

Contents lists available at [ScienceDirect](#)

## The Leadership Quarterly

journal homepage: [www.elsevier.com/locate/leaqua](http://www.elsevier.com/locate/leaqua)

# Personality and Leadership Developmental Levels as predictors of leader performance

Sarah E. Strang<sup>\*</sup>, Karl W. Kuhnert

Department of Psychology, The University of Georgia, Athens, GA 30602-3013, United States

## ARTICLE INFO

Available online xxxx

### Keywords:

Leadership  
Constructive-developmental theory  
Big Five personality  
360-degree feedback  
Leader performance

## ABSTRACT

This study is an empirical investigation of constructive-developmental theory as a theoretical framework for understanding leadership and as a predictor of 360-degree leader performance ratings. Constructive-developmental stage (conceptualized as Leadership Developmental Level) was found to predict performance ratings from all rater sources (superiors, peers, and subordinates). Furthermore, the predictive ability of Leadership Developmental Level is compared to that of Big Five personality dimensions in a model of 360-degree leader performance ratings. Leadership Developmental Level was found to account for a unique component of the variance in leader performance as rated by peers and subordinates, even above and beyond that which can be accounted for by personality.

© 2009 Elsevier Inc. All rights reserved.

## 1. Introduction

Studies of leadership consistently report that leadership ability is directly linked to subordinate performance, behaviors, and reactions including job satisfaction, positive mood, affective commitment to the organization, reduced turnover, reduced withdrawal behaviors, improved work performance, pursuit of more challenging goals, goal attainment, perseverance, greater resistance to stress, and value of progress (Bass, 1990; Gardner & Schermerhorn, 2004; Hogan, Curphy, & Hogan, 1994; Hughes, Ginnett, & Curphy, 1993; Luthans & Avolio, 2003; Yukl, 1989). Furthermore, subordinate reactions to inept leadership have been found to include turnover, malingering, insubordination, and industrial sabotage (Bass, 1990; Hogan et al., 1994; Hughes et al., 1993). The links between leadership and subordinate reactions (e.g., Rhoades & Eisenberger, 2002; Shaw, Duffy, & Johnson, 2005; Vandenberghe, Bentein, & Stinglhamber, 2004) make a convincing argument for the need for more than empirical associations, but deeper theoretical understanding of the leader (McCauley, Drath, Palus, O'Conner, & Baker, 2006).

The purpose of this study is to investigate the application of constructive-developmental theory in the study of leadership, answering a call for systematic empirical studies using constructive-developmental theory to further the understanding of leadership (McCauley et al., 2006). Differences in leader performance as a function of Leadership Developmental Level (constructive-developmental stage) are investigated. Leadership Developmental Level (LDL) is tested as a predictor of leader performance. In addition, this study is an attempt to understand what unique contribution the use of constructive-developmental theory may add to our current understanding of leadership. In order to do this, the predictive ability of constructive-developmental theory is compared to that of a known predictor of leader performance: Big Five Personality. This comparison allows us to answer the question, "Can LDL tell us anything about a leader's performance that we couldn't find out through a test of personality?" Only after answering this question can we begin to understand and measure those qualities that make leadership distinct from other constructs such as personality.

### 1.1. Leadership and constructive-developmental theory

Constructive-developmental theory explains individual differences as a function of the way individuals construct or organize experiences relating to themselves and their social/interpersonal environments (Kegan, 1982; Kuhnert & Lewis, 1987). According

<sup>\*</sup> Corresponding author.

E-mail addresses: [sestrang@gmail.com](mailto:sestrang@gmail.com) (S.E. Strang), [kkuhnert@uga.edu](mailto:kkuhnert@uga.edu) (K.W. Kuhnert).

to Kegan (1982), individuals must compose and internally experience events and situations in order for them to exist psychologically. Constructive-developmental theory outlines six discrete stages of human development, each representing a different way of understanding the world; each stage results in a new way of making meaning of experiences and a new form of self-expression (Kegan, 1982; Kegan & Lahey, 1984; Merron, Fisher, & Torbert, 1987; Rooke & Torbert, 2005).

Kegan (1982) used two internal structures to define each constructive-developmental stage: these structures are called *subject* and *object*. The subject is the process through which individuals organize and understand their experience; it is the lens through which the world is viewed and the rule by which it is defined (Kegan, 1982). The subject is very basic to human functioning—so basic, that people are typically unaware of it and unable to take perspective on it (Kuhnert & Lewis, 1987). The object is the content of the experience that is organized and understood by way of the subject (Kegan, 1982). As one develops from one stage to the next, what was previous subject becomes object. This means that one gains the ability to take perspective on what was previously an organizing process; as stated by Kuhnert & Russell (1990), “individuals are able to see and reflect upon the way that they previously organized their experience, rather than being defined by it” (p. 599) (see Table 1). Constructive-developmental theory conceptualizes the process of development as a life-long journey, contingent upon time, experience, change, and perspective. All individuals develop from one stage to the next without skipping stages, and it is not possible to regress from a higher level to a lower level because once a person is able to take perspective on his/her lens (subject), this lens can no longer be the framework for viewing the world. Although all individuals progress through the same stages in the same order, the rate and catalysis of development, as well as the capacity (maximum level) of development varies among individuals. In general, as individuals develop through the constructive-developmental stages, their self-definition changes from externally-defined to internally-defined, their interpersonal focus changes from self to others, and their understanding of the world changes from simple to complex.

A recent review of leadership literature specifically focuses on stage theories of adult development as a framework for the study of leadership (McCauley et al., 2006). This review specifically highlights constructive-developmental theory, discussing some thirty-some studies which employ this framework to further our understanding of leadership and to study many aspects of leader effectiveness and leader performance. In one of these studies, Kuhnert & Lewis (1987) applied constructive-developmental theory to the study of leadership, arguing that a leader’s constructive-developmental stage (method of meaning-making) may be the source of transactional and/or transformational leadership behaviors. In a related study, Eigel & Kuhnert (2005) further conceptualized the relationship between constructive-developmental theory and leadership capacity. According to this conceptualization, constructive-developmental stage is analogous to Leadership Development Level (LDL) and is defined as the “measurable capacity to understand ourselves, others, and our situations” (Eigel & Kuhnert, 2005; p. 359). For the purposes of this study, the same conceptualization of leadership employed by Eigel & Kuhnert (2005) is used: LDL will be used to refer to a leader’s constructive-developmental stage and will serve as a measure of a leader’s capacity to lead others.

Although Kegan (1982) outlines six stages, only four of these (LDLs two through five) pertain to adult development, and are applicable to the study of leadership (Kuhnert & Lewis, 1987) (see Table 1). At *LDL two*, the subject is personal goals and agendas; this means that for people in level two, experiences, events, and feelings are evaluated in terms of whether or not their own personal goals are fulfilled. At *LDL three*, individuals are able to take perspective on their personal goals and agendas (this former subject becomes the object) and their new subject is interconnectedness. At *LDL three*, individuals have learned how to override their own goals in order to remain connected to others, and so for this group, mutual support, promises, and expectations are of key importance. At *LDL four*, individuals gain the ability to take perspective on their goals and interpersonal connections (these become the object), while operating out of a personal value system. Leaders operating at *LDL four* are able to transcend the personal needs of self and others (thus risking interpersonal harmony) in order to operate according to their personal value system. At *LDL five*, individuals are able to take perspective on their own personal value systems from the vantage point of a new subject; this new subject is a value system with a wider base, composed less of personal values and more of values pertaining to the well-being of broader entities, such as an organization, an industry, or even a society (Kegan, 1982). Kuhnert & Lewis (1987) summarize the process of development:

Throughout this developmental process (which extends into adulthood for most individuals), there is an expansion of people’s abilities to reflect on and understand their personal and interpersonal worlds. This expansion is made possible by an increasing differentiation of oneself from others and by simultaneously integrating the formerly undifferentiated view into a more complex and encompassing view (p. 651).

Constructive-developmental theory provides a framework for understanding the ways in which leaders construct meaning (for themselves and for others), through which we might gain a more complete understanding of how these differences affect performance. Constructive-developmental theory proposes that people with more advanced levels of development are able to

**Table 1**  
Subject–object relations in constructive-developmental theory.<sup>a</sup>

CD stage/LDL	Subject (organizing process)	Object (content of experience)
Two	Personal goals and agenda	Immediate needs and feelings
Three	Interpersonal connections	Personal goals and agenda
Four	Personal standards and value system	Interpersonal connections
Five	Openness and paradox	Personal standards and value system

CD = constructive-developmental.

<sup>a</sup> From “Transactional and Transformational Leadership: A Constructive-developmental Analysis,” by K. W. Kuhnert & P. Lewis, 1987, *Academy of Management Review*, 12, p.652. Adapted with permission of the authors.

understand and influence people at or below their levels of development because they have the ability to operate at other levels and adopt the developmental perspectives of those at lower levels of development. Previous research findings suggest that a person's level of development does impact leader performance as evidenced by personal and organizational outcomes. For example, [Rooke & Torbert \(1998\)](#) found that the ego development stage (LDL) of a company's Chief Executive Officer and his/her senior advisors is a critical variable in successful organizational transformation; [Barlow, Jordan, & Hendrix \(2003\)](#) found that students in the U.S. Air Force Air University displayed significantly higher character development (selflessness, self-understanding, integrity) at each increase in rank and level in their respective programs. Perhaps it is logical to begin this investigation by examining the possibility of differences in leader performance scores as a function of LDL: Do leaders at different developmental levels perform differently?

### H1. Mean performance ratings will differ as a function of a leader's LDL.

While an understanding of performance differences between LDLs is descriptive and important for gaining a full understanding of the concept, a logical next step in these analyses is to understand whether LDL might be used to predict or infer a leader's performance: in other words, once we know *if* LDL matters, the following question is, "How does it matter?" [Harris & Kuhnert \(2006\)](#) found LDL to be predictive of 360-degree feedback; this study attempts to replicate that finding for the purpose of demonstrating the potential utility of constructive-developmental theory and establishing a foundation for the remainder of the study.

### H2. LDL will significantly predict leader performance.

#### 1.2. Personality and the "Big Five" Model

[Hogan, Hogan, & Roberts \(1996\)](#) argue that "it is not *what* a person does, but *how* he or she does it (e.g., calmly, creatively, attentively, etc.) that determines effective performance" (p. 473). Perhaps one reason that personality has been used as a framework for understanding leadership is because behavior is a function of personality—what people do is a function of who they are ([Hogan et al., 1996](#); [Mount & Barrick, 1998](#); [Ployhart, Lim, & Chan, 2001](#); [Smither, London, & Richmond, 2005](#)). Perhaps another reason for the employment of personality theories in leadership studies is because personality has a trait-like nature: personality is consistent across adulthood and has longitudinal predictive power ([Conley, 1984](#); [Conley, 1985](#); [Costa & McCrae, 1988](#); [Finn, 1986](#); [Gough & Heilbrun, 1983](#); [Helson & Moane, 1987](#); [Helson & Wink, 1992](#)).

The "Big Five," or the five-factor model (FFM) of personality, is a well-established and frequently-used measure of normal personality. The Big Five is a comprehensive method for the systematic exploration of global personality; many personality researchers now agree that the existing personality inventories all measure essentially the same five broad dimensions with varying degrees of efficiency ([Hogan et al., 1996](#); [McCrae & John, 1992](#)). As stated by [Digman \(1990\)](#):

At a minimum, research on the five-factor model has given us a useful set of very broad dimensions that characterize individual differences. These dimensions can be measured with high reliability and impressive validity. Taken together they provide a good answer to the question of personality *structure* (p.436).

The Big Five has been heavily researched and is consistently found to account for nearly all systematic variance in personality inventory responses, based upon either self-ratings or ratings by persons who know the target well ([Costa & McCrae, 1992a](#); [Goodstein & Lanyon, 1999](#); [McCrae & Costa, 1987](#)); these results are consistent regardless of which approach to factor analysis is taken ([Goldberg, 1982](#); [Goodstein & Lanyon, 1999](#)). It has been demonstrated that results show convergent and discriminant cross-observer and cross-instrument validity for all five factors ([McCrae & Costa, 1987](#)). Furthermore, the Big Five can be profitably used in most applied settings (such as selection systems) and the results are efficient and straightforward, providing at least a general description of personality with as few as five scores ([McCrae & John, 1992](#)). The Big Five model of personality has been chosen in lieu of other conceptualizations of adult personality because its theoretical support, empirical strength, real-world utility, and wide-spread use in applied settings make the Big Five a good fit for the needs and intentions of this study.

For the purposes of this study, a common conceptualization of the Big Five has been used, whereby the five personality dimensions are referred to as *Extraversion*, *Agreeableness*, *Conscientiousness*, *Neuroticism*, and *Openness to Experience*. Generally speaking, Extraversion is the extent to which a person is active, assertive, energetic, enthusiastic, outgoing, and talkative. Agreeableness is the extent to which a person is appreciative, forgiving, generous, kind, sympathetic, and trusting. Conscientiousness is the extent to which a person is efficient, organized, reliable, responsible, and thorough. Neuroticism is the extent to which a person is anxious, self-pitying, tense, touchy, unstable, and worrisome. Openness to Experience is the extent to which a person is artistic, curious, introspective, imaginative, insightful, original, and has a wide range of interests.

Research indicates that Conscientiousness, Extraversion, and Openness to Experience should be the dimensions of primary interest to those investigating the predictive ability of Big Five personality in a model of leader performance. In a widely-cited meta-analysis, [Barrick & Mount \(1991\)](#) found that Conscientiousness correlates positively with job performance in five broad occupational groups, which may indicate that individuals who are dependable, persistent, goal-directed, and organized tend to be higher performers on any job ([Barrick & Mount, 1991](#)). They also found that Extraversion correlates positively with job performance in two of the occupational groups—management and sales—where interactions with others make up a significant portion of the job ([Barrick & Mount, 1991](#)). [Ployhart et al. \(2001\)](#) found that Extraversion and Openness to Experience predict performance specifically in leadership contexts. Furthermore, Openness to Experience is thought to resemble intellect and is notably correlated with general cognitive ability, which has been found to correlate with leadership emergence and perceptions of leadership ([Bass, 1990](#); [Bass, 1997](#); [Judge & Bono, 2000](#); [Lord, DeVader, & Alliger, 1986](#); [McCrae & Costa, 1987](#)). Based on relevant

literature, it follows that the known relationships between personality and leader behaviors should be synthesized and systematically assessed in the context of a study that focuses specifically on leadership (as opposed to general job performance):

**H3.** Conscientiousness, Extraversion, and Openness to Experience will significantly predict leader performance.

### 1.3. Constructive-developmental theory and Big Five personality

McCauley et al. (2006) call for an increase in the number and quality of links between leadership research founded in constructive-developmental theory and other lines of leadership literature, such as the leadership–personality interface. This paper seeks to meet the need for clarifying the concurrences and distinctions between separate lines of leadership research by exploring the relationship between constructive-developmental theory and Big Five personality.

As a preliminary step toward understanding the intersection of personality and constructive-developmental theory—specifically, whether there are differing levels of Big Five personality dimensions captured by each Leadership Developmental Level—an exploratory hypothesis is proposed:

**E1.** Mean scores on the Big Five personality dimensions will differ as a function of a leader's LDL.

This exploration is an important step toward understanding how these two lines of research might relate. Are they redundant, separate, or complementary in any way? By clarifying any existing distinctions between the two, it is hoped that we will achieve some clarification about what each of these theories can uniquely offer to the understanding and study of leadership.

For example, LDL and personality theory share the belief that the primary source of leadership is inherent in the person, not the situation. It is not the case that the situation is unimportant to leadership—it is just not the primary focus in understanding leader behavior. The fundamental difference between LDL and personality theory is that LDL is grounded in the growth and maturity of leaders across the life span whereas the basis of personality theory is in innate, stable yet complex attributes of leaders. Do leaders systematically grow in their ability to lead others or is personality destiny? It is not in the scope of this paper to test LDL against personality theory as a way to explain leader behavior, but this study does empirically examine whether LDL captures something unique, a quality above and beyond that which can be described or explained by personality theory with the data gathered in this study. The dominant frame for contemporary leadership research is contingency or behavioral approaches. Aside from constructive-developmental theory, there are few, if any, alternatives to an “inside approach” to the study of leadership as is advocated by personality researchers (Hogan & Holland, 2003).

**H4.** In a model including both LDL and Big Five personality dimensions as predictors, LDL will account for a unique component of variance in leader performance, beyond that which is accounted for by personality.

## 2. Summary

The purpose of this study is to investigate the application of constructive-developmental theory in the study of leadership. Differences in leader performance as a function of Leadership Developmental Level (constructive-developmental stage) are investigated. Leadership Developmental Level (LDL) is tested as a predictor of leader performance. In addition, this study is an attempt to understand what unique contribution the use of constructive-developmental theory may add to our current understanding of leadership. This paper seeks to meet the need for clarifying the concurrences and distinctions between separate lines of leadership research by exploring the relationship between constructive-developmental theory and Big Five personality.

## 3. Method

### 3.1. Sample

This study is based upon data collected from 67 management executives who have participated in an executive development program designed to increase self-awareness and develop general leadership skills through a consulting firm in Atlanta, GA. Participation in the program was paid for by the participants' employers, and all participants entered the program voluntarily for developmental purposes only. Males accounted for 70% of the sample and females represented 30% of the sample. Participants' mean age was 46.13 years ( $SD = 7.393$ ). Of the 67 participants, seven held manager-level positions, 14 held director-level positions, 25 held vice president-level positions, one held a president-level position, and four held officer-level (e.g., CEO, CFO) positions; for 16 participants, job level was not recorded. [Note: Participants' job level is presented here simply for descriptive purposes; these data are not included in analyses. Because all participants were not employed within the same organization, job level is approximate.]

### 3.2. Measures

#### 3.2.1. Leadership Developmental Level

Each participant took part in a semi-structured interview conducted by a trained Industrial/Organizational Psychologist to determine his/her constructive-developmental stage, or LDL. The interview was conducted in accordance with the technique outlined by Lahey, Souvaine, Kegan, Goodman, & Felix (1988). Each interview lasted approximately one hour. The topics covered in the interview were loosely structured using five prompt cards, each printed with a single word from which the interviewer

prompted discussion on the participants' experiences, beliefs and values pertaining to how they lead others. Participants chose one card at a time and were prompted to discuss their leadership experiences pertaining to the topic on the card. The words on the cards and the accompanying prompts are as follows:

*Important* What is most important to you as a leader?

*Success* What does success mean to you as a leader?

*Conflict* Tell me about a time when you experienced conflict as a leader.

*Change* How have you changed as a leader?

*Strong Stand* Tell me about a time when you took a strong stand as a leader and why.

While this structure is central to the interview process, it is important to note that the cards and the specific content of what was said was actually of minor importance in this interview process; instead, the interviewer's key focus was to learn how executives organize their experience, to extract how the executives come to know what they know. Thus, *what* is said by the executive is less important than *where* or what level (LDL) it is said from. As an example using the "strong stand" card, the interviewer wants to know 1) why the leader took a strong stand, 2) how the leader interprets his or her strong stand, and 3) what the stakes are for leader and others and the difficult value choices around the strong stand. The goal for the interviewer is to hypothesis-test for different LDLs and probe for what is subject (recall the discussion of constructive-developmental theory), or lens—the way in which he/she views and organizes the world.

Each interview was audio-recorded and transcribed. After reviewing the transcription, the interviewer then provided an overall LDL rating for each participant. Two graduate students, trained in scoring the subject-object interview reviewed the transcripts. This method ensured an acceptable level of interrater reliability which resulted in 93% agreement. Discrepant ratings were discussed until consensus was reached. The interview technique employed in the current study has shown to be valid in a wide variety of settings, populations, and ages (Barger, 2006).

Traditionally, LDL ratings are assigned one of 20 distinct scores (each of the four levels includes five sub-levels); however, considering the small sample size used for this study, this method would result in very little variability among LDLs. To allow for more meaningful analysis, LDL ratings were not parsed into sub-levels. Because LDL actually exists on a continuum, most individuals are in transition from one level to the next at any given point in time. For these individuals, the dominant lens was used to classify LDL. For example, an individual who mostly operates from LDL 3 but who has occasional "moments" of LDL 4 thinking would be categorized as LDL 3. On the other hand, an individual who operates primarily at LDL 4 but who occasionally lapses into LDL 3 activities would be classified as LDL 4.

### 3.2.2. Personality dimensions

Each participant completed the Personality and Leadership Profile (PLP), a self-report measure of personality (Hagberg Consulting Group, 2002b). The PLP is composed of 342 self-referent statements; participants indicate the degree to which the statement applies to them using a 4-point Likert scale. The coefficient alpha value for this scale is .87. Using a sample of 214 individuals, the dimensionality of the PLP items was analyzed using principal axis factor analysis. Three criteria were used to determine the number of factors to extract and rotate: the a priori hypothesis that the Big Five accounts for all systematic variance in personality inventory responses (McCrae & Costa, 1987; Costa & McCrae, 1992a; Goodstein & Lanyon, 1999), the scree test, and the interpretability of the factor solution. The scree plot indicated that the a priori hypothesis was probable; therefore, five factors were rotated using a Direct Oblimin rotation procedure. Careful inspection of item content revealed that the rotated solution yielded five interpretable factors: Conscientiousness, Neuroticism, Openness to Experience, Extraversion, and Agreeableness, accounting for 11.45%, 9.71%, 8.81%, 8.15%, and 4.58% of item variance, respectively. Eighty-eight items displayed significant complex loadings, indicating that these items did not measure a distinct facet of personality and were not well-designed items; thus, these items were not included in the analysis. The coefficient alpha for the reduced scale (254 items) is .79. The coefficient alphas for each dimension are as follows: Conscientiousness (42 items), .80; Neuroticism (59 items), .90; Openness to Experience (73 items), .90; Extraversion (45 items), .87; and Agreeableness (35 items), .82 (see Table 2).

### 3.2.3. Leader performance

For the purposes of this study, leader performance is conceptualized as 360-degree feedback. Also known as multisource feedback, 360-degree feedback refers to evaluations gathered from a "full circle" of rating sources, usually including self, supervisors, peers, subordinates, and even customers and suppliers (Dalessio, 1998; Dunnette, 1993; London & Smither, 1995; Smither et al., 2005; Tornow, 1993). The purpose of collecting ratings from multiple perspectives is to provide a more comprehensive, reliable picture of an

**Table 2**

Summary of principal axis exploratory factor analysis using Direct Oblimin rotation ( $n = 214$ ).

Factor	$\alpha$	Items	Eigenvalue	% variance	Cumulative % variance
1. Conscientiousness	.80	42	4.925	11.454	11.454
2. Neuroticism	.90	59	4.175	9.709	21.162
3. Openness to experience	.90	73	3.789	8.812	29.974
4. Extraversion	.87	45	3.505	8.151	38.125
5. Agreeableness	.82	35	1.971	4.583	42.707

individual's performance (Dyer, 2001). While 360-degree feedback is often used for developmental purposes such as leadership development programs, it is also used in conjunction with formal appraisal systems with administrative purposes (including, for example, promotion and compensation decisions) (Atwater & Waldman, 1998; Borman, 1997; Church & Waclawski, 1998). The use of 360-degree feedback in formal organizational decisions, such as promotion and compensation, suggests that for the purposes of this study, this measure of performance may serve as an acceptable proxy for "harder" measures of performance.

The efficacy and utility of 360-degree feedback systems rely on an understanding of the nature of rating differences observed across rater levels (Borman, 1997). It is important to consider the perspective of raters and the ability of rating sources to evaluate performance in certain contexts when deciding upon the uses of their feedback; raters provide more reliable ratings on dimensions for which they are in good position to make judgments of performance (Borman, 1974). Due to the high-level management positions of the participants in this study, customer relations are more likely to be handled by subordinates; therefore, customer ratings are not likely to provide reliable evaluations of performance in this context, and are not included in this study. This decision is supported by Pollack & Pollack (1996), who suggest that customers provide better evaluations of products and services than individuals. Self-ratings have also been shown to be problematic: in general, self-ratings tend to be inflated, unreliable, and biased, and in management personnel, they may be systematically deflated (Yammarino & Atwater, 1997; Alimo-Metcalfe, 1998). In general, it is recommended that self-ratings should not be used for any purpose other than developmental purposes (Harris & Schaubroeck, 1988); because this study utilizes these ratings as a proxy for "hard" measures of performance (as opposed to developmental feedback), self-ratings are not included in analysis. Superior ratings, peer ratings, and subordinate ratings have all been shown to be related to job performance, and ratings of the same individual from these three sources tend to be correlated with each other, indicating that these individuals may be best able to rate job performance (Church, 2000; Harris & Schaubroeck, 1988; Sala & Dwight, 2002). For the purposes of this study, only the ratings of supervisors, peers, and subordinates are included in analysis.

The 360-degree feedback instrument used in this study was developed specifically for the purposes of the aforementioned executive development program; this measure has been validated, although the results of the validation study were not published because the scale is for commercial use (Hagberg Consulting Group, 2002a). Principle axis exploratory factor analysis of the 360 measure reveals one dominant factor accounting for 56% of variance in item responses; this is a primary indication of the measure's cohesiveness. Internal consistency estimates (coefficient alpha) of the 360 measure for all raters, superior raters, peer raters, and subordinate raters are .98, .95, .95, and .98, respectively. The instrument consists of 46 behaviors and characteristics, each considered to be a critical leadership competency. Participants created their own rater lists due to their unique familiarity with their coworkers. Raters entered their ratings using a secure internet login; they indicated the participant's level of performance/ability on each of the 46 behaviors/characteristics using a 5-point Likert scale. A mean of supervisor ratings, peer ratings, and subordinate ratings was calculated to create an overall performance score for each participant. For the purpose of exploratory investigation of rater source differences, a mean of ratings from each rater source was also computed.

**Table 3**Descriptive statistics and Kendall's tau correlations between study variables ( $n = 67$ ).

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
Gender	67	1.30	.461	1.0				
Job type	51	2.63	1.019	-.276*	1.0			
Age	67	46.13	6.037	-.223*	.339**	1.0		
LDL	67	3.60	.676	-.044	.194	.254*	1.0	
Conscientiousness	67	122.58	10.970	-.002	.061	-.025	.046	1.0
Neuroticism	67	174.09	7.979	.080	.042	.018	-.027	.361**
Openness to experience	67	186.46	10.184	.320**	-.109	-.012	-.053	.052
Extraversion	67	109.13	10.479	.246*	-.060	-.185*	-.247*	.062
Agreeableness	67	94.54	5.366	-.080	-.129	.239**	.259**	-.009
Leader performance (all raters)	67	3.89	.349	.144	.106	.153	.291**	.085
Leader performance (superior raters)	61	3.92	.484	.161	.030	.112	.223*	.074
Leader performance (peer raters)	60	3.84	.325	-.037	.177	.228*	.296**	.068
Leader performance (subordinate raters)	62	3.91	.404	.182	.124	.140	.326**	.101
Variable	6	7	8	9	10	11	12	13
Gender								
Job type								
Age								
LDL								
Conscientiousness								
Neuroticism	1.0							
Openness to experience	.177*	1.0						
Extraversion	.163	.205*	1.0					
Agreeableness	.133	.135	-.048	1.0				
Leader performance (all raters)	.068	.093	-.019	.171*	1.0			
Leader performance (superior raters)	.063	.019	-.029	.183*	.656**	1.0		
Leader performance (peer raters)	.068	.009	-.033	.163	.506**	.257**	1.0	
Leader performance (subordinate raters)	.063	.114	-.047	.168	.650**	.383**	.297**	1.0

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

### 3.3. Procedure

Each participant completed the PLP and underwent the LDL interview. A 360-degree feedback assessment was conducted for each participant. In order to protect the identity of raters, a minimum of three raters per rating source was collected, with the exception of raters who are supervisors (due to the lack of supervision of these high-level employees). LDL remained confidential, privy only to the interviewer who scored the transcripts. The interviewer remained blind to 360-degree feedback results so that this information would not bias the evaluation of LDL.

## 4. Results

Descriptive statistics for all study variables and Kendall's tau correlations between study variables may be found in Table 3. [Note: Kendall's tau correlations were used because they effectively accommodate multi-source data and small sample sizes, while producing a result comparable to Spearman  $r$  in Power (Davis, Kendall, & Stuart, 1951; Kendall, 1938; Kendall & Gobbons, 1990).] Significant correlations between gender and Openness to Experience ( $\tau = .320, p = .002$ ) and gender and Extraversion ( $\tau = .246, p = .017$ ) indicate that gender effects should be controlled in all analyses involving these dimensions of the Big Five. Significant correlations between age and LDL ( $\tau = .254, p = .013$ ) indicate that the effects of age should be controlled in all analyses involving LDL.

Other correlations of note may also be found in Table 3. Superior, peer, and subordinate ratings of leader performance are highly intercorrelated, a testament to the validity of these ratings ( $\tau = .257-.656, p = .006-.000$ ). Agreeableness is significantly correlated with superior ratings of leader performance ( $\tau = .183, p = .041$ ); this is the only rater source to have significant relationships to any of the Big Five dimensions, which may be of interest when explaining findings pertaining to superior ratings.

### H1. Mean performance ratings will differ as a function of a leader's LDL.

In order to test for mean differences in performance ratings between LDLs (H1), a one-way analysis of variance (ANOVA) was computed. Hypothesis 1 received partial support. ANOVA revealed that the effect of LDL on performance ratings from all raters was significant,  $F(3, 63) = 3.240, p = .028, d = .31$  (see Table 4). ANOVA also revealed that the effect of LDL on performance ratings was significant for peer and subordinate raters separately:  $F(3, 56) = 4.279, p = .009, d = .36$  and  $F(3, 58) = 4.156, p = .01, d = .35$ , respectively. Post hoc analyses using the Tukey HSD criterion for significance indicated that mean performance scores as rated by peer raters were significantly lower at LDL 2 ( $M = 3.401, SD = .341$ ) and LDL 3 ( $M = 3.771, SD = .338$ ) than at LDL 5 ( $M = 4.198, SD = .211$ ). Post hoc analyses also revealed that mean performance scores as rated by subordinate raters were significantly lower at LDL 3 ( $M = 3.739, SD = .466$ ) than at LDL 5 ( $M = 4.368, SD = .200$ ).

### H2. LDL will significantly predict leader performance.

**Table 4**

Summary of regression analyses: personality (Big Five) traits predicting leader performance and Leadership Developmental Level predicting leader performance.

Criterion (rater source)	Predictor	<i>n</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>F</i>	<i>d</i>
All	LDL	67	.160	.063	.309*	5.847**	.42
Superior	LDL	61	.182	.091	.259*	4.161*	.36
Peer	LDL	60	.152	.059	.324*	6.687**	.45
Subordinate	LDL	62	.234	.078	.383**	5.630**	.41
All	Conscientiousness	67	.009	.004	.288*		
	Neuroticism		-.003	.007	-.070		
	Openness to Experience		.000	.005	-.014		
	Extraversion		-.003	.004	-.082		
	Agreeableness		.015	.009	.225	1.386	.20
Superior	Conscientiousness	61	.012	.006	.265		
	Neuroticism		-.003	.010	-.042		
	Openness to Experience		-.005	.008	-.110		
	Extraversion		-.004	.007	-.085		
	Agreeableness		.019	.012	.216	1.202	.19
Peer	Conscientiousness	60	.000	.005	.004		
	Neuroticism		.003	.006	.064		
	Openness to Experience		.002	.005	.054		
	Extraversion		-.002	.005	-.070		
	Agreeableness		.015	.009	.244	.755	.16
Subordinate	Conscientiousness	62	.009	.006	.234		
	Neuroticism		-.003	.008	-.057		
	Openness to Experience		.004	.006	.098		
	Extraversion		-.007	.005	-.178		
	Agreeableness		.014	.011	.181	1.684	.23

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

In order to test the predictive ability of LDL (H2), a multiple regression was computed, controlling for age and including LDL as a predictor of leader performance. Hypothesis 2 received full support (see Table 5). LDL is a significant predictor of performance ratings from all raters and from superior, peer, and subordinate raters separately;  $F(2, 64) = 5.847, p = .005, d = .42$  ( $\beta = .309, p = .014$ );  $F(2, 58) = 4.161, p = .02, d = .36$  ( $\beta = .259, p = .05$ );  $F(2, 57) = 6.687, p = .002, d = .45$  ( $\beta = .324, p = .013$ ); and  $F(2, 59) = 5.630, p = .006, d = .41$  ( $\beta = .383, p = .004$ ), respectively.

**H3.** Conscientiousness, Extraversion, and Openness to Experience will significantly predict leader performance.

In order to test the predictive ability of personality (H3), a multiple regression was computed, including Conscientiousness, Neuroticism, Openness to Experience, Extraversion, and Agreeableness as predictors of leader performance. Hypothesis 3 received minimal support,  $F(6, 60) = 1.386, p = .235, d = .20$  (see Table 5). When the criterion is a mean performance rating from all rater sources (superior, peer, and subordinate ratings combined), Conscientiousness is a significant predictor ( $\beta = .288, p = .044$ ). Interestingly, none of the personality dimensions was found to be a significant predictor of superior ratings, peer, or subordinate ratings separately.

**E1.** Mean scores on the Big Five personality dimensions will differ as a function of a leader's LDL.

In order to test for mean differences in Big Five personality dimensions between LDLs (E1), a one-way analysis of variance (ANOVA) was computed. Exploratory Hypothesis 1 was not supported. ANOVA revealed that the effect of LDL on Conscientiousness, Neuroticism, Openness to Experience, Extraversion, and Agreeableness was not significant:  $F(3, 63) = .299, ns$ ,

**Table 5**

Analysis of variance for mean differences in leader performance and leader personality between Leadership Developmental Levels.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE M</i>	<i>df</i>	<i>F</i>	<i>d</i>
Leader performance (all raters)					3 (63)	3.240*	.31
LDL 2	2	3.517	.018	.011			
LDL 3	28	3.791	.435	.082			
LDL 4	32	3.961	.226	.040			
LDL 5	5	4.158	.261	.118			
Leader performance (superior raters)					3 (63)	2.591	.28
LDL 2	2	3.397	.176	.125			
LDL 3	28	3.777	.630	.129			
LDL 4	32	4.058	.307	.056			
LDL 5	5	4.043	.355	.159			
Leader performance (peer raters)					3 (63)	4.279**	.36
LDL 2	2	3.400	.341	.241			
LDL 3	28	3.771	.338	.068			
LDL 4	32	3.862	.273	.052			
LDL 5	5	4.198	.211	.094			
Leader performance (subordinate raters)					3 (63)	4.156**	.35
LDL 2	2	3.741	.106	.075			
LDL 3	28	3.740	.466	.095			
LDL 4	32	3.982	.315	.056			
LDL 5	5	4.368	.200	.100			
Conscientiousness					3 (63)	.299	.10
LDL 2	2	117.50	9.192	6.500			
LDL 3	18	121.79	11.939	2.256			
LDL 4	26	123.22	9.404	1.662			
LDL 5	4	125.00	17.000	7.603			
Neuroticism					3 (63)	.966	.17
LDL 2	2	169.50	2.121	1.500			
LDL 3	18	175.54	8.448	1.597			
LDL 4	26	172.75	7.645	1.352			
LDL 5	4	176.40	8.264	3.696			
Openness to experience					3 (63)	1.595	.22
LDL 2	2	178.00	12.728	9.000			
LDL 3	18	188.43	9.449	1.786			
LDL 4	26	184.53	10.311	1.823			
LDL 5	4	191.20	11.100	4.964			
Extraversion					3 (63)	2.387	.27
LDL 2	2	113.00	.000	.000			
LDL 3	18	112.75	9.774	1.847			
LDL 4	26	106.50	10.659	1.884			
LDL 5	4	104.20	10.085	4.510			
Agreeableness					3 (63)	2.036	.25
LDL 2	2	91.50	3.536	2.500			
LDL 3	18	92.89	5.350	1.011			
LDL 4	26	95.91	5.183	.916			
LDL 5	4	96.20	5.357	2.396			

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

**Table 6**

Summary of hierarchical regression analyses for variables predicting leader performance: increment of LDL.

Variable	<i>n</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>F</i>	$\Delta F$	<i>d</i>
All raters	67				.223	.048	2.077	3.588	.33
Gender		.109	.102	.145					
Age		.011	.008	.197					
Conscientiousness		.008	.004	.249					
Neuroticism		-.002	.006	-.051					
Openness to Experience		.000	.005	-.005					
Extraversion		.001	.004	.026					
Agreeableness		.005	.009	.082					
LDL		.130	.069	.253					
Superior raters	61				.188	.026	1.502	1.687	.23
Gender		.184	.155	.178					
Age		.016	.012	.192					
Conscientiousness		.010	.006	.224					
Neuroticism		-.002	.009	-.039					
Openness to Experience		-.005	.007	-.097					
Extraversion		.000	.007	-.002					
Agreeableness		.009	.013	.099					
LDL		.131	.101	.186					
Peer raters	60				.221	.085	1.804	5.566*	.41
Gender		.005	.101	.006					
Age		.011	.008	.193					
Conscientiousness		.000	.005	-.013					
Neuroticism		.004	.006	.104					
Openness to Experience		.002	.005	.051					
Extraversion		.002	.005	.059					
Agreeableness		.003	.009	.051					
LDL		.159	.067	.339*					
Subordinate raters	62				.268	.087	2.428*	6.302*	.44
Gender		.179	.121	.195					
Age		.007	.009	.109					
Conscientiousness		.009	.005	.232					
Neuroticism		-.003	.008	-.059					
Openness to Experience		.006	.006	.154					
Extraversion		-.002	.005	-.057					
Agreeableness		.001	.011	.017					
LDL		.207	.083	.340*					

\*  $p < .05$ , two-tailed.

$d = .10$ ;  $F(3, 63) = .966$ ,  $ns$ ,  $d = .17$ ;  $F(3, 63) = 1.595$ ,  $ns$ ,  $d = .22$ ;  $F(3, 63) = 2.387$ ,  $ns$ ,  $d = .27$ ; and  $F(3, 63) = 2.036$ ,  $ns$ ,  $d = .25$ , respectively (see Table 4).

**H4.** In a model including both LDL and Big Five personality dimensions as predictors, LDL will account for a unique component of variance in leader performance, beyond that which is accounted for by personality.

In order to test the incremental predictive ability of LDL (H4), a hierarchical multiple regression was computed including gender and age as control variables, as well as Big Five personality dimensions and LDL as predictors of leader performance. The order of entry for each of these predictors was as follows: Conscientiousness, Neuroticism, Openness to Experience, Extraversion, Agreeableness, and LDL. Big Five personality dimensions were entered in order of the percentage of variance accounted for (see Table 2), followed by LDL. The Big Five dimensions were entered before LDL because personality reaches stability at an early age, while LDL reaches stability later in life, if ever (e.g., Costa & McCrae, 1988). Hypothesis 4 received partial support. When the criterion is a mean performance rating from all rater sources or from superior raters separately, the increment of LDL above and beyond personality is non-significant,  $F(8, 58) = 2.077$ ,  $ns$ ,  $\Delta R^2 = .048$ ,  $\Delta F = 3.588$ ,  $ns$ ,  $d = .33$ ) and  $F(8, 52) = 1.502$ ,  $ns$ ,  $\Delta R^2 = .026$ ,  $\Delta F = 1.687$ ,  $ns$ ,  $d = .23$ ), respectively (see Table 6). However, when the criterion is a mean performance rating from peer raters or subordinate raters separately, the increment of LDL above and beyond personality is significant,  $F(8, 51) = 1.804$ ,  $ns$ ,  $\Delta R^2 = .085$ ,  $\Delta F = 5.566$ ,  $p = .022$ ,  $d = .41$ ) and  $F(8, 53) = 2.428$ ,  $p = .026$ ,  $\Delta R^2 = .087$ ,  $\Delta F = 6.302$ ,  $p = .015$ ,  $d = .44$ ), respectively.

## 5. Discussion

A Power analysis revealed that a sample size of approximately 78 would be sufficient to detect significant effects ( $\alpha = .05$ ) with Power of .80 (as suggested by Cohen, 1994); unfortunately the sample size available for this study was only 67. The expected Power for the current sample size is approximately .74. Due to restrictions on sample size and the specific nature of this sample, readers should interpret these findings with caution. Also reported is Cohen's  $d$ , a measure of effect size, which may allow readers to more accurately assess the magnitude of effects than traditional significance testing (Cohen, 1994; Gigerenzer, 1993; Keppel & Zedeck, 1989).

There are some notable findings among the Kendall's Tau correlations. LDL is significantly correlated with age; this is expected and validates the tenet of constructive-developmental theory suggesting that leadership development is contingent upon time and life experience (Kegan, 1982; Kuhnert & Lewis, 1987). It is also important to mention that Conscientiousness, Neuroticism, and Openness to Experience are not significantly correlated with LDL; this is a preliminary suggestion that personality measures a personal characteristic which is distinct from Leadership Developmental Level.

This study begins by examining the possibility of differences in leader performance scores as a function of LDL (H1). When examining performance scores from a combination of all rater sources, no significance was found. When examining each rater source separately, no significant differences were found among superior ratings; however, there were detectable differences in peer ratings between LDL 2 and LDL 5 and also between LDL 3 and LDL 5. Likewise, there were significant differences in subordinate ratings between LDL 3 and LDL 5. This means that peer and subordinate raters rate LDL 5 leaders higher than LDL 2 and 3 leaders; there is some detectable difference in performance that is salient to these two classes of raters. Upon further investigation, it became clear that this result may be an artifact of the content of the 360-degree feedback instrument. The items composing this instrument are geared toward leadership behaviors at work as opposed to general work performance; thus those in position to most accurately perceive and rate these behaviors are peers and subordinates (Borman, 1974, 1997).

Further analysis demonstrated the predictive ability of constructive-developmental theory (H2). This hypothesis was a replication of Harris & Kuhnert (2006) and was included in this study in order to provide a foundation for the remainder of the study. LDL was found to predict leader performance as reported by all rater sources combined and also by superior, peer, and subordinate raters separately. These findings support the use of constructive-developmental theory in the study of leadership, as they are an indication that LDL may be an effective predictor of leader performance (Harris & Kuhnert, 2006; McCauley et al., 2006). This is an encouraging step toward understanding the connection between what leadership is "made of" and how to quantitatively measure/predict these elusive qualities.

To provide a basis for comparing different lines of leadership research, the predictive ability of personality was investigated, as personality is an avenue of research that has made important contributions to the study of leadership (e.g., Bass, 1990; McCrae & Costa, 1987; Ployhart et al., 2001). When the criterion is a mean performance rating of all rater sources (superior, peer, and subordinate ratings combined), Conscientiousness was found to be a significant predictor. This finding supports other trends within the Big Five literature (e.g., Barrick & Mount, 1991), although it is somewhat surprising that Conscientiousness is the only dimension of the Big Five to successfully predict leader performance. Big Five personality research indicates that other dimensions of the Big Five, particularly Extraversion and Openness to Experience, have been related to performance in leadership contexts, including job performance, training proficiency, leadership emergence, and perceptions of leadership (Barrick & Mount, 1991; Bass, 1990; Bass, 1997; Judge & Bono, 2000; Lord et al., 1986; Ployhart et al., 2001; and McCrae & Costa, 1987). Further investigation is needed to determine the implications of this finding. The ability of personality to predict ratings from each rater source (superior, peer, and subordinate) was investigated independently and interestingly, none of these criteria were successfully predicted by any of the Big Five dimensions. This finding may point to the benefit of using multiple criteria/sources to achieve a more comprehensive impression of a construct such as performance (e.g., Borman, 1974; London & Smither, 1995). With further investigation, this may pose implications for the use and application of 360-degree feedback as a developmental tool or a performance appraisal tool.

Exploration demonstrated that there are no important differences in mean personality scores on the Big Five dimensions as a function of LDL. This finding appears to dismiss the notion that personality and LDL are redundant, supporting the exploration of constructive-developmental theory as a framework for understanding a unique aspect of leadership, and setting the stage for an additional investigation.

A final inquiry examined the predictive ability of LDL above and beyond personality. The increment of LDL was significant when the criterion was a mean of peer ratings or subordinate ratings. Although the effect is relatively weak, suggesting that LDL is not the most important factor in the determination of leader effectiveness, the significance of the increment of LDL is perhaps the most important contribution of this study, especially considering the number of variables included in the analysis and the small sample size employed (Cohen, Cohen, West & Aiken, 2003). This is another indication that LDL may be a substantial predictor of leader performance, a legitimate contender with at least one popular line of leadership research (i.e., personality). However, the weakness of the effect also suggests that there is no evidence discounting the legitimacy and strength of the relationship between leadership and personality. Perhaps it is through the conjunction of multiple theories that we may achieve the most complete understanding of leadership. This finding supports further investigation of constructive-developmental theory as a framework for understanding leadership and points to the potential for important implications for workplace practices such as leader selection and performance appraisal (e.g., Fielder, 1996; Waldman, Bass, & Einstein, 1987) and for organizational behavior research such as the role of adult development and instrumental workplace culture (e.g., Russell & Kuhnert, 1992; Fisher, Merron, & Torbert, 1987; Kinjerski & Skrypnik, 2006).

The importance of peer and subordinate ratings/feedback in the study of leadership was an unintended finding that emerged throughout this study; peer and subordinate ratings repeatedly emerge as important criteria. It is curious, however, why LDL is not predictive of superior ratings. Once again, this may be due to the fact that the items composing the 360-degree feedback instrument are geared toward leadership behaviors at work as opposed to general work performance. While superiors might be able to effectively rate other aspects of work performance, peers and subordinates are most directly affected by leadership and thus would be the source to most acutely detect it (Borman, 1974, 1997; Herold & Fields, 2004). There is also another reason to suspect the validity of superior ratings in the context of leadership performance (as opposed to general work performance). Superior ratings are significantly correlated with the Agreeableness dimension of the Big Five, which may be a preliminary indication that superior raters are either basing their ratings in qualities that are salient to them (as opposed to leadership behaviors, which may be less salient), or that they are more focused on a leader's congeniality than their actual performance. This concept is somewhat

consistent with Hogan et al. (1994), who found that middle managers are often chosen from the ranks of first-line supervisors on the basis of likeability and perceived ability to cooperate with senior management. Further research is needed to evaluate and clarify the importance of rater source perspective with respect to leadership behaviors.

### 5.1. Limitations and suggestions for future research

In order to fully consider the potential implications of this study, there are several limitations that must be addressed. Although small sample sizes are not atypical for interview-based data collection methods (e.g., D'Abate, 2005), the small sample size used in this study is likely to have limited Power, or the ability to detect a significant effect. However, considering this limitation, the fact that any significance was obtained is impressive and suggests that these effects may be more important than is detected using this limited sample (Hays, 1994).

A second limitation of the study sample is its ability to represent the general population of workplace leaders. All participants are enrolled in a formal leadership development program, which may be an indication that this is a sample of individuals who are already strong leaders and who have the potential to be even better (Giberson, Resick, & Dickson, 2005). One may wonder if, in the real world, all leaders would be receptive to a personal improvement endeavor of this sort, and if that means this sample represents a unique subsection of leaders.

In this discussion of limitations, it is important to include mention of the controversy over the use of manager samples to test/study leadership phenomena. Bedeian & Hunt (2006) help to clarify the details of the issue, whereby the current body of leadership literature is largely characterized by studies that collect a sample of individuals at a certain organizational level, assume that they are "leaders," and draw conclusions about "leadership." While it is not the opinion of the authors that management and leadership are concepts to be used synonymously, there seems to be considerable overlap in the two conceptualizations; furthermore, for the feasibility of leadership research, some assumptions need to be made about which populations should be sampled in order to glimpse leadership. Admittedly, this study makes an assumption that individuals at an executive level, who are enrolled in a leadership development program, are a legitimate pool from which to test for "leadership." However, due to the known controversy with this sampling method, results should be interpreted carefully.

The use of a Big Five measure other than the widely-accepted and validated NEO Personality Inventory-Revised (Costa & McCrae, 1992b) is a third limitation. The personality scale used in this study was developed by a professional assessment company for the purpose of use in consulting and coaching scenarios (Hagberg Consulting Group, 2002b); it was designed as a measure of general personality and underwent extensive validation, although the validation studies were not published. The Big Five has been heavily researched and is consistently found to be extremely robust. In fact, this five-factor conceptualization of personality has been found to account for nearly all systematic variance in personality inventory responses, based upon either self-ratings or ratings by persons who know the target well (Costa & McCrae, 1992a; Goodstein & Lanyon, 1999; McCrae & Costa, 1987); these results are consistent regardless of which approach to factor analysis is taken (Goldberg, 1982; Goodstein & Lanyon, 1999). Although previous research suggests that the approach taken may be acceptable, future research should replicate and further investigate these findings using the NEO PI-R (Costa & McCrae, 1992a,b).

A second challenge faced in the use of this personality measure is the limited sample size available for factor analysis, which may cause some readers to call into question the results of the exploratory factor analysis. While a general rule of thumb for factor analysis is 300 cases per factor (Tabachnick & Fidell, 1996), this would require a sample of some 1500 or more participants and was not a feasible option for this study. A more lenient rule of thumb is 50 cases per factor (Pedhazur & Schmelkin, 1991), which would stipulate approximately 250 participants—in fact, very near the 214 available for this factor analysis. Furthermore, there may be a caveat to this requirement: Guadagnoli & Velicer (1988) have demonstrated that solutions with several high-loading marker variables (>.80), as was the case in this analysis, do not require as many cases. In addition, the authors will point out that multiple criteria were used to determine the final factor solution: the a priori hypothesis that the Big Five accounts for all systematic variance in personality inventory responses (McCrae & Costa, 1987; Costa & McCrae, 1992a; Goodstein & Lanyon, 1999), the scree test, and the interpretability of the factor solution. All three criteria were met and the resulting internal consistency estimates for each of the five dimensions/subscales were impressive (ranging from .80 to .90).

An additional limitation of this study is the use of general distinctions between LDLs, as opposed to sub-level ratings of LDL. Sub-level ratings would provide a finer level of distinction and increase the variance between leaders at the same general level; future studies should incorporate sub-level scoring into the interview methodology.

The use of only one measure of leader performance is another limitation of this study, although the authors contend that the use/investigation of multiple rater sources was one way to increase the study's depth and breadth of contribution. Future research should extend this research to include "hard" measures of performance, such as financial gain, number of sales, customer retention, and so forth. Future research should also consider the predictive ability of LDL above and beyond other established measures/predictors of leader effectiveness, such as experience and cognitive ability (e.g., Avery, Tonidandel, Griffith, & Quiñones, 2003; Csoka, 1974).

The authors join McCauley et al. (2006) in their call for longitudinal examinations of constructive-developmental theory in the study of leadership. Because constructive-developmental theory implies a potential for growth, it will be important to investigate the change in performance as leaders grow from one LDL to the next. Furthermore, it would be informative to conduct a longitudinal study of individuals who are not already in positions of leadership: would there be differences in the LDLs of those who become workplace leaders? What would be the relationship between LDL and performance for those who became workplace leaders over time and those who did not? Will LDL also predict performance for those who are not in formal positions of leadership, and if so, are those individuals seen by their peers and superiors as "emergent leaders"?

McCauley et al. (2006) point to the need for combining and comparing constructive-developmental research to other parallel lines of leadership research to form a more cohesive body of knowledge. While this study provides a link between the constructive-developmental approach to leadership and relevant Big Five personality research, more such connections are needed. One example of a logical follow-up to this study that would achieve such an aim is the investigation of transactional/transformational leadership in a similar model of leader performance. Eigel & Kuhnert (2005) have already begun to pave this road, arguing that a leader's constructive-developmental stage (method of meaning-making) may be the source of transactional and/or transformational leadership behaviors and authentic leadership.

This study is also an attempt to demonstrate the utility of constructive-developmental theory in the workplace: future research could continue to investigate this possibility. For example, on an individual level, constructive-developmental theory could be formally conceptualized as a leadership development tool. So much of the current state of leadership development focuses on managerial content and techniques and an emphasis on what and how much you know. Alternatively, the constructive developmental approach is more vertical than horizontal in that how you know (what leadership level you say it from) is more likely to result in more effective leadership behavior. The importance of the present findings suggests both lateral (what you know) and vertical development (how you know) may be necessary for effective leadership. Lastly, Constructive-developmental theory could also be utilized on an organizational level as a framework for the design of organizational culture, vision, or structure, where these entities are designed such that employees experience the most developmentally relevant work experience possible.

## 6. Conclusions

This study serves to connect two important lines of leadership research, while empirically investigating the application of constructive-developmental theory in the study of leadership. Leadership Developmental Level has emerged as an important predictor of leader performance. The construct appears to capture an aspect of leadership distinct from and above-and-beyond that which is attributable to personality. In general, this study consistently demonstrates the empirical legitimacy and potential utility of constructive-developmental theory as a framework for understanding the nature and structure of leadership.

## References

- Alimo-Metcalfe, B. (1998). 360 degree feedback and leadership development. *International Journal of Selection and Assessment*, 6, 35–44.
- Atwater, L., & Waldman, D. (1998). 360 degree feedback and leadership development. *Leadership Quarterly*, 9(4), 423–427.
- Avery, D. R., Tonidandel, S., Griffith, K. H., & Quiñones, M. A. (2003). The impact of multiple measures of leader experience on leader effectiveness: New insights for leader selection. *Journal of Business Research*, 56, 673–700.
- Barger, J. G. (2006). Adult development theory and executive coaching practice. In D. R. Stober, & A. M. Grant (Eds.), *Evidence Based Coaching Handbook* (pp. 77–102). Hoboken, NJ: John Wiley & Sons, Inc.
- Barlow, C. B., Jordan, M., & Hendrix, W. H. (2003). Character assessment: An examination of leadership levels. *Journal of Business and Psychology*, 17, 563–584.
- Barrick, M. K., & Mount, M. R. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1–26.
- Bass, B. M. (1990). *Bass & Stogdill's handbook of leadership*, (3rd ed.) New York: Free Press.
- Bass, B. M. (1997). Personal selling and transactional/transformational leadership. *Journal of Personal Selling and Sales Management*, 17, 19–28.
- Bedeian, A. G., & Hunt, J. G. (2006). Academic amnesia and vestigial assumptions of our forefathers. *The Leadership Quarterly*, 17, 190–205.
- Borman, W. C. (1974). The rating of individuals in organizations: An alternative approach. *Organizational Behavior and Human Decision Processes*, 12, 105–124.
- Borman, W. C. (1997). 360 ratings: An analysis of assumptions and a research agenda for evaluating their validity. *Human Resource Management Review*, 7(3), 299–315.
- Church, A. H. (2000). Do higher performing managers actually receive better ratings? A validation of multirater assessment methodology. *Consulting Psychology Journal: Practice and Research*, 52, 99–116.
- Church, A. H., & Waclawski, J. (1998). Making multirater feedback systems work. *Quality Progress*, 31(4), 1–12.
- Cohen, J. (1994). The earth is round ( $p < .05$ ). *American Psychologist*, 49, 997–1003.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*, (3rd ed.) Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Conley, J. J. (1984). Longitudinal consistency of adult personality: Self-report psychological characteristics across 45 years. *Journal of Personality and Social Psychology*, 47, 1325–1333.
- Conley, J. J. (1985). Longitudinal stability of personality traits: A multitrait-multi-method-multioccasion analysis. *Journal of Personality and Social Psychology*, 49, 1266–1282.
- Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: A six-year longitudinal study of self-reports and spouse ratings on the NEO personality inventory. *Journal of Personality and Social Psychology*, 54, 853–863.
- Costa, P. T., & McCrae, R. R. (1992a). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653–665.
- Costa, P. T., & McCrae, R. R. (1992b). *Revised NEO personality inventory (NEO-PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Csoka, L. S. (1974). A relationship between leader intelligence and leader rated effectiveness. *Journal of Applied Psychology*, 59, 43–47.
- D'Abate, C. P. (2005). Working hard or hardly working: A study of individuals engaging in personal business on the job. *Human Relations*, 58, 1009–1032.
- Dalessio, A. T. (1998). Using multi-source feedback for employee development and personnel decisions. In J. W. Smither (Ed.), *Performance appraisal: State-of-the-art in practice* San Francisco, CA: Jossey-Bass.
- Davis, S. T., Kendall, M. G., & Stuart, A. (1951). Some questions of distribution in the theory of rank correlation. *Biometrika*, 38, 131–140.
- Digman, J. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, 41, 417–440.
- Dunnette, M. D. (1993). My hammer or your hammer? *Human Resource Management*, 32, 373–384.
- Dyer, K. M. (2001). The power of 360-degree feedback. *Educational Leadership*, 2, 35–38.
- Eigel, K. M., & Kuhnert, K. W. (2005). Authentic development: Leadership development level and executive effectiveness. In W. Gardner, B. Avolio, & F. Walumbwa (Eds.), *Authentic leadership theory and practice: Origins, effects and development* Monographs in Leadership and Management, vol. 3. (pp. 357–385).
- Fielder, F. E. (1996). Research on leadership selection and training: One view of the future. *Administrative Science Quarterly*, 41, 241–250.
- Finn, S. E. (1986). Stability of personality ratings over 30 years: Evidence for an age/cohort interaction. *Journal of Personality and Social Psychology*, 50, 813–818.
- Fisher, D., Merron, K., & Torbert, W. R. (1987). Human development and managerial effectiveness. *Group & Organization Studies*, 12, 257–173.
- Gardner, W. L., & Schermerhorn, J. R. (2004). Performance gains through positive organizational behavior and authentic leadership. *Organizational Dynamics*, 33, 270–281.

- Giberson, T. R., Resick, C. J., & Dickson, M. W. (2005). Embedding leader characteristics: An examination of homogeneity of personality and values in organizations. *Journal of Applied Psychology, 90*, 1002–1010.
- Gigerenzer, G. (1993). The superego, the ego, and the id in statistical reasoning. In G. Keren & C. Lewis (Eds.), *A handbook for data analysis in the behavioral sciences: Methodological issues* (pp. 311–339). Hillsdale, NJ: Erlbaum.
- Goldberg, L. R. (1982). From Ace to Zombie: Some explorations in the language of personality. In C. D. Spielberger & J.N. Butcher (Eds.), *Advances in personality assessment* (pp. 203–234). Hillsdale, NJ: Erlbaum.
- Goodstein, L. D., & Lanyon, R. I. (1999). Applications of personality assessment to the workplace: A review. *Journal of Business and Psychology, 13*, 291–322.
- Gough, H. G., & Heilbrun, A. B., Jr. (1983). *The Adjective Checklist Manual: 1983 edition*. Palo Alto, CA: Consulting Psychologists Press.
- Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*, 265–275.
- Hagberg Consulting Group. (2002a). 360° Multi-rater feedback assessment San Mateo, CA: Author.
- Hagberg Consulting Group. (2002b). Personality and leadership profile San Mateo, CA: Author.
- Harris, L. S., & Kuhnert, K. (2006, August). An examination of executive leadership effectiveness using constructive/developmental theory. *Paper presented at the annual meeting of the Academy of Management, Atlanta, GA.*
- Harris, M. M., & Schaubroeck, J. (1988). A meta-analysis of self-supervisor, self-peer, and peer-supervisor ratings. *Personnel Psychology, 41*, 43–62.
- Hays, W. L. (1994). *Statistics*, (5th ed.) Belmont, CA: Wadsworth Group/Thompson Learning.
- Helson, R., & Moane, G. (1987). Personality change in women from college to midlife. *Journal of Personality and Social Psychology, 69*, 1173–1183.
- Helson, R., & Wink, P. (1992). Personality change in women from early 40 s to early 50 s. *Psychology and Aging, 7*, 46–55.
- Herold, D. M., & Fields, D. L. (2004). Making sense of subordinate feedback for leadership development: Confounding effects of job role and organizational rewards. *Group and Organization Management, 29*, 686–703.
- Hogan, J., & Holland, B. (2003). Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *Journal of Applied Psychology, 88*, 100–112.
- Hogan, R., Curphy, J., & Hogan, J. (1994). What we know about leadership effectiveness and personality. *American Psychologist, 49*(6), 493–504.
- Hogan, R., Hogan, J., & Roberts, B. W. (1996). Personality measurement and employment decisions: Questions and answers. *American Psychologist, 51*, 469–477.
- Hughes, R. L., Ginnett, R. A., & Curphy, G. J. (1993). *Leadership: Enhancing the lessons of experience*. Homewood, IL: Irwin.
- Judge, T. A., & Bono, J. E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology, 85*, 751–765.
- Kegan, R. (1982). *The evolving self: Problem and process in human development*. Cambridge, MA: Harvard University Press.
- Kegan, R., & Lahey, L. L. (1984). Adult leadership and adult development: A constructionist view. In B. Kellerman (Ed.), *Leadership: Multidisciplinary Perspectives* (pp. 199–230). Englewood Cliffs, NJ: Prentice-Hall.
- Kendall, M. G. (1938). A new measure of rank correlation. *Biometrika, 30*, 81–93.
- Kendall, M. G., & Gibbons, J. D. (1990). *Rank correlation methods*, (5th ed.) London: Arnold.
- Keppel, G., & Zedeck, S. (1989). *Data analysis for research designs*. New York, NY: W. H. Freeman and Company.
- Kinjerski, V., & Skrypnik, B. J. (2006). Creating organizational conditions that foster employee spirit at work. *Leadership & Organization Development Journal, 27*, 280–295.
- Kuhnert, K. W., & Lewis, P. (1987). Transactional and transformational leadership: A constructive/developmental analysis. *Academy of Management, 12*, 648–657.
- Kuhnert, K. W., & Russell, C. J. (1990). Using constructive developmental theory and biodata to bridge the gap between personnel selection and leadership. *Journal of Management, 16*, 595–607.
- Lahey, L. L., Souvaine, E., Kegan, R., Goodman, R., & Felix, S. (1988). *A guide to the subject/object interview: Its administration and interpretation*. Cambridge, MA: The Subject-Object Research Group.
- London, M., & Smither, J. W. (1995). Can multi-source feedback change perceptions of goal accomplishment, self-evaluations, and performance-related outcomes? *Personnel Psychology, 48*, 803–839.
- Lord, R. G., DeVader, C. L., & Alliger, G. M. (1986). Meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology, 71*, 402–410.
- Luthans, F., & Avolio, B. (2003). Authentic leadership development approach. In K. S. Cameron, J. E. Dutton, & R. E. Quinn (Eds.), *Positive Organizational Scholarship* (pp. 241–258). San Francisco, CA: Berrett-Koehler.
- McCauley, C. D., Drath, W. H., Palus, C. J., O'Conner, P. M. G., & Baker, B. A. (2006). The use of constructive-developmental theory to advance the understanding of leadership. *Leadership Quarterly, 17*, 634–653.
- McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*, 81–90.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60*, 175–216.
- Merron, K., Fisher, D., & Torbert, W. R. (1987). Meaning making and management action. *Group and Organization Studies, 12*, 274–286.
- Mount, M. K., & Barrick, M. R. (1998). Five reasons why the "big-five" article has been frequently cited. *Personnel Psychology, 51*, 849–857.
- Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, NJ: Erlbaum.
- Ployhart, R. E., Lim, B., & Chan, K. (2001). Exploring relations between typical and maximum performance ratings and the five-factor model of personality. *Personnel Psychology, 54*, 809–843.
- Pollack, D. M., & Pollack, L. J. (1996). Using 360° feedback in performance appraisal. *Public Personnel Management, 25*(4), 507–528.
- Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology, 87*, 698–714.
- Rooke, D., & Torbert, W. R. (1998). Organizational transformation as a function of CEO's developmental stage. *Organization Development Journal, 16*(1), 11–28.
- Rooke, D., & Torbert, W. R. (2005). Seven transformations of leadership. *Harvard Business Review, 83*, 66.
- Russell, C. J., & Kuhnert, K. W. (1992). Integrating skill acquisition and perspective taking capacity in the development of leaders. *Leadership Quarterly, 3*, 335–353.
- Sala, F., & Dwight, S. A. (2002). Predicting executive performance with multirater surveys: Whom you ask makes a difference. *Consulting Psychology Journal: Practice and Research, 54*(3), 166–172.
- Shaw, J. D., Duffy, M. K., & Johnson, J. L. (2005). Turnover, social capital losses, and performance. *Academy of Management Journal, 48*, 594–606.
- Smither, J. W., London, M., & Richmond, K. R. (2005). The relationship between leaders' personality and their reactions to and use of multisource feedback. *Group and Organization Management, 30*, 181–210.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*, (3rd ed.) New York: HarperCollins.
- Tornow, W. W. (1993). Perceptions or reality: Is multi-perspective measurement a means or an end? *Human Resource Management, 32*, 221–230.
- Vandenbergh, C., Bentein, K., & Stinglhamber, F. (2004). Affective commitment to the organization, supervisor, and work group: Antecedents and outcomes. *Journal of Vocational Behavior, 64*, 47–71.
- Waldman, D. A., Bass, B. M., & Einstein, W. O. (1987). Leadership and outcomes of performance appraisal processes. *Journal of Occupational Psychology, 60*, 177–186.
- Yammarino, F. J., & Atwater, L. E. (1997). Do managers see themselves as others see them? Implications of self-other rating agreement for human resources management. *Organizational Dynamics, 2*, 1997.
- Yukl, G. (1989). *Leadership in organizations*, (2nd ed.) Englewood Cliffs, NJ: Prentice-Hall.