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IN PURSUIT OF GREATNESS: CEO NARCISSISM, ENTREPRENEURIAL ORIENTATION, AND FIRM PERFORMANCE VARIANCE

ABSTRACT

Building upon the perspective that narcissism is a leadership trait with both ‘bright’ and ‘dark’ sides, the present study examines the question of whether companies led by narcissistic CEOs exhibit higher levels of entrepreneurial orientation (EO). Moreover, this research examines whether EO partially explains why narcissistic CEO led firms experience greater variability in firm performance. Using survey data collected from 173 CEOs, and an archival measure of firm performance variance, we find support for our model. These findings offer an improved understanding of how CEO narcissism influences performance variance, and why the firms they lead may even, at times, be viewed as on a path to success. Study implications are discussed.

Keywords:

CEO Leadership Traits; Narcissism; Strategic Posture; Entrepreneurial Orientation; Firm Performance Variance

INTRODUCTION

Narcissism is broadly defined as an exaggerated, yet fragile self-concept of one's importance and influence (Resick et al., 2009). Most of the work on narcissism to date has explored the negative implications of the phenomenon for individual-level functioning and leadership (Judge et al., 2006; Kets De Vries and Miller, 1985). However, prior research also indicates that many chief executive officers (CEOs) who are perceived as narcissistic lead highly successful companies (Maccoby, 2000). How might this be so?

To begin, Chatterjee and Hambrick (2007) observe that narcissistic CEOs are associated with more extreme firm performance—both bigger gains and bigger losses. While increased variability in firm performance has neither an inherently positive or negative organizational implication, higher variability can be interpreted as beneficial if the achievement of a superior competitive position—i.e., above-average performance—is preferred over maintenance of the firm's extant competitive position which lower variance would help protect (March, 1991). Yet, CEO narcissism itself is insufficient to fully account for such firm performance extremes in the pursuit of superior performance. This raises the research question: What firm-level mechanisms might narcissistic CEOs employ to obtain such wide variations in organizational outcomes?

Given that entrepreneurial processes and practices are often associated with stimulating company renewal and growth (Guth and Ginsberg, 1990; Hoskisson et al., 2011), CEOs often promote a firm-level entrepreneurial orientation (EO) within the organizations they lead (Rauch et al., 2009). As will be discussed, firm-level entrepreneurial activities have also been identified as an explanatory factor of firm performance variance, that is, relatively stronger *and relatively weaker* firm performance (Wiklund and Shepherd, 2011). The present study proposes a linkage between CEO narcissism and firm-level EO, and specifically asks whether EO might be a key

firm-level mechanism that enables narcissistic CEOs to lead organizations that experience a wide range of performance outcomes. Chatterjee and Hambrick (2007) demonstrate that CEO narcissism can affect firm strategy-making and performance variance independently. The present study seeks to extend their findings by asking whether EO partially mediates the relationship between CEO narcissism and firm performance variance.

By investigating these questions, this research makes three principal contributions to the management literature. First, by further clarifying the relationship between CEO narcissism and firm performance variance, we address the call by Rosenthal and Pittinsky (2006) to progress beyond simple discussions of narcissistic leadership as inherently ‘good’ or ‘bad’, and focus instead on its implications for company outcomes. In this vein we also build on the emerging perspective that there are both “bright” and “dark” sides to narcissistic CEO leadership (Resick et al., 2009), and thus it may have both positive and negative effects on their companies fate.

Second, our study extends the work of Chatterjee and Hambrick (2007) by identifying EO as a strategy making construct that is not only affected by CEO narcissism, but also partially mediates the CEO narcissism—performance variance relationship. Given the important and sometimes dramatic role that entrepreneurial processes and practices may play in changing the fate or direction of a company (Hoskisson et al., 2011), we posit that the tendency of narcissistic CEOs to endorse firm-level EO helps explain why their organizations experience an increase in performance variance, and may even, at times, be viewed as on a path to success. Third, while narcissism has become a broad managerial phenomenon of interest (Bergman et al., 2010), little consideration has been given to empirically examining this phenomenon using psychometrically valid scales within broad samples of executives (Bollaert and Petit, 2010). Our study provides a robust test of our theorized model using both survey data and archival performance measures.

The remainder of the paper is organized as follows. First we review narcissism as a leadership trait. We then develop a research model and posit hypotheses linking CEO narcissism, EO, and firm performance variance. This is followed by a discussion of methods and a report of findings. Finally, we conclude with a discussion of implications and future research directions.

THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Narcissism—an inflated but fragile view of one’s self-importance—is a construct that has generated substantial interest across the social sciences for many decades (e.g., Morf and Rhodewalt, 2001). The negative consequences of narcissism have been well documented in the literature (e.g., Resick et al., 2009). Narcissistic individuals are principally concerned with actions that reflect favorably upon themselves, which often leads to perceptions of entitlement, shameless self-admiration, excessive arrogance, and hostility towards external criticism (Judge et al., 2006; Lubit, 2002; Resick et al., 2009). Thus, in interpersonal relationships, they are often viewed as abrasive and insensitive to their impact on others (Judge et al., 2009). Despite the interpersonal issues typically associated with narcissism, maintaining unrealistic, inflated levels of self-esteem creates a continuous need for narcissists to obtain external self-affirmation through social interaction. One place narcissists receive such affirmation is in leadership roles.

A key reason narcissists are attracted to organizational leadership roles is their desire to leave behind a grand, admirable legacy of achievement (Maccoby, 2000). Organizational settings can provide narcissistic leaders with positions of authority and influence that can facilitate achievement of their personal ambitions. In general, the role of CEO provides narcissists with the greatest authority and hence studies in the management literature have previously focused on examining narcissism among CEOs (e.g., Chatterjee and Hambrick, 2007; Resick et al., 2009).

An analysis of narcissism and leadership by Kets De Vries and Miller (1985) was among the first to appear in the management literature. They noted that narcissism, while typically viewed as detrimental, can also be conceived as beneficial for firm leaders and linked to higher productivity. Subsequent analyses tend to support this view. Describing the tension between the positive and negative elements of narcissistic leadership, Judge and colleagues (2009) classified narcissism as a ‘dark’ leadership trait with some potentially ‘bright’ sides. In this regard, Rosenthal and Pittinsky (2006) note that while it may at first seem ‘preposterous’ to suggest that narcissists could possess strong leadership characteristics with both negative *and* positive implications for organizational performance, it is certainly possible even if it does occur as a result of self-aggrandizing motivations. For instance, it has been argued that narcissists, who are generally viewed as arrogant, self-important and insensitive, can also be considered tough-minded visionaries and evangelistic leaders (Maccoby, 2004). In this regard, some of the positive attributes of narcissism operate similarly to those of charisma¹. Both may inspire devotion and commitment in others to achieve higher performance. This semblance may help explain why individuals are sometimes attracted to narcissistic leaders and may even view their leadership as transformational (Rosenthal and Pittinsky, 2006).

While extreme narcissism is a diagnosable personality disorder², social science research generally views it as a matter of degree, ranging from mild to severe (Foster and Campbell, 2007; Kets De Vries and Miller, 1985). Consistent with current research in social psychology and strategic management, we view narcissism among executives as not necessarily reflective of a personality disorder which presents itself as a binary state (i.e., sufferers v. non-sufferers). Rather, we view narcissism as a personality trait which manifests in varying degrees along a continuum. By adopting this view we recognize that different levels of narcissism among CEOs

can influence a range of organizational strategic behaviors. But the force of CEO personality alone is insufficient to fully explain changes in firm performance. For CEO attributes and ambitions to influence organizational outcomes, they must be translated into specific firm-level strategic behaviors. In the following sub-section, we investigate the implications of CEO narcissism for the manifestation of a particular firm-level strategic orientation, EO.

CEO Narcissism and Entrepreneurial Orientation

When CEOs possess higher levels of narcissism they are more likely to strive for bold, daring actions which increase their stature by drawing attention to their vision and leadership (Judge et al., 2009). Further, narcissists are driven by an overwhelming desire to compete (Maccoby, 2004; Rosenthal and Pittinsky, 2006). To fulfill these needs, narcissistic CEOs will likely direct their organizations to take bolder and more aggressive strategic actions, which would be characteristic of an EO (Covin and Slevin, 1991; Lumpkin and Dess, 1996). We propose that by inspiring their firms to assume a more entrepreneurial, competitively focused strategic posture (Rauch et al., 2009), narcissistic CEOs can enhance their personal prestige and fulfill their desire for positive accolades through the attributions they receive for their role in the entrepreneurial initiatives their firm undertakes.

Entrepreneurial orientation (EO) refers to the strategy-making policies and practices that firms use to identify and launch new ventures (Miller, 2011; Mintzberg, 1973; Dess and Lumpkin, 2005). According to Miller (1983, p. 771), a firm is entrepreneurial when it “engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch.” As such, EO manifests through higher levels of organizational *innovativeness* (engaging in creativity and experimentation by introducing new products/services, as well as technological leadership via R&D); *risk-taking*

(venturing into the unknown, borrowing heavily, and/or committing significant resources in uncertain environments); and *proactiveness* (forward-looking, opportunity-seeking initiatives launched in anticipation of future demand) (Miller and Friesen, 1978; Venkatraman, 1989a; Lumpkin and Dess, 1996). Hence, EO captures the extent to which organizations may be considered entrepreneurial in their firm-level activities and strategic behaviors (Covin and Wales, 2012; George, 2011; Hoskisson et al., 2011).

Miller and Friesen (1982) contend that executive goals and temperaments are central to driving EO in a firm. It has been theorized that the top managers of EO firms adopt and exhibit entrepreneurial management styles, which are evidenced within the firms' strategic decisions and operating management philosophy (Covin and Slevin, 1989). Thus, consistent with Hambrick and Mason's (1984) upper echelons perspective which posits that CEOs are responsible for helping to set and direct the organization's strategic orientation, CEOs have a major role in influencing the manifestation of firm-level EO (Simsek et al., 2010; Wales et al., 2011).

Several features of a narcissistic personality increase the likelihood that a narcissistic CEO's actions will be closely aligned with EO organizational strategies. These personality characteristics of narcissistic leaders include biased expectations that their decisions will be successful, a desire to inspire awe and adoration among followers, and a lack of concern for resource constraints when pursuing their agendas. We now explore each of these characteristics.

First, narcissists make decisions based on biased expectations that they will be successful (Campbell et al., 2004), and exhibit confidence levels that notably exceed accurate perceptions of a situation (Lahey et al., 2008). As a strategic orientation, EO is characterized by the frequency with which organizations commit sizable portions of their resources towards the pursuit of innovative product-market entries (Covin and Slevin, 1989; Lumpkin and Dess, 1996). To

manifest a high level of EO firm leadership must judge numerous risky, innovative projects to have sufficient “upside” to support the commitment of organizational resources. When considering the potential gains from engaging in higher-risk, higher-return entrepreneurial initiatives, there is an increased likelihood that narcissistic CEOs will lead their firms to pursue a greater number of new entry opportunities and thus manifest a higher level of EO.

Second, narcissistic CEOs’ attempts to inspire awe and foster adoration may further increase their propensity to support organizational strategies aimed at pioneering bold innovations. Adoration fosters an ‘invincibility complex’, which further increases the probability that a narcissistic CEO will lead their organization to engage in high-risk, high-return projects (Lubit, 2002). Developing a firm EO would be attractive to narcissistic CEOs because strategies involving innovation and pioneering are more likely to enhance their power and influence, and thus their ability to inspire awe and adoration among followers. Hence, entrepreneurial actions provide the greatest opportunity for the firm to experience growth and expansion as opposed to more conservative actions (Covin et al., 2006; Lumpkin and Dess, 1996).

Third, because narcissistic CEO’s have inflated perceptions of how others view their leadership and abilities, they exhibit overconfidence and believe that the consequences of high risk activities will be free of costs (Lobuts and Pennewill, 1986). Overconfident managers are more likely to pursue opportunities, such as new product-market entry, with less concern for the size of their available resource bases or capabilities (Hayward et al., 2006). Given their extreme confidence narcissistic CEOs are also more likely to ignore counterfactual information when considering opportunity costs (Campbell et al., 2004; Judge et al., 2006). Hence, narcissistic CEOs have a tendency to exhibit judgment and decision-making biases which increase their likelihood of supporting bolder firm strategies irrespective of resource limitations.

In sum, narcissistic CEOs are likely to pioneer their grand innovative visions without the expected concern for risk, resource limitations, or feedback. Narcissists are not fond of either dissent or differing opinions, possess an exaggerated sense of control over the world around them, and seek to expand their power and influence (e.g., Resick et al., 2009; Watson et al., 1991). This suggests that they are likely to be among the first to champion bold innovations, and push their firms toward new entry. Given this propensity, we suggest that a higher level of EO will be found among firms lead by narcissistic CEOs. Therefore, we hypothesize:

Hypothesis 1: CEO narcissism is positively associated with entrepreneurial orientation.

Entrepreneurial Orientation and Firm Performance Variance

In the sub-section that follows, we discuss the potential influence of CEO narcissism on firm performance variability as partially mediated by EO. Here, our aim is to argue that EO is a likely source of variability in firm performance. Relative to other strategic postures, EO is a more risky strategic orientation (Miller, 1983; Lumpkin and Dess, 1996; Covin and Slevin, 1989). Evidence suggests that higher risk is associated with both higher positive and higher negative returns to firm performance (Fama and MacBeth, 1973; Miller and Bromiley, 1990).

Given that few theoretical and empirical studies have explicitly considered the link between EO and firm performance variance, we now examine three areas in which EO is a more risky strategic orientation—organizational uncertainty, opportunity selection, and experimentation.

First, uncertainty, or inestimable risk, is a fundamental aspect of the entrepreneurial process (Knight, 1921). Uncertainty makes the final performance returns from developing an entrepreneurial orientation unknowable. The degree to which entrepreneurial efforts succeed or fail to create performance gains is impossible to predict *a priori*. Theoretically, if the returns from entrepreneurial initiatives were not shrouded in uncertainty, all new product-market entries

would return positive gains since a firm would choose only those entries destined to succeed and thereby improve firm financial positions. Given this, EO is a more risky strategic orientation.

Second, previous research suggests that a firm may be considered more (or less) entrepreneurial based upon the types of opportunities which it pursues (e.g., Baird and Thomas, 1985; Covin and Slevin, 1989; Lumpkin and Dess, 1996; Miller, 1983; Miller, 2011).

Opportunities for new entry can range from more incrementally focused product-market advances with relatively low financial risk, to more growth focused and therefore financially risky, product-market entries or technology-based transformations (March, 1991). Along this continuum, EO represents a strategic orientation characterized by the pursuit of more risky, growth oriented opportunities (Bierly et al., 2009; Wiklund and Shepherd, 2011).

Finally, EO has recently been discussed as a process of experimentation conducted by organizations as they search for profitable new entry opportunities (Wiklund and Shepherd, 2011). An experimentation perspective suggests that new entries are essentially untested hypotheses which the firm must examine to determine if their insights were correct (Garvin, 2004). Since some of the experiments will result in failures, this emerging perspective serves to further illustrate that EO is a risky strategic orientation, and that greater variation in firm performance from higher levels of EO is inevitable. Therefore, based upon these fundamental characteristics of the strategic orientation, we offer the following hypothesis:

Hypothesis 2: EO is positively associated with firm performance variance.

CEO Narcissism, Firm Performance Variance and Entrepreneurial Orientation

Given the work of Chatterjee and Hambrick (2007), which observes a positive relationship between narcissistic CEO leadership and more extreme performance levels, we expect that CEO narcissism will have a direct impact on firm performance variance. Nonetheless, there is limited

understanding of how narcissism may manifest itself through firm's strategic behaviors to increase performance variability. While the direct effects of narcissism on performance could represent an aggregation of various outcomes resulting from narcissism, a partial mediation model controls for such direct effects while enabling theorizing concerning the unique effects of narcissism on performance variability through EO. In this sub-section, therefore, we argue that EO partially mediates the CEO narcissism—performance variance relationship.

Our first rationale for CEO narcissism leading to greater EO and hence higher firm performance variance builds upon the observation that CEOs are central to driving the scope of organizational project investment (Hayward et al., 2006). CEOs are in a position to initiate and expand the scope of investments into an organization's entrepreneurially oriented firm processes, practices, and projects. EO is a resource intensive strategic orientation (Covin and Slevin, 1991) and the influence of EO on performance outcomes should increase when more resources are available (Wiklund and Shepherd, 2011). Given that, narcissistic CEOs may be emboldened to garner control over more resources when pursuing entrepreneurial initiatives.

In general, narcissistic CEOs are likely to be organizational resource 'hogs' who take possession of whatever resources are accessible, even when such acquisitions might result in resource depletions that damage the effectiveness of other firm objectives (Campbell et al., 2005). Given their exaggerated perceptions that their decisions will be successful (Lakey et al., 2008), narcissistic CEOs will often attempt to gain control over the largest possible resource pools from which to support aggressive levels of investments into firm initiatives which promise to help achieve their grandiose ambitions. When those grandiose ambitions are entrepreneurially oriented as discussed in hypothesis one, investments in EO activities will naturally grow in magnitude. But since not all EO activities will have a positive pay-off (Wiklund and Shepherd,

2011), in firms where narcissistic CEOs influence greater investment into higher levels of EO, increased variability in firm performance is likely.

Secondly, the creation of firm performance variance through EO may also be influenced by the erratic behavior of narcissistic CEOs. Because entrepreneurial initiatives often take longer to reach fruition and payoff than more incremental or conservative firm actions (Covin and Slevin, 1991; Hoskisson et al., 2011), investments into EO firm initiatives must be given time to develop. Yet, narcissistic CEOs lack self-control and are prone to change the strategic behavior of the firm on an impulse (Chatterjee and Hambrick, 2007; Lubit, 2002; Vazire and Funder, 2006; Wink and Donahue, 1997). When narcissistic CEOs become impatient or bored, or perceive that a new entrepreneurial initiative could more immediately enhance the positive accolades they require to sustain their self-concept, they may abandon their current entrepreneurial investments without concern for the depth of their resource allocations. Such volatile strategic changes to their entrepreneurial initiatives could, at times, help them develop more profitable emerging opportunities, and thus lead to increased performance. However, it is also likely that such behavior will waste resources and prematurely scuttle promising opportunities, leading to decreased performance. Hence, the tendency of narcissistic CEOs to produce grand swings in resource deployments also makes it more likely that they will contribute to greater variability in firm performance when encouraging higher levels of firm EO.

While it is probable that CEO narcissism will contribute to firm performance variance through EO, it is plausible that narcissistic leadership will also manifest other, additional, indirect effects on firm performance variance. It would be challenging, if not impossible, to theoretically rule out other strategic firm-level factors that narcissistic CEOs might influence, such as the organizations level of resource-orchestration capability (Sirmon et al., 2007) or

strategic flexibility (Anderson et al., 2009). As such firm-level strategic factors may allow narcissistic CEOs to more proficiently manipulate their organizations resource bases to conform to their ambitions, they may also partially explain CEO narcissism's impact on firm performance variance. Therefore, we theorize that EO will play a partial mediating role in the relationship.

Taken together, we argue that some, however not all, of the influence which CEO narcissism has on firm performance variance occurs through EO. Both CEO narcissism and EO are likely to drive firm performance variance. However, a meaningful portion of the increased variance may be explained by the partial mediating effect of entrepreneurial strategic orientations in narcissistic CEO led companies. Therefore, we hypothesize:

Hypothesis 3: EO partially mediates the relationship between CEO narcissism and firm performance variance (i.e., in addition to directly increasing performance variance, CEO narcissism indirectly increases variability through promoting higher firm-level EO).

Building upon and extending past theory, Figure 1 presents our research model.

-----Insert Figure 1 about here -----

METHODS

Data Collection Procedure and Data Quality

Sampling frame. We draw on archival performance data and survey data of high-technology manufacturing firms in the mid-western United States with 10 to 250 employees and 10 years of age or younger. Smaller, younger firms represent an ideal context for studying as executive's influence on EO and performance outcomes is likely to be stronger and more direct in this context (Rauch et al., 2009; Wiklund, 1999). By limiting our focus to a single industry sector we limit potential heterogeneity in factors affecting performance variance, reduce the effects of unobserved factors driving variously narcissistic individuals to lead more or less EO

companies, and control for industry specific factors which may either reinforce or mitigate the effects of narcissistic leadership. Additionally, an empirical rationale driving our sampling frame was the ability to identify performance data from third-party sources. The potential common method bias resulting from self-report performance could be severe when investigating CEO narcissism as prior research would suggest that respondents high in narcissism are more likely to underreport lower performance and overreport higher performance (Campbell et al., 2004). By focusing on the high-tech manufacturing sector in the present study we were able to triangulate performance information from two third-party sources containing secondary sales information – Corptech, a directory of high-tech firms, and Dun and Bradstreet, a directory of private firms.

We started with the Corptech directory as our sampling frame. Corptech is considered a reliable source of technology firm listings, and has been used widely for research on high technology firms (e.g., Lee and Lieberman, 2010). In addition, Corptech provides yearly sales and firm size (number of employees) information collected through surveys and annual phone interviews. To balance survey cost and scope we focused on high-tech manufacturing firms in the U.S. states of Illinois, Indiana, Kentucky, Ohio, and Missouri. We were able to identify 1,526 listed in the 2009 Corptech directory, representing thirty different NAICS codes³.

Contacting CEOs. CEOs play a central role in the strategic direction and day-to-day management of small firms. They are well-informed of strategic issues that explicitly entail an organizationally-wide or external focus (Sharfman, 1998). Thus, traditionally top management team members in general, and the CEO in particular is surveyed regarding his or her perceptions of the firm's EO (Covin and Slevin, 1989; Rauch et al., 2009; Wales et al., 2011). A packet containing our survey, along with a cover letter and pre-paid business reply envelope was sent to the CEO of each firm. To enhance typically low response rates among CEOs, in the initial mail

survey we informed the respondents that we would donate USD \$20 for every complete survey to a charity of their choice. After the first mailed survey, and three follow-up reminder emails conducted between October 2009 and January 2010, we received responses from 219 CEOs, for a response rate of 14.35%. Low response rates (10-15%) are typical for mailed surveys to top executives, particularly when asking sensitive questions, and are comparable to other similar studies (Cycyota and Harrison, 2002; Ling et al., 2008). In the final data set, we excluded 46 firms with incomplete data on narcissism scale items. This yielded a final sample of 173 firms.

Assessing key informant quality and nonresponse bias. To assess the extent of CEO involvement in the manifestation of firm-level EO, we used three self-report items (1 – ‘not at all,’ to 5 – ‘to a great extent’): (a) ‘How involved are you in developing and implementing your venture’s innovation strategies?’ [mean = 4.83; s.d.=.24], (b) ‘How actively are you engaged in managing venture’s risk?’ [mean = 4.65; s.d.=.19], (c) ‘How actively are your involved in identifying, pursuing, and exploiting opportunities in the environment’ [mean = 4.25; s.d.=.31]. This provides the present investigation with some assurance that the respondents had detailed knowledge concerning their organization’s EO.

We tested non-response bias for early and late respondents and also the mean responses of respondents and non-respondents on age, sales revenues, firm size (number of employees), industry, CEO age, CEO gender, and CEO industry work experience. We found no significant differences, leading us to conclude that non-response bias was not a significant threat to study estimates. Furthermore, we calculated sampling error based on all firms in the thirty NAICS codes sampled from the Corptech directory in 2009. The sampling error of 5.87% (at a 95% confidence level) is below recommended limits and indicates that the sample is generally representative of the population of high-technology firms (Särndal et al., 2003).

Dependent variable. Firm performance variance. The importance of sales as a meaningful dependent variable in the case of small firms has been previously theorized (Chandler et al., 2009; Hmieleski and Corbett, 2008). Moreover, we chose to examine sales data given its secondary reporting within the Corptech directory and Dun and Bradstreet Million Dollar Directory. We triangulate the secondary sales data from the Corptech and Dun and Bradstreet Directories. Apart from our survey, triangulating sales data from two secondary sources lessens concerns regarding common method bias and provides a more consistent measure of sales. The efficacy and use of such directories for the compilation of secondary performance measures has been supported by numerous studies (Lee and Lieberman, 2010; Lee and Paruchuri, 2008; Puranam et al., 2009; Puranam and Srikanth, 2007; Sine et al., 2006).

We began by compiling sales for 2006, 2007, 2008, 2009, and 2010 from Corptech and the Dun and Bradstreet Million Dollar Directory. We also compiled information on industry-level sales by collecting data for each firm continuously listed for all five years (2006-2010) at the six-digit NAICS code in Corptech and Dun and Bradstreet Million Dollar Directory. We used the mean reported sales values from Corptech and the Dun and Bradstreet Million Dollar Directory for each six-digit NAICS sector. Examining this data, we were able to calculate the standard deviation of the sales for each firm, and also calculate the standard deviation of sales for all industry firms over the five-year period. Although firms may experience significant fluctuations in sales, by adjusting for the standard deviation of industry sales we further control for systematic industry specific effects. We then subtracted the median standard deviation of sales at the industry-level from each firm's standard deviation of sales to arrive at our final measure of industry-adjusted firm performance variance.

Independent variable. CEO narcissism. Previous studies have used proxies of narcissism based on information available in the public domain (e.g., 10-K annual reports, ExecuComp, Chatterjee and Hambrick, 2007). It is important to note that all measurement approaches are imperfect. Information within the public domain is influenced by sources beyond the CEO such as inputs from the top management team, the board of directors, and other stakeholders. Several individuals may be involved in preparing shareholder letters or grooming CEOs for interviews, and further, the content analysis used to develop proxies for CEO prominence may introduce researcher bias (Krippendorff, 2004). Therefore, we offer a different, but a complementary test of the CEO-narcissism—Firm-performance-variance relationship using a previously validated and well established psychometric scale.

Narcissism was assessed using a continuous measure based on the 16-item measure (NPI-16) proposed and validated by Ames and colleagues (2006). The scale consists of 16-paired statements that require a forced choice between a narcissistic response (=1) and a non-narcissistic response (=0). This scale has been psychometrically validated (Ames and Kammrath, 2004) and is a shorter version of Raskin and Terry's (1988) NPI-40. Although the 16-item scale used in the current study has been validated only recently, the longer version of this scale (NPI-40) has found increased support over the years. Samuel and Widiger (2008) provide a review of the face, content, convergent, divergent and nomological validity of the narcissism scale, and several other meta-analyses offer evidence of the validity of the NPI-40 scale (Campbell et al., 2000; Campbell et al., 2002; Campbell et al., 2007; Foster et al., 2003; Twenge and Foster, 2008; Twenge et al., 2008). As a derivative of NPI-40, the shorter 16-item version proposed by Ames and colleagues (2006) is rooted within a robust tradition of psychometric-research exploring narcissism.

The forced-choice scale includes items such as ‘I really like to be the center of attention vs. It makes me uncomfortable to be the center of attention,’ and ‘I think I am a special person vs. I am no better or no worse than most people.’ The respondent is asked to choose one of the two statements in each scale item. For example, if the respondent chooses ‘I really like to be the center of attention’ it is coded as 1, if the respondent chooses ‘It makes me uncomfortable to be the center of attention’ then it is coded as 0. We list scores of either 1 or 0 for each item in Table A.I. The final narcissism score, based on Ames et al. (2006), is the sum of the scores divided by 16. The measure of narcissism is the average of all of the forced choice responses. The final 16-item scale measure is continuous, ranging from 0 to 1, where ‘1’ represents the highest level of narcissism and ‘0,’ represents the lowest level of narcissism.

The recommended cut-off values for item loadings, reliability, average variance extracted (AVE), constrained-unconstrained models, and confirmatory factor analysis (CFA) are listed in Table I. Significant item loadings indicate stronger evidence for a relationship among the observed indicators and their respective latent factors. In addition to Cronbach's alpha, we also use two other measures of reliability—Raykov's ρ and ordinal reliability alpha. For discriminant validity we use AVE, and constrained-unconstrained models as suggested by Venkatraman (1989b).

-----Insert Table I about here -----

The lowest item loading for the narcissism measure was 0.742 (t-value = 8.337) and the highest item loading was 0.869 (t-value=8.355). The scale reliability for narcissism was above the recommended cut-off of 0.7 ($\alpha=0.782$; $\rho=0.783$; ordinal reliability = 0.785). The AVE (=0.653) was above the recommended cut-off, and the change in chi-square was significant for constrained-unconstrained models between narcissism and EO, and EO's sub-scales. Finally,

confirmatory factor analysis (CFA) in Table I, shows acceptable fit ($\chi^2(df)=125.348$ (103); CFI=0.942, TLI=0.937; RMSEA=0.065; SRMR=0.031).

Mediating variable. Entrepreneurial orientation. To measure EO we use the widely adopted scale developed by Covin and Slevin (1989). The three components of EO are: innovativeness (3 items), proactiveness (3 items), and risk taking (3 items). Sample items include “My business places a strong emphasis on: Tried and tested practices, equipment, and products or services vs. Innovation, technological leadership and R&D” [innovativeness], “My business typically Responds to initiatives my competitors initiate vs. Initiates action to which my competitors then respond” [proactiveness], “My business is inclined toward low risk projects with normal rates of return vs. High risk projects with a chance of very high returns” [risk-taking]. As shown in Table A.I. (Appendix), all item loadings were significant. The lowest item loading for EO was for EO-risk-taking (0.778; t-value=5.328) and highest loading was for EO-Innovativeness (0.882; t-value=7.875). The scale reliability for EO was above the recommended cut-off of 0.7 ($\alpha=0.836$; $\rho=0.839$; ordinal reliability = 0.839). Table A.II (Appendix) additionally confirms a robust second-order fit for the EO measure. Furthermore, as listed in Table A.I, AVE for EO (=0.745) was above the recommended cut-off of 0.5. Constrained-unconstrained analysis listed in Table 1 also shows that the lowest change in chi-square was 8.505 (1), $p<0.001$. Finally, we conducted a CFA, listed in Table I, which demonstrates acceptable fit ($\chi^2(df)=49.205$ (24); CFI=0.910, TLI=0.907; RMSEA=0.083; SRMR=0.034). Overall, EO shows acceptable reliability and acceptable discriminant validity.

Controls. Based on information in Corptech, we control for *firm age* and *firm size*. As firms age, they develop more adequate routines and processes and acquire more resources. Larger firms, measured as the number of employees, also have more resources and market power

which may affect performance variance. We also control for *industry-adjusted mean firm sales* (\$millions). As a proxy for firm competitive position, higher mean performance may influence whether firms exhibit performance variance (March, 1991).

In addition, we control for three industry-level measures—*environmental dynamism*, *environmental complexity*, and *environmental munificence*—which may influence firm performance variance. The measures of dynamism and munificence are based on earlier measures suggested by Dess and Beard (1984) and Keats and Hitt (1988). The measure of complexity is based on Dess and Beard (1984) and was recently employed by Heeley et al. (2006). Environmental dynamism and munificence are derived from two-regressions: (i) $\ln[\text{Sales}]$ on time [2006 to 2010] and (ii) $\ln[\text{operating income}]$ on time [2006 to 2010]. The information on sales and operating income was triangulated from firms in the 4-digit SIC codes in Corptech and D&B Million Dollar Directory. Environmental munificence is computed as the average of the antilog of the betas of two regressions. Environmental dynamism is computed as the average of the antilog of standard errors of the two regressions. Environmental complexity is the beta derived by regressing market shares of firms in an industry (4-digit SIC code) in 2010 on firms' markets shares in 2006. A high beta indicates a trend towards and a low beta indicates a trend away from large firm industry dominance. To ease interpretation, in line with Heeley et al. (2006) we multiply the coefficient by -1 so that higher numbers indicates greater complexity.

We also use a self-report measure of *CEO age* as it may influence CEO risk-taking proclivities. Using Corptech listings we control for number of years of *CEO tenure* and average top management team (*TMT*) size over the last five years. Managerial team size has been theorized to manifest potentially significant influences upon firm strategic decision-making processes and including the length of CEO tenure helps control for past performance variance.

Finally, it is possible that social desirability could lead to biased responses on the narcissism and EO related measures. To partially control for such effects, we use a 10-item social desirability scale ($\alpha=0.76$) by Strahan and Gerbasi (1972) in our analyses. The Strahan and Gerbasi (1972) scale has been extensively validated as a short-form social desirability scale (e.g., Reynolds, 1982; Thompson and Phua, 2005).

ANALYSIS AND RESULTS

Table II presents mean, median, minimum, maximum, standard deviations, and zero-order correlations for each of the measures. We observe low to moderate levels of correlations. Moreover, as shown in the Table 1 and the Appendix, the proposed measures show adequate convergent and discriminant validity. All VIFs were less than 4.324 indicating that multicollinearity was not a problem, and the condition index did not exceed 7.746, which further suggests that multicollinearity is not an issue (O'Brien, 2007). The fit indices were as follows for the overall measurement model: $\chi^2(df)=103.424 (127)$; CFI=0.968; TLI=.960; RMSEA=0.057; SRMR=0.016 (Table I). The fit indices exceeded the threshold value of 0.90 suggested by Hu and Bentler (1998). Furthermore, chi-square fit was not significant and the ratio of χ^2/df was below the recommended value of three. As we focus on the high-tech manufacturing sector, it is likely that there could be outliers in our sample. Using Cook's distance cut-off = $4/[n-(k+1)]=4/[215-k+1]=0.005$. The highest value of Cook's distance was 0.004. Therefore, outliers are not a significant concern. Furthermore, we winsorize observations at the 1st and 99th percentile.

-----Insert Table II and Figure 2 about here -----

Common Method Bias

Although our outcome measure along with several control variables are from archival sources (Corptech, and the Dun and Bradstreet Million Dollar Directory), common method bias could affect our self-report scales. Common method bias relates to the systematic variance shared among variables attributable to the measurement method such as reporting from the same method or source (Podsakoff and Organ, 1986). Ideally, the narcissism and EO measures would be collected from different respondents, such as narcissism from the CEO and EO from an external expert, as this would reduce any systematic error variance in the reporting of EO by a narcissistic CEO. In a self-report survey setting (or, same source data collection), for several reasons, including social desirability bias or impression management, narcissistic CEOs may be more likely to overreport EO than less narcissistic CEOs. Given the possibility of inflated correlations between EO and narcissism due to the measurement method, we test whether common method variance is a significant threat to the validity of our inferences.

To test for common method bias, we begin by examining Harman's one-factor test (Podsakoff and Organ, 1986). Five factors accounting for 74.82% of the variance (eigenvalue>1) were extracted and the first factor accounted for 23.75% of the variance. To further test for common method bias, Richardson et al. (2009)⁴ recently proposed three alternative approaches for addressing common method bias: (i) a split-group approach; (ii) a marker variable approach; and (iii) examining an unmeasured methods latent factor. The split-group approach refers to different respondents reporting different data in a group setting. While a split-group approach is not feasible in the current study, we were able to draw our outcome measures along with the vast majority of control variables from external sources.

Next, we consider the marker variable approach. A marker variable is defined "as a variable that is theoretically unrelated to substantive variables and for which its expected

correlation with these substantive variables is zero” (Williams, Hartman, Cavazotte, 2010, p. 478). Using partial correlations of substantive model variables derived from a marker variable reduces method variance among the substantive variables. Partial correlations of substantive variables derived from the marker variable are used in the main analysis.

The marker variable can be derived from an archival source or could be asked in a survey. To avoid any additional common method related errors, we draw on industry efficiency as a marker variable from archival sources. In industries requiring higher levels of efficiency, investments in EO are less likely given its exploratory, resource intensive nature. Moreover, narcissistic CEOs are likely to be less attracted to environments where demands for efficiency may limit CEO discretion. Therefore, industry efficiency should share a low correlation with EO and CEO narcissism. Industry efficiency is defined as the industry median adjusted return on assets at the six-digit NAICS level. Per guidelines from Lindell and Whitney (2001), we use the partial correlation matrix derived from industry efficiency as an input in our path analysis model. The results were consistent in magnitude, direction, and significance.

Following the marker variable approach, we include a method factor in the measurement model to examine the relative variance explained by substantive factors and by the method factor. The substantive constructs explained 89.74% of the variance, and the method factor explained 0.95% of the variance. Next, an unobserved latent methods factor model where all items for Narcissism and EO were allowed to load on their respective factors and on a method factor ($\chi^2=1335.638$, $df=557$, $CFI=0.977$, $TLI=0.971$; $RMSEA=0.038$) was compared to a model where items loaded only on their respective factors ($\chi^2=1379.605$, $df=592$, $CFI=0.972$, $TLI=0.968$; $RMSEA =0.037$). The methods factor model did not show a significant improvement in model fit ($\Delta\chi^2/\Delta df=43.967$ (35), $p>0.10$, $\Delta CFI=0.005$, $\Delta TLI=0.003$, $\Delta RMSEA=0.001$). As

observed by Richardson et al. (2009), the above approaches are necessary to test for common method bias but not sufficient to ensure that effects of common method bias are eliminated.

However, by deriving our outcome measure and control variables from external sources, and conducting additional tests, we reduce concerns regarding common method bias.

Analytical Approach – Path Analysis

The study hypotheses indicate a partial mediation model, where CEO narcissism directly affects firm performance variance and also indirectly increases firm performance variance through EO. Traditionally, Baron and Kenny's (1986) approach to testing mediation based on a two-stage OLS regression has been used. However, to derive more robust estimates, recent work has called for using path analysis based on bootstrap standard errors (Preacher, Rucker, and Hayes, 2007; Hayes, 2009; Edwards and Lambert, 2007). Therefore, to test our hypotheses, we use a path analysis approach. Our results did not differ significantly when using the more traditional Baron and Kenny (1986) approach based upon OLS regression.

Alternate Model Tests

As shown in Table III, we start by testing whether alternate models provide a better fit than the proposed model. In model 2, we directly load CEO narcissism ($\beta=0.153$, $s.e.=0.042$, $p<0.001$) and EO on firm performance variance ($\beta=0.139$, $s.e.=0.053$, $p<0.01$) and the relationships between the control variables and firm performance variance. Despite significance of the effects, the model fit was not acceptable ($\chi^2(df)=216.532$ (78); CFI=0.852; TLI=.837; RMSEA=0.155; SRMR=0.118). The proposed partial mediation model provides a better fit than Model 2 ($\Delta\chi^2(\Delta df)=10.596$ (1), $p<0.001$) and higher fit indices.

-----Insert Table III about here -----

We next assess whether a full-mediation model provides a better fit than the proposed partial mediation model. Compared to the partial mediation model where the link between CEO narcissism and firm performance variance is modeled in addition to the mediation effect (i.e., CEO narcissism → EO → Firm performance variance), in the full mediation model, the link between CEO narcissism and firm performance variance is not modeled. The full-mediation model was significantly different from the partial mediation model ($\Delta \chi^2(\Delta df) = 8.806(1)$, $p < 0.001$) and exhibited lower fit indices (CFI=0.886; TLI=.875; RMSEA=0.133; SRMR=0.098) than the partial mediation model. Overall, a partial mediation model is supported.

Results

Figure 2, shows the mediation results. Hypothesis 1 proposed that higher levels of CEO Narcissism are positively associated with higher levels of EO ($\beta = 0.234$, $p < 0.01$). Hypothesis 2 proposed that EO is positively associated with increased variation in firm performance ($\beta = 0.267$, $p < 0.001$). Hypothesis 3 proposed a partial mediation effect of entrepreneurial orientation within the relationship between CEO narcissism and firm performance variance (indirect effect = 0.062; Sobel test = 2.260, $p < 0.05$; Aroian test = 2.208, $p < 0.05$; Goodman test = 2.315, $p < 0.05$). In sum, empirical support is observed for all three study hypotheses.

DISCUSSION AND CONCLUSIONS

Our findings extend recent research focusing on CEO personality as a determinant of firm-level strategic activities and outcomes (Delgado-Garcia and De La Fuente-Sabate, 2010; Miller and Le Breton-Miller, 2011; Simsek et al., 2010; Tang et al., 2011), and build upon recent studies that suggest prominent leadership traits may have both positive and negative firm implications (Goel and Thakor, 2008; Judge et al., 2009). As the force of CEO personality alone is insufficient to fully explain such organizational outcomes (Simsek et al., 2010; Tang et al.,

2011), the present study investigated firm-level entrepreneurial orientation as a strategic mechanism that narcissistic CEOs may leverage to influence changes in organizational performance.

Theoretical Implications

Our theory and findings have several important implications. A primary theoretical contribution of this work is that the relationship between CEO narcissism and firm performance variance can, and should, be viewed as significantly influenced by the manifestation of entrepreneurial orientation. Supporting our core thesis, this study found that narcissistic CEOs have a propensity to increase EO in the organizations that they lead. Thus, of notable consequence, CEO narcissism is associated with the manifestation of an established orientation towards organizational growth—increased innovation, risk-taking, and proactiveness (Covin and Slevin, 1989; Covin and Wales, 2012; Lumpkin and Dess, 1996; Miller, 2011; Wiklund and Shepherd, 2011). This observation helps to explain and support largely untested notions that CEO narcissism, as a ‘dark’ leadership trait, may indeed simultaneously possess both ‘bright’ and ‘dark’ sides (Judge et al., 2009).

Another important contribution of this study is the recognition and exploration of the association of EO with an increase in firm performance variance, i.e., increases as well as decreases in firm performance. Wiklund and Shepherd (2011) suggest that through EO firms experience a wider distribution of outcomes. Building upon an emerging ‘EO-as-experimentation’ perspective, the present study sheds light on this important research gap by further developing the rationale and supporting evidence for a positive relationship between EO and performance variance in firms. As discussed in the entrepreneurship and broader management literature, EO is generally viewed as beneficial to firm growth (Rauch et al., 2009).

However, by linking EO to increased firm performance variance, which is inherently neither beneficial nor detrimental (March, 1991), a more meaningful perspective of EO emerges. This view represents EO as an organizational mechanism for facilitating significant changes, i.e., swings in firm performance. Thus, our examination of the EO-firm-performance-variance relationship provides robust evidence that, *ceteris paribus*, high-EO firms will have significantly greater impact on changes in firm performance than will their low-EO industry peers.

Moreover, we found EO to partially mediate the relationship between CEO narcissism and firm-performance-variance. This finding offers an improved understanding of how CEO narcissism influences performance variance, and why the firms they lead may even, at times, be viewed as on a path to success. In their self-aggrandizing pursuit of ‘greatness’ narcissistic leaders push their firms to ‘swing for the fences’ in the pursuit of big gains. Yet, the pursuit of exceptional performance to satisfy the narcissist CEO necessitates an organizational orientation that provides the possibility of superior organizational growth. EO fulfills this role. Through its emphasis on innovation, risk-taking, and proactiveness in the pursuit of new entry opportunities, entrepreneurial orientation—and the experimentation that this strategic orientation entails (Wiklund and Shepherd, 2011)—enables the potential discovery of new avenues for firm growth (Covin et al., 2006; Lumpkin and Dess, 1996). While higher EO may also lead to markedly decreased performance, narcissistic CEOs are less concerned with this risk and possible eventuality, and therefore tend to lead more entrepreneurial companies.

To speculate, the bold entrepreneurial efforts of narcissistic CEO-led firms may lead some firm analysts to conclude that the organization, while experiencing variance, is on ‘a path to success’. Because the EO activities of innovation, risk-taking, and proactiveness may lead to firm growth and have often been portrayed as ‘good for the firm’ in the media and popular

culture (Rauch et al., 2009), observers may view the performance trajectory of narcissistic CEO-led firms to be more positive than negative, especially if the variability in firm performance associated with the narcissistic leadership has recently produced increased performance. As research in finance suggests, investors tend to give the CEO disproportionate credit for performance gains (Bushman et al., 1996; Kolev 2008).

How long these perceptions endure is questionable given that the increased variability in firm performance associated with narcissistic CEO leadership suggests that significant downturns in firm performance will also occur. Nonetheless, by advancing understanding of EO as a general mechanism for increased firm performance variance we provide critical insight into how EO captures a potential means through which organizations may change, adapt, and stay competitive (Wales et al., 2011). While EO may at times diminish performance (Wiklund and Shepherd, 2011), firms also have the potential to create new paths to achieving organizational transformation, environmental adaptation, and product-market growth. This suggests that EO can serve as a variation mechanism within the variation-selection-retention model of organizational adaptation (Aldrich, 1979). Employing a variation-selection-retention lens may help provide additional direction to recent calls for novel research on moderators within the EO literature (e.g., Rauch et al., 2009). At present, little is understood regarding possible organizational selection and retention mechanisms that may serve as boundary conditions to the effectiveness of EO as a variation increasing strategic orientation.

Future Research Directions

Given that the present study provides support for a partial mediation model, it is likely that other mechanisms will work in tandem with EO to further explain this relationship. As discussed, it would be difficult to theoretically rule out other mechanisms through which CEO

narcissism has the potential to impact performance variance. These mechanisms may include, for instance, the level of resource-orchestration capability (Sirmon et al., 2007) or strategic flexibility (Anderson et al., 2009) present in an organization. Thus we submit that firm-level capabilities which enable narcissistic CEOs to better manipulate their organizational resource bases may add to the explanation of CEO narcissism's influence on firm performance variance. We offer the exploration of such additional factors as an important direction for future research.

Concerning EO as an outcome of CEO narcissism, future research may also provide insight into possible factors that moderate the influence of CEO narcissism on firm-level EO. In certain contexts it is possible that CEO narcissism may not influence EO or may do so only negatively, such as, perhaps in near perfect competition industries (e.g., steel manufacturing).

Further, the influence of CEO narcissism on EO may be weakened in contexts where narcissistic CEOs see less opportunity to realize their personal goals and needs for power and prestige. Such contexts may be similar to those described in the EO literature as more benign industries or less dynamic task environments (Covin and Slevin, 1989). Internal contextual considerations may include CEO compensation practices. For example, compensation bonuses and options may exacerbate narcissistic tendencies to embrace entrepreneurial activities.

The possibility for moderated-mediation is also present when narcissistic leaders foster firm-level EO. Future research may explore factors that could strengthen or weaken the observed mediation effects of EO as a mechanism through which CEO narcissism impacts firm performance variance. For instance, as governance may influence the effectiveness of entrepreneurial behavior (Coombes et al., 2011), an interesting area of future investigation may be the prevalence of narcissism within the board and/or top management team (TMT). In general, we would expect that higher overall narcissism within the firm's upper echelons could

increase EO and performance variance. More specifically, the distribution of levels of narcissism across members of the TMT could potentially influence the manifestation of these phenomena.

To speculate, drawing upon the concept of separation proposed by Harrison and Klein (2007), if the TMT is more balanced across levels of narcissism there may be a better balance of exploration (driven by members with higher levels narcissism) and exploitation (driven by the less narcissistic members). This balance may partially determine the distribution of organizational outcomes and possibly influence performance variance.

Regarding the relationship between EO and firm performance variance, future researchers might ask whether managers should moderate their firm's level of EO given that increased variance implies more significant failures in the pursuit of firm growth. It is, of course, every manager's hope that higher EO will produce a higher competitive position, but as discussed, this is not always the case. Thus, increasing EO should be perceived as a calculated managerial risk, and future research should seek a better understanding of which factors moderate the EO—firm performance variance relationship. As such, a pertinent goal of managers, and direction for future scholarly research, would be to determine the conditions, policies, procedures, etc. which terminate failing entrepreneurial initiatives and reinforce successful efforts. Understanding how to shape the distribution of outcomes in order to achieve a higher ratio of successes-to-failures is an important direction within future research exploring EO (Wiklund and Shepherd, 2011).

Additionally, through failed entrepreneurial initiatives (i.e., new entry 'experiments'), EO firms may generate strategic learning (Anderson et al., 2009). Thus, it is possible that following failed attempts firms may launch new entries which examine more refined 'hypotheses' with higher chances of success. As such, whether the relationship between EO and firm performance

variance holds over time is still an open question. It may be that when examined longitudinally the relationship between EO and firm performance variance will decrease in magnitude or disappear entirely if the positive gains in firm performance made possible through strategic learning are eventually large enough to fully compensate for the losses from failed initiatives.

Finally, future research may investigate performance variability as it relates to different types of narcissism, such as reactive (e.g., ruthless grandiosity) vs. self-deceptive (e.g., unfeeling Machiavellianism) (Kets De Vries and Miller, 1985). However, measuring narcissism using the NPI-16 scale provided us with a greater range of responses from which to test the robustness of our theoretic mediatory model. Further, although narcissistic CEOs may foster the manifestation of firm-level EO, and the potentially high-risk, high-returns model of firm performance which EO promises, with extremely self-aggrandizing motivations, some narcissistic CEOs may foster EO and its associated performance variance with more noble motivations. Understanding the circumstances under which organizations can support higher levels of performance variance also represents an important direction for future research. For example, are there levels of market share or particular organizational resource positions in which increased performance variance is more or less desirable? Exploring these types of questions will help researchers and practitioners understand the potential conditional utility of increased performance variance as a means of achieving firm growth.

Limitations

The contributions of this study should be considered in light of its research limitations. First, the present study covered years during which the U.S. was experiencing a recession, which may have influenced our findings. However, as our data was collected after the recessionary period started and also included two years of non-recessionary data, we believe the ‘treatment’

effect would be applicable to all firms. Second, while the high-tech sector facilitates exploration of our research model, questions remain as to whether the observed relationships can be extended to firms in other industry contexts. Further, by focusing on manufacturing firms within the high-tech sector, our results may not necessarily generalize to less dynamic industrial-environmental sectors. Moreover, the level of discretion necessary to execute entrepreneurial behaviors may be more limited in industries driven by more certain, efficiency-based competitive bases. Therefore, it is possible that our findings, however robust, could potentially represent an artifact of the industry and the relatively high degree of volatility associated with U.S. high-tech manufacturing firms⁵.

Third, the logic that CEO attributes may contribute to firm-level strategic orientations has notable underpinnings within upper-echelons theory (Hambrick and Mason, 1984; Simsek et al., 2010). Nonetheless, it is possible that EO firms may attract more narcissistic CEOs⁶. To an extent, unobservable self-selection effects may be driving the choice of industry among narcissistic CEOs. Although beyond the scope of the present research, such self-selection effects could be controlled for in future research through empirical strategies such as matched-paired sampling between more and less narcissistic CEOs in an industry. Furthermore, to draw more robust inferences concerning the effects of CEO narcissism, the ‘fixed-effects’ of CEOs on firm performance, as measured by the effects of a CEO’s presence on firm performance over the course of the CEO’s career, could also be controlled for to additionally help assess the unique effects of CEO narcissism. Finally, the present study specifically focuses on the performance variance experienced by active companies, and thus has the potential for survival bias common to entrepreneurial orientation research (Wiklund and Shepherd, 2011). Incorporating firm

failures, mergers, and acquisitions within future sampling efforts may yield more complete pictures of the influence that CEO narcissism may have upon a company's fate.

In concluding, the significance of CEO narcissism as an antecedent to the manifestation of EO is particularly noteworthy given its assumed prevalence as a personality trait among the world's most powerful leaders and executives (Rosenthal and Pittinsky, 2006). While the present research marks only the beginning of promising new areas of investigation examining these phenomena, it is our hope that our findings will inspire additional research in the scholarly vein linking CEO personality to firm strategic orientation and performance outcomes.

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NOTES

¹ We would like to thank an anonymous reviewer for this insight.

² According to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) published by the (American Psychiatric Association, 2000), narcissistic personality disorder is characterized by particular behaviors and beliefs, which include at least five of the following (a) an exaggerated sense of self-importance, (b) preoccupation with fantasies of unlimited success, power, brilliance, beauty, or ideal love, (c) belief s/he is 'special' and can only be understood by, or should associate with, other special or high-status people (or institutions), (d) requirement of excessive admiration, (e) sense of entitlement, (f) selfishness displayed by taking advantage of others to achieve his/her own ends, (g) absence of empathy, (h) envy of others or belief that others are envious of him/her, or (i) arrogant, patronizing, or otherwise contemptuous behaviors or attitudes.

³ 334111 Electronic Computers; 334112 Computer Storage Devices; 334113 Computer Terminals; 334119 Other Computer Peripheral Equipment; 334210 Telephone Apparatus; 334220 Radio & TV Broadcasting & Wireless Communications Equipment; 334290 Other Communications Equipment; 335921 Fiber Optic Cables; 334310 Audio & Video Equipment; 334411 Electron Tubes; 334412 Bare Printed Circuit Boards; 334414 Electronic Capacitors; 334415 Electronic Resistors; 334416 Electronic Coils, Transformers, & other Inductors; 334417 Electronic Connectors; 334418 Printed Circuit Assembly; 334419 Other Electronic Components; 334413 Semiconductor & Related Devices; 333295 Semiconductor Machinery; 334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical Systems and Instruments; 334512 Automatic Environmental Controls; 334513 Industrial Process Control Instruments; 334514 Totalizing Fluid Meter & Counting Devices; 334515 Electricity Measuring & Testing Equipment; 334516 Analytical Laboratory Instruments; 334519 Other Measuring & Controlling Instruments; 334510 Electromedical & Electrotherapeutic Apparatus; 334517 Irradiation Apparatus; 333314 Optical Instrument & Lens; 333315 Photographic & Photocopying Equipment

⁴ We acknowledge helpful guidance from an anonymous reviewer in identifying these additional tests.

⁵ We acknowledge the help of an anonymous reviewer in noting this study limitation.

⁶ Ibid

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Table I
Measurement Description

	Lowest Item Loading	α	Raykov's ρ	Ordinal reliability	Average Variance Extracted	CFA	$\Delta\chi^2(\Delta df)$ Constrained-unconstrained model ³	$\Delta\chi^2(\Delta df)$ Constrained-unconstrained model	$\Delta\chi^2(\Delta df)$ Constrained-unconstrained model	$\Delta\chi^2(\Delta df)$ Constrained-unconstrained model
Recommended values	$t > 0.05$	≥ 0.7	≥ 0.7	≥ 0.7	≥ 0.5	$\chi^2/df \leq 3$; CFI ≥ 0.90 ; TLI ≥ 0.90 ; RMSEA ≤ 0.08 ; SRMR ≤ 0.06	$p < 0.05$	$p < 0.05$	$p < 0.05$	$p < 0.05$
Entrepreneurial Orientation	0.778, $t=5.328$	0.836	0.839	0.839	0.745	$\chi^2(df)=49.205 (24)$; CFI=0.910, TLI=0.907; RMSEA=0.083; SRMR=0.034)	1			
EO-Innovativeness	0.746, $t=6.739$	0.844	0.843	0.842	0.676	$\chi^2(df)=11.081 (4)$; CFI=0.961, TLI=0.955; RMSEA=0.055; SRMR=0.022)	8.505 (1)***	1		
EO-Proactiveness	0.801, $t=4.855$	0.886	0.889	0.892	0.760	$\chi^2(df)=8.662 (4)$; CFI=0.973, TLI=0.969; RMSEA=0.054; SRMR=0.019)	10.426 (1)***	12.187 (1)***	1	
EO-Risk taking	0.758, $t=6.397$	0.857	0.858	0.859	0.677	$\chi^2(df)=49.673 (4)$; CFI=0.918, TLI=0.915; RMSEA=0.09; SRMR=0.04)	12.026(1)***	12.676 (1)***	8.551 (1)***	1
Narcissism	0.742, $t=8.337$	0.782	0.783	0.785	0.653	$\chi^2(df)=125.348(103)$; CFI=0.942, TLI=0.937; RMSEA=0.065; SRMR=0.031)	20.754 (1)***	20.771 (1)***	27.049 (1)***	34.725 (1)***
Full-Model CFA: $\chi^2(df)=103.424 (127)$; CFI=0.968; TLI=.960; RMSEA=0.057; SRMR=0.016										

³ Indicates change in chi-square between constrained and unconstrained models between two constructs

Table II
Correlation Table

	Mean	Median	Min	Max	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Industry-adjusted SD sales	0.23	0.25	0.11	0.98	0.38	1											
2. Entrepreneurial Orientation	3.38	3.55	1.09	6.44	0.73	0.32	1										
3. CEO Narcissism	0.60	0.57	0.16	0.91	0.18	0.24	0.27	1									
4. Firm Age	8.15	8.75	4.00	10.00	0.79	-0.07	0.07	0.06	1								
5. Firm Size	25.19	29.63	15.00	239.00	17.42	-0.18	0.26	0.11	0.31	1							
6. Industry-adjusted venture sales (\$millions)	1.15	1.62	0.49	8.54	6.10	0.39	0.22	0.17	0.16	0.24	1						
7. Environmental Dynamism	1.01	1.21	0.94	1.33	0.07	0.42	0.33	0.27	-0.25	-0.38	-0.31	1					
8. Environmental Complexity	-0.92	-0.88	-1.19	-0.78	0.09	-0.26	0.24	0.16	0.16	0.15	-0.22	0.29	1				
9. Environmental Munificence	1.52	1.44	1.13	1.82	0.11	-0.15	0.16	0.13	0.19	0.08	0.19	0.12	0.24	1			
10. CEO Age	40.45	42.16	28.00	64.00	9.05	-0.10	0.03	-0.07	0.05	0.05	0.05	0.05	0.06	0.03	1		
11. CEO Tenure	8.19	8.64	7.00	12.00	1.63	0.10	0.02	0.11	0.02	0.03	0.03	0.04	0.02	0.01	0.15	1	
12. TMT Size	4.82	5.19	3.00	11.00	2.86	-0.08	0.17	-0.04	0.09	0.16	0.04	0.11	0.11	0.02	0.10	0.06	1
13. Social Desirability	2.25	2.48	1.49	3.56	1.18	0.07	0.09	0.09	0.07	0.09	0.04	0.03	0.03	0.01	0.08	0.05	0.05

Notes.

N=173 firms

All correlations above |0.12| are significant at 0.05 (two-tailed)

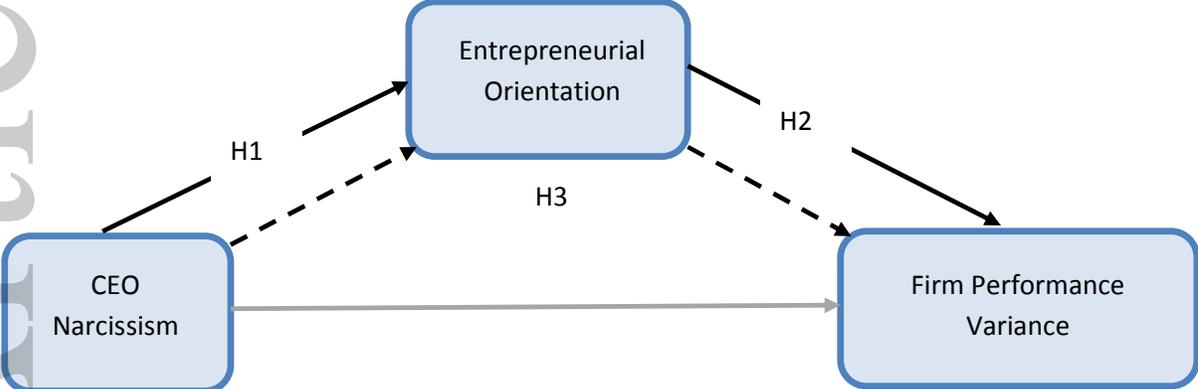
All correlations above |0.19| are significant at 0.01 (two-tailed)

Table III

Alternate Model Specification

	χ^2	df	$\Delta \chi^2(\Delta df)$	CFI	TLI	RMSEA	90% RMSEA	SRMR
Recommended values	$\chi^2/df \leq 3$			≥ 0.90	≥ 0.90	≤ 0.08		≤ 0.06
Model 1: Partial Mediation Model: Narcissism \rightarrow EO \rightarrow firm performance variance (and, Control variables)	145.936	77		0.928	0.927	0.075	(0.067, 0.85)	0.033
Model 2: Direct effects of Narcissism, EO, and Control variables on firm performance variance	156.532	78	10.596 (1)*** [Model 1 and Model 2]	0.852	0.837	0.155	(0.128, 0.182)	0.118
Model 3: Full Mediation Model: Narcissism \rightarrow EO \rightarrow firm performance variance (and, Control variables)	153.742	78	8.806 (1) *** [Model 1 and Model 3]	0.886	0.875	0.133	(0.124, 0.145)	0.098

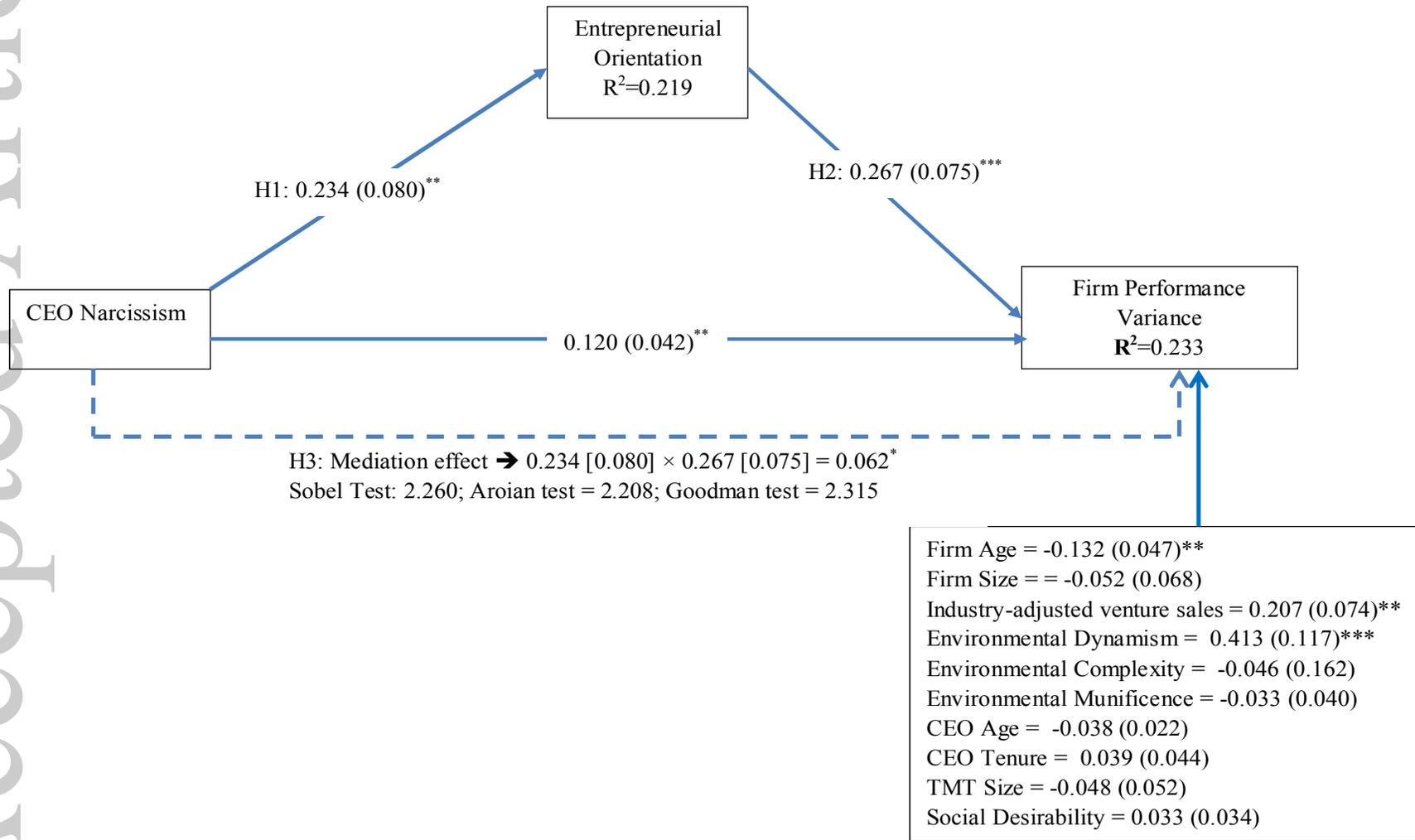
Figure 1 - Research Model⁴



⁴ Dotted lines indicate the proposed partial mediation effect

Figure 2

Path Analysis Results – Partial Mediation Model.



Appendix

Table A.I

Parameter estimates and item reliabilities for the proposed Model

Scale Description	Items	First-order Std. Factor Loading	Second-order Factor Loading	se ⁵	t-value ⁶	α	Raykov's ρ	Ordinal reliability
Entrepreneurial Orientation (Scale points: [...] vs. [...] - (Strongly, not so strongly) (Equally) (not so strongly, strongly)) (AVE=0.745) EO –Innovativeness.						0.836	0.839	0.839
			.882	0.112	7.875			
	'My business places a strong emphasis on: Tried and tested practices, equipment, and products or services vs. Innovation, technological leadership and R&D' (I1)	0.811		0.192	4.231	0.844	0.843	0.842
	'In the last three years, my business has marketed: Many NEW products or services vs. Innovation, technological leadership and R&D' (I2)	0.746		0.111	6.739			
	'In the last three years, changes in my products or services have been: Mostly of a minor nature vs. Usually quite dramatic' (I3)	0.871		0.092	9.447			
EO - Proactiveness			.862	0.160	5.377			
	'My business typically Responds to initiatives my competitors initiate vs. Initiates action to which my competitors then respond' (P1)	0.834		0.126	6.624	0.886	0.889	0.892
	'My business is the first to introduce new products or services, administrative techniques, etc. the first to introduce new products or services, administrative techniques, etc.' (P2)	0.801		0.165	4.855			
	'My business typically seeks to avoid competitive clashes, preferring a “live and let live” posture vs. Adopts a very competitive “undo the competitors” posture' (P3)	0.856		0.091	9.376			
EO – Risk taking			.778	0.146	5.328	0.857	0.858	0.859
	'My business is inclined toward low risk projects with normal rates of return vs. High risk projects with a chance of very high returns' (RT1)	0.777		0.246	3.157			
	'Due to the nature of the business environment in which I operate, it is best to Explore potential opportunities gradually through cautious, incremental behavior vs. Take bold, wide-ranging actions to achieve the firm’s objectives' (RT2)	0.758		0.119	6.397			
	'When confronted with decisions involving uncertainty, the firm typically adopts a bold posture in order to maximize probability of exploiting opportunities.' (RT3)	0.828		0.089	9.283			

⁵ s.e. calculated based on the current estimation algorithm

⁶ Based on s.e. derived from the current estimation algorithm

Narcissism 16-item scale (AVE=.653)						0.782	0.783	0.785
<i>Narcissistic Response</i>	<i>Non-narcissistic response</i>							
I know that I am good because everybody keeps telling me so (=1)	When people compliment me I sometimes get embarrassed (=0)	0.815		0.100	8.166			
I like to be the center of attention (=1)	I prefer to blend in with the crowd (=0)	0.820		0.169	4.849			
I think I am a special person (=1)	I am no better or nor worse than most people (=0)	0.793		0.177	4.488			
I like having authority over people (=1)	I don't mind following orders (=0)	0.772		0.209	3.687			
I find it easy to manipulate people (=1)	I don't like it when I find myself manipulating people (=0)	0.824		0.176	4.671			
I insist upon getting the respect that is due me (=1)	I usually get the respect that I deserve (=0)	0.860		0.201	4.283			
I am apt to show off if I get the chance (=1)	I try not to be a show off (=0)	0.771		0.185	4.168			
I always know what I am doing (=1)	Sometimes I am not sure of what I am doing (=0)	0.742		0.089	8.337			
Everybody likes to hear my stories (=1)	Sometimes I tell good stories (=0)	0.746		0.241	3.098			
I expect a great deal from other people (=1)	I like to do things for other people (=0)	0.808		0.145	5.565			
I really like to be the center of attention (=1)	It makes me uncomfortable to be the center of attention (=0)	0.790		0.189	4.180			
People always seem to recognize my authority (=1)	Being an authority doesn't mean that much to me (=0)	0.828		0.110	7.527			
I am going to be a great person (=1)	I hope I am going to be successful (=0)	0.803		0.175	4.602			
I can make anybody believe anything I want them to (=1)	People sometimes believe what I tell them (=0)	0.853		0.166	5.148			
I am more capable than other people (=1)	There is a lot that I can learn from other people (=0)	0.869		0.104	8.355			
I am an extraordinary person (=1)	I am much like everybody else (=0)	0.786		0.136	5.792			

Table A.II

Entrepreneurial Orientation - Second Order Factor Validity

Model	χ^2 (df)	GFI	IFI	TLI	CFI	RMSEA
Model 1 (one-factor model)	80.219 (27)	.827	.813	.792	.785	.17
Model 2 (three correlated factors)	63.454 (24)	.844	.838	.822	.827	.14
Model 3 (second order factor)	47.628 (24)	.929	.925	.911	.914	.09