measures correlate highly with self-presentation measures and predict behaviors more related to self-presentation than the construct being assessed. They discuss three types of misrepresentation by participants on these measures: 1) deliberate, 2) habitual and unintentional, and 3) self-

deceptive. Deliberate misrepresentation is just as the name implies, intentional deception. The person actively, consciously, and intentionally over- or under-reports his or her level of the construct being tested. Habitual and unintentional misrepresentation starts as intentional deception, but becomes practiced and less intentional over time. This is essentially a person who lies to himself until he comes to believe the lie. Self-deceptive misrepresentation involves a person's own skewing of reality based on their honest perception. This is more related to inaccurate perception and coping mechanisms that distort one's view of reality than intentional misrepresentation. Olson, Fazzio, and Hermann (2007) found support for the idea that misrepresentation on explicit measures impacts the validity of the measure. They demonstrated that correlations between implicit and explicit measures of the same personality construct were increased by providing instructions to participants on the explicit measure to not over- or underrepresent themselves.

Another concern with explicit measures is their inability to assess parts of the personality not accessible to the conscious. There are aspects of the personality, known as implicit personality, that are experienced unconsciously and are not available to conscious report by the individual (Winter, Stewart, Klohnen, & Duncan, 1998). It is believed by some that implicit aspects of personality are built upon affective experiences that occur early in life, generally before the development of speech (McClelland et al., 1989). These motives are activated by incentives inherent in participating in an activity and do not require social prompts to be activated (McClelland et al., 1989). Implicit personality tends to be associated with both more spontaneous behaviors and long-term trends in behavior (McClelland et al., 1989; Winter et al., 1998). McClelland et al. (1989) discuss findings in which *n* Achievement (implicit) predicts entrepreneurial activity over time and inhibited power-motive (implicit) predicts managerial success over a 16-year period.

Because implicit personality is, by definition, unconscious, it must be measured indirectly; the person will not be able to report on that component of personality (Bosson, 2000). Since these parts of the personality are not available to self-report, explicit measures would not be expected to accurately measure them, therefore, reliance on self-report would likely omit a crucial predictor of leadership.

Implicit Personality Measures

This naturally leads to the exploration of implicit personality measures to assess personality characteristics theoretically related to successful leadership. Because implicit personality is, by definition, not available to the conscious it must be measured indirectly (Bosson, 2000). Implicit measures are designed to assess unconscious aspects of personality and to prevent misrepresentation on the part of the individuals being tested (Bosson, 2000; Farnham et al., 1999; Greenwald & Banaji, 1995). These tests attempt to measure personality indirectly, thereby capturing parts of personality not available to conscious report and bypassing mechanisms that may give rise to misrepresentation. Some implicit traits have been shown to be related to leadership behavior. McClelland and Boyatzis, (1982) proposed that a pattern of implicit motives, which included a moderate-to-high need for power (*n* Power), a low need for affiliation (*n* Affiliation), and high activity inhibition (self-control), were related to successful leadership. In a study of 237 AT&T managers, they found that this motive pattern was related to managerial advancement after eight to 16 years for nontechnical managers. Support for this relationship in hierarchical organizations has been found in a handful of other studies as well (McClelland & Boyatzis, 1982; McClelland & Burnham, 1976; Stahl, 1983).

However, there have been many more studies with inconsistent results regarding the relationship between implicit personality traits and leadership (James & Meyer, 2011). This appears to be due in large part to the poor psychometric properties of traditional implicit measures. The most commonly used implicit personality tests are the Thematic Apperception Test (TAT), the Rorschach Inkblot Test, and the Implicit

Association Test (IAT). These tests typically use projective methods in which ambiguous stimuli are presented and on which the participant is expected to project the unconscious trait. Additionally, the IAT is based on the premise that reaction time reflects the strength of unconscious associations, despite several other possible explanations for reaction time variance (Back et al., 2009; Bosson, 2000; Farnham et al., 1999; Greenwald & Farnham, 2000; Oakes et al., 2008; Winter et al., 1998). These implicit measures tend to have low inter-rater and test-retest reliabilities, and they have only weak correlations with each other, thereby failing to demonstrate convergent validity (Bosson, 2000). Additionally, the TAT and Rorschach also take substantial time to administer and score, the scoring is largely subjective, and much of the variance in the scores has been attributed to the scorer, as opposed to the respondent's attributes (Bornstein, 2002). The IAT has theoretical weaknesses, specifically the assumption that reaction time is a measure that reflects unconscious processes, as opposed to confounding variables, such as practice, order effects, manual dexterity, and processing speed (Bosson, 2000). The problems with traditional implicit measures have led to the development of a new theory and method of implicit personality assessment known as conditional reasoning (James, 1998; James and LeBreton, 2011; James & Mazzerole, 2000; James et al., 2005; James & Meyer, 2011).

CHAPTER 3

THE CONDITIONAL REASONING TEST FOR LEADERSHIP

Conditional reasoning is an implicit measurement process based on the theory that when an individual has a motive that violates social norms, an unconscious conflict is created between this motive and the motive to feel good about one's self. Expression of the unsavory motive would bring upon the individual not only disapproval by others, but personal condemnation due to the violation of internalized societal standards. Therefore, to allow the expression of this motive, the individual develops Justification Mechanisms (JMs), which are unconscious, that enable rationalizations to influence the reasoning process (James, 1998; James and LeBreton, 2011; James & Mazzerole, 2000; James et al., 2005; James & Meyer, 2011). These JMs cause the individual to frame a situation in such a way that the expression of the motive appears to be the most rational course of action. In other words, the individual truly believes behavior driven by this unconscious motive is objectively logical.

Conditional reasoning measures have attempted to assess these unconscious motives by creating measures, presented as reasoning tests, that allow the person to choose between equally logical responses, one of which includes a JM for the motive and the other that does not. Theoretically, a person possessing the motive will systematically be drawn to the logical responses that contain JMs over those that do not. Across the measure, then, one should see a pattern of choosing responses tied to one or more JMs for the tested motive if the individual possesses that underlying motive. This system of measurement has been successfully used to assess implicit aggression and achievement motive and to predict behaviors related to both across several studies and situations (Bing, LeBreton, Davison, Migetz, & James, 2007; Frost 2005; Frost et al., 2007; James, 1998; James & Mazzerole, 2000; James et al., 2005).

The Conditional Reasoning Test for Aggression (CRT-A) has been shown to predict supervisory ratings of patrol officers (r = -.49), undergraduate absences (r = .37) and lying about extra credit (r = .49), and theft (r = .63) (James et al., 2005). This measure not only demonstrates construct and criterion-related validity, but it has a robust theoretical foundation, it is resistant to faking, and it is in an easily administered and scored multiple-choice format (James, 1998; James et al., 2005; LeBreton, Barksdale, Robin, & James, 2007).

The Conditional Reasoning Test for Leadership (CRT-L).

A new conditional reasoning measure has been developed to assess implicit traits related to leadership (James and LeBreton, 2011; James & Meyer, 2011). This measure assesses implicit power motive and implicit aggression for the purpose of predicting effective leaders and toxic leaders. On the CRT-L, like other conditional reasoning measures, the individual is asked to solve 25 multiple-choice inductive reasoning problems, 17 of which are scored for power and aggression. This test is presented as an assessment of reasoning ability, therefore the participants are not aware that the test is actually a measure of leadership potential.

Implicit Aggression

The relationship of implicit aggression to effective leadership is not fully clear at this stage of theory development. What is clear is that highly aggressive people who seek and attain leadership positions are often toxic leaders (James and LeBreton, 2011). These leaders wreak havoc in their organizations, mistreating subordinates, crossing ethical boundaries, and acting in self-interest at the expense of the organization (James & Meyer, 2011). There is some evidence that moderate aggression expressed instrumentally (to achieve organizational goals) may be positively associated with successful leadership outcomes (James and LeBreton, 2011). This is something that needs to be explored further. There are some items that are scored purely for aggression and some which

include both power and aggression components. The aggression JMs are the same as those assessed in the CRT-A and are listed in Table 1.

Table 1: Justification Mechanisms for Aggression

1. Hostile Attribution Bias A propensity to sense hostility and perhaps even danger in the behavior of others. The alarm and feelings of peril engendered by this heightened sensitivity to threat trigger a concern for self-protection. Apprehension about self-preservation enhances the rational appeal of self-defense, thus promoting the self-deceptive illusion that aggression is justified.
2. Potency Bias A proclivity to focus thoughts about social interactions on dominance versus submissiveness. The actions of others pass through a perceptual prism primed to distinguish (a) strength, assertiveness, dominance, daring, fearlessness, and power from (b) weakness, impotence, submissiveness, timidity, compliance, and cowardice. Fixations on dominance versus submissiveness generate rationalizations that aggression is an act of strength or bravery that gains respect from others. Failing to act aggressively shows weakness.
3. Retribution Bias A predilection to determine that retaliation is more rational than reconciliation. This bias is often stimulated by perceptions of wounded pride, challenged self-esteem, or disrespect. Aggression in response to the humiliation and anger of being demeaned is rationalized as justified restoration of honor and respect.
4. Victimization by Powerful Others Bias A bias to see inequity and exploitation in the actions of powerful others. The ensuing perceptions of oppression and victimization stimulate feelings of anger and injustice. This sets the stage for rationalizing aggression as a legitimate strike against oppression and a justified correction of prejudice and injustice. This sets the stage for rationalizing aggression as a legitimate strike against oppression and a justified correction of prejudice and injustice.

table1continued

5. Derogation of Target Bias This bias consists of an unconscious tendency to characterize those one wishes to make (or has made) targets of aggression as evil, immoral, or untrustworthy. To infer or associate such traits with a target makes the target more deserving of aggression.
6. Social Discounting Bias A proclivity to frame social norms as repressive and restrictive of free will. Perceptions of societal restrictiveness promote feelings of reactance. These feelings furnish a foundation for justifying socially deviant behaviors such as aggression as ways to liberate oneself from repressive social customs and to exercise one's lawful right to freedom of expression.

Implicit Power

The primary focus for this project is the implicit power component of the test. This is the new addition to implicit motive assessment via conditional reasoning, and it is theorized to be directly related to leadership outcomes. The power motive is defined as "the primary motivating force for striving to attain positions where one can affect courses of events by influencing how people think (e.g., decisions they make), feel (e.g., how stressed are they), and act (e.g., how they perform)" (James and LeBreton, 2011). An individual with this motive seeks positions of influence, particularly in dominance hierarchies, and has a strong need to have maximum impact on others. These people are drawn to situations in which they can exercise influence and impact, namely leadership positions.

There is evidence that power is associated with successful leadership. Howard and Bray (1988) found that need for power positively correlated with leadership positions attained across a 20-year span among AT&T managers. As noted earlier, McClelland and Boyatzis (1982) found implicit moderate-to-high need for power, high activity inhibition, and low need for affiliation, as measured by the TAT, predicted managerial advancement

after eight to 16 years. House, Spangler, and Woycke (1991) compared personalities of more and less successful presidents, defined by evaluations of cabinet members, legislative accomplishments, and historians' ratings. Those presidents with a high need for power and achievement, as well as being energetic and socially assertive were more effective. Berman and Miner (1985) found that the most relevant components for managerial motivation were desire for power, desire to compete with peers, and a positive attitude toward authority figures. Findings from several other scientific studies support the idea that effective leaders are often socially skilled individuals who strive to be dominant (Foti & Hauenstein, 2007; Judge, Bono, Ilies, & Gerhard, 2002; McClelland, & Boyatzis, 1982; Stricker & Rock, 1998; Veroff, 1992; Winter, 1973; Winter, 1992).

Power seeking, however, is generally viewed with suspicion, distrust, and contempt (James, Power, 201; Overbeck, 2010; Winter, 1992). Those who overtly seek power are often seen negatively, therefore having to hide this motive. Power itself is a "dirty word" and tends to be viewed as "sinister" or coercive (Depret & Fiske, 1993; Ng, 1980; Overbeck, 2010). Pfeffer (1994) suggests that people are ambivalent about conceding that power exists, because to do so would violate the common belief that organizational decisions are made based on "objective truth". Thus, individuals possessing the power motive frequently bury this drive in the unconscious and have no awareness that they are motivated by it (James and LeBreton, 2011). Leaders generally describe their motivations as having a sense of duty or service, rather than being driven to attain power over others (Winter, 1992).

Some disagree with this characterization of the power motive however. Overbeck (2010) maintains, "Power can also be seen as a universal, necessary and even inevitable force. Without power, no collection of people would be able to accomplish any end." (p. 30). Winter (1992) notes that leadership researchers "miss the mark" when classifying the seeking of power as unsavory. James and LeBreton (2011) note that power brings with it substantial obligation for others' achievement and welfare. Effective leaders work long

hours and make difficult decisions. They undertake enormous responsibility and sacrifice for group outcomes and bear the burden of blame when those outcomes are undesirable. James argues that these people seek positions of power not solely for personal gain, but because they believe they are the best and most capable to guide the organization to success. Indeed, Magee and Langer's (2008) research shows that though personalized (self-serving) power is associated with antisocial decisions, socialized (other-serving) power is associated with prosocial decisions. Thus, implicit power motive, in and of itself, is not an undesirable quality in a leader, but in fact, a psychological mechanism that impels people to seek positions in which they can most effectively and successfully control group outcomes.

Justification Mechanisms for Power

Because, power motive is typically viewed in a negative light and violates social norms, individuals with this motive typically are not aware they possess it. It exists at the unconscious level. To express power, they must rationalize their power-seeking behavior, which leads to the development of justification mechanisms (JMs) for power. Therefore, those high in power motive, known as "POs" are theorized to possess these JMs, whereas those with weak power motive, known as "NPs" would not. James and LeBreton (2011) describe four justification mechanisms for power. These JMs are described in detail in Table 2.

Table 2: Justification Mechanisms for Power

1. Agentic Bias.
When attempting to think rationally and objectively about strategic decisions, POs instinctively take the perspective of the agents or initiators of actions. Consequently, their thinking often evidences a propensity to confirm (e.g., build logical support for) the

table2continued

agents' ideas, plans, and solutions. These ideas, plans, and solutions are viewed as providing logically superior strategic decisions. The key to the Agentic Bias is the perspective from which people frame and reason. POs instinctively look down; that is, they identify with the people (like themselves) who reside in management positions, create strategic plans, and then lead others to carry out the plans. People with weak or nonexistent power motives, whom we will refer to as "NPs," instinctively look up. When thinking about strategic decisions, they take the perspectives of those lower in the organization, who are affected by the decisions and actions.
2. Social Hierarchy Orientation. Reasoning from this orientation reflects implicit acceptance of hierarchical authority structures as the primary form of human organization. Reasoning is often based on the unstated, and for many POs, unrecognized premise that disproportionate influence, privilege, and distribution of resources are rational ways of organizing and leading (as opposed to egalitarian power structures). The unstated assumptions they identify are thus likely to be supportive of the premise. An assumption such as the following is illustrative: Decisions can be made quickly without lengthy discussion or dissention. NPs on the other hand are unlikely to be supportive of the premise because they do not implicitly accept hierarchical authority structures as the primary and most natural form of human organization. In fact, they may well be disposed to reason that power structures that involve disproportionate influence, privilege, and distributions of resources often produce less than optimal decisions. The unstated assumptions they identify are thus likely to be critical of the premise.

table2continued

3. Power Attribution Bias.

Reasoning with this bias reflects a predisposition to logically connect the use of power with positive behavior, values, and outcomes. Acts of power are interpreted in positive terms such as "taking initiative", "assuming responsibility", and being "decisive". These same acts are logically associated with positive outcomes, such as organizational survival, stability, effectiveness, and success. The powerful are viewed as talented, experienced, and successful leaders. In like manner, successful leadership is rationally attributed to the use of power. The Power Attribution Bias stands in contrast to the tendency of society, including a great many NPs, to correlate the exercise of power with entitlement, corruption, and tyranny. More specifically, the power motive is held culpable for (a) placing personal gain ahead of group welfare, (b) the seeking of influence simply in order to dominate others, (c) the willingness to use threat and coercion in order to gain power, status, and entitlements, and (d) the building of organizations ruled by narcissistic tyrants who oppress, exploit, and victimize subordinates and employees. NPs who make attributions that those seeking power are dishonest or corrupt believe their framing and analyses are logical and rational. POs on the other hand are predisposed to infer that seeking power is necessary for the survival of the collective and the achievement of important goals. Basically, POs desire to engage in power clearly places them on the defensive in a climate that tends to frame power in derogatory terms. Justification mechanisms such as the Power Attribution Bias are needed to give POs ostensibly objective and rational reasons for engaging in acts of power.

table2continued

4. Leader Intuition Bias.

Decisions and actions appear more reasonable (to POs) when they are based on resources and strategies that confer power to the leader. POs are predisposed to intuitively think of strategies that confer power to themselves (or people like themselves). NPs will be significantly less prone to intuitively identity these same types of strategies as promising. What has likely happened here is that, over the years, POs selectively attended to patterns and decisions that were not only efficacious but that also involved resources that conveyed power to the leader. Examples of such resources include (a) receiving recognition for such things as being an expert or a first-mover, (b) being able to inflict pleasure (rewards) or pain (punishment) on subordinates, (c) being in the nexus of communication or influence structures; (d) being in control of resources; (e) functioning in hierarchical authority structures where one has personal responsibility for important decisions, and (f) working in cultures where the accumulation and exercise of power via forming alliances and coalitions is expected, even encouraged. The result of selective attention and learning is that strategies and actions that allow POs to develop a power base become part of their tacit knowledge structure. This tacit knowledge is accessed automatically (without awareness), which makes it appear as experience-based intuition of how to solve strategic problems. NPs may also develop tacit knowledge structures and then rely on experienced-based intuition to solve strategic decisions. However, these knowledge structures are unlikely to involve cognitive associations between effective leadership and resources that enhance the NPs' power.

These are the JMs that the power component of the CRT-L has been designed to assess. The results of early research using the CRT-L are promising (James and LeBreton, 2011). A study of 101 managers and assistant managers in large retail stores from a national chain looked at the relationship between the CRT-L and monthly profits, adjusted for store size, for each of seven months. The results indicate that approximately fifteen to twenty percent of the managers had a strong need for power (POs). Approximately seventy percent had a low or non-existent need for power (NPs). Initial validities were .44 for monthly store sales and .46 for monthly store profit. These initial results suggest the CRT-L is a promising new measure for leadership selection.

This Study

The success of conditional reasoning methods of measurement and the initial validities of the CRT-L provide a promising foundation for future exploration of the CRT-L's properties. The intent of this project was to investigate multiple aspects of validity for this measure. If this measure is to be used for selection purposes, then its predictive validity needs to be further verified. This was assessed by looking at the relationship between the CRT-L and peer nominations of leadership, power, and toxicity. Self-nominations were also collected for exploratory purposes. The CRT-L's relationship to explicit measures of leadership and aggression were assessed to explore its construct validity.

CHAPTER 4

METHODS

Participants

MBA students from a single MBA course and undergraduate psychology students from multiple psychology courses were recruited through advertising to their classes and posting the study on the School of Psychology Experimetrix website. The final sample was comprised of 186 students, 65 of whom were MBA students and 121 of whom were psychology students. Of these students, 103 were male and 75 were female. The demographic makeup of the entire sample was such that 66.84% were 18-25 years old, 22.99% were 26-35 years old, 8.05% were 36-45 years old, and 2.14% were 46-55 years old. The majority, 59.55%, was Caucasian, 6.74% were Black, 23.03% were Asian, and the remaining 10.68% were another race. There were some notable differences between the MBA and psychology students. The MBA students, whose mean age fell in the 26-35-year-old category, were older than the psychology students, whose mean age fell within the 18-25-year-old category. The MBA students were predominantly male (76.6%), whereas the psychology students had a slight majority of females (52.6%). The racial makeup of the two sets of students was comparable.

Measures

Conditional Reasoning Test for Leadership (CRT-L)

This measure consists of 25 multiple-choice reasoning problems. The measure is presented to participants as a test of reasoning ability. However, it is actually a "conditional reasoning" test, because the answer one finds most logically appealing on many of the problems is conditional on whether or not that person is a PO or NP. The first problem in Table 3, the Power item, is designed to assess the presence of an Agentic Bias.

PO Alternative

Alternative b, "The leader is strong and has definite ideas about what should be done," is designed to be logically appealing to respondents who tend to take the perspective of leaders, managers, or those who are in positions to make strategic decisions. In this problem, in addition to the mention of the leader's role in decision-making, there is also mention of the participants' involvement in decision-making. Therefore, choosing Alternative b means that the respondent is specifically choosing to relate to the leader's perspective, and not the follower's. It is believed that choosing Alternative b indicates the presence of an underlying Agentic Bias, and this implies the presence of a strong latent power motive. This reasoning process is what is known as "informal reasoning", in that reasoning focuses "less on the strict standards of formal inductive analyses and more on what POs consider reasonable or logical in real, everyday human activity" (James and LeBreton, 2011 p. 22).

NP Alternative

NPs, whose reasoning is not influenced by power JMs, tend to be skeptical of reasoning based on the Agentic Bias. NPs tend to frame situations from the perspective of the follower. In this problem, Alternative c, "The subordinates are well informed about the problem at hand," focuses on the perspective and well-being of the followers. The focus is on *the followers* being well informed, therefore choosing this response would indicate the presence of a weak power motive.

Illogical Alternatives

Because this test is presented as a traditional inductive reasoning test, there must also be clearly illogical alternatives for the problems. In this case, the Alternatives a and d are the illogical choices. The intention is to design these alternatives so that almost no respondents will choose them.

Scoring the CRT-L Power Alternatives

The majority of problems in the CRT-L assess the degree to which the four JMs for power affect the reasoning of a respondent. There are other types of problems and alternatives that will be discussed later. For the Power score, +1 is given for every PO alternative selected and 0 is given for any other alternative selected. These scores are then summed. A high Power score indicates that JMs for power are present in the respondent's reasoning process and that the respondent possesses a strong underlying power motive. A low score on the CRT-L indicates that the JMs for power are not systematically influencing the respondent's reasoning. The lack of a defensive system to justify use of power suggests that respondents have a weak power motive and are unlikely to engage in power-related decision making and behavior.

Table 3: Sample CRT-L Questions

1. Illustrative Conditional Reasoning Problem for Power

Participative leadership involves inviting subordinates to share in discussions and decision-making with their leader. Together, the leader and subordinates generate and evaluate ideas, and then attempt to reach a consensus about what should be done. Subordinates are often more committed to a course of action when they have had a chance to participate in deciding what it will be.

Based on the above, which one of the following provides the most logical reason for using participative leadership?

a. The subordinates are independent and prefer to work alone.

b. The leader is strong and has definite ideas about what should be done.

c. The subordinates are well informed about the problem at hand.

d. The subordinates are uncooperative and do not work well together.

Table3continued

2. Illustrative Conditional Reasoning Problem for Power and Toxic Leadership

After placing surveillance cameras in workplaces, employee theft usually decreases. The cameras also make many employees nervous and unhappy.

Which of the following is the most reasonable conclusion based on the above?

a. Surveillance cameras are seen as an invasion of privacy.

b. Many employees have something to hide.

c. Many companies have serious problems with employee theft.

d. Surveillance cameras were on sale last year.

Toxic Leaders

As discussed earlier, one reason previous research on leadership style has failed to predict successful leaders is because it is not the style of leadership that is primarily responsible for leader success, but the underlying motives. It is possible then, that there are many styles that could be effective depending on the influence of the leader's other personality traits. The leader may well self-select into situations in which his or her style best fits. The leader may also channel the power motive into certain behaviors based on other motives that are present. For instance, aggressive people who want to lead tend to channel their power motives into abusive and hostile behaviors that create toxic environments for their coworkers and subordinates (James and LeBreton, 2011).

One reason there is value in looking at how aggressive leaders channel their power motives is that it is likely that much of the negative sentiment about power is based on experiences with aggressive behavior. A leader with both a high power motive and a high aggression motive would be expected to engage in behavior that is damaging both to individuals in an organization and the organization itself. These behaviors include abuses of power through intimidation, threats, or force, counterproductive work behaviors, and engaging in behavior that self-aggrandizes. These people are often seen as

bullies who manipulate their subordinates for personal gain. These leaders will be referred to as "toxic". These leaders would possess JMs for both power motive and aggression motive.

Aggression components from reasoning problems from the Conditional Reasoning Test for Aggression (CRT-A) were integrated into some of the CR problems in the CRT-L. In addition to identifying POs and NPs, the CRT-L attempts to divide the POs into those who are POs and not aggressive versus those who are POs and aggressive. Therefore, there are PO alternatives without aggression (the PO alternative) and alternatives designed for PO respondents who wanted to justify the aggressive use of power (the TX or toxic alternative). The NP alternatives reflect only weak power motive and do not attempt to distinguish between aggressive and nonaggressive NPs. Finally, a single illogical alternative is included. The second problem in Table 3 illustrates a CR problem that includes PO, TX, and NP alternatives in the same reasoning task, plus one illogical alternative.

PO Alternative

The PO answer is Alternative c, "Many companies have serious problems with employee theft," which is designed to probe for the presence of an Agentic Bias. This alternative is designed to justify installing surveillance cameras from the perspective of management.

TX Alternative

The TX answer is Alternative b, "Many employees have something to hide," which is designed to assess both an Agentic Bias from power and a Hostile Attribution Bias from aggression. This alternative also attempts to justify installing surveillance cameras from the perspective of management. However, it also includes an attribution implying hostile intent by employees. Powerful respondents are anticipated to be

attracted to this answer if they also have a general propensity to sense hostile intent in the behavior of other people.

NP Alternative

The NP answer is Alternative a, "Surveillance cameras are seen as an invasion of privacy," which reflects perspective-taking from the point of view of the employees and a focus on what makes employees unhappy.

Illogical Alternative

Finally, Alternative d, "Surveillance cameras were on sale last year," is meant to be clearly illogical, as it does not logically follow from the information given in the problem.

Scoring the CRT-L Power and Aggression Alternatives

The scoring key for the CRT-L Leadership score, which includes the PO, TX, NP, and illogical alternatives, is based on a study of 101 managers and/or assistant managers of large retail stores associated with a national chain. The criteria consisted of monthly profits adjusted for store size for each of seven months. It was found that the p-values (proportions of respondents selecting an alternative) were modest for the PO alternatives (approximately 15% to 20% of the managers), lower for the TX alternatives (8% to 12%), quite large for the NP alternatives (approximately 70% of managers), and essentially nonexistent for the illogical alternatives. Correlations between responses to the CR problems and the profits criterion were estimated for the month of August. Results demonstrated that these correlations (a) were generally positive and often significant for the PO alternatives, (b) were generally negative and often significant for the TX alternatives, and (c) were generally negative and often significant for NP alternatives if the problem did not have a TX alternative, and low and nonsignificant if the problem included a TX alternative.

An empirical scoring key was built based on these results. Alternatives with significant positive correlations with profits were scored +1. Alternatives with significant negative correlations with profits were scored -1. All other alternatives were given a zero. The score on the empirical key, the Leadership score, was the sum of all the +1's and -1's.

Motivation to Lead (MTL)

This 27-item self-report measure that includes items such as " I prefer to be a leader", "I will agree to lead if I can see personal benefit", and "I feel I have a duty to lead when asked". Chan and Drasgow (2001), who developed this measure, include three scales, Affective-Identity, Noncalculative, and Social-Normative, each with nine items. Affective-Identity is considered a personal desire to lead with a strong affective tone. This motive has a strong dominance component and therefore, is the one most theoretically related to the CRT-L's implicit power motive. Noncalculative refers to motives related to personal gain. Chan and Drasgow argue that since leadership involves many costs and sacrifices, those who are not calculative, i.e. less concerned with personal gain, would be more likely to pursue leadership positions. The Social-Normative scale assesses motives to serve out of a sense of duty. This is more related to social norms and expectations. Answers are given as a range of agreement to disagreement with each statement on a 5-point Likert scale, 1 = "Strong Disagree", 2 = Disagree", 3 = "Neutral", 4 = "Agree", and 5 = "Strongly Agree". Higher scores reflect a stronger motivation to lead.

NEO Hostility Scale

The NEO Hostility scale is comprised of 29 self-report items such as "If someone wrongs you it is best to turn the other cheek" and "Most people have hidden agendas but won't admit it". This scale is a subscale of the NEO Personality Inventory Revised (NEO-PI-R) and is proposed to measure one's tendency to experience anger, frustration, or bitterness. Participants choose their agreement with each statement on a 5-point Likert

scale, 1 = “Strong Disagree”, 2 = Disagree”, 3 = “Neutral”, 4 = “Agree”, and 5 = “Strongly Agree”. Higher scores reflect higher levels of self-reported hostility.

Criteria

Peer Nominations

As part of the survey process, participants were asked to nominate three classmates for each of three categories, leadership, power, and toxicity. Most of the psychology participants had participated in group work with their classmates, and therefore, were deemed to have a sufficient level of familiarity to nominate their peers for this exercise. The MBA students had familiarity with each other through some class work and attending multiple classes with each other. These nominations were summed for each category. For the leadership nominations, the participants were given the instructions below:

> Effective leadership greatly contributes to successfully achieving group or organizational goals. Effective leaders are willing to bear responsibility for the group, to work long hours, and to make difficult decisions. These types of leaders tend to believe that they know the best way to achieve group goals and, therefore, tend to be very motivated to seek positions in which they can make the most impact. Based on this description of effective leaders, what 3 people in your course (the one you are taking this survey for) most demonstrate effective leadership?

For the power nominations, the participants were given these instructions:

> Some people have a strong desire to seek positions of influence. These people are likely to frame situations from the point of view of the person in charge, as opposed to the people who are following that person. They tend to believe groups need leaders and prefer hierarchical leadership structures, as opposed to more

collaborative leadership structures. Based on this description, what 3 people in your course (the one you are taking this survey for) most closely match this description?

For the toxicity nominations, the participants were given the following instructions:

> A "toxic" person is a person who seeks to harm others in some way. This person may do this directly (e.g. insulting someone) or indirectly (e.g. not passing along an important phone message). Toxic people often perceive people's intentions as hostile, even when others do not. These people tend to be difficult to work with and often provoke conflict when working in groups. Based on this description, what 3 people in your course (the one you are taking this survey for) most closely match the description of a toxic person?

Self-Nominations

Self-nominations, nominations in which the participant gave his or her own name when asked to nominate a classmate, were calculated for each category for exploratory purposes.

Procedure

The CRT-L, NEO, MTL, and peer nominations, which were included at the end of the NEO, were administered online using Survey Monkey. Participants were given instructions that each survey should take approximately 45 minutes and surveys taking longer than one hour would be discarded. This was to minimize participants looking up answers, researching the tests, or asking others for help. Only one survey took longer than one hour, as verified by the time stamp, and was thrown out. The measures were presented in four counterbalanced formats based on the month in which the participant

was born to minimize order effects. The mean time for participants to complete the three surveys was approximately 1.5 hours.

Data Analysis

Correlations among the measures' scores were calculated to determine the relationships among the measures and the criteria using the LISREL statistical program. This program was chosen to analyze these data because it allows for more accurate data analysis when the normal distribution assumption has been violated. Typically, scores on a number of conditional reasoning problems violate this assumption due to having skewed distributions, which previous research with the CRT-L has demonstrated. Regression analyses were conducted to determine if any of the demographic variables accounted for significant variance in the criteria. Additionally, a factor analysis was conducted to identify underlying the factor structure of this measure.

CHAPTER 5

RESULTS

CRT-L, NEO, and MTL Scores

CRT-L

Descriptive Statistics

Table 4 contains the descriptive statistics for the three measures. Across the entire sample, the CRT-L Leadership scores ranged from -6 to 8, with a mean score of .17 and a standard deviation of 2.38. The scores showed a relatively normal distribution. Approximately 8.5% of the sample scored 4 or higher and 11.1% scored -3 or below, with the remaining scores falling between these two points. The psychology students had a comparable range and distribution, 9.7% for the higher scores and 11.5 % for the lower, however, the MBA students' scores ranged from -6 to 4. They had fewer in the 4 and above range (3.1%) and a larger proportion in the -3 or below range (13.9%). A t-test determined that the psychology mean (.61) and the MBA mean (-.58) were significantly different ($t = 3.31$, $p < .01$).

The Power scores followed a similar pattern. The entire sample had a relatively normal distribution of scores, with a range of 0 to 9 out of a possible 12, a mean of 3.44 and a standard deviation of 1.37. There were 7.3% of scores falling at 6 or above and 7.3% falling at 1 or below. The psychology students had 9.7% of scores fall at 6 or above and 5.3% fall at 1 or below, whereas the MBA students had 3.1% in the higher range and 10.7% in the lower range. Again, the psychology mean (3.71) and the MBA mean (2.97) were significantly different ($t = 3.60$, $p < .01$). There was no relationship between race and the CRT-L scores. Interestingly, women had significantly higher Leadership scores ($t = 2.18$, $p < .05$) and Power scores ($t = 2.63$, $p < .01$) than men in the entire sample. The women's mean for the Leadership score was .62, whereas the men's

mean was -.16, and the women's mean for the Power score was 3.75, whereas the men's mean was 3.21.

Table 4: Descriptive Statistics for the CRT-L, NEO, and MTL

Measure	Entire Sample N = 186		Psychology Students N = 121		MBA Students N = 65	
	M	SD	M	SD	M	SD
CRT-L Leadership	.17	2.38	.61	2.41	-.58	2.13
CRT-L Power	3.44	1.37	3.71	1.39	2.97	1.21
NEO Hostility	86.63	9.28	86.90	9.94	86.13	7.95
MTL	80.53	3.13	80.81	6.41	80.05	5.57
MTL Affective-Identity	25.79	4.99	26.20	4.80	25.03	5.27
MTL Noncalculative	23.11	5.02	23.14	4.96	23.05	5.19
MTL Social-Normative	29.48	6.19	29.46	6.20	29.51	6.23

Reliabilities

The internal consistency estimate was calculated using Formula 21 taken from page 389 of Gulliksen (1950), with provisions discussed in James and LeBreton (2011). This formula is highly sensitive to the total item number. Currently, since there are only 12 scored Power items, the internal reliability is .55. Work is being done to add items to this measure, and it is expected that this will raise the reliability to acceptable levels. For instance, the mean item-total biserial correlation for these 12 items is .41. If the item number were increased to 20 while maintaining that same mean biserial, the reliability would increase to .74. Therefore, at this stage of the test development, this reliability is promising.

Factor Analysis

A principal axis factor analysis was conducted using polychoric correlations. Polychoric correlations were used to avoid underestimation of the relationships due to the

skewed data. The results suggest three underlying factors should be extracted. These factors were then rotated obliquely using promax rotation and were significantly intercorrelated. The rotated factor structure is reported in Table 5. Upon further exploration of the loadings, it appears that the first factor, with which five items had relationships, is most related to the Agentic Bias. These items reflect the tendency to frame situations from the point of view of the leader, as opposed to the follower. The second factor, with which five items were related, appears to be reflecting the Social Hierarchy Orientation. These items capture one's tendency to believe that people, and specifically organizations, should be arranged in a hierarchy as opposed to a more level or collaborative structure. The third factor, with which three items were related, captures the Leader Intuition Bias. This is the tendency to view things that confer power to the leader as positive. These factors are consistent with the underlying theory behind this measure.

Table 5: Factor Analysis of 12 Problems in the CRT-L

	Factor		
CR Problem	1	2	3
1	.491	-.247	.129
2	-.108	-.150	.495
3	-.115	-.460	.143
4	.597	.298	-.027
5	-.322	-.616	-.082
6	-.215	.460	-.235
7	-.054	.285	.518
8	-.475	.117	.110
9	.219	-.110	.660
10	-.190	.455	.397
11	.552	.081	.001
12	-.059	.284	.053

NEO

For the entire sample, the NEO Hostility Scale scores were normally distributed, with a mean of 86.83 and a standard deviation of 9.28. The lowest score was 60 and the highest 114 out of a possible 145. Both the psychology and MBA student groups had similar distributions and ranges. Men (M = 88.02, SD = 7.88) had significantly higher mean NEO scores than women (M = 84.91, SD = 7.88, t = 2.28, $p < .05$). There were also differences in score by race ($r = .224$, $p < .05$), with the scores of the Black students being significantly higher than the other racial groups.

MTL

The MTL Scale scores were normally distributed, as were the scores on the subscales, with a mean of 80.53 and a standard deviation of 3.13. The lowest score was 65 and the highest 99 out of a possible 135. Both the psychology and MBA student groups had similar distributions and ranges on the scale and subscales. There was no relationship between gender and the MTL scores or race and MTL scores.

Criteria

Three primary criteria were collected across classes, Leadership Peer Nominations (LPNs), Power Peer Nominations (PPNs), and Toxic Peer Nominations (TPNs). The descriptive statistics for these criteria can be found in Table 6. The LPNs were positively skewed (2.76), with a mean of 2.66 and a standard deviation of 4.07 and ranged from 0 to 13. Eighty participants out of the possible 186 received at least one nomination. Only 3.5% of participants received 6 nominations or higher, 41.1% received between 1 and 5 nominations, and 55.3% received 0 nominations. Both the psychology and MBA student groups had a comparable proportion of participants receiving 6 or more nominations (2.7% and 3.0% respectively), however, there was a significant difference in the means ($t = 4.16$, $p < .01$) with the psychology students' mean falling at .92 and the MBA students' mean at 1.55. This is attributable to the difference in the proportion of

students who received no peer nominations in the psychology and MBA groups (60.5% and 46.2% respectively).

The PPNs (on which 84 participants received at least one nomination) ranged from 0 to 11 and were also positively skewed (3.19) with a mean of 1.01 and a standard deviation of 1.82. The distributions of these nominations followed a similar pattern to the LPNs. The proportion of participants receiving 8 or more nominations was 2.3% across all participants, 2.7% for the psychology students, and 3.0% for the MBA students. There were 81.6% receiving 1 or fewer nominations, with the remaining receiving between 2 and 8 nominations. Again, the psychology students were more likely to receive 0 nominations (57.0%) than the MBA students (46.2%), and there was a significant mean difference between the groups (psychology M = .86, MBA M = 1.28, $t = 3.54$, $p < .01$).

There were few TPNs (on which 55 received at least one nomination) relative to the other categories. The mean number of TPNs was .50 with a SD of 1.04. The majority of participants, 69.3%, were not nominated in this category. Approximately 20% received one nomination, 9% received 2 to 4 nominations, and only 1.1% received 6 or more nominations. This distribution was positively skewed (3.54) and both subgroups had similar statistical properties.

Table 6: Descriptive Statistics for the Peer Nominations

Criterion	Entire Sample N = 186			Psychology Students N = 121			MBA Students N = 65		
	N	M	SD	N	M	SD	N	M	SD
LPNs	80	2.66	4.07	45	.92	1.75	35	1.55	2.19
PPNs	84	1.01	1.82	49	.86	1.66	35	1.28	2.06
TPNs	55	.50	1.04	35	.60	1.36	20	.45	.80

Note: N refers to the number of students who received at least one nomination

For exploratory purposes, self-nominations were calculated for each category. These are instances in which a participant nominated his- or herself for a category. The descriptive statistics for these nominations can be found in Table 7. Very few people nominated themselves, so there is little to expand on in this category. There are some interesting relationships between these variables and the peer nominations that will be discussed in a later section.

Table 7: Descriptive Statistics for the Self-Nominations

Criterion	Entire Sample N = 186			Psychology Students N = 121			MBA Students N = 65		
	N	M	SD	N	M	SD	N	M	SD
LSNs	18	.11	.37	14	.14	.42	4	.06	.24
PSNs	7	.07	.36	6	.09	.41	1	.03	.25
TSNs	4	.03	.26	4	.05	.32	0	.00	.00

Note: N refers to the number of students who had at least one self-nomination

Relationships among the Measures

Correlations among Personality Measures

One of the more well known, and at times confounding, relationships among personality measures is the consistently low correlation between implicit and explicit personality measures of the same trait (Bornstein, 2002; Bosson, 2000; Farnham et al., 1999; McClelland et al., 1989; Oakes, 2008; Winter et al., 1998). Numerous studies have demonstrated that they typically show little to no relationship with each other. One possible reason for this is that, for reasons discussed earlier, the self-report explicit measures have substantial error in measurement, which contaminates the scores and results in low convergent validity with implicit measures (Bosson, 2002; Farnham et al., 1999).

Over time, however, researchers have come to believe that these two categories of measures may actually measure two unrelated components of personality, the implicit and the explicit (McClelland et al., 1989). Winter et al. (1998) contend that the implicit motive provides the energy to behave in a relatively stable fashion across time, whereas the explicit motive provides a variety of options about how to express that motive and is under the influence of varying external factors. In other words, the implicit motive is related to initiation of behavior, and explicit motive is related to direction of behavior. Because there are so many options as to how the motive is expressed, one would not expect a high correlation between the two.

Since the NEO is an explicit measure of hostility (aggression) and the MTL is an explicit measure of dominance-based leadership that contains elements of aggression and potency, it was expected that they will have a significant and positive relationship. Because the CRT-L is an implicit measure, it would not be expected to have as strong a relationship with either of the explicit measures as they have with each other. Therefore:

Hypothesis 1: The NEO and the MTL will have a stronger (positive) relationship with each other than either measure will have with the CRT-L.

This hypothesis was supported. The correlation between the NEO and MTL was .42 ($p < .01$), indicating a significant positive relationship. The relationship between the CRT-L Leadership score and the NEO was negative ($r = -.16$, $p < .05$) as was its relationship with the MTL ($r = -.16$, $p < .05$). Steiger's z-test was used to compare the correlations and the NEO-MTL relationship is stronger than either the CRT-L-NEO or CRT-L-MTL relationship ($z = -5.83$, $p < .05$). Two of the three MTL subscales (Affective-Identity and NonCalculative) had significant positive relationships with the NEO, but none of the subscales had any relationship with the CRT-L. This is consistent with findings of other conditional reasoning test research, which regularly demonstrates

little or no relationship between conditional reasoning tests and explicit measures of parallel constructs. It is also consistent with the tendency of explicit measures of similar constructs to have significant positive relationships with each other. The CRT-L Power scores had no significant relationship with either the NEO or the MTL. This result is also consistent with prior findings that implicit and explicit measures tend to not have strong relationships. These correlations can be found in Table 8. This same pattern occurred in the Psychology subgroup. These validities are reported in Table 9. Due to the relatively small sample size of the MBA subgroup, some of the validities do not reach the level of significance, however a similar pattern of relationships among the measures was found. These validities are reported in Table 10.

Table 8: Zero-Order Correlations for Entire Sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CRT-L Leadership	-												
2. CRT-L Power	0.85**	-											
3. NEO	-0.16*	-0.14	-										
4. MTL Total	-0.16*	-0.12	0.42**	-									
5. MTL Affective-Identity	0.02	0.06	.018*	0.66**	-								
6. MTL Noncalculative	-0.08	-0.03	0.40**	0.54**	0.71**	-							
7. MTL Social-Normative	-0.06	0.01	0.10	0.69**	0.77**	0.58**	-						
8. LPNs	0.25**	0.22**	0.00	0.08	0.12	0.02	0.11	-					
9. PPNs	0.21**	0.22**	0.10	0.13	0.14	0.02	0.09	0.78**	-				
10. TPNs	-0.03	0.03	0.11	0.16*	-0.11	-0.19**	-0.06	0.32**	0.45**	-			
11. LSNs	.0.09	0.01	-0.10	-0.02	0.03	0.04	0.01	0.17*	0.07	0.16*	-		
12. PSNs	-0.03	-0.03	-0.04	0.02	0.05	0.02	0.02	0.04	0.07	0.15*	0.58**	-	
13. TSNs	0.03	-0.04	-0.11	-0.08	0.03	-0.04	0.03	0.05	0.07	0.19*	0.62**	0.70**	-

*Note: * indicates correlation is significant at the .05 level (2-tailed). ** indicates correlation is significant at the .01 level (2-tailed).*

Table 9: Zero-Order Correlations for Psychology Students

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CRT-L Leadership	-												
2. CRT-L Power	0.88**	-											
3. NEO	-0.19*	-0.17	-										
4. MTL Total	-0.19*	-0.12	0.45**	-									
5. MTL Affective-Identity	0.08	0.04	0.26**	0.67**	-								
6. MTL Noncalculative	-0.14	-0.02	0.54**	0.55**	0.71**	-							
7. MTL Social-Normative	-0.14	-0.01	0.20*	0.73**	0.77**	0.55**	-						
8. LPNs	0.37**	0.43**	-0.01	0.17	0.13	0.06	0.10	-					
9. PPNs	0.38**	0.46**	0.03	0.09	0.16	0.09	0.05	0.83**	-				
10. TPNs	0.06	0.06	-0.02	0.16	0.03	0.03	0.12	0.46**	0.42**	-			
11. LSNs	0.03	-0.05	-0.14	-0.02	0.04	0.00	0.02	0.21*	0.13	0.37**	-		
12. PSNs	-0.11	-0.13	-0.06	0.00	0.04	0.01	0.02	0.12	0.10	0.26**	.70**	-	
13. TSNs	0.00	-0.09	-0.14	-0.10	0.02	-0.05	-0.05	0.09	0.11	0.32**	.67**	.77**	-

*Note: * indicates correlation is significant at the .05 level (2-tailed). ** indicates correlation is significant at the .01 level (2-tailed).*

Table 10: Zero-Order Correlations for MBA Students

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CRT-L Leadership	-												
2. CRT-L Power	0.76**	-											
3. NEO	-0.15	-0.13	-										
4. MTL Total	-0.14	-0.20	0.34**	-									
5. MTL Affective-Identity	0.09	-0.01	0.02	0.67**	-								
6. MTL Noncalculative	0.00	-0.01	0.13	0.54**	0.71**	-							
7. MTL Social-Normative	0.08	0.04	-0.11	0.60**	0.77**	0.63**	-						
8. LPNs	0.19	0.02	0.04	-0.04	0.17	-0.02	0.13	-					
9. PPNs	0.05	-0.04	0.23	0.22	0.17	-0.06	0.16	0.71**	-				
10. TPNs	-0.10	0.05	0.32*	0.17	-0.22	-.40**	-0.22	0.21	0.48**	-			
11. LSNs	0.19	0.11	0.03	-0.06	-0.04	0.14	-0.03	0.17	-0.04	-0.11	-		
12. PSNs	0.15	0.21	0.05	0.07	0.05	0.05	0.03	-0.09	0.04	0.04	-0.03	-	
13. TSNs	a	a	a	a	a	a	a	a	a	a	a	a	a

*Note: * indicates correlation is significant at the .05 level (2-tailed). ** indicates correlation is significant at the .01 level (2-tailed).*
Note: a indicates correlation cannot be computed because at least one of the variables is constant.

Criterion-related Validity

Peer Nominations

One somewhat unique aspect of leadership is that it is inextricably tied to those who follow. One cannot lead without effectively convincing others to fall in line with one's vision and goals. Therefore, others' perceptions of an individual as a leader would be an important indicator of effective leadership. Peer nominations were chosen as criteria because they provide feedback from a large number of participants on which students are perceived to be the most effective leaders, the highest in power motive, and the most toxic (aggressive). There is evidence that, when peer nomination questions are constructed to be as specific as possible, peer nominations, can predict behavior more accurately than self-report measures. This was demonstrated by Henry (2006) when peer nominations and instructor ratings predicted physical aggression, verbal aggression, initiation and disruptive behavior, whereas self-report measures of aggression had no relationship to these behaviors. Therefore:

Hypothesis 2: The CRT-L will have a stronger positive relationship with the Leadership Peer Nominations (LPNs) than either the NEO or MTL will have with the LPNs.

For each category the total number of peer nominations was calculated. The total Leadership Peer Nomination (LPN) score positively correlated .25 ($p < .01$) with the CRT-L score. The NEO and the MTL (and its subscales) had no relationship to any of the leadership nominations. Additionally, the CRT-L Power scores significantly predicted the LPNs with a validity of .22 ($p < .01$). Therefore, this hypothesis is supported. The CRT-L does have a stronger positive relationship with the LPNs than either of the other measures (NEO and CRT-L, $z = 2.44$, $p < .01$; MTL and CRT-L, $z = 1.68$, $p < .01$).

The psychology subgroup had stronger relationships between the CRT-L Leadership scores and LPNs (r = .37, p < .01) and the CRT-L Power scores and LPNs (r = .43, p < .01), than the MBA subgroup, which had no significant relationship among any of these variables. Both subgroups had no relationships between either the NEO or the MTL with the LPNs.

Because the CRT-L is primarily composed of implicit power items, and power is a socially undesirable motive that is likely to be unconscious, it should predict the Power Peer Nominations (PPNs) better than the explicit measures, therefore:

Hypothesis 3: The CRT-L will have a stronger positive relationship with the Power Peer Nominations (PPNs) than either the NEO or MTL will.

The results support the CRT-L's prediction of PPNs. The CRT-L Leadership score had a validity of .21 (p < .01) with the PPNs and the CRT-L Power score's validity was .22 (p < .01). The MTL (as well as its subscales) and the NEO had no significant relationship with the PPNs. There the CRT-L had a stronger relationship with the PPNs than either the NEO (z = 1.75, p < .01) or the MTL (z = 1.66, p < .05). Again, the psychology subgroup had stronger relationships between the CRT-L Leadership score and the PPNs (r = .38, p < .01) and the CRT-L and the LPNs (r = .46, p < .01), than the MBA subgroup which had no significant relationship among any of these variables.

Toxicity Nominations

Currently, it is unclear how well the CRT-L predicts toxicity, therefore, Toxicity Peer Nominations (TPNs) were collected for exploratory purposes. The number of TPNs was substantially lower than the number of nominations for other categories limiting inferences that can be made about this variable's relationship to the others. There was no

significant relationship between the CRT-L or the NEO and TPNs. However, there was a significant positive relationship between the MBA total score and the TPNs ($r = .16$, $p < .05$) as well as a significant negative relationship between the MTL Noncalculative score and the TPNs ($r = -.19$, $p < .01$). The psychology subgroup had no significant relationship among any of these variables. The MTL subgroup, however, had a significant positive relationship between the NEO and TPNs ($r = .32$, $p < .01$) and a significant negative relationship between the MTL Noncalculative scale and TPNs ($r = .40$, $p < .01$).

Self-Nominations

Ad hoc calculations of self-nominations were also conducted for exploratory purposes. These tended to be relatively rare in this sample, however there were some noteworthy patterns. None of the measures predicted the Leadership Self-Nominations (LSNs), Power Self-Nominations (PSNs), or Toxic Self-Nominations (TSNs) in the entire sample or either of the subgroups. The LSNs (listing oneself in the nomination field) were positively correlated ($r = .17$, $p < .05$) with the Leadership Peer Nominations (LPNs), suggesting modest but significant agreement between these people's perceptions of themselves and other's perception of them as effective leaders. Another interesting finding was that all three self-nomination variables, LSNs, PPNs, and TSNs were positively correlated with Toxicity Peer Nomination (TPNs) ($r = .16$, $r = .15$, $r = .19$, $p < .05$, respectively).

Demographic Variables

Regression analyses were conducted with the demographic variables to determine if they had any impact on the variance of the criteria. Neither race nor gender significantly accounted for the variance in any of the criteria.

CHAPTER 6

DISCUSSION

The CRT-L has shown initial promise in accurately predicting effective leaders and leader outcomes, however it is a work in progress and there were many questions raised in this project that require further investigation. One somewhat surprising finding is that the MBA students, who are older, more experienced, and presumably more likely to be in leadership positions in industry, had significantly lower CRT-L Leadership and Power scores than the younger psychology undergraduates. This may seem counterintuitive, as MBA students are often extending their education specifically because they wish to advance up the leadership ladder in their organization. However, prior conditional reasoning research provides some support for this finding.

A study was conducted in an MBA student population at a large Southeastern university using a conditional reasoning measure for the Achievement Motive (James and Rentsch, 2004). Achievement Motive (AM) is a motive to accomplish difficult tasks. People high in this motive persistently seek out opportunities to achieve, and they endure substantial obstacles and hardships to do so. The counterpart to Achievement Motive is Fear of Failure (FF). People high in Fear of Failure tend to avoid difficult tasks and develop Justification Mechanisms that help them reason that this avoidance is logical and preferable. In this study, whether students signed a petition to change the MBA program format from individual work (preferred by those high in AM) to a group format (preferred by those high in FF) was related with a correlation of -.62 to a conditional reasoning measure of AM and FF. This correlation indicated that, as would be expected, those high in AM were less likely to sign the petition, while those high in FF were more likely to do so. The interesting aspect of this study was the large portion of the MBA student body (approximately 67%) that had scores high in FF. This was a surprising

result at the time, but it highlights that traits typically attributed to MBA students may not, in fact, be the traits that they possess.

As to why one might find that MBA students would have lower leadership scores than undergraduates, there are several possible explanations. One possibility is that those very high in leadership motive would be less likely to pursue an extended higher education because they feel they can make a greater impact elsewhere. These people may be more motivated to create their own opportunities and follow their own visions than to study the methods of others. Another possibility is that leadership motive may diminish with age. The mean age of the undergraduates fell within the 18-25 year range, whereas, the mean age for the MBAs fell within the 26-35 year range. Unfortunately, due to how the age data were collected, it was not possible to analyze with confidence the relationship of age to the leadership or power motives, though there is some indication that these motives are negatively related to age. Finally, due to the current economic stresses, many people are going back to school either to be more competitive in the job market or because they cannot currently find employment. Therefore, current MBA students may not reflect the type of leadership-oriented student who traditionally pursues this degree.

Another interesting finding is that women had significantly higher CRT-L Leadership and Power scores than men across the entire sample. This appears to be driven largely by the psychology students, who had 52.6% females compared to the MBA students who has only 23.4% females. There were significant mean differences between the psychology and MBA female student's CRT-L Leadership scores (M = .95, M = -.63, respectively, $t = 2.49$, $p < .01$) and the CRT-L Power scores (M = 4.08, M = 2.50, respectively, $t = 4.52$, $p < .01$). There were no significant mean differences between male psychology and MBA students for either the CRT-L Leadership or Power scores. It was unknown if there would be gender differences in implicit leadership motive, but based on gender stereotypes, one might arguably expect women to be lower in power.

Perhaps in this case women with high power motive seek out higher education, at least at the undergraduate level, to enhance their credibility in the workplace and be more competitive with men, who have traditionally held positions of power. High power men may not be as likely to pursue even a bachelor's degree, since they tend to be more commonly afforded positions of power. However, women may not progress onto an MBA, because they can find other means to pursue power and impact that are more aligned with their goals than continuing their education, or they may pursue other types of advanced degrees.

The next curious discovery was that though the psychology students had higher CRT-L Leadership and Power scores than the MBA students, they had lower mean Peer Leadership and Power Nominations. This was in large part because psychology students were less likely to receive peer nominations than MBA students. The data were standardized and reanalyzed, and this made no difference in the results. The MBA class was smaller than most of the psychology classes. Additionally, MBA students tend to take several classes together as part of their program, whereas many of the students in the psychology subgroup are not psychology majors and are less likely to take a several courses with the same students. Therefore, this may simply reflect a difference in familiarity among the students within the subgroups. Another possibility is that the MBA students are more primed to see their fellow classmates as leaders, since many are in leadership positions in industry and the program strives to do training in leadership.

Finally, the Toxic Peer Nominations (TPNs) were relatively low compared to the other peer nomination categories. It would be interesting to explore if this is because toxicity is a relatively rare or if people are hesitant to list others as being toxic for some reason. It is known that implicit aggression, as measured by the CRT-A is relatively rare, with high scoring CRT-A individuals making up only about eight to 12 percent of the population. As mentioned earlier, the TPNs had significant positive relationships with all three of the self-nomination categories. This could indicate that those who are prone to

seeing themselves as leaders may be seen as toxic by others. As further development occurs with the CRT-L, the aggression component should be disentangled from the power component to allow for further investigation of how toxicity behaves in leaders.

Attempting to compare the validities across the subgroups is difficult, because the relatively small size of the MBA diminished the power of the analyses for that subgroup. In general, both subgroups had similar patterns of relationships among the measures. The NEO and MTL were both negatively correlated with the CRT-L and significantly and positively correlated with each other. This was the expected pattern. Both the CRT-L Power and Leadership scores predicted the Leadership Peer Nominations (LPNs) and the Power Peer Nominations (PPNs) in the psychology subgroup. These relationships were not significant in the MBA subgroup. One noticeable difference between the subgroups is that the MBA subgroup NEO score significantly (r = .32, $p < .05$) predicted the Toxic Peer Nominations (TPNs). There was no significant relationship in the psychology subgroup. Another difference is in the relationship between the MTL Noncalculative score and the TPNs. Again the psychology group showed no relationship whereas the MBA group had a significant negative relationship (r = -.40, $p < .01$) between the two. It is unclear why there would be these differences. It is interesting that in both cases an explicit measure predicted reports of toxicity by peers. This will require replication and further investigation before conclusions can be drawn about why these differences among the subgroups exist.

Limitations and Future Research

This study did have limitations. The criteria used were primarily subjective. While this is somewhat appropriate for leadership research, in that people's subjective opinions of leaders are relevant, it does open the door to contamination and error in the criteria. Additionally, conditional reasoning tests tend to have the strongest relationship with objective data. Many of the correlations in this study were modest (.10-.20) and fully developed conditional reasoning tests have the potential to predict criteria in the .30-

.40 range and higher. So, future research should explore how well the CRT-L predicts objective variables that are associated with leader success, such as sales, revenue, or turnover.

Another limitation is that, due to practical constraints and sample pool availability, the data only reflect those students who participated in this study. It is possible that there were students with high power motive, who were not as academically motivated to participate, on whom data were not collected. In other words, the best leaders may not be reflected in this data set. They may have been other students in the class who for a variety of reasons chose to not participate in this study. Additionally, the peer nomination process could have been contaminated by memory or familiarity issues, as the participants may not know other students by their full names. This was somewhat mitigated by the availability of a student directory and discussion with instructors to help identify individuals who were only listed by their first or last names, nicknames, or names that were misspelled.

Finally, it would be exciting to explore a channeling model of leadership. Regression analyses incorporating interactions between the implicit and explicit measures yielded no significant results. The outcome may be different with other criteria, particularly if both objective and subjective criteria are used. Previous research with the CRT-A has demonstrated that specific types of aggressive behavior can be predicted based on the patterns of explicit and implicit aggression scores (Frost, Ko, & James, 2007). It would be interesting to see how a person with a high implicit power motive, but a low *explicit* power motive manifests those motives.

Overall, the CRT-L did behave as expected in relation to the other measures, which provides evidence for its validity. The CRT-L scores also followed the expected pattern of relationships with the criteria, providing evidence of the CRT-L's criterion-related validity. The questions elicited from this study provide many opportunities to

further explore the CRT-L's properties. As it continues to be tested and refined, it will offer a valuable alternative to other forms of leadership prediction currently available.

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