Spring 2015

Narcissism and Leadership: A Meta-Analytic Review of Linear and Nonlinear Relationships

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Published in *Personnel Psychology* 68:1 (Spring 2015), pp. 1–47;
doi: 10.1111/peps.12072

Published online February 19, 2014.

Narcissism and Leadership: A Meta-Analytic Review of Linear and Nonlinear Relationships

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Abstract

Past empirical studies relating narcissism to leadership have offered mixed results. This study integrates prior research findings via meta-analysis to make four contributions to theory on narcissism and leadership, by (a) distinguishing between leadership emergence and leadership effectiveness, to reveal that narcissism displays a positive relationship with leadership emergence, but no relationship with leadership effectiveness; (b) showing narcissism's positive effect on leadership emergence can be explained by leader extraversion; (c) demonstrating that whereas observer-reported leadership effectiveness ratings (e.g., supervisor-report, subordinate-report, and peer-report) are not related to narcissism, self-reported leadership effectiveness ratings are positively related to narcissism; and (d) illustrating that the nil linear relationship between narcissism and leadership effectiveness masks an underlying curvilinear trend, advancing the idea that there exists an optimal, mid-range level of leader narcissism.

During the last decade, organizational researchers have become increasingly interested in narcissism, as recently evidenced by several insightful contributions (e.g., Galvin, Waldman, & Balthazard, 2010; Harms, Spain, & Hannah, 2011; Judge, LePine, & Rich, 2006; Judge, Piccolo, & Kosalka, 2009; Nevicka, Ten Velden, De Hoogh, & Van Vianen, 2011; Peterson, Galvin, & Lange, 2012),

including a meta-analysis of narcissism and work performance (O'Boyle, Forsyth, Banks, & McDaniel, 2012). Narcissism's rise in popularity coincides with a larger trend in the field of organizational psychology toward building a more thorough understanding of negative workplace behaviors (e.g., counterproductive work behaviors [CWB], abusive supervision, and incivility; Andersson & Pearson, 1999; Sackett, 2002; Tepper, 2000). Within this context, negative personality traits have a newfound appeal, as they carry the potential to harness validity left untapped by trait paradigms focused on the more positive side of personality (Grijalva & Newman, in press; Hogan & Hogan, 2001; Judge et al., 2006; O'Boyle et al., 2012; Paulhus & Williams, 2002; Penney & Spector, 2002; Wu & LeBreton, 2011).

This paper seeks to integrate and extend existing findings regarding narcissism's impact on leadership. To be clear, much existing research already focuses on narcissism's role in leadership (Kets de Vries & Miller, 1985; Maccoby, 2000; Rosenthal & Pittinsky, 2006); but this research has not produced consensus concerning whether narcissistic leaders hinder or benefit their organizations. To begin clarifying this issue, we first note that researchers typically define narcissism by listing several diagnostic criteria for Narcissistic Personality Disorder from the *Diagnostic and Statistical Manual of Mental Disorder-IV* (DSM-IV; APA, 2000; e.g., "has a grandiose sense of self-importance"; "requires excessive admiration"; "has a sense of entitlement"; "has a lack of empathy"; "tends to be exploitative, manipulative, and arrogant"; p.717); however, our current focus is on subclinical narcissism. Since the beginning of narcissism's relatively long history as a psychological construct, there have been those who suggest that narcissism is a key ingredient to leadership success. For example, Freud wrote that, "the leader himself needs love no one else, he may be of a masterful nature, *absolutely narcissistic*, self-confident, and independent." (Freud, 1921, p. 123–124, emphasis added). Researchers have also argued that because leadership roles are often held by narcissists, such as chief executive officers and U.S. presidents (Deluga, 1997; Maccoby, 2000; Rosenthal & Pittinsky, 2006), there must be something about narcissism that affords opportunities for leadership.

The claim that narcissism is positively associated with leadership has been supported by multiple studies (Davies, 2004; Galvin et al., 2010; Harms, Spain, & Hannah, 2011; Judge et al., 2006). For example, in a longitudinal study of military school cadets, narcissism positively predicted leadership development and performance (Harms, Spain, & Hannah, 2011). Further, Judge and colleagues (2006) found that narcissism was positively related to supervisor reports of transformational leadership, even after controlling for the Big Five personality traits—and despite narcissism's moderate positive relationship with extraversion (Trzesniewski,

Donnellan, & Robins, 2008). Finally, narcissism is positively related to charismatic leadership through the *visionary boldness* component of charisma—or the component representing the tendency to take risks and be inspirational and exciting (Galvin et al., 2010).

At the same time, a separate set of studies has found a negative association between narcissism and leadership (Benson & Campbell, 2007; Blair, Hoffman, & Helland, 2008; Khoo & Burch, 2008; Resick, Whitman, Weingarden, & Hiller, 2009; Yocum, 2006). For example, narcissism has been negatively related to charismatic leadership through the *socialized vision* component of charisma—or the component representing the tendency to act altruistically (Galvin et al., 2010). In other words, narcissists are less likely to selflessly place the needs of others above their own needs. Also, in a group of Major League Baseball CEOs, narcissism was negatively associated with contingent reward leadership (i.e., narcissists were less likely to promote equitable exchange relationships); and as an indirect effect of this association, narcissistic CEO's firms had higher manager turnover (Resick et al., 2009). Finally, having a narcissistic leader has been associated with reduced group-level information exchange, which can prove detrimental to team performance (Nevicka, Ten Velden, et al., 2011). This finding lends credence to the long-held suspicion that narcissists' pattern of resisting and devaluing others' input eventually has negative consequences (Kets de Vries & Miller, 1985; Maccoby, 2000; Rosenthal & Pittinsky, 2006).

Despite the growing body of literature focusing on the relationship between narcissism and leadership, no consensus has been reached regarding narcissism's impact on leadership. There are several possible reasons for this inconsistency of past findings. First, past theorizing on the leadership outcomes of narcissism (Padilla, Hogan, & Kaiser, 2007) has differentiated narcissism's association with leadership *emergence* (i.e., "whether (or to what degree) an individual is viewed as a leader by others, who typically have only limited information about that individual's performance"; Judge, Bono, Ilies, & Gerhardt, 2002, p. 767; Lord, de Vader, & Alliger, 1986) versus narcissism's association with leadership *effectiveness* (i.e., "a leader's performance in influencing and guiding the activities of his or her unit toward achievement of its goals" [Judge et al., 2002, p. 767; see Stogdill, 1950]). Research shows that narcissists generally make a positive first impression, as others preliminarily perceive them to be charming and self-confident; but over time more negative qualities such as arrogance, exploitativeness, and self-centeredness damage narcissists' relationships (Back, Schmukle, & Egloff, 2010; Paulhus, 1998; Robins & Beer, 2001). Second, past inconsistent findings might be attributable to the use of different sources of leadership reports, with self-reports of leadership outcomes likely yielding larger correlations to

narcissism because narcissists tend to inflate their own importance and achievements. In this work, we will assess these and other possible explanations for inconsistent past findings.

The current series of studies will attempt to make four main contributions to theory on narcissism and leadership by using meta-analytic methods to: (a) distinguish between leadership emergence and leadership effectiveness to reveal whether these two types of leadership display differing linear relationships with narcissism, (b) examine whether the source of leadership ratings (e.g., self-report, supervisor report, subordinate report, and peer report) substantially impacts the narcissism–leadership relationship, (c) investigate leader extraversion as an explanation for the observed positive association between narcissism and leader emergence, and (d) evaluate whether the relationship between narcissism and leadership effectiveness is curvilinear. This research also has clear practical implications, as the results may determine the type of advice offered to organizations regarding the selection of narcissists into leadership roles. For example, should limited resources be expended to actively avoid hiring narcissistic leaders, or are narcissistic leaders not as ineffective as originally feared?

Study 1

The Narcissism–Leadership Relationship and Its Moderators

Leadership emergence. Implicit leadership theory suggests that we choose our leaders based on how well people's characteristics match our conception of the prototypical leader (Lord, Foti, & DeVader, 1984; Shondrick, Dinh, & Lord, 2010). Therefore, it should be noted that many of narcissists' characteristics are "leader-like," such as being socially dominant, extraverted, and having high self-esteem (Ensari, Riggio, Christian, & Carstaw, 2011; Judge et al., 2002). Consistent with these characteristics, narcissism has been associated with social skills and charisma under conditions of minimal acquaintance (Back et al., 2010; Brunell et al., 2008; Nevicka, De Hoogh, Van Vianen, Beersma, & McIlwain, 2011; Nevicka, Ten Velden, et al., 2011; Paulhus, 1998; Paulhus, Westlake, Calvez, & Harms, in press; Schnure, 2010). Narcissists are likely to emerge as leaders in leaderless group discussions regardless of their individual performance on team tasks and are likely to be singled out as having leadership potential (Brunell et al., 2008; Nevicka, Ten Velden, et al., 2011). For example, within a sample of managers participating in a leaderless group discussion exercise, narcissists emerged as leaders even when rated by a group of independent experts who had received at least 20 hours of rater training (Brunell et al., 2008).

To better understand the process that leads to narcissists' charismatic appearance under conditions of minimal acquaintance, it is helpful to reference process models of interpersonal judgments such as the realistic accuracy model (RAM; Funder, 1995). RAM proposes that for others to accurately judge a personality trait, it must have relevant, observable behavioral manifestations that others are able to correctly interpret (Funder, 1995). For narcissism, the behavioral manifestations that contribute to positive first impressions include the tendency to be well-dressed, use charming facial expressions, display self-assured body movements, and use verbal humor (Back et al., 2010; Vazire, Naumann, Rentfrow, & Gosling, 2008). These traits are relevant because they "are related to four generally valued aspects of targets: attractiveness, competence, interpersonal warmth, and humor" (Back et al., 2010, p. 134; see also Berscheid & Reis, 1998). In addition, narcissists tend to be highly extraverted (Emmons, 1984; Paulhus, 1998; Trzesniewski et al., 2008), and extraversion is one of the most visible and most accurately perceived personality traits (Borkenau, Brecke, Mottig, & Paelecke, 2009; Connolly, Kavanagh, & Viswesvaran, 2007). High levels of extraversion are important because extraversion is a leading indicator of leadership emergence (Ensari et al., 2011; Judge et al., 2002). Based on all of these considerations, we hypothesize the following:

Hypothesis 1: Narcissism will be positively related to leadership emergence.

In an attempt to better understand the hypothesized positive relationship between narcissism and leadership emergence, we also plan to investigate extraversion. As previously mentioned, narcissists tend to be highly extraverted. The facets of extraversion include assertiveness, sociability, unrestraint, and activity/adventurousness (Saucier & Ostendorf, 1999). We thus believe that narcissism's overlap with extraversion (i.e., narcissists' energetic/outgoing/dominant [extraverted] behaviors) can explain why narcissism will have a positive relationship with leadership emergence. Thus,

Hypothesis 2: The relationship between narcissism and leader emergence can be fully explained by narcissism's overlap with extraversion, such that narcissism will no longer relate to leader emergence once extraversion has been accounted for.

Leadership effectiveness. In this study, we expect the negative aspects of narcissism to be more relevant to leadership *effectiveness* than to leadership *emergence* because the negative aspects seem to only reveal themselves over more

extended timeframes (Campbell & Campbell, 2009; Paulhus, 1998). A longitudinal study conducted by Paulhus (1998) demonstrates how individuals' perceptions of narcissists change over time. In this study, participants met for leaderless group discussions over several weeks. After the first discussion, narcissistic group members were described as "confident, entertaining, and physically attractive," but by the end of the study they were rated negatively and described using adjectives such as "hostile, arrogant, and cold" (Paulhus, 1998, p. 1204; we note that these latter traits might be negatively associated with the leader prototype, making narcissists increasingly less like to emerge as leaders over the course of a relationship). In other words, narcissists appear to be skillful at initiating relationships but unable to maintain them over time. Relatedly, Blair et al. (2008) found that narcissists' supervisors rated them negatively on the interpersonal components of leadership but that narcissism was unrelated to more task-specific aspects of leadership. This has serious implications for narcissists' ability to effectively supervise subordinates because evidence suggests a positive relationship between subordinate performance and the quality of leader–follower exchange relationships (Dansereau, Graen, & Haga, 1975; Deluga & Perry, 1994; Dockery & Steiner, 1990; Gerstner & Day, 1997).

More broadly, interpersonal deficiencies have been found to be a leading predictor of managerial derailment (McCall & Lombardo, 1983). The Center for Creative Leadership (CCL) pinpointed 10 key reasons why managers derail, and whereas no explicit connection was made to narcissism, many of the reasons for derailment overlap with the very definition of narcissism. Illustrative reasons include: (a) insensitivity (abrasive, intimidating, bullying); (b) being cold, aloof, arrogant; (c) betraying trust; and (d) being overly ambitious (McCall & Lombardo, 1983). The theme of troubled relationships leading to managerial derailment has been supported across several samples (McCall & Lombardo, 1983; McCauley & Lombardo, 1990; Morrison, White, & Van Velsor, 1987; Van Velsor & Leslie, 1995).

Overall, we anticipate that there will be a negative relationship between narcissism and leadership effectiveness. The expectation of a negative relationship between the two constructs can be deduced from (a) evidence that narcissists have difficulty maintaining positive relationships over time (Paulhus, 1998) and (b) the assertion that part of being an effective leader entails maintaining positive relationships with one's subordinates (which is demonstrated by the inclusion of a relationship component across many prominent leadership theories [e.g., Bass, 1985; Graen & Uhl-Bien, 1995; Stogdill, 1963; Uhl-Bien, 2006]). Thus,

Hypothesis 3: Narcissism will be negatively related to leadership effectiveness.

Potential Moderators of the Narcissism–Leadership Linear Relationships

Source of leadership report. Researchers use a variety of methods to measure leadership, including different sources or perspectives (e.g., self-reports, supervisor reports, etc.). We will compare self-reports, subordinate reports, coworker reports, and supervisor reports of leadership, with the expectation that correlations based on self-reports of leadership emergence/effectiveness will reflect a stronger positive relationship with narcissism (which is also self-reported). This is expected because narcissists have a documented propensity to self-enhance across a variety of measures including intelligence, interpersonal skills, public speaking, creativity, and course grades (Campbell, Reeder, Sedikides, & Elliot, 2000; Farwell & Wohlwend-Lloyd, 1998; Gabriel, Critelli, & Ee, 1994; John & Robins, 1994; Robins & John, 1997). Given the self-enhancement tendencies of narcissists, we therefore assert that narcissists will inflate self-reports of their own leadership (see preliminary evidence for this by Judge et al., 2006). Thus we hypothesize,

Hypothesis 4: The relationship between narcissism and leadership (i.e., leadership emergence and effectiveness) is moderated by the source of the leadership report, such that the relationship is stronger for self-reports than for observer reports of leadership.

Narcissism inventory. A second potential moderator is the type of narcissism inventory used. By far the most widely used measure of narcissism is the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), which consists of forced-choice, paired statements where one option is more likely to be endorsed by narcissistic individuals. For example, one NPI item pair is, "I like to be the center of attention," paired with "I prefer to blend in with the crowd." A second narcissism scale is derived from items in the California Personality Inventory (CPI; Gough & Bradley, 1992, 2002; Wink & Gough, 1990) and is proprietary (i.e., example items cannot be reported). Finally, the Bold scale of the Hogan Development Survey (HDS-Bold; Hogan & Hogan, 2009) consists of 14 nonobvious, dichotomous items embedded in a longer measure of personality. A sample item is "If I were in charge I could get this country moving again." The NPI, the CPI Narcissism scale, and the HDS-Bold were all developed to capture narcissism in nonpathological populations via self-report instruments.

In addition to the three commonly used narcissism inventories described above, researchers also use historiometric measures of narcissism. Historiometric measures of narcissism are idiosyncratic archival measures derived from publicly available information that is theorized to be indicative of narcissism. Prior research has used indicators such as the prominence of a CEO's photograph in a company's annual report, the CEO's cash compensation divided by that of the second-highest paid executive in a firm, or undergraduate ratings of a CEO's narcissism based on a biographical sketch compiled by the study's authors (e.g., Chatterjee & Hambrick, 2007, 2011; Resick et al., 2009). However, although these methods represent an innovative and often ingenious approach to assessing hard-to-sample populations, we anticipate that studies using this approach may result in larger effect sizes than studies using traditionally validated, inventory-based assessments. This is because researchers who use historiometric narcissism indices frequently control the idiosyncratic creation of both the narcissism measure and the leadership effectiveness measures in the same dataset; thus, there is a greater likelihood for indices to be unintentionally biased in favor of expected results.

Hypothesis 5: The relationship between narcissism and leadership emergence/effectiveness is moderated by the narcissism inventory used, such that the relationship is stronger for historiometric measures than for psychometric/survey measures of narcissism (i.e., the NPI, CPI, and HDS-Bold).

Method

Literature Search

In order to estimate the meta-analytic correlations, we electronically searched Dissertation Abstracts International (1861–2012), Google Scholar, and the American Psychological Association's PsycINFO database (1887–2012) for the following key words (and variations thereof): *narcissism, narcissistic, bold, entitlement, self-enhancement, leaderless group discussion, assessment center, leadership, management, executive, extraversion, Hogan Developmental Survey (HDS), California Personality Inventory (CPI)*, and *Narcissistic Personality Inventory (NPI)*. We also electronically searched programs from the last eight Society for Industrial and Organizational Psychology conferences (2005–2012) and the last eight annual Academy of Management conferences (2005–2012), and contacted researchers who conducted research on narcissism and leadership to obtain unpublished manuscripts.

Finally, we reviewed the reference sections of the articles obtained to identify additional articles.

Inclusion Criteria

Studies were included in the meta-analysis according to the following rules. First, a study had to report a relationship between a leadership criterion (e.g., leadership effectiveness, transformational leadership, leadership emergence) and narcissism, or a correlation between narcissism and extraversion. Second, to be included, each study had to provide sample sizes and consist primarily of adult populations, excluding clinical populations. Third, the majority of studies examining leadership emergence used undergraduates engaged in exercises such as leaderless group discussions. Both undergraduate and working adult samples were used to calculate the meta-analytic effect size between narcissism and leadership emergence, and between narcissism and extraversion. In contrast, we invoked higher standards for indexing leadership effectiveness, such that only studies using employed adults were included. Fourth, if there were several leadership effectiveness correlations reported for the same individuals (e.g., from multiple leadership effectiveness measures, or from ratings by multiple observers [peer, supervisor]), then a composite of these measures (Nunnally, 1978; or average, if either necessary information was not available to create a composite or if the predictors were not correlated; e.g., Blair et al., 2008) was used to estimate overall leadership effectiveness. However, self-reports of leadership (e.g., Khoo & Burch, 2008) were not coded as leadership effectiveness or leadership emergence, except when conducting the moderator analyses involving source of leadership report. For the overall leadership analyses, self-reports of leadership were excluded due to narcissists' known tendencies to self-enhance (Campbell et al., 2000; Farwell & Wohlwend-Lloyd, 1998; Gabriel et al., 1994; John & Robins, 1994; Raskin & Terry, 1988; Robins & John, 1997). We also excluded a study that labeled its criterion "leadership potential" but was actually based on a composite of self-reported personality items (i.e., Furnham, Trickey, & Hyde, 2012).

If multiple primary studies analyzed the same sample, then only one of these effect sizes was recorded. We encountered one sample that was reported in an unpublished thesis and in a published article, so the correlation from the published source was recorded (e.g., Benson & Campbell, 2007; Torregiante, 2005). Finally, when the primary article only reported a range of the number of participating individuals (e.g., 200–225), the lower bound was recorded as a conservative estimate of sample size.

Three narcissism inventories were considered appropriate measures of nonpathological narcissism: the NPI (Raskin & Terry, 1988), the HDS-Bold (Hogan & Hogan, 2009), and the Narcissism Inventory derived from the CPI (Gough & Bradley, 2002). In addition, meta-analytic effect sizes were calculated both with and without studies using historiometric measures (i.e., idiosyncratic archival measures of narcissism and leadership that frequently use undergraduate ratings of narcissism and/or leadership based on a profile prepared by the study's authors). We did not include correlations derived from inventories designed to measure pathological narcissism in clinical samples (e.g., the MCMI; Millon, Millon, Davis, & Grossman, 2009) or from inventories that are not widely accepted as measures of narcissism (Paunonen, Lönqvist, Verkasalo, Leikas, & Nissen, 2006). We identified 157 studies that appeared to provide data concerning relations between narcissism and leadership. The inclusion criteria resulted in a final database of 54 independent samples that met all criteria, including published journal articles ($k = 11$), dissertations and theses ($k = 7$), conference papers ($k = 4$), unpublished studies ($k = 7$), and effect sizes retrieved from technical manuals or obtained directly from Hogan Assessment Systems ($k = 21$). In Appendix A , we provide the main codes and input values for all of the primary studies and independent samples included in the narcissism–leadership meta-analysis.

The following inventories were used to measure extraversion: Saucier's Big Five Mini-Markers (Saucier, 1994), the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975), Eysenck's Maudsley Personality Inventory (Eysenck, 1958), NEO FFI (Costa & McCrae, 1992), NEO PI-R (Costa & McCrae, 1992), the Big Five Inventory (BFI; John & Srivastava, 1999), the Hogan Personality Inventory (HPI; Hogan & Hogan, 1994), Goldberg's Unipolar Big Five Markers (Goldberg, 1992), the Sixteen Personality Factor Questionnaire (16PF; Cattell, Cattell, & Cattell, 1993), and a 15-item extraversion measure developed by McCrae and Costa (1987). Of 285 studies that appeared to provide data on the relationship between narcissism and extraversion, the inclusion criteria resulted in a final database of 42 independent samples that met all criteria and included a mix of published journal articles ($k = 32$), dissertations and theses ($k = 4$), and effect sizes from technical manuals ($k = 6$). In Appendix B, we provide the main codes for all the samples included in the narcissism–extraversion meta-analysis.

Coding

Studies were coded as leadership emergence if leadership was measured using ratings of leadership potential, preferred leader, or leadership ratings after

assessment center exercises or leaderless group discussions. If a study reported narcissism–leadership correlations for leaderless group discussions that occurred over time, then the initial (time 1) correlation was coded as leadership emergence (e.g., Hendin, 2001). Further, as recommended by a reviewer, we coded the length of the raters' relationship with the focal leader as a moderator—whether raters had known the focal leader for a short period of time (i.e., less than 1 week) or for a longer time period (i.e., ≥1 week), with the expectation that narcissism would have less positive effects in relationships of longer duration (Paulhus, 1998).

Charismatic leadership, servant leadership, and transformational leadership ratings were coded as leadership effectiveness (e.g., Galvin et al., 2010). In addition, global or overall ratings of leadership performance, objective measures of leadership (i.e., firm performance; Peterson et al., 2012), and composites of many dimensions of leadership were also coded as leadership effectiveness. Many of the correlations in this meta-analysis came from the HDS technical manual, and to ensure that the measures of leadership matched our inclusion criteria, we contacted Hogan Assessment Systems for more information regarding each sample. During our communication with Hogan Assessment Systems, additional samples were made available for the meta-analysis. Eighteen of the samples from Hogan were coded as leadership effectiveness.

Studies were also coded for sample size, source of the effect size (e.g., published paper, dissertation/thesis, unpublished manuscript, conference paper, or technical manual), source of the leadership ratings, and the demographic makeup of the sample. In addition, we coded the nature of the sample including undergrads, working adults, military sample, or working students. We defined working students as MBA, master's, or undergraduate students who were currently working at the time of the study. Overall, a high degree of intercoder agreement was obtained between the study's two first authors for type of leadership (98%), type of narcissism inventory (100%), source of leadership report (100%), publication type (100%), and type of sample (91%). Divergent ratings were discussed until there was agreement about the proper coding.

Computation of Meta-Analytic Coefficients

This study followed the random effects meta-analytic procedures outlined by Hunter and Schmidt (2004). All effect sizes were corrected for unreliability in both predictor and criterion. Based on our hypothesis that narcissism will have a positive relationship with leadership emergence, there was reason to believe that the correlation between narcissism and leadership effectiveness would potentially suffer from range restriction (i.e., if individuals high in narcissism are more likely to

be appointed to leadership roles, this can create a restriction in the range of leaders' narcissism scores). However, when comparing the (restricted) average variance of narcissism scores observed in the leadership effectiveness primary studies against the unrestricted average variance found in the technical manuals for the HDS-Bold measure, we found the restricted-to-unrestricted variance ratio (U) was .97; thus, it appears there is little to no range restriction in narcissism among leaders in our primary study samples. As such, we opted not to correct for range restriction in the current meta-analyses. Regarding reliability artifacts, the approach used for studies that did not report a reliability estimate for narcissism was as follows. First, the average of available reliabilities for the NPI were used to estimate missing NPI reliabilities (average reliability for NPI = .87). A different average was computed for the NPI-16, as the shortened 16-item NPI is less reliable (average reliability for NPI-16 = .66; Ames, et al., 2006). For effect sizes based on proprietary inventories (CPI and HDS), we replaced missing reliabilities with the average reliabilities reported in the instruments' technical manuals (average reliability for CPI = .77; average reliability for the HDS-Bold = .67). Whereas our general approach was to use local reliability estimates from the primary studies whenever possible, the decision to correct the proprietary inventories using relevant technical manuals was based on there being fewer published studies using these inventories and existing studies frequently not reporting reliability information. To correct for missing extraversion reliabilities, we used the unit-weighted internal consistency reliability of .78 found in Viswesvaran and Ones (2000, p. 231). In addition, the average reliability for the NPI was slightly lower for narcissism–extraversion primary studies (average reliability for NPI = .84), so this value was used to estimate missing NPI reliabilities for narcissism–extraversion correlations.

Leadership effect sizes were corrected using Viswesvaran, Ones, and Schmidt's (1996) meta-analytic Cronbach's alpha estimates to correct for unreliability in leadership effectiveness ratings made by supervisors (.77) and peers (.61). Students' ratings of the leadership behaviors of other students were treated as peer ratings, and assessment center ratings were treated as supervisor ratings. The average reliability across all ratings (average reliability = .76) was used for studies in which the source of ratings was subordinate reports, self-reported leadership, a mixture of different report sources; or when the source of the report was not stated.

Results

Table 1 displays the meta-analytic validity estimates for narcissism and leadership. As can be seen in Table 1, the narcissism–leadership correlation is stronger

Table 1. Meta-Analytic Results for Narcissism and Leadership Criteria

						95% confidence int.		80% credibility int.	
	k	*N*	*r*	$\hat{\rho}$	*SD* $\hat{\rho}$	LL	UL	LL	UL
Leadership emergence									
Narcissism	18	3,131	.12	.16	.00	.08	.15	.16	.16
Length of acquaintance									
Minimal acquaintance	13	2,283	.13	.18	.00	.09	.18	.18	.18
Longer Acquaintance	5	848	.07	.09	.06	.002	.14	.02	.16
Leadership effectiveness									
Narcissism									
(with historiometric)	32	5,593	.02	.03	.14	−.01	.04	−.15	.20
(without historiometric)	26	4,191	.02	.03	.14	−.01	.05	−.14	.21

k = number of effect sizes included in the meta-analysis; *N* = total sample size in the meta-analysis; *r* = sample-size weighted mean correlation; $\hat{\rho}$ = correlation corrected for attenuation in the predictor and criterion; *SD* $\hat{\rho}$ = standard deviation of corrected correlation; 80% credibility int. LL/UL = lower and upper limits of 80% credibility interval for $\hat{\rho}$; 95% confidence int. LL/UL = lower and upper limits of 95% confidence interval for *r*; with(out) historiometric = effect size calculated including/excluding historiometric measures of narcissism. None of the leadership emergence primary studies used historiometric measures.

for leadership emergence than for leadership effectiveness. As expected, leadership *emergence* was positively related to narcissism (ρ = .16; 95% CI for $\bar{r}$ = [.08, .15]), supporting Hypothesis 1. Because many of the effect sizes for leader emergence were obtained from unpublished research conducted by a single author (P. D. Harms, 2009a, 2009b, 2009c, 2009d), to ensure that results from these studies were consistent with those obtained from alternate sources, we also calculated the narcissism–leadership emergence relationship without the unpublished studies from this author. Results based on the reduced number of effect sizes did not differ from the results reported above (*k* = 12, *N* = 2,612, ρ = .16; 95% CI = [.09, .16]). Next, the narcissism–leader emergence studies were broken down by the length of acquaintance between raters and focal leaders. For minimal acquaintanceship (less than 1 week) ρ = .18 (95% CI = [.09, .18]), and for longer acquaintanceship (≥1 week) ρ = .09 (95% CI = [.002, .14]), although the confidence intervals overlapped (see Table 1). Thus there is some suggestion that the narcissism–leadership emergence relationship decreases with length of

acquaintance, such that narcissists' characteristics are perceived to be less consistent with a prototypical leader after individuals get to know the narcissists better (see Paulhus, 1998).

Hypothesis 3 predicted that narcissism would have a negative relationship with leadership *effectiveness*. Surprisingly, narcissism had no linear relationship with leadership effectiveness ($\rho = .03$; 95% CI = [–.01, .04]). Further, the narcissism–leadership effectiveness confidence interval did not overlap with the narcissism–leadership emergence confidence interval, suggesting that narcissism predicts leadership emergence more strongly than it predicts leadership effectiveness. In addition, the credibility interval for the leadership effectiveness effect size was relatively wide (80% CV = [–.15, .20]), suggesting moderator variables are present.

Moderator Analyses

Results from the moderator analyses for sources of leadership effectiveness ratings are displayed in Table 2 (there was not a sufficient number of primary studies to perform this moderator analysis for the leadership emergence criterion). Supporting Hypothesis 4, the source of leadership effectiveness ratings moderated the relationship between narcissism and leadership effectiveness, such that the relationship was stronger for self-reports of leadership ($\rho = .29$; 95% CI = [.17, .25]) than for observer reports of leadership {i.e., supervisor reports ($\rho = .04$; 95% CI = [–.01, .06]), peer reports ($\rho = .02$; 95% CI = [–.04, .06]), and subordinate reports ($\rho = .12$; 95% CI = [.03, .13])}. In addition, the different types of observer reports had overlapping confidence and credibility intervals, indicating that the narcissism–leadership effectiveness relationship did not differ much across different observers' leadership reports (i.e., supervisor, peer, and subordinate ratings of leadership effectiveness).

Results for the next hypothesized moderator, the type of narcissism inventory, are also displayed in Table 2. This moderator analysis was unfortunately hindered by a lack of primary studies. For example, only one leadership effectiveness study used the CPI, and we did not find any leadership emergence studies that used historiometric measures of narcissism, so these conditions could not be analyzed. For leadership emergence, the NPI, HDS-Bold, and CPI narcissism measures all exhibited similar magnitudes of correlations with leadership emergence (ρs ranged from .13 to .16), with overlapping confidence intervals. In other words, type of narcissism inventory did not moderate the narcissism–leadership emergence relationship.

Table 2. Meta-Analytic Results for Leadership by Narcissism Inventory and Source of Leadership Report

						95% confidence int.		80% credibility int.	
	k	*N*	*r*	$\hat{\rho}$	*SD* $\hat{\rho}$	LL	UL	LL	UL
Source of leadership report*									
Leadership effectiveness									
Self-report	11	1,941	.21	.29	.15	.17	.25	.10	.48
Supervisor report	19	3,390	.03	.04	.08	−.01	.06	−.06	.14
Subordinate report	10	1,697	.08	.12	.00	.03	.13	.12	.12
Peer report	8	1,523	.01	.02	.16	−.04	.06	−.19	.23
Narcissism inventory									
Leadership emergence									
NPI	11	1,893	.13	.16	.00	.08	.17	.16	.16
HDS-Bold	3	574	.08	.13	.18	.003	.17	−.10	.37
CPI	4	664	.12	.16	.00	.04	.20	.16	.16
Leadership effectiveness									
NPI	6	601	−.06	−.09	.22	−.14	.02	−.37	.19
HDS-Bold	19	3,442	.04	.06	.09	.01	.07	−.06	.18
CPI	1	148	−.19						
Historiometric	6	1,402	.00	.00	.13	−.05	.06	−.16	.16

NPI = Narcissistic Personality Inventory; HDS = Hogan Developmental Survey; CPI = California Personality Inventory; *k* = number of effect sizes included in the meta-analysis; *N* = total sample size in the meta-analysis; *r* = sample-size weighted mean correlation; $\hat{\rho}$ = correlation corrected for attenuation in the predictor and criterion; *SD* ρ = standard deviation of corrected correlation; 80% credibility int. LL/UL = lower and upper limits of 80% credibility interval for $\hat{\rho}$; 95% confidence int. LL/UL = lower and upper limits of 95% confidence interval for *r*.

*Historiometric studies were not included in these analyses. None of the leadership emergence primary studies used historiometric measures.

For leadership effectiveness, the two available narcissism surveys, the HDS-Bold and the NPI, did not display different relationships with leadership effectiveness, and they had overlapping confidence intervals. The samples using historiometric measures of narcissism also had overlapping confidence intervals with those based on the psychometric narcissism surveys, failing to support Hypothesis 5 (see Table 2). Once again, these results should be interpreted with caution due to the small number of effect sizes available for some measures.

Table 3. Meta-Analytic Correlation Matrix of Variables in Extraversion Analyses

Variables	1	2
1. Narcissism	—	
2. Leadership emergence	.16a 18/3,131	—
3. Extraversion	.55a* 42/28,345	.33b 37/?

Each cell contains the corrected correlation, followed by *k* number of effect sizes and *N* sample size.
a. Original meta-analysis; *Extraversion–narcissism weighted mean observed r = .45; $SD\ \rho$ = .09; 95% confidence interval for r = [.44, .46]; 80% credibility interval for $\hat{\rho}$ = [.43, .65];
b. Judge et al. (2002) reported the average effect size and number of studies *k*, but did not report the *N*s for the meta-analysis broken down by leadership emergence/leadership effectiveness; for leadership emergence/leadership effectiveness combined: Extraversion-Leadership k = 60, N = 11,705.

We also investigated whether the narcissism–leadership correlations were dependent upon publication source (i.e., published papers, unpublished manuscripts, conference papers, dissertations/theses, or technical manuals). Publication type did not moderate the narcissism–leadership emergence relationship. The average relationships were ρ = .17 (for published papers; k = 4; N = 1,214), and ρ = .14 (for unpublished papers, dissertations, and technical manuals combined; k = 14; N = 1,917). Publication type also did not moderate the narcissism–leadership effectiveness relationship: ρ = .02 (for published papers; k = 7; N = 1,803) and ρ = .05 (for unpublished papers, dissertations, and technical manuals combined; k = 19; N = 2,389). In addition, the type of sample did not moderate the narcissism–leadership emergence relationship (undergraduates ρ = .17 [k = 12, N = 2,046] vs. working adults ρ = .12 [k = 6, N = 1,085]) or the narcissism–leadership effectiveness relationship (working students ρ = .05 [k = 4, N = 519]; working adults ρ = –.001 [k = 21, N = 2,753]; military cadets ρ = .08 [k = 1, N = 919]). Details of these additional meta-analyses are available from the first author.

Extraversion Analyses

We next set out to test whether the effect of narcissism on leader emergence can be explained by narcissism's overlap with trait extraversion. Table 3 contains the meta-analytic correlation matrix used in this analysis (all correlations in Table 3 are corrected for unreliability). The corrected correlation between extraversion and leadership emergence was .33 and was found in Judge et al. (2002, p. 772). To test Hypothesis 2, that the overlap between narcissism and extraversion can explain the

effect of narcissism on leadership emergence, we first note that narcissism was related to leadership emergence ($\rho = .16$, $p < .05$; Table 1). Second, narcissism was related to extraversion (from our original meta-analysis, $\rho = .55$, $p < .05$; see Table 3 footnote). Third, when leader emergence was simultaneously regressed onto narcissism and extraversion together, the direct effect of narcissism on leader emergence switched from positive ($\beta = .16$) to near zero ($\beta = –.03$, $p = .13$). The overlap between narcissism and extraversion thus fully explains narcissism's positive relationship with leadership emergence. In other words, holding extraversion constant, narcissists are no more likely to emerge as leaders.

Summary of Study 1

Narcissists are more likely to emerge as leaders, and this positive relationship is explained by the overlap of narcissism with extraversion. However, despite the fact that narcissists tend to emerge as leaders, they were no more or less likely to be effective leaders, on average. The nil overall relationship between narcissism and leader effectiveness was moderated by the source of the leadership report, such that the relationship was more strongly positive for self-reports than for observer reports of leadership.

Study 2

Nonlinear Relationship of Narcissism With Leader Effectiveness

The previous hypotheses focused on the directions of the linear relationships between narcissism and leadership constructs. However, lack of evidence of a linear relationship does not rule out the possibility of a curvilinear relationship. An undetected curvilinear relationship between narcissism and leadership effectiveness could explain some of the observed inconsistencies in the literature because undetected curvilinear effects can produce linear statistics that are a misleading summary of a relationship between two variables (Pierce & Aguinis, 2013).

There are no published studies directly examining the possibility of a curvilinear relationship between narcissism and leadership effectiveness. However, Benson and Campbell (2007) found an inverted U-shaped relationship between leadership and a composite of dark traits that included 10 other traits in addition to narcissism. Independent of these other dark traits, it remains unclear what the shape of the specific narcissism–leadership effectiveness relationship would be. Second, at the team-level of analysis, narcissism has been shown to have a

curvilinear relationship with other criteria (Goncalo, Flynn, & Kim, 2010). For example, the number of narcissists on a team has an inverted U-shaped relationship with team creative performance, such that having more narcissists is better for generating creative outcomes up to a point, after which too many narcissists becomes detrimental (perhaps because they cause distracting conflict; Goncalo et al., 2010).

We propose that the relationship between narcissism and leadership effectiveness also takes the form of a nonmonotonic, inverted U-shape. If an inverted U-shape was the best way to characterize the narcissism–leadership effectiveness relationship, this would mean that moderate levels of narcissism facilitate leadership effectiveness, whereas both very low and very high levels of narcissism would be associated with greater leadership dysfunction. It may seem counterintuitive that a lack of narcissism would result in poor leadership, but we assert here that narcissism is a potentially positive trait, when expressed in moderation. Similar to Aristotle's admonition that individuals should strive for "an intermediate between excess and defect…that which is equidistant from each of the extremes" (Aristotle, trans. 1999, p. 26; Pierce & Aguinis, 2013), it is possible that a moderate amount of what is traditionally considered a negative trait could actually be ideal.

A Behavioral Threshold Theory of Nonlinear Effects

To further explain our predicted curvilinear relationship between narcissism and leadership effectiveness, we will next articulate a behavioral threshold theory of nonlinear effects. In brief, the behavioral threshold theory states that a curvilinear (inverted U-shaped) effect of X on Y implies that, for the predictor variable X, low threshold (easy) items will tend to be more adaptive (more positively related to Y), whereas high threshold (difficult) items will tend to be more maladaptive (more negatively related to Y). This threshold-based theory of nonlinear effects has two tenets. First, an individual trait (such as narcissism) has multiple behavioral manifestations (or reflective indicators; Edwards, 2011; Edwards & Bagozzi, 2000; Joreskog, 1971), and these behavioral indicators have different *thresholds* for enactment. A reflective indicator can be a self-reported item from a personality measure, an observed behavioral frequency count, and so forth. Differing thresholds for enactment mean that some behaviors only tend to manifest at high trait levels (high threshold items), whereas other behaviors tend to manifest at low trait levels (low threshold items). The same logic of item thresholds can be seen in item response theory (IRT; Birnbaum, 1968; Hulin, Drasgow, & Parsons, 1983; Lord, 1980). Second, different behavioral manifestations of a

trait can each have differing relationships with a criterion or outcome variable. Curvilinear relationships between X and Y thus imply that the threshold of each X item is negatively related to the correlation of each X item with the criterion variable Y . For instance, if the item *thresholds* are denoted t_i, and the itemwise *criterion validities* (i.e., each X item's relationship with Y) are denoted cv_i, then behavioral threshold theory simply specifies that t_i and cv_i will be negatively correlated (i.e., $r_{t_i,cv_i} < 0$).

To be more concrete, we will explicate the behavioral threshold theory in the context of the relationship between narcissism and leadership effectiveness. First, we note that narcissism has multiple behavioral manifestations (i.e., multiple items in the narcissism measures: the NPI, CPI, and HDS-Bold), and the different manifestations of narcissism have different thresholds for enactment. For example, Ackerman, Donnellan, and Robins (2012) recently used IRT methodology on the NPI to demonstrate that narcissism items have varying thresholds. Their results showed that items with higher thresholds (high difficulty levels; e.g., "I will usually show off if I get the chance") require higher trait levels of narcissism before they will be endorsed by respondents. In addition, items with lower thresholds (low difficulty levels; e.g., "I have a natural talent for influencing people") tend to be endorsed more frequently because they are endorsed by individuals with both low and high levels of the narcissism trait. This is similar to how easy items on a cognitive ability test are endorsed (answered correctly) by individuals with both high and low ability levels.

Ackerman et al. (2012) also noted that low difficulty narcissism items tended to reflect adaptive components of narcissism (such as positive self-attitudes), whereas high difficulty items tended to represent maladaptive components of narcissism (such as exploitativeness and grandiosity). We believe that this pattern is consistent with an inverted U-shaped relationship, where increasing levels of narcissism in the lower end of the trait range would lead to better leadership performance. However, as leader narcissism levels continue to rise, maladaptive aspects of narcissism would manifest themselves and the narcissism–leadership effectiveness relationship would become negative. Consequently, we would expect that the highest levels of leader effectiveness would be found at moderate levels of narcissism.

Hypothesis 6: Narcissism will have an inverted U-shaped relationship to leadership effectiveness, such that the relationship is initially positive but becomes more negative as narcissism increases. As such, leadership effectiveness will be maximized in the midrange of narcissism.

Nonlinear (quadratic) effects are notoriously small in magnitude (Ames & Flynn, 2007; Benson & Campbell, 2007; Cucina & Vasilopoulos, 2005; LaHuis, Martin, & Avis, 2005; Le et al., 2011). In addition, past research studying personality and nonlinear effects has produced disparate results (see Le, Robbins, Ilies, Holland, & Westrick, 2011, for a review of conscientiousness and job performance). Given these challenges, we will use multiple datasets in an attempt to improve statistical power to detect the form of the relationship between narcissism and leadership effectiveness. To this end, in Study 2 we will analyze six different datasets of working adults provided by Hogan Assessment Systems, which measured self-reported narcissism using the HDS-Bold (Hogan & Hogan, 2009) and supervisor-rated leadership effectiveness. The quadratic effects from these data sets will be meta-analyzed to address Hypothesis 6.

Method

Samples

Six different samples collected by Hogan Assessment Systems at various organizations within the United States were used for Study 2. For more information regarding each sample, see Table 4. Hogan Assessment Systems supplied eight different samples for this investigation, but two samples were disqualified because they did not include a measure of leadership effectiveness. It was determined that one of the samples was of entry-level employees who did not have leadership responsibilities, and the other sample's leadership criterion was more accurately described as leadership emergence, not leadership effectiveness.

Measures

Narcissism was measured with the proprietary HDS-Bold subscale, which was specifically designed for high-stakes testing in selection settings (Hogan & Hogan, 2009). The HDS-Bold subscale consists of 14 nonobvious, true/false items embedded in a longer measure of personality, the Hogan Development Survey (HDS). The HDS assesses 11 dysfunctional dispositions (total HDS items = 168). High scorers on the Bold scale are described as overly self-confident, arrogant, and having inflated feelings of self-worth (HDS technical manual; Hogan & Hogan, 2009). Cronbach's α for the HDS-Bold from the HDS technical manual is .67. Leadership effectiveness was based on supervisor-reports, although different items assessing leadership effectiveness were used for each sample. Table 4 provides additional information about the leadership effectiveness items used for each sample.

Table 4. Description of Study 2 Samples and Leadership Measures

Sample	*N*	*Mean* nar	*SD* nar	% Male	% White	Average age	Industry	Leadership measures
Sample 1	103	8.06	2.95	97	96	43	Cost estimation	5 items; Sample items: "anticipates future needs, communicates the big picture and thinks strategically, forecasts problems/pitfalls and acts to minimize them"
Sample 2	290	7.97	2.59	—	—	—	Postal service	12 items; business leadership, people leadership, results leadership, self-leadership
Sample 3	119	7.69	2.56	62	75	38	Communications	Overall job performance of leader (unclear how many items)
Sample 4	216	7.14	2.67	53	2*	43	Banking	1 item; overall job performance of leader: 5-point Likert scale
Sample 5	798	7.46	2.64	68	4*	40	Pharmaceutical	9 items; Sample items: "adjusts his/her leadership style according to the demands of the situation, articulates goals and standards in a manner that is energizing and meaningful, communicates objectives/goals to his/her team/work unit in a timely way"
Sample 6	187	7.75	2.47	50	58	—	Manufactured goods	58 items; Overall job performance of leader; Sample item: "Balances a concern for results with a concern for the needs of individuals in his/her work group"

N = sample size; *Mean* nar = mean of narcissism measure; *SD* nar = standard deviation of narcissism measure

* Native Americans were the largest racial/ethnic group (Sample 4: 74% Native American and 20% Hispanic; Sample 5: 71% Native American and 18% Hispanic); — denotes unavailable information; All leadership measures are based on supervisor report.

Analysis

To give an overall estimate of the curvilinear effect size across the six samples, we followed the same procedure used by past researchers to meta-analyze curvilinear effects (Verhaeghen & Salthouse, 1997; Williams & Livingstone, 1994). The decision to meta-analyze the curvilinear effects, rather than to analyze the data using multilevel modeling, which analyzes all samples simultaneously but takes into account the nonindependence of employees nested within organizations, was based on the difficulty created by each of the six samples' using a different measure of leadership effectiveness. First, we performed identical multiple regressions for each independent sample. The increment in variance explained by the curvilinear effect, controlling for the linear effect, is represented by a squared semipartial correlation (ΔR^2). Second, for each sample we took the square root of the squared semipartial correlation (ΔR^2), resulting in a semipartial correlation that was an estimate of the quadratic narcissism effect, orthogonal to the linear narcissism effect. This semipartial correlation is a Pearson correlation coefficient and was therefore meta-analyzed using a similar procedure as described for Study 1 but without correcting for statistical artifacts (e.g., correction formulae do not exist for attenuation due to unreliability in a nonlinear/squared term). Finally, it should be noted that the linear correlations between narcissism and leadership effectiveness from Study 2 samples were also included in the Study 1 meta-analysis of linear effects.

Results

Table 4 reports the means and standard deviations of the HDS-Bold measure of narcissism for each of the six samples. Table 5 shows the results of multiple regression analyses examining the relationship between narcissism and leadership effectiveness for each of the six samples independently. As can be seen, the quadratic effect of narcissism in Step 2 of the regression model predicting leadership effectiveness was statistically significant for two samples: Sample 2 ($\beta = -.12$, $p < .05$; $\Delta R^2 = .014$) and Sample 4 ($\beta = -.14$, $p < .05$; $\Delta R^2 = .020$). The signs of the quadratic effects were negative for all six samples, indicating that the directions of the relationships were consistent with an inverted-U shape. Figure 1 provides a visual depiction of the quadratic regression line for each of the samples. In Figure 1, the standardized scores (z-scores) of leadership effectiveness were regressed

Table 5. Examining the Linearity of the Narcissism–Leader Effectiveness Relationship in Multiple Samples

	Sample 1				Sample 2				Sample 3			
Predictor	*B*	β	R^2	ΔR^2	*B*	β	R^2	ΔR^2	*B*	β	R^2	ΔR^2
Step 1												
Narcissism	.25	.12	.015		−.13*	−.12*	.014*		−.01	−.08	.006	
Step 2												
Narcissism	.20	.10			−.15*	−.14*			−.01	−.10		
Narcissism squared (quadratic effect)	−.03	−.05	.016	.001	−.04	−.12*	.028*	.014*	−.006	−.13	.023	.017

	Sample 4				Sample 5				Sample 6			
Predictor	*B*	β	R^2	ΔR^2	*B*	β	R^2	ΔR^2	*B*	β	R^2	ΔR^2
Step 1												
Narcissism	.01	.05	.003		.03*	.08*	.007*		.002	.01	.000	
Step 2												
Narcissism	.02	.06			.03*	.08*			−.003	−.02		
Narcissism squared (quadratic effect)	−.01*	−.14*	.023*	.020*	−.002	−.02	.007	.000	−.005	−.10	.009	.009

*$p < .05$; Sample 1: $N = 103$; Sample 2: $N = 290$; Sample 3: $N = 119$; Sample 4: $N = 216$; Sample 5: $N = 798$; Sample 6: $N = 187$; *B* = unstandardized regression coefficient; β = standardized regression coefficient; R^2 = amount of variance explained by predictors; ΔR^2 = amount of variance explained by quadratic narcissism beyond that explained by linear narcissism.

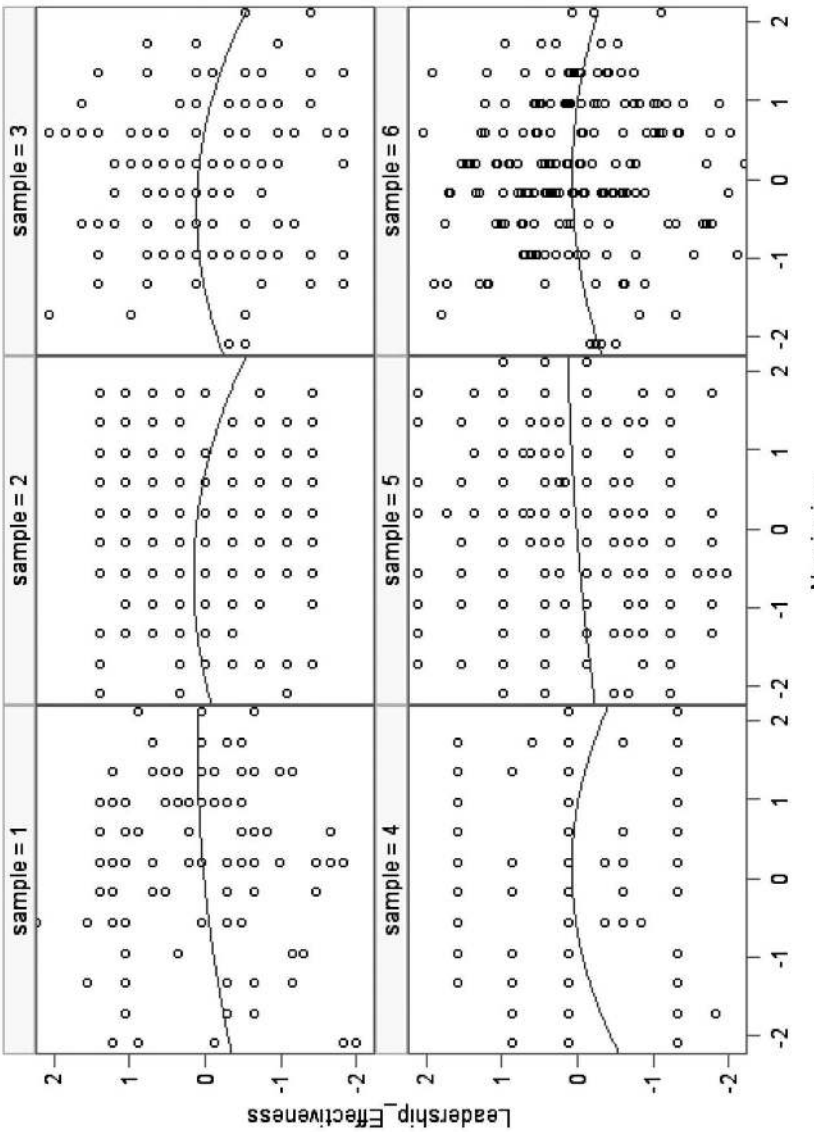

Figure 1. Relationship Between Narcissism and Leadership Effectiveness. Narcissism and leadership Effectiveness are standardized. The scale of the horizontal axis was set using ±2 standard deviations of narcissism. The scale of the vertical axis was set using ±2 standard deviations of leadership effectiveness.

Table 6. Curvilinear Relationship Between Narcissism and Leadership Effectiveness

				95% confidence int.	
DV = Leadership effectiveness	*k*	*N*	*ΔR*	LL	UL
Narcissism (quadratic effect)	6	1,713	−.06	−.11	−.01

DV = dependant variable; *k* = number of effect sizes included in the meta-analysis; *N* = total sample size in the meta-analysis; ΔR = sample-size weighted mean square root of ΔR^2; 95% confidence int. LL/UL = lower and upper limits of 95% confidence interval for *R*.

onto the standardized scores of narcissism. The *z* score of leadership effectiveness was used because each of the samples employed a different measure of leadership effectiveness. The regression lines tended to indicate inverted U-shaped relationships, with magnitudes that varied across the six samples. When looking at individual primary studies, results for the nonlinear narcissism–leadership effectiveness relationship appear weak and not consistently statistically significant. However, these small effect-size conditions are precisely the circumstances under which meta-analysis can be most useful, by revealing phenomena that would have been disregarded based upon inspecting the small-sample primary study results alone (e.g., see Barrick & Mount, 1991; Schmidt, 1992).

Following the individual hierarchical regressions, the results from all six samples were meta-analytically combined. Results of the meta-analysis of the curvilinear terms are shown in Table 6. These results support Hypothesis 6 that, on average, there is a curvilinear relationship between narcissism and leadership effectiveness. The mean quadratic semipartial correlation coefficient was –.06, and the confidence interval surrounding this effect size did not include zero (95% CI lower limit = –.11, CI upper limit = –.01), which indicated that the relationship between the two constructs took the shape of an inverted U.

Noting that narcissism's linear effect on leader *emergence* can be fully accounted for by extraversion, we next tested whether narcissism's curvilinear effect on leader *effectiveness* could also be fully explained by extraversion alone (cf. see Hypothesis 2). This analysis was conducted with four samples, as only four of the six samples from Study 2 measured extraversion. It should be noted that, even using fewer samples (four instead of six), there was still a statistically significant curvilinear relationship between narcissism and leadership effectiveness (mean quadratic semipartial $r = –.10$; $k = 4$; $N = 696$; 95% CI = [–.18, –.03]). After controlling for extraversion in each hierarchical regression and then averaging these results

meta-analytically across samples, we found that narcissism continued to have a statistically significant curvilinear relationship with leadership effectiveness. The negative mean quadratic semipartial correlation coefficient was –.16 (95% CI = [–.24, –.09]). As such, we conclude that extraversion does not explain the curvilinear effect of narcissism on leader effectiveness.

As another point of interest, although Study 2 meta-analytically supported the curvilinear narcissism–leader effectiveness relationship, we wanted to expand on the behavioral threshold theory interpretation of nonlinear effects. This theory has two tenets: (a) items on a narcissism measure will have differing item thresholds (i.e., different difficulty levels), and (b) item thresholds (t_i) will be negatively correlated with item criterion validities for predicting leadership effectiveness (cv_i) across items (i.e., $r_{ti\,,\,cvi} < 0$). We requested access to item-level criterion validities (cv_i) and item means for the proprietary HDS-Bold measure and were given access to these summary statistics for three of the Study 2 samples (Samples 2, 3, and 6). Because the HDS-Bold uses dichotomous items, we could easily transform item means into item thresholds (t_i) using the inverse standard normal cumulative distribution (i.e., Microsoft Excel formula " = – NORMSINV['item mean']"). Both tenets of behavioral threshold theory were consistently supported across the three samples, as: (a) the item thresholds (i.e., item difficulties) showed large and consistent variation across items (*SD* = .82, .80, and .72; across the three samples respectively), and (b) the item thresholds were consistently negatively correlated with item criterion validities ($r_{ti\,,\,cvi}$ = –.24, –.56, and –.26; across the three samples).

To further explore the meaning of this negative correlation ($r_{ti\,,\,cvi} < 0$), we requested permission to report the wording of the easiest (low threshold) narcissism item with more positive criterion validity for predicting leadership effectiveness. This item is HDS-Bold item 8, "I have an interesting mind." We also report the wording of the most difficult (high threshold) narcissism item with more negative criterion validity for predicting leadership effectiveness—this item is HDS-Bold item 12, "No one ever got ahead by being modest." In other words, an easy narcissism item ("I have an interesting mind") would appear to enhance leader effectiveness, whereas a difficult narcissism item ("No one ever got ahead by being modest") would appear to hinder leader effectiveness. These trends are consistent with the idea that increasing narcissism in the low range of the trait will lead to more adaptive manifestations of narcissism (Ackerman et al., 2012) that can bolster a leader's effectiveness, but increasing narcissism in the high range of the trait will produce maladaptive manifestations of narcissism (e.g., grandiosity or entitlement) that can impair a leader's effectiveness.

Summary of Study 2

The possibility of a curvilinear relationship between narcissism and leadership effectiveness was investigated meta-analytically across six samples. Narcissism exhibited a statistically significant nonmonotonic relationship with leadership effectiveness. These results suggest that moderate levels of narcissism contribute to leadership effectiveness, up to a maximum point beyond which narcissism becomes detrimental to leadership effectiveness.

General Discussion

The effect of narcissism depends on the type of leadership examined (emergence vs. effectiveness). In Study 1, meta-analysis revealed that narcissistic individuals were more likely to become leaders, and this positive relationship was completely explained by the overlap between narcissism and extraversion. That is, narcissists tend to emerge as leaders because they are more extraverted. At the same time, Study 1 results did not support the predicted negative association between narcissism and leader effectiveness, in fact, narcissism had no linear association with leader effectiveness. There was one exception to this generalization: The relationship between narcissism and leadership effectiveness was significant when leadership effectiveness ratings were based on self-reports. These self-report findings offer further evidence that narcissists will self-enhance their own leadership achievements.

The nil linear results for leadership effectiveness from Study 1 were somewhat expanded by Study 2, which demonstrated that the narcissism–leadership effectiveness relationship was curvilinear (an inverted U shape). That is, Study 2 showed that leaders were more effective when they had moderate levels of narcissism instead of very high or very low levels. The Study 2 meta-analysis was based on information from 1,713 participants and represents the most complete existing summary of the narcissism–leadership effectiveness relationship. The larger sample size gave us more statistical power to detect the curvilinear effect; yet, because this result was based on a relatively small number of studies ($k = 6$), some caution is merited.

Theoretical Implications

Our findings contribute to the narcissism and leadership literature in three ways. First, we identified a curvilinear relationship between narcissism and leadership

effectiveness. Prior theoretical discussions implicitly assumed that the relationship between narcissism and leadership effectiveness was linear. These findings shift this discussion by confirming that narcissism is neither wholly beneficial nor deleterious but is best in moderation. Further, this work highlights the importance of investigating curvilinear effects in personality–leadership research. Our results support Simonton's (1995) contention that, "Because the bulk of leadership research has relied heavily on linear measures of statistical association, the empirical literature may seriously underestimate the predictive value of many measures of personal attributes" (p. 750; see Ames & Flynn, 2007). Future research is needed to determine if the nonlinear effect found for narcissism and leadership extends to other personality traits.

Second, narcissism seems to enhance the chances that an individual will emerge as a leader. This effect is especially strong if the leader emergence takes place among individuals who have not known each other for very long, in circumstances of brief acquaintanceship. This finding supports the notion that the ugly side of narcissism takes time to emerge, and thus narcissists are most likely to benefit from this trait (i.e., to emerge as leader) when they are new to a group, when the group itself is young, or when being interviewed for a leadership position.

Third, this is the first study to demonstrate that narcissism's association with extraversion seems to drive the narcissism–leadership emergence relationship. Given this explanation, we believe future researchers who study narcissism and leader emergence should routinely measure and control for leader extraversion (which is a very rare practice to date). In addition, the fact that narcissism's effects on leader emergence can be explained by extraversion does not imply that narcissism is unimportant—it merely implies that narcissism's importance for this particular leadership criterion variable stems from the components of narcissism that overlap with extraversion rather than from the components of narcissism that are distinct from extraversion. These components of narcissism that overlap with extraversion likely include authority and exhibitionism (Bradlee & Emmons, 1992). We further note that whereas extraversion explains the narcissism–leader emergence relationship, it still does not explain the curvilinear narcissism–leader effectiveness correlation. In addition, it is not yet clear what aspects of extraversion explain this relationship. Future research is needed to show if narcissists emerge as leaders because of something as mundane as a tendency to be talkative, as opposed to extraverted characteristics such as dominance, self-confidence, and self-promotion.

Study Limitations and Future Research

One potential limitation of our study was that, due to limited availability of primary research, the sample sizes in some of our analyses were smaller than we would have liked (i.e., $N = 3{,}131$ for leadership emergence, $N = 4{,}191$ for leadership effectiveness [without historiometric samples], and $N = 1{,}713$ for the nonlinear effect). Part of the reason the narcissism–leadership debate has been difficult to resolve is that, although there is a tremendous amount of interest in the topic and a large body of theoretical work speculating on the link between narcissism and work outcomes, there has been surprisingly less empirical work compared to the many theoretical claims made in this field. A related limitation was that very few studies reported effect sizes between narcissism's subdimensions and leadership. Narcissism might be a broad factor with lower-order facets (cf. Ackerman et al., 2011; Emmons, 1984; Raskin & Terry, 1988), but because nearly all available sources only reported effect sizes for global narcissism, we were unable to investigate the role that the individual narcissism subdimensions might play in leadership. Future research on this topic should focus on collecting empirical evidence to clarify the narcissism–leadership relationship by focusing on narcissism's subdimensions.

Another limitation might be that many of the primary studies used in this meta-analysis came from unpublished sources. Unpublished sources have been accused of using inferior methods; however, it should be noted that, in the current meta-analysis, the type of inventory—proprietary versus nonproprietary (i.e., NPI vs. CPI & HDS-Bold), and unpublished versus published—did not moderate the relationship between narcissism and leadership effectiveness. Publication status also did not moderate narcissism's effect on leader emergence. We believe that using effect sizes from a diverse array of sources is the best way to reach the most stable and accurate estimate of the true mean relationship between constructs (see Aguinis, Pierce, Bosco, Dalton, & Dalton, 2010; Lipsey & Wilson, 2000; Rosenthal & DiMatteo, 2001). Relatedly, Study 2 relied exclusively on studies using the HDS-Bold, which is a less common measure of narcissism than the NPI. However, the HDS-Bold has been thoroughly validated (Hogan & Hogan, 2009), and although less common than the NPI, it is still utilized in academic research (e.g., Benson & Campbell, 2007; Harms, Spain, & Hannah, 2011).

Finally, it remains unclear whether certain types of employees tend to experience more satisfying working relationships with narcissistic leaders. It would be interesting to investigate which types of employees narcissistic leaders prefer (e.g., confident employees who stand-up for themselves vs. passive employees who never contradict their leaders; Grijalva & Harms, in press). In sum, future

research should explore the different dyadic relationships that develop between narcissistic leaders and their subordinates, integrating interpersonal theories such as leader–member exchange (Ferris et al., 2009).

Our paper provides an empirical summary of what the narcissism–leadership literature has already accomplished and also clarifies several areas in need of future research. In addition to the future research needs articulated above, research should examine narcissism's relationship with a leader's hierarchical level in an organization (i.e., low-level, mid-level, or upper-level management), different types of leader behavior (e.g., consideration, initiating structure, abusive supervision, etc.), objective versus subjective ratings of leadership, and the role of organizational climate (e.g., organizations that emphasize teamwork/collaboration as opposed to those with a more competitive climate).

Practical Implications

Our findings have several implications for practice. First, individuals high in narcissism are more likely to be selected into leadership roles, and very high levels of narcissism are expected to hinder leadership effectiveness. This means that organizations should be wary of creating selection and promotion practices that cater to narcissists' strengths (such as unstructured interviews) because, as mentioned previously, narcissists can be quite charismatic under conditions of minimal acquaintance (Brunell et al., 2008; Paulhus, 1998).

Further, organizations should be cautious regarding how they score narcissism measures used in selection practice. Our findings suggest that assuming lower narcissism scores are better is not always accurate. Instead, narcissism levels near the population mean will be associated with the most positive leadership outcomes. Thus, individuals with average levels of narcissism should be preferred over those with either very low or very high levels. An additional beneficial side effect of this approach is that it may be unlikely for applicants to fake having moderate levels of narcissism.

Conclusion

In conclusion, our findings further clarify when, why, and by how much narcissism impacts leadership. It is our hope that this meta-analysis will spark further empirical research on the conditions under which narcissism produces harmful, and beneficial, leadership outcomes.

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Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
Arvisais (2007)	Leadership effectiveness	Dissertation	Employees	Historiometric	Student ratings of leader profiles	67	.16
Benson & Campbell (2007)	Leadership effectiveness	Journal article	Employees	HDS-Bold	Mix	290	−.10
Blair, Hoffman, & Holland (2008)	Leadership effectiveness	Journal article	Employees	CPI	Supervisor; subordinate; composited different types leadership, then averaged supervisor–subordinate	148	−.13
Brunell et al. (2008) Study 1	Leadership emergence	Journal article	Students	NPI	Student ratings; LGD	432	.16
Brunell et al. (2008) Study 2	Leadership emergence	Journal article	Students	NPI	Student ratings; LGD	408	.08
Brunell et al. (2008) Study 3	Leadership emergence	Journal article	Students	CPI	Expert ratings; LGD	153	.20
Chaterjee (2009) Sample 1	Leadership effectiveness	Dissertation	Employees	Historiometric	Archival measures	542	.03[1]
Chaterjee (2009) Sample 2	Leadership effectiveness	Dissertation	Employees	Historiometric	Archival measures	440	−.03[1]
Collins & Blum (2011)	Leadership emergence	Conference paper	Students	NPI	Student ratings; LGD	200	.14
Costanza (1996)	Leadership effectiveness	Dissertation	Employees	Historiometric	Archival measures	239	−.06[2]
CPI Technical Manual – Sample 1*	Leadership emergence	Technical manual	Employees	CPI	Assessment center ratings	111	.10

Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis (*continued*)

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
CPI Technical Manual– Sample 2*	Leadership emergence	Technical manual	Employees	CPI	Assessment center ratings	200	.07
CPI Technical Manual – Sample 3*	Leadership emergence	Technical manual	Employees	CPI	Assessment center ratings	200	.12
Davies (2004)	Leadership effectiveness	Dissertation	Employees	HDS-Bold	Subordinate	183	.11
Deluga (1997)	Leadership effectiveness	Journal article	Employees	Historiometric	Historian's ratings & student ratings of leader profiles	39	.48[3]
Galvin, Waldman, & Balthazard (2010)	Leadership effectiveness	Journal article	Employees	NPI	Mix	55	.15
Harms & Wood (2004)	Leadership emergence	Unpublished data	Students	NPI	Student ratings	305	.11
Harms (2009a) – Sample 1	Leadership emergence	Unpublished data	Students	NPI	Student ratings	32	−.001
Harms (2009a) – Sample 2	Leadership emergence	Unpublished data	Students	NPI	Student ratings	26	.14
Harms (2009b) – Sample 1	Leadership emergence	Unpublished data	Students	NPI	Student ratings	32	.04
Harms (2009b) – Sample 2	Leadership emergence	Unpublished data	Students	NPI	Student ratings	28	.09

Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis (*continued*)

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
Harms, Spain, & Hannah (2011)	Leadership effectiveness (Officership; Year 4)	Journal article	Military Sample	HDS-Bold	Supervisor	919	.08
Harms, Spain, Hannah, Hogan, & Foster (2011)	Leadership effectiveness	Conference paper	Employees	HDS-Bold	Supervisor	117	.09
HDS Technical Manual – Sample 1**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	79	−.05
HDS Technical Manual – Sample 2**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	25	−.28
HDS Technical Manual – Sample 3**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	77	−.31
HDS Technical Manual – Sample 4**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	103	.07
HDS Technical Manual – Sample 5**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	73	.09
HDS Technical Manual – Sample 6**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	103	.001
HDS Technical Manual – Sample 7**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor	14	−.47

Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis (*continued*)

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
HDS Technical Manual – Sample 8**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	36	.11
HDS Technical Manual – Sample 9**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	810	.06
HDS Technical Manual – Sample 10**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	171	.07
HDS Technical Manual – Sample 11**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	25	.00
DS Technical Manual – Sample 12**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	51	−.04
HDS Technical Manual – Sample 13**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	22	.01
HDS Technical Manual – Sample 14**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Supervisor; peer; subordinate; self	210	.05
HDS Technical Manual–Sample 15**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Self	141	.16
HDS Technical Manual–Sample 16**	Leadership effectiveness	Technical manual	Employees	HDS-Bold	Self	38	.19

Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis (*continued*)

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
HDS Technical Manual–Sample 17**	Leadership emergence	Technical manual	Employees	HDS-Bold	Supervisor	23	−.30
HDS Technical Manual–Sample 18**	Leadership emergence	Technical manual	Employees	HDS-Bold	Supervisor	120	−.05
Hendin (2001)	Leadership emergence	Dissertation	Students	NPI	Students; LGD	113	.25
Huang, Harms, & Luthans (2012)	Leadership effectiveness	Unpublished data	Employees	NPI	Supervisor	103	−.04
Judge, LePine & Rich (2006) – Study 1	Leadership effectiveness	Journal article	Employees	NPI	Mix	134	.20
Judge, LePine & Rich (2006) – Study 2	Leadership effectiveness	Journal article	Employees	NPI	Supervisor	131	−.08
Khoo & Burch (2008)	Leadership effectiveness (self-report only)	Journal article	Employees	HDS-Bold	Self	80	−.12
Lindberg (2006)	Leadership effectiveness	Master's thesis	Employees	HDS-Bold	Subordinate	134	.15
Nevicka, De Hoogh, et al. (2011)	Leadership emergence	Journal article	Students	NPI	Student ratings; LGD	221	.16
Oshio & Harms (2005)	Leadership emergence	Unpublished data	Students	NPI	Student ratings; LGD	96	.05

Appendix A — Main Codes and Input Values for Leadership Studies in the Meta-Analysis (*continued*)

Study	Type of leadership	Type of publication	Sample	Narcissism measure	Source of leadership report (rating)	*N*	r^a
Peterson Galvin & Lange (2012)	Leader effectiveness	Journal article	Employees	NPI	CFO (peer ratings), archival measures	126	−.274
Resick, Whitman, Weingarden, & Hiller (2009)	Leadership effectiveness	Journal article	Employees	Historiometric	Student ratings of leader profiles, archival measures	75	−.195
Schnure (2010)	Leadership emergence	Conference paper	Employees	HDS-Bold	Assessment center	431	.14
Watts, Smith, & Lilienfeld (2013)	Leadership effectiveness	Conference paper	Employees	NPI	Self	312	.29
Yocum (2006)	Leadership effectiveness	Dissertation	Employees	NPI	Subordinate	52	−.25

N = total sample size in the meta-analysis; r^a = validity coefficient used in the overall leadership emergence/leadership effectiveness analyses—may be the result of averaging or compositing individual effect sizes—self-reports were not used in these overall analyses but are also reported; NPI = Narcissistic Personality Inventory; HDS-Bold = Hogan Developmental Survey—Bold; CPI = California Personality Inventory; Mix = effect size is a mix of different types of observer report; LGD = leaderless group discussion.

1. Average of ROA and TSR.
2. Average of return on equity and average stock return.
3. Average of charismatic leadership and mean greatness.
4. Composite of firm performance, servant, and transformational leadership.
5. Average of transformational, contingent reward, manager turnover, team winning, and attendance.

* Gough & Bradley, 2002

** Hogan & Hogan, 2009

Appendix B — Main Codes and Input Values for Extraversion/Narcissism Studies in the Meta-Analysis

Study	Type of publication	Sample	Narcissism measure	Extraversion measure	*N*	*r*
Ames, Rose, & Anderson (2006) Study 1	Journal article	Students	NPI	NEO FFI	766	.26
Ames, Rose, & Anderson (2006) Study 2	Journal article	Students	NPI	BFI	167	.41
Barelds & Dijkstra (2010)	Journal article	Students	NPI	NEO FFI	136	.44
Bradlee & Emmons (1992) Study 2	Journal article	Students	NPI	NEO PI	175	.43
Brown, Budzek, & Tamborski (2009) Study 1	Journal article	Students	NPI	BFI	740	.44
Brunell et al. (2008) Study 1	Journal article	Students	NPI	BFI	432	.42
Brunell et al. (2008) Study 1	Journal article	Students	NPI	BFI	408	.57
Buss & Chiodo (1991)	Journal article	Newlywed couples	NPI	EPQ	214	.38
Clark, Lelchook, & Taylor (2010)	Journal article	Working students	NPI	BFI	322	.47
Corry, Merrit, Mrug, & Pamp (2008)	Journal article	Students	NPI	NEO FFI	238	.29
CPI Manual Appendix C*	Technical manual		CPI	EPI	89	.32
CPI Manual Appendix C*	Technical manual		CPI	EPI	86	.28
CPI Manual Appendix C*	Technical manual		CPI	Goldberg's Adjectival Big Five Markers	289	.36
CPI Manual Appendix C*	Technical manual		CPI	Goldberg's Adjectival Big Five Markers	411	.39
Egan & McCorkindale (2007)	Journal article	Community sample	NPI	NEO FFI-R	103	.38

Appendix B — Main Codes and Input Values for Extraversion/Narcissism Studies in the Meta-Analysis (*continued*)

Study	Type of publication	Sample	Narcissism measure	Extraversion measure	*N*	*r*
Emmons (1984) Study 2	Journal article	Students	NPI	16PF	65	.53
Hendin & Cheek (1997)	Journal article	Students	NPI	BFI	151	.33
Hill & Roberts (2012)	Journal article	Students	NPI	BFI	144	.33
Hogan Technical Manual (p. 37)**	Technical manual	Employees	HDS-Bold	HPI	754	.32
Hogan Technical Manual (p. 37)**	Technical manual	Community sample	HDS-Bold	NEO-PI-R	146	.30
Jakobwitz & Egan (2006)	Journal article	Employees	NPI	NEO FFI	82	.10
Jonason, Li, & Teichner (2010)	Journal article	Students	NPI	BFI	216	.37
Jarvis (2010)	Master's thesis	Students	NPI	BFI	122	.34
Judge, LePine, & Rich (2006) Study 1	Journal article	Employees	NPI	NEO FFI	134	.36
Judge, LePine, & Rich (2006) Study 2	Journal article	Employees	NPI	BFI	131	.31
Kovacs (2007)	Dissertation	Employees	NPI	BFI	64	.56
Kubarych, Deary, & Austin (2004)	Journal article	Students	NPI	NEO FFI	338	.36
Lee & Ashton (2005)	Journal article	Students	NPI	BFI	164	.46
Marcus, Machilek, & Schutz (2006)	Journal article	Web site owners	NPI	BFI	898	.45
Miller & Campbell (2008) Study 1	Journal article	Students	NPI	NEO PI-R	271	.39
Miller & Campbell (2008) Study 2	Journal article	Parents of undergrads	NPI	NEO PI-R (short form)	211	.39
Miller, Gaughan, Pryor, Karmen, & Campbell (2012) Sample 2	Journal article	Students	NPI	NEO PI-R	49	.50

Appendix B — Main Codes and Input Values for Extraversion/Narcissism Studies in the Meta-Analysis (*continued*)

Study	Type of publication	Sample	Narcissism measure	Extraversion measure	*N*	*r*
Miller, Price, & Campbell (2012)	Journal article	Students	NPI	NEO PI-R	148	.24
Nathanson, Paulhus, & Williams (2006) Study 1	Journal article	Students	NPI	BFI	291	.37
Paulhus (1998) Study 1	Journal article	Students	NPI	15 items (McCrae & Costa, 1987)	124	.35
Paulhus (1998) Study 2	Journal article	Students	NPI	NEO FFI	89	.25
Paulhus & Williams (2002)	Journal article	Students	NPI	BFI	245	.42
Samuel & Widiger (2008)	Journal article	Students	NPI	NEO PI-R	150	.28
Trzesniewski, Donnellan, & Robbins (2008)	Journal article	Students	NPI	BFI	18,274	.49
Williams, Nathanson, & Paulhus (2010) Study 1	Journal article	Students	NPI	BFI	228	.48
Williams, Nathanson, & Paulhus (2010) Study 2	Journal article	Students	NPI	BFI	107	.36
Wonneberg (2007)	Dissertation	Employees	NPI	Big Five Mini Markers	212	.26

N = total sample size in the meta-analysis; *r* = observed validity coefficient; 16PF = Sixteen Personality Factor Questionnaire; BFI = Big Five Inventory; NEO-FFI = NEO Five Factor Inventory; NEO-PI-R = NEO Personality Inventory Revised; EPQ = Eysenck Personality Questionnaire; EPI = Eysenck-Maudsley Personality Inventory; HPI = Hogan Personality Inventory.

* Gough & Bradley, 2002.

** Hogan & Hogan, 2009c.