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The Promise and Problems of Organizational Culture: CEO Personality, Culture, and Firm Performance

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Abstract

Studies of organizational culture are almost always based on two assumptions: (a) Senior leaders are the prime determinant of the culture, and (b) culture is related to consequential organizational outcomes. Although intuitively reasonable and often accepted as fact, the empirical evidence for these is surprisingly thin, and the results are quite mixed. Almost no research has jointly investigated these assumptions and how they are linked. The purpose of this article is to empirically link CEO personality to culture and organizational culture to objective measures of firm performance. Using data from respondents in 32 high-technology companies, we show that CEO personality affects a firm's culture and that culture is subsequently related to a broad set of organizational outcomes including a firm's financial performance (revenue growth, Tobin's Q), reputation, analysts' stock recommendations, and employee attitudes. We discuss the implications of these findings for future research on organizational culture.

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In the late 1970s and early 1980s, the topic of "organizational culture" captured managers and scholars' interest. A series of poplar books (e.g., Davis, 1984; Peters & Waterman, 1982), academic conferences, and special issues of scholarly journals (*Administrative Science Quarterly*, 1979, 1983; *Journal of Management*, 1985; *Journal of Management Studies*, 1982) highlighted the promise of organizational culture as a way to understand how organizations operate and succeed. The logic offered had two components that were intuitive and seductively simple: (a) Cultures largely reflect the values and actions of their senior leaders, and (b) cultures are important determinants of firm performance.

The first premise was that organizational cultures—defined most commonly as "the basic assumptions and beliefs that are shared by organizational members" (Schein, 1985, p. 9), or "a system of shared values defining what is important, and norms, defining appropriate attitudes and behaviors" (O'Reilly & Chatman, 1996, p. 166)—are largely created by an organization's senior leaders. For example, in the very beginning of his seminal book, Schein (1985) claims that "*the only thing of real importance that leaders do is to create and manage culture*" (p. 2). He concludes some 300 pages later asserting, "The unique and essential function of leadership is the manipulation of culture" (p. 317). The widespread assumption has been that cultures reflect the values, beliefs, and actions of their senior leaders (e.g., Baron & Hannan, 2002; Davis, 1984; Kotter & Heskett, 1992). However, in a recent review of the culture literature, Schneider, Ehrhart, and Macey (2013) noted that "although the theoretical literature on organizational culture is replete with discussions of the influence of the founder and upper management have on an organization's culture, empirical studies of that relationship are hard to find" (p. 372).

The second intuitively reasonable part of the argument was that organizational culture was a significant determinant of organizational performance. Again, however, the evidence for this is mixed. Establishing a consistent direct link between culture and objective firm performance has been hampered by a number of conceptual challenges including disagreements about defining culture and the dimensions associated with it (e.g., Schneider et al., 2013), and a number of methodological challenges such as small samples, measures designed for other purposes besides assessing culture, and variance introduced by assessing multiple industries (e.g., Detert, Schroeder, & Mauriel, 2000).

More than 40 years later, these two fundamental assumptions, with some minor modifications, remain intact: Organizational culture is largely shaped by an organization's leaders and is presumed to be important because it can have consequential effects on firm performance. Yet, the empirical evidence for these claims remains fragmented and inconclusive (Hartnell, Ou, & Kinicki, 2011). In a recent review, Sackmann (2011) concluded that even as research on culture is becoming more methodologically sophisticated, researchers' use of diverse measures of culture and performance is stalling paradigm development. Almost no studies have attempted to simultaneously test these two fundamental assumptions by providing an empirical test of the effects of senior leadership personality on organizational culture and the subsequent effects of culture on objective indicators of organizational performance. In doing this, we provide a clearer picture of the origins of organizational cultures and clarify how culture can affect organizational performance.[1]

We begin by reviewing previous research on the effects of CEO personality and leadership on culture and firm performance. We then use data from more than 1,000 respondents to revalidate a measure of organizational culture originally developed by O'Reilly, Chatman, and Caldwell (1991) and investigate the associations between CEO personality, culture, and firm performance for 32 high-technology firms over a 3-year period.

CEO Personality and Organizational Culture

How do senior leaders affect organizational culture? When culture is conceived of as a consensus about norms (e.g., Cooke & Rousseau, 1988; Schein, 1985), then the recurring patterns of behavior of senior leaders becomes a critical source of information about the normative order for those in the organization (Bandura, 1986). Based on this social learning perspective, several authors have identified the mechanisms through which managers might develop and change cultures. O'Reilly and Chatman (1996) argue that the mechanisms for developing and changing culture can be seen in the social-psychological processes of normative and informational influence. Schein (1985) and others have suggested similar mechanisms that act to signal the desired normative order, including systems, structures, and processes designed to reinforce ways of thinking and behaving. While useful, these do not answer the question of *where* the desired behavioral regularities come from. Several scholars have suggested that the true origins of culture can be found in the fundamental dispositions (values and personalities) of the organizations' leaders (Schein, 1985). In this sense, leaders' values and personalities may be the primary building blocks of organizational culture (Baron & Hannan, 2002; Detert et al., 2000; Fu, Tsui, Liu, & Li, 2010).[2]

Schneider and Smith (2004) define personality broadly to refer to those individual attributes that "give form, structure, and consistency to people's behavior over time and situations" (p. 347). Personality traits are patterns of thought, emotion, and behavior that are relatively consistent over time and across situations. Similar to personality, values are enduring subjective judgments or perspectives on what is seen as important that reflect basic dispositions. Values represent one translation of dispositions into situational preferences (Parks & Guay, 2009). As such, personality and values are important precursors of patterns of behavior. With regard to organizational culture, the patterns of behavior of the CEO may then become a salient source of information about the normative order.

During the past several decades, researchers have accumulated an impressive body of findings providing convincing evidence that (a) personality and values can be assessed with great accuracy (e.g., Funder, 2012; John, Naumann, & Soto, 2008), (b) values and personality are related to a range of important individual and life outcomes (e.g., Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), and (c) the myriad of potential personality and value constructs can be reliably captured by five essential personality constructs, the so-called Big Five or the Five-Factor Model (FFM), that integrates decades of earlier research (e.g., John et al., 2008). The five underlying dimensions include (a) *Extraversion*, (b) *Agreeableness*, (c) *Conscientiousness*, (d) *Neuroticism*, and (e) *Openness to Experience*.

Of particular relevance for organizational research, a number of studies have linked Big Five dimensions to both leadership and job performance (e.g., Barrick & Mount, 1991; Hoffman & Jones, 2005; Lim & Ployhart, 2004). But the vast majority of these studies have focused not on senior leaders but on leader emergence and laboratory studies using student subjects. When the focus was on senior leaders, dispositions were less useful as predictors (Hoffman, Woehr, Maldagen-Youngjohn, & Lyons, 2011). Only a few studies have attempted to link senior level leaders' personality to culture. For example, in an archival study of 17 CEOs, Peterson and his colleagues investigated how the personality of the CEO affected the dynamics and norms of the senior team (Peterson, Smith, Matorana, & Owens, 2003). They found that CEOs higher on Agreeableness had teams rated as higher in cohesion and decentralization. Giberson et al. (2009) found some associations between Big Five measures and organizational culture but did not link culture to organizational performance. In an attempt to more directly link CEO values, culture, and firm performance, Berson, Oreg, and Dvir (2008) collected data from 26 CEOs and 256 of their subordinates. Their results showed that different values (self-direction, security, and benevolence) were associated with different

cultures (innovation oriented, bureaucratic, and supportive). Interestingly, the differing cultures were differentially related to firm outcomes. More innovative cultures had higher sales growth, more bureaucratic cultures were more efficient, and more supportive cultures had higher levels of employee satisfaction but lower sales growth.

Overall, the evidence suggests that personality as manifested in values and behavior is associated with leadership at the CEO level (Peterson et al., 2003; Tsui, Zhang, Wang, Xin, & Wu, 2006) and that these may affect the culture of the organization, although the specific form of these relationships is not clear. One implication of this argument is that an organization's senior leaders, because of their salience, responsibility, authority, and presumed status, have a disproportionate impact on culture and may be a significant source of cultural influence.

Organizational Culture and Firm Performance

Given the widespread interest in the potential effects of culture on firm performance, it is noteworthy how little clarity there is about this connection. In an early study, Siehl and Martin (1990) concluded that a link between culture and firm performance "has not been—and may well never be—empirically demonstrated" (p. 242). Almost 20 years later, Gregory, Harris, Armenakis, and Shook (2009) observed that "few empirical studies have provided detailed insight into the relationship" (p. 673). In a recent review of the associations between culture and organizational effectiveness broadly defined, Hartnell et al. (2011) found significant correlations between culture and employee job satisfaction, obtained mixed results for culture and subjective ratings of organizational processes and performance, but found too few studies of studies of objective performance indicators and culture to come to any conclusions.

Beginning with the 84 studies identified by Hartnell and including others not in their sample (e.g., Balthazard, Cooke, & Potter, 2006; Bezrukova, Thatcher, Jehn, & Spell, 2012), we identified 31 studies that appeared to explicitly investigate both culture and performance. A review of these showed that only 9 studies reported associations between culture and objective, firm-level financial performance outcomes. Of these, several used very small samples (Calori & Sarnin, 1991; Gordon & DiTomaso, 1992; Siew & Yu, 2004). Only 6 studies had a reasonable sample size and objective performance measures (Berson et al., 2008; Christensen & Gordon, 1999; Gordon, 1985; Kotter & Heskett, 1992; Peterson et al., 2003; Sørensen, 2002). Results from these ranged from no associations between culture and objective firm performance (Gordon, 1985; Sørensen, 2002) to mixed results (Christensen

& Gordon, 1999) to positive findings under specific conditions (Berson et al., 2008; Kotter & Heskett, 1992; Peterson et al., 2003). Thus, while there is evidence that organizational culture seems to be positively associated with employee attitudes and subjective assessments of performance (e.g., Bezrukova et al., 2012; Denison & Mishra, 1995), there is little evidence definitively linking organizational culture to objective firm-level outcomes.

There are several understandable reasons for this lack of clarity. First, designing studies and obtaining data that allow for the assessment of culture across organizations, especially with the CEO's participation, has been a daunting task, often resulting in studies with very small samples and low power (e.g., Calori & Sarnin, 1991; Gordon & DiTomaso, 1992). For example, Denison and Mishra (1995) used archival data on five firms to develop a theory of culture and then used survey data in an attempt to refine their theory. While useful, they acknowledge that, "Neither the survey instrument nor the traits operationalized were ideal for culture research" (p. 207). Similarly, other researchers have made use of pre-existing surveys that were not designed for culture research but, post hoc, relabeled the constructs as "culture" (e.g., Marcoulides & Heck, 1993). Further compounding the issue is that the relationship between culture and firm performance has been shown to vary across industries (e.g., Christensen & Gordon, 1999) such that a significant result obtained in one setting may not apply in another. This is not to criticize these efforts but to simply note the difficulty that culture research poses.

Second, there have been disagreements about the definition and measurement of both culture and performance that has resulted in the use of different frameworks and metrics that make aggregation of results difficult (e.g., Schneider et al., 2013). Hartnell et al. (2011) concluded that one reason for the failure to find culture-performance relationships may be that simple measures of culture may be too broad. In one of the first published articles on organizational culture, Andrew Pettigrew (1979) echoed this concern against the use of simple categorizations: "While providing a general sense of orientation, culture treated as a unitary concept in this way lacks analytical bite" (p. 574).

Responding to the concern that simple measures of culture might fail to capture the complexity of culture across different types of organizations, O'Reilly et al. (1991) developed a more variegated and comprehensive approach to developing a framework for categorizing organizational culture. Just as the Big Five personality attributes represent a mid-range theory of personality, the Organizational Culture Profile (OCP) was designed to empirically identify a set of dimensions that reflect a more comprehensive set of organizational norms to accurately reflect the complexity, uniqueness, variety, and range of an organization's culture. This approach has been refined and validated by several researchers (e.g., Barber & Wesson, 1998; Judge &

Cable, 1997; Sarros, Gray, Dentsen, & Cooper, 2005; Siew & Yu, 2004). Just as the Big Five provides a framework for summarizing the effects of personality, the OCP methodology offers a comprehensive way to characterize organizational cultures on a variety of dimensions.

Finally, as researchers have explored the possible associations between organizational culture and firm performance, there has been an evolution in understanding the form that this relationship might take, ranging from a simple direct association to contingent relationships dependent on firm strategy and environmental conditions (e.g., Christensen & Gordon, 1999; Khazanchi, Lewis, & Boyer, 2007; Sørensen, 2002). However, in spite of the strong intuition that organizational culture should be directly linked to firm effectiveness, the empirical results remain equivocal.

Hypotheses Linking CEO Personality and Organizational Culture

The argument proposed thus far is that a leader's personality is manifested in regularities in his or her attitudes and behaviors and these, in turn, shape cultural norms and expectations. Although there is no expectation that a CEO's personality should directly affect firm performance, their patterns of behavior (expressed in what questions they ask, what they pay attention to and reward, the types of people they hire, etc.) are likely to shape their firm's culture (e.g., norms regarding what people pay attention to, what behaviors are seen as important) through a process of social learning. Thus, we expect that certain CEO personality attributes, expressed in terms of the Big Five, may be associated with certain types of organizational culture. Culture, in turn, may be associated with subsequent firm performance.

Previous research has shown that, under certain conditions, each of the Big Five dimensions may be associated with leader emergence, job performance, culture, and possibly even the organization's strategy (Berson et al., 2008; Giberson et al., 2009; Judge, Bono, Iles, & Gerhardt, 2002; Nadkarni & Herrmann, 2010). Although one could easily hypothesize how combinations of the Big Five dimensions might affect organizational culture, for simplicity, we focus here solely on the potential direct effects on organizational culture.

CEO Openness to Experience

Openness to Experience is the tendency to be imaginative, unconventional, and independent. Previous research has shown mixed associations between Openness and leadership (Hoffman & Jones, 2005); however, we expect that

those CEOs who are high on Openness are more likely to create cultures that value innovation and change. For instance, Nadkarni and Herrmann (2010) reported that CEOs who were higher on Openness were also more likely to adapt their strategies in the face of change. Thus, we predict that CEOs who are higher on Openness will be more likely to have cultures that value innovation, speed, experimentation, and risk-taking:

Hypothesis 1: CEOs who are higher on Openness to Experience will be more likely to be associated with cultures that emphasize adaptability (innovation, speed, and risk-taking).

CEO Conscientiousness

Conscientiousness refers to the tendency to control impulses and tenaciously pursue goals. At very high levels, those high on Conscientiousness can also be careful, compulsive, preoccupied with rules, and concerned with avoiding mistakes. Therefore, at the CEO level, high levels of Conscientiousness may produce cultures that are more rule oriented, centralized, and careful (e.g., Peterson et al., 2003). Thus, we expect that CEOs who are high on Conscientiousness will be more likely to be associated with cultures that are more detail oriented and emphasize analysis, precision, and attention to detail.

Hypothesis 2: CEOs who are higher on Conscientiousness will be more likely to be associated with cultures that are detail oriented.

CEO Agreeableness

Individuals high on Agreeableness are typically seen as modest, helpful, and willing to compromise (e.g., Peterson et al., 2003). People who are low on Agreeableness are more competitive than cooperative and can be seen as skeptical, unconcerned about others' feelings and antagonistic. There is some evidence that low Agreeableness can lead to higher performance (e.g., Lepine & Van Dyne, 2001). At the CEO level, we predict CEOs who are lower on Agreeableness will have cultures that are more competitive and achievement oriented with higher expectations for performance.

Hypothesis 3: CEOs who are lower on Agreeableness will be more likely to be associated with cultures that are more results oriented (e.g., high expectations for performance, achievement oriented).

CEO Neuroticism

People who score high on Neuroticism tend to be anxious, emotionally unstable, defensive, and upset by minor threats or frustrations. Those who are low on Neuroticism are seen as emotionally stable, relaxed, and secure. In a meta-analysis, Judge et al. (2002) found that Neuroticism was negatively associated with leader emergence. Because of this, leaders who score high on this dimension are seen as more likely to be associated with cultures that are less collaborative. Thus, we predict the following:

Hypothesis 4: CEOs who are higher on Neuroticism will be more likely to be associated with cultures that are less collaborative.

CEO Extraversion

The most obvious aspect of Extraversion is the propensity to prefer extensive interactions with others. However, extraverts are also characterized by optimism, energy, and a preference for excitement (e.g., Judge et al., 2002). Extraverts have been shown to be socially engaging and able to involve others. For example, Giberson et al. (2009) found that CEOs who were higher on Extraversion were associated with more market-oriented cultures. Thus, we expect that CEOs who are more optimistic and sociable to be more likely to create cultures that emphasize a customer orientation than those who are more introverted.

Hypothesis 5: CEOs who are higher on Extraversion will be more likely to be associated with cultures that are more customer oriented.

Organizational Culture and Firm Effectiveness

As reviewed earlier, the evidence for a link between organizational culture and objective measures of firm performance has been mixed, with no consistent evidence showing that culture contributes to financial performance. We believe that there are two reasons for this lack of clarity. First, organizational culture is multidimensional and has been measured in a myriad of ways. It may be that a given facet of culture may be relevant in some circumstances and irrelevant in others. For instance, in a stable industry with a low-cost strategy, a hierarchical culture (internally focused-stable) might be positively associated with success, while under more dynamic conditions this culture could either be irrelevant or negatively associated with performance. This is especially important for studies where the sample of firms spans multiple

industries where different cultural dimensions may be more or less valuable (e.g., Kotter & Heskett, 1992). Research on organizational culture that uses samples where there are likely to be wide variations in industries and firm strategies may miss the subtle differences in cultures that drive performance unless the design permits these to be controlled or accounted for.

Second, the association of a firm's culture and performance may also depend importantly on the outcome variables studied. For instance, previous studies have documented associations between more people-friendly cultures and employee attitudes (e.g., Berson et al., 2008). However, those aspects that promote positive employee attitudes may be unrelated—or even negatively related—to a firm's financial performance. In contrast, those aspects of a firm's culture that promote financial performance (e.g., a strong emphasis on delivering results) may be unrelated—or negatively related—to employee attitudes. Market-based measures of a firm's value (e.g., Tobin's Q) in which analysts and investors estimate the future value of a company through its stock price may value cultural attributes like a firm's ability to innovate even if that aspect of the culture comes at the expense of short-term profit (e.g., Amazon prioritizes long-term growth over short-term profit). The fact that some cultural dimensions may be positively related to some outcomes and negatively related to others may account for some of the mixed results in studies of culture and firm performance.

In spite of these complexities, research does suggest that certain cultural dimensions may be important for firm performance and broadly related to short-term financial performance regardless of the specific strategy adopted. First, as previous research has shown, adaptability appears to be a critical cultural element in promoting firm performance (e.g., Chatman, Caldwell, O'Reilly, & Doerr, 2014; Kotter & Heskett, 1992). Second, and related, a culture that emphasizes a results-orientation appears generally useful regardless of the strategy a firm pursues (e.g., Detert et al., 2000). Finally, in terms of strategic execution, firms that are more detail oriented are more likely to perform well when compared with those that are not, especially in competitive markets (e.g., Khazanchi et al., 2007). This suggests the following three hypotheses:

Hypothesis 6: Organizations whose cultures emphasize adaptability more will perform better than those that emphasize adaptability less.
Hypothesis 7: Organizations whose cultures emphasize results more will perform better than those that emphasize results less.
Hypothesis 8: Organizations whose cultures emphasize detail orientation more will perform better than those that are less detail oriented.

Method

Research Design and Sample

There were two steps in our research design. First, to assess the culture in our sample organizations, we used a slightly revised version of the OCP (O'Reilly et al., 1991) to collect culture data in 2009 from a set of large, publicly traded, high-technology firms headquartered in the United States (n = 56 firms, n = 880 respondents) and a separate set of privately held firms headquartered in Ireland (n = 44 firms, n = 378 respondents). This full panel of data was used for our factor analyses, that is, to identify specific dimensions of organizational culture that characterize an organization. Second, once we had identified these dimensions, we used a subset of the U.S. sample to collect data on CEO personality as rated by company employees and firm performance for 2011. This subset of U.S. firms was qualified based on the reliability of responses within the firm. We used only this U.S. subsample of data to test hypotheses about CEO personality, culture, and firm effectiveness.

U.S. firm sample. We identified 60 firms to invite to participate in this study using the following criteria: The firms were publicly traded, U.S.-headquartered, had their primary operations in the high-technology sector (hardware, software, Internet services—SIC 35xx, 36xx, 38xx, 73xx; GIC Sector 45; S&P Economic Sector 940), and concurrently employed a minimum of 20 alumni from three focal West Coast business schools. Alumni from these schools are highly prone to joining high-technology firms post-graduation, and thus expedited the identification of current employees within our target industry.

Alumni of these business schools provided culture assessments of their employing organizations using the revised OCP. In fall 2009, we sent prospective informants an email inviting them to participate in an online survey assessing their organization's current culture. We specified that informants' culture assessment responses were confidential and would not be identified to their employers, and that the study results would not identify their organizations by name. We received a total of 880 culture assessments from informants in 56 of the 60 firms. We included all 880 responses from U.S.-based employees in the factor analysis described below. Eighty-nine percent of the 56 firms were included in the list of the *Fortune 1000*, representing the largest American firms, and collectively they generated 75% of the total revenue from high-technology *Fortune 1000* firms in 2009. Informants' average tenure with the focal firm was 7.19 years with 24% having worked there for more than 12 years, and 28% of the informants were women. All had earned

a bachelor's degree or higher and 74% of informants had earned an MBA. These respondents were also approached at a later time to provide assessments of CEO personality.

Irish firm sample. To diversify the sample of organizations used in assessing culture dimensions in technology firms, we invited 44 high-technology, professional services, construction, and consumer goods firms headquartered in Ireland to participate in the study. The firms were privately held and ranged in size from 20 to more than 2,000 employees ($\bar{X}$ = 210.2, *SD* = 324.6), and in age from 5 to 111 years ($\bar{X}$ = 28.8, *SD* = 23.9). Of the 469 employees invited to serve as organizational informants (using a similar email as for the U.S. firm sample), 378 (81%) completed the OCP assessment for their firm. Nineteen percent were female and the informant's average tenure was 7 years at the focal firm ($\bar{X}$ = 6.52, *SD* = 3.56); 14% had worked at the firm for more than 12 years; and 15% had MBA degrees (74% had BA/BS equivalents or higher). These responses were only used for determining the dimensions of culture; only the U.S. firms were used to test our hypotheses.

Independent Variables

The OCP uses a Q-sort method to provide a quantitative, assessment of an organization's culture. The OCP consists of 54 norm statements (e.g., fast moving, being precise) that emerged from a review of academic- and practitioner-oriented writings on culture, and were selected to provide a wide-ranging and inclusive set of descriptors (e.g., O'Reilly et al., 1991). In the two decades since the development of the original OCP item set, a variety of business and environmental factors have affected the salient aspects of organizations' cultures (e.g., Judge & Cable, 1997). Obvious examples include shifts in customer service models, changes in technology, globalization, and financial failures (e.g., Berman, 2011). Therefore, we modified or replaced 16 of the original items to make the item set more timely, relevant, and comprehensive. We retained the 54-item distribution structure and deleted original items that were highly redundant, did not discriminate in past research, or did not load cleanly on the OCP factor structure, replacing them with new or modified items.

The email invitation sent to informants included a link to the online OCP assessment. Informants were presented with a definition of culture ("those things that are valued and rewarded within your company—that is, the pattern of beliefs and expectations shared by members, and their resulting behaviors"). They were then prompted to sort the 54 value statements that are *most characteristic and uncharacteristic of your organization's culture* by

assigning them into one of nine categories labeled from 1 = "Most Uncharacteristic" to 9 = "Most Characteristic," placing fewer items in the extreme and more items in the middle categories. (The required distribution was 2-4-6-9-12-9-6-4-2.)

Culture dimensions. Consistent with the processes used in developing the original OCP, we conducted a principal components analysis with varimax rotation to derive the factor structure of the revised OCP (n = 1,258). We began the principal components analysis with all 54 items, and iterated to both (a) eliminate items that did not load on any factors or loaded highly on more than one factor, and (b) revise the number of identified factors based on the scree plot (indicating successively decreasing eigenvalues). Based on this sample, we ultimately derived a six-factor solution that includes 34 of the OCP items and explains 44% of the total variance. All of the final items loaded above .40 on one factor and had cross-loadings on other factors of less than .30. The six-factor solution was readily interpretable and consistent with a scree plot. Each factor had an eigenvalue over 1.0. The six factors were labeled Adaptability, Integrity, Collaborative, Results Oriented, Customer Oriented, and Detail Oriented. These factors overlap substantially with the original factor analyses of the OCP (O'Reilly et al., 1991), with the differences between the original and the ones we identify primarily being attributable to the modified items (e.g., customer oriented). Table 1 shows the rotated component matrix including the amount of explained variance each factor accounts for, as well as each item's factor loadings. The appendix contains the full item set and identifies revised items.

We calculated factor scores for the six factors for each respondent. The overall measure of each dimension of an organization's culture was computed by averaging the individual respondents' factor scores on that dimension. Thus, each firm is measured on six independent attributes of culture. We used these firm-level measures for all subsequent analyses. The average number of respondents per company is 20.25 (SD = 13.11).

To determine the appropriateness of aggregating culture-factor responses at the firm level, we computed several metrics of inter-rater reliability and agreement (LeBreton & Senter, 2008). First, we calculated an $r_{wg(j)}$ value for each firm. The $r_{wg(j)}$ indicates how highly respondents within the firm agree on the level of the six culture factors, as compared with a uniform distribution of responses (i.e., the null hypothesis). We obtained values for all firms ($\bar{X}$ = 0.91, SD = 0.03) that exceeded the recommended minimum value of 0.70 (Klein et al., 2000), indicating high within-firm agreement. Second, we calculated two intraclass correlation (ICC) metrics: ICC(1), which indicates how much variance in ratings of each of the culture factors is explained by

Table 1. Factor Analysis—Rotated Component Matrix.

	Components (Factors)					
	Adaptability	Integrity	Collaborative	Results oriented	Customer oriented	Detail oriented
	Variance accounted for					
	10.5%	8.5%	7.9%	6.6%	5.6%	5.1%
Being innovative	0.60	0.09	(0.01)	0.06	0.04	0.09
Risk-taking	0.59	(0.15)	(0.27)	0.01	(0.02)	(0.13)
Being willing to experiment	0.59	(0.10)	(0.05)	(0.12)	(0.08)	(0.09)
Fast moving	0.51	(0.37)	(0.21)	0.10	(0.13)	(0.10)
Being quick to take advantage of opportunities	0.46	(0.34)	(0.19)	(0.01)	0.15	(0.08)
Not being constrained by many rules	0.42	(0.18)	0.01	(0.27)	(0.23)	(0.24)
Adaptability	0.41	(0.27)	0.02	(0.07)	0.03	(0.12)
Making your numbers	(0.43)	(0.11)	(0.17)	0.39	0.18	(0.30)
Predictability	(0.63)	(0.06)	(0.01)	(0.18)	0.05	(0.09)
Being rule oriented	(0.63)	(0.12)	(0.11)	0.05	(0.05)	0.11
Being careful	(0.64)	(0.09)	0.05	(0.25)	(0.09)	0.15
Having integrity	(0.01)	0.77	0.08	(0.02)	(0.03)	0.02
Having high ethical standards	(0.05)	0.76	0.07	0.01	0.02	0.04
Being honest	0.01	0.67	0.03	(0.04)	(0.06)	0.04
Respecting individuals	0.00	0.53	0.35	(0.20)	(0.03)	(0.11)
Being fair	(0.02)	0.48	0.07	(0.31)	0.05	(0.10)
Working in collaboration with others	0.03	0.06	0.71	0.11	(0.03)	(0.00)
Being team oriented	0.02	0.12	0.65	0.10	(0.03)	0.02
Cooperative	(0.09)	0.03	0.60	(0.16)	(0.08)	(0.02)
Being supportive	(0.07)	0.17	0.44	(0.36)	(0.03)	(0.01)
Avoiding conflict	(0.38)	(0.16)	0.43	(0.29)	(0.07)	(0.09)
Hard-driving	0.04	(0.33)	(0.44)	0.28	(0.17)	(0.07)
Confronting conflict directly	0.11	0.02	(0.47)	0.11	(0.16)	0.12
Being aggressive	0.02	(0.26)	(0.51)	0.26	(0.14)	(0.10)
Being results oriented	(0.12)	(0.10)	(0.12)	0.60	0.11	(0.12)
Having high expectations for performance	0.13	(0.07)	(0.08)	0.58	(0.07)	0.02
Achievement oriented	(0.05)	(0.08)	(0.11)	0.53	(0.08)	(0.09)
Security of employment	(0.16)	(0.01)	(0.07)	(0.57)	(0.09)	(0.11)
Being customer oriented	0.05	0.01	0.07	(0.04)	0.80	0.05
Listening to customers	0.00	0.05	0.06	0.00	0.79	0.08
Being market driven	(0.05)	(0.16)	(0.07)	0.09	0.52	(0.23)
Paying attention to detail	(0.08)	(0.03)	0.02	0.09	(0.12)	0.74
Emphasizing quality	(0.04)	0.09	0.00	(0.11)	0.25	0.62
Being precise	(0.27)	(0.08)	(0.14)	(0.08)	(0.12)	0.62

Note. Extraction method was Principal Component Analysis. Rotation method was Varimax with Kaiser Normalization. Rotation converged in seven iterations.

firm membership, and ICC(2), which informs us how reliable the firm-level culture-factor scores are (Bliese, 2000). The average ICC(1) value ($\bar{X} = 0.19$, $SD = 0.14$) for the six culture factors exceeded the recommended minimum value of 0.06. Likewise, the average ICC(2) value ($\bar{X} = 0.88$, $SD = 0.09$) exceeded the recommended minimum value of 0.70. Together, these measures provide justification for aggregating each of the six culture-factor ratings at the firm level and indicate that the six culture factors are shared, reliable constructs with significant between-firm variance (Bliese, 2000; Klein et al., 2000).

CEO personality. To assess CEO personality, we administered the Ten-Item Personality Inventory (TIPI) which assesses personality using the Big Five Model (or FFM). This instrument was developed by Gosling, Rentfrow, and Swann (2003) and has been shown to be reliable and valid (e.g., Anderson, Brion, Moore, & Kennedy, 2012; Ehrhart, Ehrhart, Roesch, Nadler, & Bradshaw, 2009). Previous research has suggested that the accuracy of observers' ratings of personality is higher than self-assessments (Funder, 2012; Oh, Wang, & Mount, 2011). For example, Kolar, Funder, and Colvin (1996) demonstrated that aggregated personality judgments made by others were more accurate than self-ratings.

In spring 2011, we contacted 648 of the 880 respondents to our fall 2009 culture survey of U.S. high-tech firms. These 648 respondents were current employees who were based in the United States (i.e., the remaining 232 respondents were either former employees or based overseas). Of these 648 respondents, 250 individuals completed a follow-up survey asking them to assess their CEO's personality (39% response rate). We analyzed personality data for the CEOs of 32 U.S.-headquartered high-tech firms, and from 250 U.S.-based current-employee informants. The demographic profile of CEO personality informants is very similar to that of the culture informants. Thirty-four percent were female and their average tenure with the focal firm was 7.19 years, with 25% having worked at their focal firm for more than 12 years. All had earned a bachelor's degree or higher and 69% of informants had earned an MBA. We therefore have an average of 7.81 informants per CEO personality assessment ($SD = 4.87$; range = 3-25).

To determine the appropriateness of grouping the CEO personality ratings by company, we conducted a similar analysis on the five personality dimensions as described above for the six culture factors. The average $r_{wg(j)}$ of the personality scale scores of the firms ($\bar{X} = 0.78$, $SD = 0.12$) exceeded the 0.70 cutoff, indicating high within-firm agreement. The two ICC metrics also support aggregation. The average ICC(1) value ($\bar{X} = 0.09$, $SD = 0.03$) for the five separate personality traits exceeded the recommended minimum value of

0.06, and the average ICC(2) value ($\bar{X}$ = 0.72, *SD* = 0.10) exceeded the recommended minimum value of 0.70. As with the culture factors, these three measures provide justification for aggregating each of the five personality-dimension ratings at the firm (CEO) level.

Firm Performance

One of the difficulties in making sense of previous research on organizational culture and firm performance is the lack of standardization and comparability across dependent variables. Therefore, for this study, we assessed firm performance on five separate dimensions. First, we collected financial performance metrics (revenues) for the 2 years after the culture data were obtained. This provides a measure of firm growth. Second, to assess the market valuation of the firm, we collected Tobin's Q, which is the market-to-book value of the company. Third, because external perceptions of a firm can be a valuable intangible resource, we used the 2010 *Fortune Magazine* "Most Admired" ranking as an indicator of firm reputation. To investigate the association of organizational culture and employee attitudes, we used employee ratings of their firm for 2010 as reported by the website Glassdoor. Finally, we gathered stock analysts' buy and sell recommendations for the period 2009 to 2011.

Change in financial performance. The logged value for each firm's total revenue ($\bar{X}$ = US$9.26 million, *SD* = US$1.51 million) for the 2011 fiscal year (FY2011) was obtained from Compustat North America Financials Annual. This indicator represents a firm's ability to generate sales. The equivalent 2009 metric was included in the revenue model, as we were interested in changes in performance. One of our sample firms was acquired prior to the FY2011 reporting period, so we analyze revenue growth using a sample of 31 rather than 32 firms. We conducted the analyses using both logged versions of the dollar-value for revenues.

Tobin's Q. Tobin's Q is the ratio of the market value of a firm's assets (stock market value) compared with the book value. It is a widely used measure of the future value of a firm as perceived by the stock market (Chung & Pruitt, 1994).

Corporate reputation. We assessed corporate reputation using the 2010 *Fortune Magazine* "Most Admired" ranking (Bernasek, 2010). We use the inverse value of a firm's rank such that higher numbers represent a better reputation. The *Fortune* surveys were conducted by polling 4,170 executives, directors, and securities analysts who work at 667 companies within the 10

largest U.S. industries. For the "Most Admired" ranking, respondents selected the 10 companies they admired most from a list of the companies that ranked in the top 25% in the prior year's survey, plus the top 20% of their own industry ($\bar{X}$ = 8.41, *SD* = 16.81).

Analysts' stock recommendations. We gathered historical data regarding stock analysts' recommendations for each firm during the study-period years (2009-2011) from Thompson-Reuters I/B/E/S First Call. Analysts who cover each stock recommend that investors either Buy, Sell, or Hold the stock each year. For each company, based on the analysts who followed the company, we computed the average percentage of Buy recommendations over the 3-year period ($\bar{X}$ = 55.4%, *SD* = 17.2%).

Glassdoor ratings. Glassdoor is a website that uses anonymous employee comments and ratings (on a five-point scale) to rate employee satisfaction with the company (www.glassdoor.com). We obtained overall ratings for each of the 32 firms in our sample ($\bar{X}$ = 3.23, *SD* = 0.41, range = 2.40-4.0). The number of employees rating each company ranged from 64 to more than 5,000 ($\bar{X}$ = 1,038).

Control Variables

We controlled for a set of variables that could influence culture and firm performance. First, even though the sample firms were in the high-technology industry, we identified each firm's sector as software, hardware, or a combination, using SIC codes, from Compustat North America. Firms with SIC 35xx (Industrial and Commercial Machinery and Computers), 36xx (Electrical and Electronic Equipment Except Computers), or 38xx (Instruments and Related Products) were coded as Hardware (variable "SW" = 0), whereas those with SIC 73xx (Business Services) were coded as Software (variable "SW" = 1). To determine whether a company was involved in a mixture of hardware- and software-oriented production, each company's fiscal year 2009 business segments (as reported in the 10-K) were analyzed. Companies that derived more than one third of their revenue from their nonprimary sector (as determined by SIC) were coded as Mixed (variable "HWSW (Hardware/Software) Mix" = 1).

We also controlled for firm size using the log of the number of employees in fiscal year 2009, gathered from Compustat North America. We included two indicators of firm age in our initial regression equations: number of years since founding and number of years since going public, gathered from company reports and SEC (Security and Exchange Commission) filings;

however, we dropped these indicators because they never changed our results and were highly correlated with firm size. We also included a dummy variable indicating whether the CEO was also the founder of the firm. This did not change the results and was excluded from the reported results.

Results

Table 2 reports the correlations among the variables. As expected, given the use of factor scores, correlations among the six culture dimensions are modest. For the dependent variables, revenues for 2009 and 2011 are highly correlated. Highly admired firms are also those with more employees, higher revenues, and a higher Tobin's Q. Interestingly, CEOs who are higher on Openness also have a higher Tobin's Q, suggesting that external raters such as investors are sensitive to the CEO's personality. Consistent with several of the hypotheses, the bivariate correlations show that CEO personality dimensions are related to organizational culture (e.g., higher levels of Agreeableness and lower levels of Neuroticism are associated with more collaborative cultures) and that culture is related to firm outcomes (e.g., more adaptable cultures have a higher Tobin's Q, are more admired in the *Fortune* rankings, and have higher employee ratings). Finally, and consistent with previous research demonstrating that there are industry-based variations in organizational cultures (e.g., Christensen & Gordon, 1999; Siew & Yu, 2004), there are differences in culture across firms depending on their market segment.

Table 3 reports the regressions of CEO personality on the six culture dimensions. After controlling for differences in market segments and firm size, the results reveal a number of significant relationships between CEO personality and firm culture. First, as proposed in Hypothesis 1, CEOs who were more Open (curious, comfortable with new ideas, nonconventional) had cultures that were more adaptive (risk-taking, fast moving, willing to experiment). Consistent with Hypothesis 2, more Conscientious CEOs (hard working, orderly, disciplined) were associated with more detail-oriented cultures (analytical, precise, attention to detail). Results also support Hypothesis 3 which proposed that CEOs who were rated as less Agreeable (less willing to compromise, less concerned with the feelings of others, less trusting) would be associated with cultures that were more results oriented. No support was found for Hypothesis 4 which proposed a relationship between CEO Neuroticism and collaboration. There was also no confirmation of Hypothesis 5 that proposed an association between CEO Extraversion and a more customer-oriented culture. Overall, these results suggest that the personality of the CEO can be significantly related to the organization's culture. Although not reported here,

Table 2. Means, Standard Deviations, and Correlations among Study Variables.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Software																					
0 = Hardware	56%																				
1 = Software	44%																				
2. HWSW mix			−.75**																		
0 = Not Mixed	37%																				
1 = Mixed	63%																				
3. Log Employees FY 2009	9.75	1.28	.08	.15																	
4. Culture: Adaptability	0.07	0.67	−.13	.09	−.01																
5. Culture: Integrity	0.20	0.50	.12	−.22	.05	−.27															
6. Culture: Collaboration	−0.04	0.69	.34	−.54**	−.06	−.11	.40*														
7. Culture: Results oriented	0.15	0.44	−.28	.47**	.33	−.24	−.34	−.34													
8. Culture: Customer oriented	−0.11	0.54	.07	.14	.20	−.24	.21	.31	.05												
9. Culture: Detail oriented	0.05	0.48	−.23	.29	−.08	.02	−.24	−.39*	.11	−.12											
10. Personality: extraversion	4.92	1.31	.16	−.07	.14	.16	.00	−.12	−.06	−.05	−.13										
11. Personality: Agreeableness	4.21	1.25	−.04	−.19	−.35*	.07	.29	.55**	−.35*	.12	−.48**	−.07									
12. Personality: Conscientiousness	5.84	0.63	−.23	.21	−.25	.09	.17	.22	−.03	.13	.14	−.37*	.44*								
13. Personality: Neuroticism	3.06	1.13	.00	.27	.23	.15	−.31	−.62**	.15	−.19	.40*	.45**	−.81**	−.58**							
14. Personality: Openness	5.05	0.94	.05	−.08	−.13	.54**	−.23	−.19	−.32	−.34	.14	.09	.01	.17	.14						
15. Log Revenue FY 2009 (US$millions)	9.02	1.54	.06	.19	.94**	.21	−.05	−.08	.29	.09	−.15	.19	−.30	−.23	.25	−.04					
16. Log Revenue FY 2011 (US$millions)	9.26	1.51	.03	.25	.91**	.29	−.13	−.13	.35	.09	−.07	.16	−.31	−.19	.26	.00	.99**				
17. Tobin's Q 2009	3.67	2.02	.23	.09	.26	.42*	−.16	−.12	−.18	.25	.14	−.23	−.22	.05	.18	.42*	.31	.37*			
18. *Fortune* Most Admired	8.59	16.75	.24	.18	.50**	.46**	−.06	−.18	.06	.04	.20	.13	−.25	.05	.31	.25	.63**	.69**	.54**		
19. Glassdoor 2010	3.23	0.41	.01	−.10	−.27	.51**	.01	−.01	−.15	−.28	.12	−.04	.24	.17	−.07	.48**	−.20	−.13	.16	.17	
20. Analyst "Buy" 2009-2011	55.4	17.2	.13	−.04	.46**	.24	.22	−.03	.11	.11	.00	.33	−.13	.01	.15	−.01	.47**	.50**	.10	.48**	.09

*$p < .05$. **$p < .01$.

Table 3. CEO Personality and Organizational Culture.

	Adaptability	Integrity	Collaboration	Results oriented	Customer oriented	Detail oriented
Software	−0.04	−0.27	−0.30	0.03	0.25	0.03
HWSW mix	0.16	−0.41	−0.77**	0.44	0.32	0.36*
Log Employees FY 2009	0.00	0.22	0.20	0.28	0.21	−0.14
Extraversion	−0.08	0.02	−0.04	0.30	0.28	−0.18
Agreeableness	0.05	0.26	0.36	−0.88*	−0.41	−0.30
Conscientiousness	−0.17	0.35	0.24	−0.21	−0.17	0.62**
Neuroticism	0.07	0.20	−0.05	−0.96†	−1.07	0.62
Openness	0.50**	−0.28	−0.20	−0.11	−0.11	−0.07
Adjusted R^2	0.28	0.66	0.46	0.36	0.16	0.27
F	2.38*	0.55	4.00**	2.88*	1.68	2.32†
Number of firms	29	29	29	29	29	29

Note. Entries are standardized coefficients.
†$p < .10$. *$p < .05$. **$p < .01$.

additional analyses suggested that the associations between CEO personality and organizational culture were stronger for CEOs with longer tenure.

Table 4 reports the results of hierarchical regressions and show the relationships among the culture dimensions and five measures of firm performance. Hypothesis 6 proposed that cultures that emphasized adaptability (innovation, risk-taking, speed) would be related to subsequent firm performance. Results show that firms whose cultures were higher on adaptability had significantly higher revenue growth over the 2009-2011 period, higher market valuations (Tobin's Q), were seen as more admired by *Fortune* raters, were more likely to be recommended by stock analysts, and had higher employee ratings as reported by Glassdoor. No support was found for Hypothesis 7 which proposed that firms with more results-oriented cultures would have significantly higher revenue growth. Finally, Hypothesis 8 proposed that firms with more detail-oriented cultures would also perform better. Model 1 in Table 4 shows a significant association between culture and revenue growth. Model 3 also shows that firms rated as higher in the *Fortune* Most Admired rankings also had more detail-oriented cultures. Although not hypothesized, the results in Table 4 also show that firms with more customer-oriented cultures (market driven, listening to customers) had a higher Tobin's Q, suggesting that investors place a higher value on organizational cultures that emphasize a customer orientation. Results also showed that firms whose cultures placed a higher value on integrity (honest, fair, ethical) were more likely to be more recommended by stock analysts. Overall, these results

Table 4. Organizational Culture and Firm Performance.

	Revenue Growth 2009-2011	Tobin's Q 2009	*Fortune* Most Admired	Glassdoor 2010	Analyst "Buy" 2009-2011
Software	0.01	0.91**	0.70**	−0.04	−0.07
HWSW Mix	0.05	0.83**	0.65**	−0.09	−0.18
Log Employees FY 2009	−0.16	0.04	0.35*	−0.26	0.50*
Log Revenue FY 2009	1.12**				
Adaptability	0.09*	0.50*	0.54**	0.66*	0.51*
Integrity	−0.06	−0.13	0.18	0.33	0.47*
Collaboration	0.02	−0.01	0.06	0.01	−0.29
Results oriented	0.10*	−0.20	0.03	0.31	0.22
Customer oriented	0.05	0.36†	−0.08	−0.10	0.18
Detail oriented	0.09†	0.20	0.27*	0.18	0.13
Adjusted R^2	0.98	0.40	0.69	0.21	0.26
F	161.50**	3.21**	8.75**	1.93†	2.14†
Number of firms	31	32	32	32	30

Note. Entries are standardized coefficients.
†$p < .10$. *$p < .05$. **$p < .01$.

generally support the hypothesized associations between organizational culture and measures of firm performance.

When the results in Tables 3 and 4 are taken together, a clear picture emerges showing that three of the Big Five personality dimensions (Conscientiousness, Openness, and Agreeableness) were significantly related to three dimensions of organizational culture (detail oriented, adaptability, and results oriented). Importantly, adaptability and detail oriented were subsequently related to firm outcomes (revenue growth, market value, reputation, and employee attitudes).

Additional Analyses

Although we had no a priori expectations that CEO personality would be directly associated with firm outcomes, the implicit model of CEO personality-culture-firm performance suggests a possible mediation model. Combining our two sets of hypotheses, we used the bootstrapping method suggested by Preacher and Hayes (2008) to examine specific mediating

effects of culture on personality and performance. These results showed that the effect of CEO Openness on revenue growth was mediated by a culture of adaptiveness. However, independent of culture, there were significant positive effects of CEO Openness on Tobin's Q, *Fortune* reputation, and Glassdoor employee rankings, suggesting that when external judgments are made by investors and industry experts, the personality of the CEO has effects independent of culture. No other significant mediation effects for other personality variables emerged.

Although the data do not permit us to make strong claims about causality, these results are consistent with a model that suggests that the personality of the CEO can shape organizational culture which, in turn, may be associated with firm performance. The results suggest that when a comprehensive assessment of culture is made, and when the sample is homogeneous with regard to industry, there are direct links between culture and firm performance.

Discussion

Since the inception of research on organizational culture, scholars have suggested that this research should provide a critical link between firm leadership and organizational performance (e.g., Barney, 1986; Schein, 1985). Unfortunately, that promise has remained largely unfulfilled. Although organizational culture remains a topic of great interest and importance to practitioners, academic research on the topic has largely failed to elucidate the relationships among leadership, culture and objective indicators of organizational performance. In spite of the 4,600 studies of culture identified by Hartnell (Hartnell et al., 2011), only a few empirical studies have addressed this topic (e.g., Berson et al., 2008; Peterson et al., 2003). Using comprehensive measures of both personality and organizational culture, we contribute to this stream of research by showing that the personality of the CEO is associated in predictable ways with types of organizational culture and that culture can be related to firm performance.

The specific links that we found were quite straightforward. For instance, CEOs who are higher on Openness to Experience are more likely to be associated with cultures that emphasize adaptability than are those CEOs who are less Open to Experience. CEOs who are more Conscientious have cultures that are more detail oriented than those who are lower on Conscientiousness. CEOs who are less Agreeable (skeptical, competitive) are more likely to have organizational cultures that are more results oriented than those who are higher on Agreeableness. These findings are consistent with a social learning perspective on culture; that is, insofar as personality is a precursor to consistent patterns of behavior and insofar as cultural norms reflect the behaviors of

their senior managers, it seems reasonable to expect that CEOs with different personality profiles will engender cultures that reflect their personalities.

Although previous studies of culture and objective firm performance have yielded mixed results, we find clear associations between organizational culture and firm performance in terms of financial performance, market valuation, reputation, analysts' recommendations, and attitudes among employees. For example, cultures that are more adaptable and detail oriented are positively linked to revenue growth. The logic here is straightforward. When a culture, or normative order, emphasizes adaptability (e.g., being fast, taking advantage of opportunities), a firm is more likely to adjust to changes. Similarly, when people in an organization share consistent expectations about the importance of being detail oriented (e.g., emphasizing quality, paying attention to detail), the firm is more likely to successfully implement their plans. In this way, culture, acting as a social control system, can help with the execution of strategy.

The results also show that cultures that emphasize adaptability and detail orientation are significantly associated with higher ratings from *Fortune's* Most Admired list, are given more positive evaluations by employees, have a higher market-to-book value, and are evaluated more positively by stock analysts. These results suggest that while CEO personality, as expected, has little direct effect on a firm's financial performance, it can affect perceptions of others in the form of how the market and employees evaluate the company.

Although we are unable to investigate the specific mechanisms linking CEO personality to culture and culture to performance, previous research offers insight into how these might be related. First, research has shown that personality is strongly associated with behavioral regularities (e.g., Barrick & Mount, 2005; Ozer & Benet-Martinez, 2006). The logic is that personality drives patterns of behavior which, in turn, affect how people interpret what is important and how to think and behave. At the CEO level, these consistent patterns of behavior may shape interpretations of what is important and how to behave—the culture of the organization (O'Reilly & Chatman, 1996; Schein, 1985).

Given how pervasive the assumptions about CEO leadership, culture, and performance are, why has the empirical evidence been so thin? There are several answers to this question. First, while there have been numerous studies (laboratory and field) linking personality and leadership, these have not been conducted at the CEO level where collecting data is more difficult. Second, because of the variations in the definition and measurement of culture, the linkage between culture and firm performance has been hard to explicate. Some earlier studies have been limited by imposing a restricted model of culture thereby reducing the opportunity to discover relationships between a range of salient culture characteristics and firm performance

(Hartnell et al., 2011). Third, aside from variations in the measurement of culture, previous studies have used a variety of subjective measures of firm effectiveness (e.g., Gregory, et al., 2009). These often relied on perceptual measures or judgments of perceived performance, making it difficult to compare across studies.

Compounding these difficulties, many of the studies of culture and performance have often used convenience samples of companies in different industries where performance measures may or may not be relevant (e.g., Gordon, 1985; Siew & Yu, 2004). For example, comparing the ROI (Return on Investment) of firms in one industry with those in another may give a misleading impression of performance across companies. Studies that attempt to find relationships using heterogeneous samples, especially without careful industry controls, can easily fail to uncover real relationships. We believe that a strength of the present study, and perhaps one reason why we find strong associations of culture and performance, is that we focused narrowly on one industry where the performance metrics had equivalent relevance.

Finally, studies that have explored the interrelationships among CEO personality, culture, and performance (Berson et al., 2008; Peterson et al., 2003; Siew & Yu, 2004) have been forced to rely on comparatively small samples. Using small samples with narrow measures of culture, subjective performance metrics, and firms from heterogeneous industries does not seem like a successful strategy for investigating these relationships. In the present study, we attempt to minimize these weaknesses by using comprehensive measures of personality and culture and focusing on a narrowly defined sample where performance metrics are likely to be comparable and relevant.

Limitations and Future Research Directions

There are several obvious and important limitations to the present study. First, although we have a reasonable number of respondents across firms in the sample, our final sample size is 32 firms, which means that any analyses are of comparatively low power and more subject to misinterpretation than large sample studies. This is both a legitimate cause for caution in interpreting and generalizing from the results and a fact of life of doing cross-organizational studies that require the participation of senior leaders. The fact that our sample is drawn from the same industry and we use further industry controls may mitigate some of the problems associated with the use of heterogeneous samples. Similarly, the use of standardized firm effectiveness measures in the present study may make it easier to compare across future studies.

A second important limitation of the current study has to do with the causality among our variables. Although we were careful to collect financial data

after our assessment of culture, the CEO personality data were collected after the original culture data. As personality has been shown to be reasonably stable over very long time periods, our inference is that culture is more apt to reflect the CEO's personality rather than the opposite, but any timing for causation is ambiguous. It may be that reverse causation is occurring. For example, it may be that in established organizations with clearly defined cultures, the CEO is chosen on the basis of fit with that culture rather than the CEO shaping the culture. However, for a number of our firms, the CEO was also the founder, so the causality in these instances seems clear. Similarly, it is also possible that firms with a particular record of performance may end up with characteristic cultures, rather than the opposite. Again, the use of dependent variables that were measured after the culture was assessed may mitigate some of this effect but cannot rule it out. Clearly, it will take a more rigorous research design and significant longitudinal data to resolve these issues.

An additional limitation of the present study may be its focus on firms from a single industry. As we noted above, focusing on one industry allows for the use of relevant performance measures and controls appropriate to an industry, but studying a single industry leads to questions about how findings might generalize. For example, for our sample of technology-driven firms, adaptability was strongly related to our performance measures. These companies are often dealing with short product life cycles, rapidly evolving technologies, and challenging competition. In this environment, the ability to innovate and evolve may be critical. For companies in other industries, other aspects of a culture such customer orientation might be more predictive of performance. Future research could explore these variations.

A final potential weakness of the present study has been its phenomenon-driven focus. The emphasis has been on documenting the empirical relationships between CEO personality, culture, and objective performance, not on fine-grained testing of nuanced theories. Although the overarching theoretical framework for our study is that of culture operating through normative and informational influence, the study was not designed to permit more fine-grained tests of this or other theories of culture. Similarly, we investigated only direct relationships between CEO personality and culture and not more complicated profiles (e.g., Barondes, 2011). Finally, we did not hypothesize mediated relationships between personality, culture, and performance or between firm strategy, culture, and effectiveness. Having established that, with appropriate controls, direct associations among these constructs can exist, more fine-grained research is clearly warranted.

A practical implication of these results is relevant for CEOs and boards of directors. Although the CEO's personality may not have direct effects on firm performance, the evidence presented here suggests that it may have important

effects on the culture of the company. Furthermore, the results suggest that important observers of the firm, such as analysts, may make substantive judgments about the firm based on the CEO's pattern of behavior. These judgments may have effects on the firm's reputation.

Appendix

Items in Organizational Culture Profile (OCP) Assessment.

Achievement oriented	*Cooperative*
Action oriented	Emphasis on professional growth
Adaptability	Emphasizing quality
Avoiding conflict	*Fast moving*
Being aggressive	*Hard-driving*
Being analytical	*Having high ethical standards*
Being calm	Having high expectations for performance
Being careful	*Having integrity*
Being competitive	High levels of conflict
Being customer oriented	*Individual goals are transparent*
Being decisive	*Learning from mistakes*
Being easygoing	*Listening to customers*
Being fair	*Making your numbers*
Being honest	Not being constrained by many rules
Being innovative	Paying attention to detail
Being market driven	Predictability
Being people oriented	*Putting organization's goals before unit's goals*
Being precise	Respecting individuals
Being quick to take advantage of opportunities	Risk-taking
Being reflective	Security of employment
Being results oriented	Sharing information freely
Being rule oriented	Stability
Being supportive	Taking individual responsibility
Being team oriented	Taking initiative
Being tolerant	*Urgency*
Being willing to experiment	*What you know matters more than who you know*
Confronting conflict directly	Working in collaboration with others

Note. Items in italics were added in revising the OCP, replacing the following items: Autonomy, Being Demanding, Being Highly Organized, Being Socially Responsible, Developing Friends at Work, Emphasizing Simplicity Over Complexity, Enthusiasm for the Job, Fitting In, Flexibility, Having a Clear Guiding Philosophy, Having a Good Reputation, High Pay for Good Performance, Informality, Integrity and Honesty, Making Your Numbers, Working Long Hours.

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Notes

1. Organizational *culture* and organizational *climate* are both constructs that have been used to understand psychological phenomena in organizations; both focus on the creation and impact of social contexts and rest upon the assumption of shared meanings, and in this sense, they are complementary constructs (Ostroff, Kinicki, & Tamkins, 2003; Schneider et al., 2013). Although both constructs focus on shared meanings, climate is grounded in temporal perceptions of aspects of organizational structure and systems while culture reflects the meanings derived from underlying values and norms (Schneider et al., 2013). Since climate focuses on perceptions of situational phenomena (e.g., organizational systems and structures), it is, by definition and measurement, more transitory and, in our view, less likely to be related to organization-level performance over time. Culture, on the other hand, rooted in fundamental values and beliefs, is likely to be more enduring and is likely to have more pervasive effects on organizational functioning and performance. For this reason, we focus here on organizational culture.
2. We use the compound term *values and personality* here because a number of studies of CEOs have used "values" rather than personality. As Parks and Guay (2009) note, the two constructs are similar in that they both influence behavior through habitual routines. They are different in that "values" are more learned and normative than personality. Previous research has often made little distinction between the two.

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