

Parsing organizational culture: How the norm for adaptability influences the relationship between culture consensus and financial performance in high-technology firms

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Summary

The relationship between organizational culture and financial performance remains elusive even though researchers have studied it for some time. Early research suggested that a strong culture that aligns members' behavior with organizational objectives boosts financial performance. A more recent view is that, because strong cultures promote adherence to routines and behavioral uniformity, they are less effective in dynamic environments. We suggest that the relationship between culture and performance can be reconciled by recognizing that culture encompasses three components: (1) the content of norms (norm content); (2) how widely members agree about norms (culture consensus); and (3) how intensely organizational members hold particular norms (norm intensity). We hypothesize that "strong cultures"—where a high consensus exists among members across a broad set of culture norms—can contribute to better financial performance even in dynamic environments if norm content intensely emphasizes adaptability. We test this hypothesis in a sample of large firms in the high-technology industry. Firms characterized by higher culture consensus and intensity about adaptability performed better three years later than did those characterized by lower consensus, lower intensity about adaptability, or both. We discuss how parsing culture into content, consensus, and intensity advances theoretical and empirical understanding of the culture–performance relationship. Copyright © 2014 John Wiley & Sons, Ltd.

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Organizational researchers have been interested in the role of culture in organizational life and by some estimates have generated more than 4600 articles on the topic (Hartnell, Ou, & Kinicki, 2011). Significant debates emerged during the 1980s and 1990s, as organizational culture became a management fad (Abrahamson, 1996). Academic debates focused on whether culture should be viewed as a unitary or distributed construct, how explicit culture is—with some viewing culture as mostly tacit and implicit (Martin, 1992; Schein, 1985) and others focusing on its observable behavioral manifestations (Carroll & Harrison, 1998)—and how it should be assessed and studied (see Harrison & Carroll, 2006, for a review). What these debates uncovered was that organizational culture could be viewed from different perspectives (e.g., as a variable vs. a metaphor). These differences have been well explicated elsewhere (e.g., Alvesson, 2013; Martin, 1992; Rousseau, 1990). One key theoretical question that has not been resolved, however, is how organizational culture, manifested in terms of normative order, may affect organizations' financial performance.

Initially, many researchers favored a direct positive relationship in which certain types of cultures lead to better financial performance (Barney, 1986). Underlying this view is the logic that the clarity derived from salient shared norms that

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are strongly enforced among members promotes greater strategic alignment and goal attainment in strong-culture firms (e.g., Bezrukova, Thatcher, Jehn, & Spell, 2012; Rousseau, 1990; Tushman & O'Reilly, 2002). Others, however, have suggested that the relationship between culture and an organization's financial performance is not so straightforward and may be contingent on exogenous conditions. Sørensen (2002), for example, suggested that strong-culture firms gain advantages in stable environments, but because of the corresponding social control that promotes conformity among members, their financial performance may be worse or less reliable in dynamic environments and during periods of external change. Because many organizations operate in dynamic environments, this view suggests that having a strong culture in these circumstances may reduce a firm's financial performance. Given the stark contrast between these two views and the equivocal support that has emerged, many have concluded that the link between organizational culture and financial performance lacks a comprehensive and compelling theory (Hartnell et al., 2011).

To resolve the inconsistencies in our understanding of the relationship between organizational culture and financial performance, we offer a conceptual advance and a methodological advance. First, we suggest that researchers have not been clear enough in distinguishing between and understanding the relationship among three elements of culture: (1) *culture consensus*, which we define as the degree to which members agree about a broad set of cultural norms; (2) *norm intensity*, which we define as the force with which a specific norm is held; and (3) *norm content*, which we define as the actual substance of particular norms that give rise to the attitudes and behaviors defining that content. We define a *strong culture* as one with both high levels of consensus about a system of norms and intensity around the most valued norms (O'Reilly, 1989; O'Reilly & Chatman, 1996). Second, we suggest that it is not enough to simply identify these components. Instead, because the impact of strong cultures on behavioral variation will differ depending on the content of cultural norms—and particularly, which norms are intensely held and whether intensely held norms exist within the context of more or less consensus across a broad range of norms—the three components of culture must be examined together.

Considering the content of a norm is important because conformity to it may not result in uniform behavior when the norm promotes divergent behavior. For example, people can conform to a norm to be willing to experiment but do so in highly divergent, nonuniform ways (Flynn & Chatman, 2001). This distinction is critical as behavioral variation associated with “challenging the status quo” or “agreeing to disagree” could easily be interpreted as a sign of a culture lacking in both consensus and norm intensity. An example is the emphasis on “constructive confrontation” at Intel, which fosters what founder and former CEO Andy Grove (1996) called “ferocious arguing and disagreement about ideas in the pursuit of new knowledge” (p. 84). It is not that members of Intel lack consensus about their culture or lack intensity about a particular norm, but rather that they feel intensity about a norm to disagree and challenge current practices. Intel's norm is intensely held but results in less uniform behavior and fewer routines because of the variation in behaviors that correspond to the norms of constructive confrontation and questioning the status quo.

We suggest that the contradictions that have arisen in prior research linking organizational culture to financial performance can be resolved by recognizing that, even in dynamic environments, organizations that are characterized by higher consensus among members across a comprehensive set of cultural norms and whose members intensely embrace a certain kind of cultural norm, one that promotes nonuniform behaviors and adaptability in particular, will perform better financially than will organizations characterized by lower consensus, lower intensity about adaptability, or both.

We begin by defining organizational culture in terms of shared behavioral norms and the structural and content aspects of these. We then consider how adopting a norm for adaptability will enable organizations to be simultaneously aligned and flexible, and we hypothesize that having an intensely held adaptability norm will boost financial performance in organizations whose cultures are characterized by consensus across a broad set of norms. We provide evidence for these ideas in a sample of large, publicly traded high-technology firms by assessing their organizational culture and relating culture consensus about a broad system of norms and intensity about adaptability to their financial performance. We conclude by discussing the theoretical implications of these conceptual and methodological advances.

Parsing Organizational Culture: Identifying Culture Consensus, Culture Content, and Norm Intensity

Defining organizational culture in terms of norms

Culture has been identified as a pattern of shared assumptions, beliefs, and expectations that guide members' interpretations and actions by defining appropriate behavior within an organization (Fiol, 1991; Schein, 1985). We focus on cultural norms, which are socially created standards emerging from an organization's values. Norms help group members interpret and evaluate various events and set expectations about appropriate behaviors (O'Reilly & Chatman, 1996). Though not the only way to conceptualize culture, many researchers have viewed norms as a useful construct for understanding organizational culture (e.g., Chatman & Jehn, 1994; O'Reilly, 1989; Rousseau, 1990; Sheridan, 1992) because norms represent expressions of a group's central values and significant beliefs, such as how to interact with one another and prioritize objectives (Bettenhausen & Murnighan, 1991; Feldman, 1984, p. 47). Norms help people solicit and attend to the information and behaviors that are likely to be valued or useful within their organizational context (Ashford & Northcraft, 1992).

Researchers in organizational psychology have typically focused only on one or two cultural norms, such as an organization's orientation toward customer service or safety (Luria, 2008; Schneider, White, & Paul, 1998). They typically measure culture strength as the inverse of the variance (dispersion) in questionnaire responses about a specific norm across members (Lindell & Brandt, 2000; Schneider, Salvaggio, & Subirats, 2002). Although this approach usefully reflects consensus versus deviance on one or a few norms, it neglects to explicitly examine consensus across a broad set of cultural norms and the intensity of particular norms in the context of such consensus.

In contrast, organizational sociologists have equated strong culture with commonly understood and persistent practices. For example, Burt, Gabbay, Holt, & Moran (1994) and Sørensen (2002) reanalyzed Kotter and Heskett's (1992) landmark study of 207 *Fortune 500* firms. The data set included outsiders' responses to three items that were intended to represent a strong corporate culture, including the extent to which managers in the firm commonly spoke of their company's style or way of doing things, whether the firm had made its values known through a creed or credo and made consistent attempts to get managers to follow them, and the extent to which the focal firm had been managed according to long-standing policies and practices other than those just of the current chief executive officer. Interestingly, as Sørensen (2002, p. 78) noted, these indicators focus less explicitly on consensus: "Kotter and Heskett's measurement strategy leads a firm to be characterized as having a strong culture if other actors in its industry associate the firm with a unique and common way of doing things, relative to other firms in the industry... This culture strength variable does not directly measure the extent to which there is consensus within the firm however." Instead, Kotter and Heskett's (1992) approach to conceptualizing and measuring culture strength represents a hybrid of consensus, which, in their model, might be manifested through common ways managers spoke of the organization's style, and intensity, which, in their model, is closest to the notion of long-standing policies that are consistently enforced.

This distinction, between conformity to a norm and uniform behavior emerging from such conformity, has two critical implications for studying organizational culture. First, it suggests that rather than requiring uniform adherence, a culture can be deemed strong simply if members interpret a broad set of norms similarly (culture consensus) and conform to the most important norms regularly (norm intensity)—even if conforming takes the form of divergent behaviors. Second, it suggests that previous assessments of organizational culture may have conflated norms that generate uniform behaviors with norms to which members conform but that elicit nonuniform behaviors. Equating these two types of norms can lead to erroneous conclusions about whether the culture is strong or weak. Next, we discuss both the distinctive features of the culture components and how they may relate to one another.

Relationships among the components of organizational culture

We begin by considering norm intensity. Importantly, an organization does not have to embrace very many norms intensely to have a culture characterized by high intensity. Typically, only one or two central norms characterize strong-culture firms (O'Reilly, 1989). What is critical is that these norms are so intensely held that members of the organization are willing to tell one another when they are not living up to a core belief and norm enforcement is predictable and consistent (Bernhard, Fehr, & Fishbacher, 2006). Thus, norm intensity needs to be understood in terms of how forcefully members embrace a particular norm. Norm intensity can be described in terms of norm content on a norm-by-norm basis. For example, an organization can be described as intensely emphasizing adaptability or cooperation.

In contrast, culture consensus has been a unifying element of many definitions of culture reflecting its shared nature (Ravasi & Schultz, 2006). In defining culture consensus as agreement among members across a broad set of attributes, it represents a structural property of a culture, and as such, it is possible to observe culture consensus independently of any particular content. Even though the structural aspect of consensus can be considered independently of culture content, when simultaneously considering norm content and intensity in the context of culture consensus, it is critical to include attributes that characterize the organization in appropriately comprehensive and relevant terms (Chatman, 1989). Focusing only on one or a few norms can lead to errors in estimating how much culture consensus actually exists across multiple relevant norms (Schneider, Ehrhart, & Macey, 2013). And, if culture consensus across a set of norms is high, members are more likely to align their behavior around one or a few intensely held norms due to greater overall commitment to the organization and cohesion among members (O'Reilly & Chatman, 1986; Reagans & McEvily, 2003). An organization characterized by low consensus would be more likely to be characterized by unaligned subgroups (Boisnier & Chatman, 2003).

Thus, intensely held norms are likely to emerge as highly salient and identity defining, whereas culture consensus about a comprehensive set of norms can be viewed as a structural feature of an organization's culture. We defined strong culture as one in which there is both intensity around one or two key norms and broader consensus about a comprehensive set of norms, which implies that culture consensus and norm intensity are not necessarily aligned. Specifically, variance can exist in how much culture consensus and norm intensity is present in an organization. On the one hand, an organization could exhibit high intensity but no consensus such that some subgroups care deeply about a norm that is different from one that is intensely held by other subgroups. For example, a given norm, such as being detail oriented, can be intensely valued in one group (e.g., manufacturing and accounting) and not valued at all in another (e.g., research and development (R&D) and strategic planning). Such cultures can be characterized as "warring factions." Alternatively, an organization in which members understand what top management values but attach no strong approval or disapproval to these beliefs or behaviors can be characterized as having high consensus but low intensity, or a vacuous culture. A failure to share norms or to consistently reinforce the central norms may lead to a vacuous culture, conflicting interpretations, or microcultures that exist only within subunits. Therefore, we focus in this study on culture consensus across a comprehensive set of culture norms.

In the next section, we discuss how accounting simultaneously for a norm emphasizing adaptability in terms of norm content and intensity and the extent to which organizational members agree about a comprehensive set of norms can resolve previous conceptual and empirical inconsistencies in understanding the relationship between culture and financial performance.

The Adaptability Norm and Firm Financial Performance

Cultivating a strong culture has often been viewed as a potential path to aligning employees with an organization's strategic priorities (Denison & Mishra, 1995; Tushman & O'Reilly, 2002). Consensus and intensity about certain norms increase a group's efficiency and free members to concentrate on non-routine challenges (Hackman &

Wageman, 2005). The existence of strong group norms and their predictable enforcement can increase a group's felt distinctiveness, commitment, and longevity (Rucker, Polifroni, Tetlock, & Scott, 2004).

Others, however, have been skeptical of the notion that a strong culture boosts performance, particularly in dynamic environments. Most notably, Sørensen (2002) found that strong-culture firms gained an advantage in static environments through greater reliability in financial outcomes but that having a strong culture was associated with less reliable and ultimately weaker financial results in turbulent environments. Sørensen (2002) theorized that strong cultures lead to consistency in performance by increasing employee consensus and willingness to endorse organizational goals, reducing uncertainty through goal clarity, and increasing motivation. Further, he argued that this social control leads to greater consistency and reliability in performance. But, in volatile environments, those in which technology and macroeconomic conditions are changing rapidly, he and others (Van den Steen, 2005) found that the very consistency that boosted firms' financial performance in static environments appeared to constrain a firm's ability to adapt to new strategic challenges and reduce its performance.

In a more psychologically based version of this critique, others have argued that strong cultures can induce cognitive and behavioral uniformity among group members (Goncalo & Staw, 2006) because cohesive groups tolerate less deviation among members (Kaplan, Brooks-Shesler, King, & Zaccaro, 2009). Nemeth and Staw (1989) argued that ambiguity is needed to promote the behavioral variation essential for creativity in organizations. If people are free to express any ideas they wish without fear of ridicule or reprisal from other members of their group, they will generate more creative solutions (Forster, Friedman, Butterbach, & Sassenberg, 2005). In contrast, these authors argue, strong norms can induce people to choose to adopt the dominant perspective or at least affirm it in the presence of their peers. Further, as Nemeth and Staw (1989) note, this tendency may be exacerbated in organizations, where "one of the most significant psychological tendencies is a strain toward uniformity, a tendency for people to agree on some issue or to conform to some behavioral pattern" (p. 175).

This perspective suggests that strong cultures serve as a coordinating mechanism but also constrain behavioral variation. This rigidity becomes particularly problematic when competitive environments are dynamic and demand change, which has led scholars such as Sørensen (2002) to conclude that strong-culture firms are not suited to perform well in dynamic environments. We suggest, instead, that this view offers a limited consideration of the variation in culture consensus, norm content, and norm intensity that can occur among strong-culture organizations.

How might an organization's culture promote variation in behaviors that permit the discovery of new ways of learning and problem solving? One way this can occur is through the adoption of norms that promote creativity and adaptability. For instance, Hargadon and Sutton (1997) have described how IDEO, the well-known product design firm, is characterized by strong norms for creativity and implementation that result in the firm being "routinely innovative." Khazanchi, Lewis, and Boyer (2007) made a similar observation, noting that a culture needs to promote both flexibility and control to be innovative. In a study of 759 firms, Tellis, Prabhu, and Chandy (2009) found that radical innovations were more likely to emerge when an organization's culture had a higher risk tolerance, was future oriented, and promoted cannibalizing existing products. Thus, when a culture is characterized by norms such as risk taking, a willingness to experiment, taking initiative, and being fast moving, the strong normative order may promote what appears to be nonuniform behaviors—but which actually arise from adherence to a norm that promotes adaptability and learning (Baer & Frese, 2003; Caldwell & O'Reilly, 2003).

An adaptability norm encompasses innovation but is defined more broadly. "Innovation," as typically used, often refers to technical advances in products or processes. Conventionally, innovation has been defined as the introduction into an applied setting of something that is new (Caldwell & O'Reilly, 2003). As such, innovation is a narrower construct in that it does not include the broader set of actions required for an organization to adapt to environmental changes. For example, it would be possible for an organization to be "innovative" in terms of product or process but also fail to adapt to changing circumstances (Benner & Tushman, 2002). Thus, innovation is more internally driven and concerned with value creation, whereas adaptation focuses on a firm's viability and reaction to external market conditions and exogenous change (Moon, Quigley, & Marr, 2012). Indeed, Hannan and Freeman (1977) conceptualized adaptation as an organization's ability to remain relatively intact through its life cycle (and the life cycle of its relevant population of firms).

Adaptability is, thus, an important cultural variable. In his seminal book, Schein (1985) proposed that culture addresses two fundamental issues confronting organizations: the need to adapt to external changes and the need to provide internal integration. To promote adaptability, the norms that define an organization's culture need to promote flexibility, risk taking, and experimentation within the firm. Several studies have shown that cultures emphasizing these norms and values can enhance organizational innovation and adaptation in the marketplace (Bueschgens, Bausch, & Balkin, 2010).

This focus on adaptability may explicitly contradict the argument that culture necessarily exerts a homogenizing effect on behavior because behavior associated with divergent thinking and implementing adaptive products or processes may vary dramatically across actors and situations (Goncalo & Duguid, 2011). Further, being adaptive may be how organizations derive the purported advantages of strong cultures even in rapidly changing situations (Flynn & Chatman, 2001). Groups that successfully cultivate adaptability typically permit members to express themselves in wide-ranging behaviors, and this freedom of expression helps groups explore divergent solutions to a problem (De Dreu & West, 2001). At a psychological level, a cultural focus on adaptability can stimulate novel outcomes by attaching social approval to activities that facilitate group creativity and implementing new ideas (Chatman, Polzer, Barsade, & Neale, 1998).

Compared with high-consensus culture organizations that intensely emphasize norms that promote behavioral uniformity, those emphasizing adaptability are more likely to recognize environmental volatility and discover alternative routines (Deshpande, Farley, & Webster, 1993). They are also more likely to recognize the value of hiring people whose beliefs challenge the organization's dominant mindset (Sutton, 2001). Indeed, the claim that homogeneity engendered by the selection process limits creativity (Schneider et al., 2002) is dubious because selection processes can also deliberately favor hiring diverse people who are open to new circumstances (Flynn & Chatman, 2001). Further, organizations can be ambidextrous, simultaneously competing in mature and emerging technologies and markets, by designating different alignments and cultures across "explore" and "exploit" units. Recently, O'Reilly and Tushman (2013) suggested that what has been called "contextual ambidexterity" may simply be a culture in which an adaptability norm is strongly held (intensity) in the context of high consensus about a broad set of cultural norms.

As our discussion above implies, organizations that intensely emphasize adaptability may perform better in dynamic environments. A consistent focus on behaviors that cultivate trial-and-error experimentation and being opportunistic may promote an organization's ability to take advantage of changes in the market over time. Encouraging risk-taking and divergent behavior could help strong-culture organizations avoid becoming overly reliant on organizational routines and failing to learn, two tendencies that are associated with the performance disadvantages of strong cultures (e.g., Goncalo & Duguid, 2011). Some have argued that any organization in which high consensus exists undermines creativity, innovation, and adaptability and that maintaining as much heterogeneity in beliefs is much more conducive to innovation (e.g., Staw, 2009). We suggest, instead, that deliberately developing and maintaining an intensely held norm of adaptability in the context of high consensus across a broader set of cultural norms may result in better financial performance over time because members are more likely to recognize that environmental change is imminent, as well as to be highly committed to enabling their organization's success (Levinthal, 1991; O'Reilly & Chatman, 1986).

Consistent with this logic, several studies have explored how a culture that values adaptability may enhance organizational performance. Khazanchi et al. (2007) examined 271 manufacturing plants and found that greater intensity among members about flexibility and control was associated with faster and more complete implementation of a new process technology. Flexibility encouraged worker empowerment and creativity, and control aided in the implementation of the new ideas. Other studies of culture and adaptability have emphasized the seemingly paradoxical need to promote both exploration, or coming up with new product or process ideas and market opportunities, and exploitation, or implementing those new ideas in order to improve performance inherent in adaptability (O'Reilly & Tushman, 2013). Taken together, we suggest that resolving the inconsistencies in our understanding of the culture-performance relationship requires deconstructing culture by considering culture content, consensus, and intensity as distinct constructs. More formally, we predict the following.

Hypothesis 1: The intensity of the adaptability norm will moderate the relationship between culture consensus and financial performance. Specifically, among organizations with higher consensus across a broad set of norms, those with higher levels of intensity about a norm of adaptability will perform significantly better over time in terms of key financial indicators than will those with lower adaptability intensity. In contrast, among firms with lower levels of consensus across a broad set of norms, variation in the intensity of the adaptability norm will have less influence on those firms' financial performance.

Method

Deconstructing culture requires conceptual and methodological advances. First, culture consensus needs to be objectively assessed across a comprehensive set of norms. Rather than asking members to report explicitly on the strength of their culture, which can confuse consensus and intensity as well as induce social desirability biases, assessments of culture consensus and norm intensity would ideally be based on objective statistical analyses of consensus about a comprehensive set of norms as well as the intensity with which particular norms are held (in the current study, the adaptability norm). Second, culture content and strength (where strength constitutes consensus and intensity) need to be evaluated by an organization's insiders, because an intensely held adaptability norm may foster more nonuniform behavior and insiders are in a better position to understand the meaning of nonuniform behaviors associated with adaptation than are outsiders.

Research design and sample

There were three components to our research design. First, we updated the Organizational Culture Profile (OCP) (O'Reilly, Chatman, & Caldwell, 1991) and used it to identify the content of firms' cultures. Second, based on these results, we focused on the intensity of the adaptability culture norm. Finally, we investigated the joint effects of a culture that intensely values adaptability and the overall consensus about a broad set of cultural norms on sample firms' financial performance. We used informants from companies in the computer hardware and software industries to test our hypothesis. We focused on companies in these industries because the competitive challenges and the pace of technological advancements make the ability to adapt to technology and market changes particularly important.

The U.S. firm sample used for hypothesis testing

We identified firms to test our hypothesis using the following criteria: The firms were publicly traded, U.S. headquartered, had their primary operations in the high-technology sector (hardware, software, and Internet services—SIC 35xx, 36xx, 38xx, 73xx; GIC Sector 45; and S&P Economic Sector 940), and concurrently employed a minimum of 20 alumni from three focal West Coast business schools. Alumni of these business schools provided culture assessments of the 60 firms that met these initial criteria 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 assessments 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 (number of informants per firm: $M = 16.7$, $SD = 13.3$). We included all 880 responses from U.S.-based employees in the factor analysis deriving the culture dimensions described below. Eighty-nine percent of these 56 firms were included in the list of the *Fortune 1000*, representing the largest American firms, and collectively represented 73% of the total 2009 revenues generated by technology-related *Fortune 1000* companies.

The sample of U.S. firms that we used to test our hypothesis was smaller than the sample we used to reestablish the culture dimensions. The decline in sample size resulted from three issues. First, of the initial 56 U.S. firms, two had responses only from employees who worked in overseas outposts (i.e., not in the United States), so these firms were eliminated. Second, of the remaining 54 firms, 12 had too few informants to calculate an interpretable Spearman–Brown coefficient (assessing the overall reliability of the profiles rather than specific dimensions, described below) and so were eliminated, reducing the sample to 42 firms. And third, of these 42 firms, three were acquired subsequent to our original culture data collection period (2009). The remaining 39 firms, which we used to test our hypothesis, are well known with recognizable brands, products, and services, with all but one included in the *Fortune 1000*. Informants' average tenure with their focal firm was 7.67 years with 43 percent having worked there for at least nine years. Twenty-seven percent of the informants were women. All informants had earned a Bachelor's degree or higher and 70 percent of informants had earned an MBA. Table 1 provides additional demographic characteristics for these informants (e.g., job level and function). The period of the study for testing our hypothesis was three years, with 2009 as "Year 0" and through 2012, considered a volatile period for much of the U.S. economy, and particularly for the high-technology sector.

Updating the Organizational Culture Profile using combined samples

To broaden the sample of organizations for updating the OCP dimensions, we included informants from two sets of companies. One set consisted of the large publicly traded high-technology firms in the United States described above

Table 1. Informant demographics

Characteristics	Percentage
Gender	
Male	73
Female	27
Education	
BS/BA or higher	100
MBA	70
Tenure	
0–2 years	13
3–5 years	29
6–8 years	15
9–11 years	19
12+ years	24
Job level	
C-level executive	2
Director	25
Vice president	8
Senior manager	17
Manager	14
Individual contributor	33
Other	1
Function	
Administration	2
IT	5
Engineering	14
Finance	12
Marketing	27
Production/operations	11
R&D	7
Sales	9
Other	13

($N = 56$ firms and 880 informants), and the other was smaller privately held firms headquartered in Ireland. We used this combined sample ($N = 100$ firms, $n = 1258$ informants) only to identify the OCP organizational culture dimensions. Because objective performance data were not available for the Irish firms, we tested the study hypothesis using just a sample of U.S. companies.

Irish firm sample. We invited 44 growth-oriented firms headquartered in Ireland to participate in the study. Our decision to use the Irish firms was guided by the GLOBE study of leadership and culture (House, Hanges, Javidan, Dorfman, & Gupta, 2004), which found that the United States and Ireland are positioned in the same country cluster (“Anglo”—one of 10 clusters), indicating a high degree of cultural similarity. We thus believed that firms from these two countries (United States and Ireland) would likewise be similar with regard to the underlying dimensions of organizational culture in our study.

The Irish firms were privately held and ranged in size from 20 to more than 2000 employees ($M = 210.2$, $SD = 324.6$) and in age from 5 to 111 years ($M = 28.8$, $SD = 23.9$). Following a similar process as with the U.S. firms, we invited 469 employees to serve as organizational informants, and 378 (81%) completed the OCP. Informants’ profile (average tenure, percentage female, and education profile) was similar to the U.S. set. Again, these responses were *only* used to determine the culture dimensions, not for hypothesis testing.

Independent variables: assessing culture consensus and adaptability intensity

The OCP is based on the *Q*-sort method and provides a quantitative assessment of an organization’s culture. The OCP consists of 54 norm statements (e.g., fast moving and being precise) that emerged from a review of academic-oriented and practitioner-oriented writings on culture and were selected to provide a wide-ranging and inclusive set of descriptors (Chatman, 1989, 1991). The OCP has been used extensively in organizational research (Sarros, Gray, Densten, & Cooper, 2005). In the two decades since the original OCP item set was developed, a variety of business and environmental factors have affected organizations’ cultures (Judge & Cable, 1997). Obvious examples include shifts in customer service models, changes in technology, globalization, and financial failures (Berman, 2011). To ensure that the item set was relevant and comprehensive, we modified 16 original items that were redundant, did not discriminate in past research, or did not load cleanly on the OCP factor structure, replacing them with new or modified items, though we retained the 54-item *Q*-sort structure.

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 consensus

We calculated culture consensus as the similarity in rankings of the 54 OCP attributes among informants who were current employees working in the headquarters’ country (i.e., United States for U.S. firms and Ireland for Irish firms) within each firm. Following past research (Chatman, 1991), we assessed the level of consensus within firms by averaging firm informants’ *Q*-sorts, item by item, and then compiling them into single profiles representing each firm. We also followed prior research by assessing consensus using the Spearman–Brown general prophecy formula (Caldwell, Chatman, & O’Reilly, 2008; Chatman, 1991), which indicates how similar each firm member’s rankings of the set of items is to the total firm profile, essentially estimating how likely it is that the same profile would emerge if everyone in the firm, rather than the informants in this sample, had *Q*-sorted the OCP items. The culture consensus scores for the 39 firms used to test our hypothesis ranged from .40 to .97 ($M = 0.82$, $SD = 0.17$).

Intensity of the adaptability cultural norm

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 ($n = 1258$). We began the principal components analysis with all 54 items and iterated to both: (i) eliminate items that did not load on any factors or loaded highly on more than one factor and (ii) 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 percent 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 .40. The six-factor solution was readily interpretable and consistent with a scree plot, and 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 2 displays the full list of items and factors.

We derived orthogonal factor scores for the six factors for each informant. Culture profiles for the firms in the final sample were created by averaging the factor scores across informants within each firm on each of the six factors. Thus, each firm was measured on six independent attributes of culture. We measured the intensity with which an organization held the adaptability norm by averaging informants' standardized factor score on adaptability within each firm (individual level: $M = 0.00$, $SD = 1.00$, range = -2.64 to 2.63 ; firm level: $M = 0.21$, $SD = 0.73$, range = -0.87 to 1.60). We used these firm-level measures for all subsequent analyses.

To determine the appropriateness of aggregating culture responses at the firm level, we computed inter-rater reliability and agreement scores (LeBreton & Senter, 2008). First, we calculated an $r_{wg(j)}$ value for each firm. The $r_{wg(j)}$ indicates how highly informants 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 ($M = 0.88$, $SD = 0.04$) that exceeded the recommended minimum value of 0.70 (Klein et al., 2000), indicating high within-firm agreement. Second, we calculated an intraclass correlation (ICC) metric, ICC(2), which indicates how reliable the firm-level culture factor scores are (Bliese, 2000). The average ICC(2) value ($M = 0.85$, $SD = 0.09$) exceeded the recommended minimum value of 0.70. These measures provide justification for aggregating each of the six culture-factor ratings at the firm level.

Establishing construct validity of the adaptability cultural norm

The adaptability factor dimension is defined by 11 items, with the items "being innovative," "risk-taking," "being willing to experiment," "fast-moving," "being quick to take advantage of opportunities," "not being constrained by many rules," and "adaptability" loading positively. In addition, four items loaded negatively on the adaptability factor: "predictability," "being rule-oriented," "making your numbers," and "being careful." Consistent with our theory, the adaptability dimension includes more than just a focus on innovation; it reflects a willingness to adapt to changing circumstances. To assess the construct validity of cultural adaptability, we related each firm's cultural prioritization of adaptability to their emphasis on adaptability in the text of their annual reports and to the change in their research and development investments over the study period, as we describe below.

Emphasis on adaptability in external communications. Annual reports provide a rich source of data for text-based content analysis offering clues about the firm's assumptions, beliefs, values, priorities, and intentions (Schein, 1985). Thus, mentioning adaptability more frequently in 10-K reports provides evidence that an organization values adaptability more than firms who mention it less. We assessed the number of adaptability-related words that each company included in its fiscal year 2010 10-K report using the Linguistic Inquiry and Word Count (LIWC) approach (Tausczik & Pennebaker, 2010). LIWC is a text analysis program used to demonstrate relationships between word use patterns and thought processes, emotional states, intentions, and motives in individuals and groups. We created a defined list of target words and word stems to identify adaptability and synonyms (e.g., adapt*, creat*, novel*, innovat*—where asterisks represent wildcards such that the words creative, creativity, and creativeness would all

Table 2. Factor analysis—rotated component matrix

	Components (factors)					
	Factor number					
	1	2	3	4	5	6
	Factor name					
	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

Extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization. Rotation converged in seven iterations.

be recognized). The text from a digital copy of each company's 10-K report was analyzed using this custom dictionary to count the total number of adaptability-related words used ($M = 70.90$, $SD = 28.12$).

Research and development investments. Another way of corroborating an organization's focus on adaptability to changing environmental conditions is to observe the intensity of efforts to develop new technologies, processes, and products (Katila & Ahuja, 2002). We examined each firm's change in R&D expenses. We recorded the R&D expenses for fiscal year 2012 ($M = \$2449\text{m}$, $SD = \$2572\text{m}$) using Compustat North America Financials Annual. In models predicting 2012 R&D expenses, R&D expenses for 2009 were included in the model to measure the expected increases in such investments as a function of the intensity of the adaptability norm. We present results of both construct validity tests in the results section.

Dependent variables

Change in financial performance

We obtained each firm's total net income, revenue, and operating cash flow (OCF), stated in millions of U.S. dollars for the 2012 fiscal year, from Compustat North America Financials Annual. We calculated OCF using the same method as Sørensen (2002: 79): "annual sales less the sum of cost of goods sold, selling, general, and administrative expenses, and the annual change in inventory." Taken together, these indicators represent a firm's ability to generate sales and make effective use of resources. Because these variables all were all positively skewed and could include negative values, we followed standard procedures and added a constant before log-transforming the data. We use these log values of net income ($M = 9.20$, $SD = 0.50$), revenue ($M = 9.46$, $SD = 1.44$), and OCF ($M = 8.97$, $SD = 1.07$) in testing the hypothesis. In models predicting financial outcomes, the equivalent 2009 metric was included in the model as we were interested in predicting improvement in financial performance as a function of the interaction of adaptability intensity and culture consensus.

Control variables

We controlled for a set of variables that could influence culture and financial 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. This was important because an organization's level of specialization could be related to its adaptability. Using SIC codes, from Compustat North America, we distinguished between firms with SIC 35xx (Industrial and Commercial Machinery and Computers), 36xx (Electrical and Electronic Equipment Except Computers), or 38xx (Instruments and Related Products) codes, which were coded as hardware (variable "SW" = 0), and those with SIC 73xx (Business Services) code, which were coded as software (variable "SW" = 1). To determine whether a company was involved in a mixture of hardware-oriented 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 Mix" = 1).

Beyond identifying each organization's HWSW mix, it is possible that firms that partition resources as specialists and generalists, respectively, may not compete directly against one another even if they operate in the same industry (e.g., Carroll & Swaminathan, 2000). Our research design and hypothesis mitigate this concern in a few ways. First, sample firms represent the largest firms in the computing industry, ensuring a basic level of proximity among them as well as a limit on how specialized they can be given their size. For example, the smallest firm in our sample in terms of 2009 employees is a generalist (hardware–software) and in 2009 sold 65% hardware and 35% software (by revenue). Similarly, the smallest firm in terms of 2009 revenue (a different firm) is also a generalist (hardware–software) and in 2009 sold 63% hardware and 37% software (by revenue). These data points support the notion that

there is a limit on how specialized the firms in our sample can be given their size because even the smallest among them offer a range of products.

Second, we include each firm's prior-year performance in our regressions. We do this deliberately as we are less interested in competition against one another than in a firm's performance over time, and we hypothesize that firms with adaptability intensity and high consensus will show the most improvement compared with their own prior financial performance (albeit in the relevant competitive context). Finally, because of the regularity of technological innovation in this industry, it would be inaccurate to characterize it as having a fixed pie of opportunity over the study period, and thus, the need to consider our sample firms' direct competitors with static market share opportunities is reduced.

As our final control variable, we included firm size using the log of the number of employees in fiscal year 2009, gathered from Compustat. We initially included two indicators of firm age in our regression equations: number of years since founding and number of years since going public, gathered from company reports and SEC filings; however, we dropped these indicators because they never changed our results and were highly correlated with firm size.

Results

Means, standard deviations, and correlations among study variables are presented in Table 3. Before testing the overall hypothesis, we present the results of the construct validity tests of our culture adaptability measure in Table 4. As expected, the intensity of the adaptability norm is significantly and positively related to both public communications of adaptability in 10-K reports ($\beta = .65, p < .01$) and growth in R&D expenditures over the three-year period ($\beta = .21, p < .05$) (Table 4). Interestingly, none of the other five culture dimensions were significantly related to either of these variables, providing some evidence of the discriminant validity of the adaptability dimension.

To test our hypothesis that intensity of the adaptability norm would moderate culture consensus in explaining variance in firms' financial growth, we used hierarchical regressions, entering the control variables in the first step, standardized values for the intensity of the adaptability norm and overall consensus about the culture in the second step, and the product of the standardized values for intensity and culture consensus in the third step. Table 5 shows the results of these analyses predicting the log of 2012 net income, the log of 2012 revenue, and the log of 2012 operating cash flow.

Across the three dependent variables, we found that industry segment was not significantly related to financial performance. Company size was significantly related to change in 2012 log net income ($\beta = .58, p < .01$). Not surprisingly, 2009 log revenue was strongly related to 2012 log revenue ($\beta = .77, p < .01$), though firms' 2009 log net income and log OCF were not significantly related to their 2012 log net income and log OCF.

Consistent with prior research (Gordon & DiTomaso, 1992), for log net income, a main effect for culture consensus emerged (2012 net income: consensus: $\beta = .48, p < .01$). For log revenue, a main effect for adaptability intensity and a marginally significant main effect for culture consensus emerged (2012 log revenue: intensity, $\beta = .14, p < .05$; consensus, $\beta = .09, p < .10$). A more consistent pattern of findings emerged with regard to the interaction that we hypothesized. The interaction of adaptability intensity and culture consensus was positively related to 2012 log net income ($\beta = .30, p < .01$), 2012 log revenue ($\beta = .20, p < .01$), and 2012 log OCF ($\beta = .34, p < .10$). Figure 1 shows the shape of these significant interactions, which is similar across the three financial indicators. After controlling for industry segment, company size, and previous performance, adaptability intensity moderated the relationship between culture consensus and 2012 financial performance such that firms with high-consensus cultures were most affected in their financial performance by the intensity of the adaptability norm. Across our three dependent variables, the form of the interactions and nature of the slopes were consistent and supported our hypothesis: Consensus about the culture was positively related to financial performance when adaptability intensity was high but negatively related to performance when adaptability intensity was low. Analysis of the simple slopes generally confirmed this pattern. In firms with high culture consensus, those with a more intense adaptability norm performed

Table 3. 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
1 Software																				
0 = Hardware	55%																			
1 = Software	45%																			
2 HWSW mix			-0.66**																	
0 = not mixed	43%																			
1 = Mixed	57%																			
3 Log employees	9.94	1.38	-0.07	0.15																
FY 2009																				
4 Culture intensity: adaptability	0.21	0.73	-0.20	0.13	0.22															
5 Culture intensity: integrity	0.19	0.54	-0.07	-0.12	0.20	-0.09														
6 Culture intensity: collaboration	-0.03	0.65	0.32*	-0.36*	0.00	-0.06	0.33*													
7 Culture intensity: results	0.11	0.53	-0.13	0.24	0.15	-0.37*	-0.31*	-0.28												
8 Culture intensity: customer	-0.05	0.57	-0.03	0.09	0.30	-0.05	0.08	0.16	0.16											
9 Culture intensity: detail	0.18	0.57	-0.05	0.10	-0.14	0.05	-0.20	-0.22	-0.09	-0.14										
10 Culture consensus	82.25	17.39	0.12	0.03	0.00	-0.19	0.06	-0.08	0.19	-0.18	-0.43**									
11 Adaptability words in 10-K	70.90	28.12	-0.12	0.15	0.10	0.61**	-0.09	-0.19	-0.15	-0.23	0.04	0.00								
12 R&D FY 2009 (\$M)	1,705	1,888	0.11	0.08	0.62**	0.08	0.14	-0.12	0.16	0.10	-0.17	0.16	0.16							
13 R&D FY 2012 (\$M)	2,449	2,572	0.09	0.06	0.58**	0.20	0.08	-0.20	0.17	0.06	-0.11	0.23	0.26	0.92**						
14 Log net income FY 2009	8.94	1.09	-0.12	0.19	0.29	0.23	-0.04	-0.03	0.13	0.07	0.02	0.11	0.22	0.32*	0.33*					
15 Log net income FY 2012	9.20	0.50	0.05	0.03	0.63**	0.19	0.08	-0.08	0.22	0.00	-0.12	0.46**	0.18	0.64**	0.69**	0.36*				
16 Log revenue FY 2009	9.02	1.54	0.03	0.09	0.91**	0.30	0.05	-0.01	0.20	0.17	-0.09	0.07	0.26	0.64**	0.66**	0.32*	0.68**			
17 Log revenue FY 2012	9.46	1.44	-0.02	0.18	0.89**	0.34*	0.05	-0.04	0.23	0.21	-0.12	0.13	0.25	0.62**	0.70**	0.36*	0.75**	0.94**		
18 Log OCF FY 2009	8.82	0.53	0.14	0.20	0.69**	0.15	-0.12	-0.06	0.34*	0.12	0.05	0.10	0.21	0.54**	0.54**	0.33*	0.68**	0.73**	0.72**	
19 Log OCF FY 2012	8.97	1.07	0.14	0.08	0.40*	-0.07	-0.07	-0.08	0.26	-0.02	0.10	0.27	0.10	0.41*	0.47**	0.22	0.52**	0.48**	0.53**	0.46**

Financial dependent variables were stated in millions (\$) prior to log transformation. For net income and OCF, which could take negative values, a constant was added prior to log transformation.
 † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 4. Equations establishing adaptability norm construct validity

Variable	Adaptability words in 10-K		R&D expenditures FY 2012	
	Step		Step	
	1	2	1	2
Software	0.14	0.31	-0.02	0.06
HWSW Mix	0.29	0.27	-0.05	-0.08
Log employees FY 2009	0.03	-0.10	0.03	0.01
R&D FY 2009			0.91**	0.87**
Culture intensity: adaptability		0.65**		0.21*
Culture intensity: integrity		0.08		0.03
Culture intensity: collaboration		-0.13		-0.11
Culture intensity: results		0.20		0.11
Culture intensity: customer		-0.11		-0.02
Culture intensity: detail		0.00		0.01
r^2	0.05	0.40	0.85	0.89
r^2 change		0.34		0.04
F change		3.00		1.91
F	0.74	2.32	48.22**	23.53**
df	3, 37	9, 31	4, 34	10, 28

Entries represent standardized coefficients.

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 5. Equations predicting financial performance

Variable	Log net income FY 2012 ^a			Log revenue FY 2012			Log OCF FY 2012		
	Step			Step			Step		
	1	2	3	1	2	3	1	2	3
Software	0.07	-0.04	-0.05	0.03	0.05	0.05	0.20	0.12	0.11
HWSW Mix	-0.07	-0.18	-0.14	0.07	0.05	0.08	0.12	0.07	0.10
Log employees FY 2009	0.58**	0.58**	0.66**	0.18	0.27*	0.45**	0.17	0.18	0.39
Log net income FY 2009	0.21	0.13	0.13						
Log revenue FY 2009				0.77**	0.65**	0.51**			
Log OCF FY 2009							0.30	0.30	0.17
Adaptability intensity		0.16	0.12		0.14*	0.13*		-0.10	-0.15
Culture consensus		0.48**	0.35**		0.09†	0.02		0.20	0.05
Interaction: Adaptability × Consensus			0.30**			0.20**			0.34†
r^2	0.44	0.66	0.72	0.90	0.92	0.94	0.24	0.29	0.37
r^2 change		0.22	0.07		0.02	0.03		0.05	0.07
F change		9.99**	7.56**		3.78*	13.59**		1.16	3.47†
F	6.67**	10.12**	11.53**	75.37**	59.73**	73.28**	2.61†	2.14†	2.48*
df	4, 34	6, 32	7, 31	4, 34	6, 32	7, 31	4, 33	6, 31	7, 30

Entries represent standardized coefficients.

^aBecause 2012 net income for one firm was drastically affected by a significant accounting event, the equivalent 2011 metric was used for that firm.

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

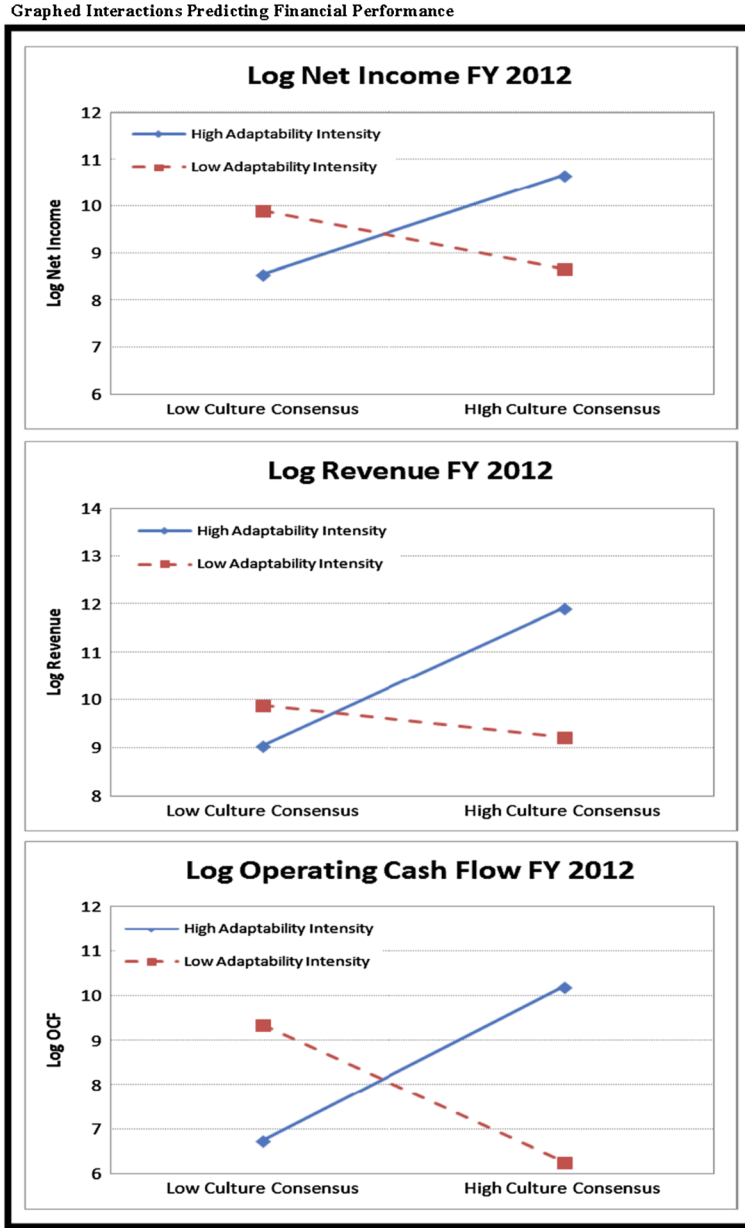


Figure 1. Graphed interactions predicting financial performance

significantly better than did those with less intense adaptability (2012 log net income: $t = 1.98, p < .05$; 2012 log revenue: $t = 2.28, p < .05$; 2012 log OCF: $t = 2.14, p < 0.05$). Interestingly, among firms with lower culture consensus, lower adaptability intensity was associated with higher financial performance (2012 log net income: $t = -2.16, p < .05$; 2012 log revenue: $t = -1.78, p < .10$; 2012 log OCF: $t = -2.49, p < .05$). For net income and revenue, financial performance was lowest when adaptability was more intense but cultural consensus was low, a finding that we discuss further below.

Additional analyses

Directionality

Our analyses above show that adaptability intensity moderated the relationship between culture consensus and change in financial performance three years later. Though our findings suggest that culture consensus and intensity influence subsequent financial performance because of the separation in time between the culture measures (2009) and the financial performance measures (2012), our research design does not rule out the possibility that stronger financial performance leads firms to both emphasize adaptability and agree more about their culture (Goncalo & Duguid, 2011).

To address this issue, we conducted additional analyses using the same financial indicators but from prior years. First, we used each of the same financial variables from 2006 to 2008, respectively, to predict the adaptability intensity–culture consensus interaction. Only one of the three financial indicators in any of the three years (one of nine total equations) significantly predicted the culture consensus–adaptability intensity interaction (2008 log revenue: $\beta = 1.71, p < .05$). Second, we combined the data from the early years and the later years and included both in a single regression. We regressed these combined data against our controls and independent variables with the addition of a dummy variable for the period (early or late) and an interaction term for Period \times Adaptability–Consensus interaction. The significance of this interaction term across all three dependent variables (net income: $p < .10$; revenue: $p < .05$; OCF: $p < .05$) suggests that the adaptability–consensus interaction is not the same for the years 2006–2008 as it is for the years 2010–2012. Finally, we performed two sets of regressions: One set regressed the combined 2006–2008 financial measures against our control and independent variables. The other used the 2010–2012 financial measures. We then compared the differences in the beta values of the interaction terms using a Wald test. Overall, the beta values of the interaction terms for the two periods were significantly different for all three measures (revenue: $t = 2.48, p < .05$; net income: $t = 2.15, p < .05$; OCF: $t = 2.68, p < .01$).

Combined, these analyses provide evidence that results for the prior period are significantly different than for the subsequent period. Taken together, they indicate that the culture consensus–adaptability intensity interaction is more likely related to concurrent and future financial performance, at least up to three years later, than it is to prior financial performance, suggesting that the culture interaction is more likely to affect financial performance than the reverse.

Understanding why adaptability intensity may be harmful in low-consensus cultures

Our theoretical model focused primarily on the prediction that culture consensus and adaptability intensity would interact additively to improve organizational performance over time. One unanticipated but interesting finding was that adaptability intensity led to reduced performance when culture consensus was low. To try to better understand this unexpected result, we considered the way members of these firms interpret conflict or political behavior more generally. We reasoned that firms with high culture consensus and a more intense adaptability norm would view conflict as a positive and functional attribute (e.g., Jehn, 1995) and that, as such, it can help contribute to improved financial performance, in the same manner as Intel's "constructive confrontation" described above. In contrast, in low-consensus–high-adaptability intensity firms, conflict is more likely viewed as a negative or dysfunctional force. In these organizations, high levels of conflict and politics would likely slow down decision making and reduce members' focus on shared goals.

We explored this possibility by constructing a conflict-politics scale based on items contained in the OCP. We used raw scale values for three OCP items: high levels of conflict, sharing information freely (reverse scored), and honest (reverse scored) (coefficient alpha = .62). We matched each company's conflict-politics score with their factor scores for adaptability intensity and their level of culture consensus and then regressed conflict-politics on the controls (sector and size), adaptability intensity, culture consensus, and the adaptability–consensus interaction.

The interaction term significantly predicted the conflict-politics score ($\beta = .46, p < .05$). A plot of the interaction revealed two positive-sloping lines that intersect, such that the highest level of conflict arises in high-culture-consensus–high-adaptability-intensity (HiCC–HiAI) firms and the lowest manifests in high-culture-consensus–low-adaptability-

intensity (HiCC–LoAI) firms. Analyzing the simple slopes, in firms with higher culture consensus, those with an intense norm for adaptability reported objectively higher levels of conflict than did those with a less intense adaptability norm ($t=2.41, p < .05$). Culture consensus within firms may help members interpret conflict-oriented behavior consistently and either avoid it (HiCC–LoAI) or use it functionally such that it is translated into performance (HiCC–HiAI). For firms with lower culture consensus, the result was different ($t=2.05, p < .05$). In these firms, members may interpret conflict inconsistently and allow it to interfere with activities that would contribute to performance. Although the effect size was small and the test was exploratory, these results suggest that the LoCC–HiAI firms experience high levels of conflict and political behavior and interpret it as a negative, obstructive force, which may translate into performance challenges.

Discussion

For some time, researchers have advanced conceptual arguments about how strong organizational cultures stifle creativity, innovation, and adaptability (Goncalo & Staw, 2006; Nemeth & Staw, 1989). Using Kotter and Heskett's (1992) data, Sørensen (2002) showed that strong cultures promoted consistent financial performance under stable conditions, but in dynamic environments, their performance became less reliable. This study shows that, in contrast to these earlier claims that strong cultures necessarily constrain performance by reducing reliability in turbulent environments, there is another possibility: that a strong culture that is characterized by high consensus about a comprehensive set of norms but also by intensity about a norm of adaptability is positively associated with improving financial performance even in a turbulent industry.

We generated these insights by focusing on two conceptual and one methodological contribution. We distinguished culture content from strength and recognized two components of culture strength: the degree of consensus about a system of cultural norms among members and the force or intensity with which a particular norm is held. We considered these three culture components together to show that within the context of a high-consensus culture, intensely emphasizing an adaptability norm in which the content supports behavioral variation enables an organization to perform well financially in a dynamic industry.

This approach improves on previous research in two ways. First, compared with research that only considers one or two culture attributes that are presumed to be stronger or more relevant than other norms, or research that looks only at norm strength without specifying its content, we explicitly measured the intensity of the adaptability norm. We also considered members' consensus about the arrangement of a comprehensive set of culture norms, making our culture consensus measure similar to that used in personality research in which the "whole person" is considered in terms of the idiographic organization of their traits (Weiss & Adler, 1984). In this case, we captured the "whole culture."

In redefining culture strength in terms of culture consensus and norm intensity, our analyses generated two significant main effects out of six possible, with culture consensus affecting net income and adaptability intensity affecting revenue. Our contribution, however, is in uncovering a key moderator, adaptability intensity, which systematically influenced the relationship between culture consensus and financial performance across all three financial indicators. We should note that our goal was not to test changes in financial performance as a function of changes in culture, but rather to simply demonstrate the relationship between the combination of culture consensus and intensity and such performance. It is possible that we found limited main effects (marginal significance in predicting 2012 revenue) for culture consensus, in particular, because our sample of high-technology firms includes many firms that value adaptability intensely and many that do not. This contrasts with Kotter and Heskett's (1992) sample of firms from multiple industries, which may have included fewer firms with cultures emphasizing adaptability. In other words, because the organizations in our sample are all working in a dynamic industry, the potential confound between culture content and strength is clearer than it would be in a more heterogeneous sample of firms from more and less dynamic industries.

Using an updated version of the OCP, we found support for the hypothesis that higher intensity about a norm of adaptability boosted financial performance over a three-year period more for firms that also had higher consensus about a comprehensive set of norms. We demonstrated these effects in the context of the high-technology industry, which is marked by rapid technological change. Thus, by considering both culture strength and content and developing a more differentiated approach to culture strength as culture consensus and intensity about specific norms, we offer a nuanced view about the role of strong cultures in influencing firms' financial performance, one that may reconcile the lack of consistency in previous research attempting to understand the organizational culture–financial performance relationship.

Our main finding that adaptability intensity moderated the relationship between culture consensus and financial performance was confirmed and suggests several revised interpretations of past research. First, unlike Siehl and Martin (1990, p. 242) who concluded that a link between culture and firm performance “has not been—and may well never be—empirically demonstrated,” we do find a clear association between culture, decomposed into consensus and intensity about adaptability, and financial performance. Second, Sørensen's (2002) finding that having a strong culture led to less reliable financial performance in turbulent environments can be reconsidered. Because Kotter and Heskett's (1992) data set was likely comprised of a subset of strong-culture firms with norms that emphasized uniform behavior (e.g., U.S. Air, Quaker Oats, and Pacific Gas) and also a subset that emphasized strong norms associated with non-uniform behavior such as adaptability (e.g., DuPont, Pfizer, and Hewlett-Packard), the two subsets of strong-culture organizations likely varied significantly in their performance. And, because the content of cultural norms was not assessed, the potential insights that are generated about the role of culture in affecting performance may be limited in these studies. Our findings underscore the importance of explicitly assessing the culture content of strong-culture firms.

It is also important to note that Kotter and Heskett's (1992) data set relied on outside observers to assess focal firms' cultures. Because the outward manifestation of an intensely held adaptability norm could be a lack of behavioral uniformity, outside observers may have been particularly susceptible to errors in determining if nonuniform behavior is a sign of a weak culture or, instead, an intensely held norm of adaptability. Future research should investigate directly whether insiders and outsiders perceive a culture that emphasizes adaptability less similarly than one that emphasizes other norms.

The theory we developed offers insight both about why it has been so difficult to link strong culture and financial performance and also how culture research can progress by building our understanding about a variety of norm content/structure combinations. Future research might usefully examine the intensity of specific norms, as we did the adaptability norm, in the context of high and low levels of culture consensus. This would enable the development of a more comprehensive theory of how specific norms moderate the relationship between culture consensus and financial performance. Based on our findings in this study, we would expect that the intensity about norms that cause static (rather than divergent) behavior will lead to less successful financial performance when organizations have high consensus and that low consensus in such circumstances may even result in better performance. This should be the next programmatic effort for culture research, which would enable a differentiated picture of intense norms that promote versus constrain financial performance when culture consensus is high.

In addition to reinterpreting past research, two novel findings arose from parsing culture into the three dimensions of content, intensity, and consensus. First, though our prediction was supported regarding the combination of high consensus and high adaptability intensity resulting in the greatest financial performance growth over the three-year period, we did not make specific predictions regarding which combination of these culture strength dimensions would result in the least growth. A symmetrical logic would suggest that the lowest growth should correspond to lower adaptability intensity and lower culture consensus (a “weak” culture). But our findings suggested that adaptability intensity was a critical moderator of the relationship between culture consensus and financial performance such that across the three financial indicators, higher adaptability intensity decreased financial performance in firms that had lower culture consensus. It is possible that this result emerged because a broader lack of consensus resulted in uncoordinated attempts within some firms to adapt to changing circumstances. We explored this possibility by developing a conflict scale and showing that firms that were higher in adaptability intensity also had cultures that

were characterized by significantly higher conflict. Given the different financial performance outcomes among these firms, we theorize that firms with higher consensus about the culture were able to use conflict constructively (i.e., channel it productively, leading to better financial performance). Future research might use this as a point of departure to confirm whether internal interpretations of “conflict” help explain the differences in performance among firms with high levels of adaptability. Further, it would be useful to understand whether low culture consensus is similarly problematic for firms characterized by high intensity on other dimensions besides adaptability.

We also found evidence that firms with less intensity about adaptability were not as affected in their financial performance over the study period by the overall level of consensus in their culture. This suggests that emphasizing adaptability may matter less for firms with lower culture consensus, possibly because conformity to a set of norms may serve as an organizing framework helping an organization avoid devolving into anarchy when adaptability and the associated nonuniform behaviors are intensely embraced. Future research might examine the extent to which this pattern is the same for firms characterized by other culture content dimensions.

Implications of the adaptability norm

Adaptability is a particularly intriguing cultural norm because of its implications for conformity versus uniformity in behavior. Specifically, adaptability may “protect” firms that have high levels of consensus about their culture across a broad set of attributes from becoming overly inertial and relying on common routines that prevent it from identifying and adapting to environmental changes. Thus, cultures characterized by high levels of consensus, a typical way that culture strength has been defined and tested, can experience constrained financial growth or improved financial growth depending on the content of the norms that are intensely held. A culture characterized by an intense focus on adaptability, in the present study, was associated with specific behavioral norms like being willing to experiment, being innovative, being quick to take advantage of opportunities, risk taking, fast moving, and not being focused on making your numbers. Taken together, this dimension is likely associated with less uniformity in behavior, and yet, the high consensus in culture may serve to increase coordination among the less uniform behaviors such that members still align their nonuniform behaviors with their organization’s overall strategic objectives.

Limitations and future directions

We intentionally focused on a single industry in this study to hold constant a number of potential alternative hypotheses and, importantly, conduct a specific test of how strong-culture firms perform as they face a similarly turbulent environment. That said, drawing from only one industry makes it harder to generalize our findings to other industries. Further, overall history effects may have influenced the extent to which the adaptability norm was related to subsequent financial performance, suggesting that an even longer time horizon could be useful. Further, previous research has shown that organizational culture content is more similar within an industry than between industries (Chatman & Jehn, 1994; Siew & Yu, 2004). Thus, including firms from just one industry may reduce the range on culture content and—especially important for this study—the extent to which adaptability relates to financial performance. Future research might also usefully consider how intensity moderates the relationship between culture consensus and financial performance using other norms. For example, retail firms might need to be both adaptive and customer oriented, whereas manufacturing firms might usefully emphasize a detail-oriented culture.

A second limitation is that, even with a separation in time between the culture assessment and the financial outcomes, we cannot unambiguously determine causality. Though we showed that the adaptability intensity–culture consensus interaction was related to concurrent and future financial performance up to three years after culture was assessed and not to prior financial performance, future research could offer even more rigorous causal tests. Laboratory experiments that manipulate organizational culture (Chatman et al., 1998) might enable a more direct understanding of the interplay between norm intensity, culture consensus, and outcome success. For example, organizations

that fail financially in a first round may be more, or even less, motivated to change culture content. Employees' motivation to modify their culture may be influenced by their attribution for previous successes and failures. For example, when the collective organization is viewed as successful, certain content dimensions like collectivism are less likely to change (Goncalo, 2004). Researchers could follow organizations from their founding (Baron, Hannan, & Burton, 2001) to see if certain culture content, intensity, and consensus combinations fuel faster growth or time to initial public offering. Finally, researchers could collect culture data yearly for an extended period and relate each year to financial performance as a true time-series analysis with both financial performance and culture data each year to help identify the causal relationship between them (Harrison & Carroll, 2006).

A third limitation is that our sample of informants for testing the hypothesis was limited to graduates from three schools, which might have affected the extent to which they viewed the firms similarly. And, fourth, we only focused on financial performance, which, even though it is perhaps the outcome of most interest for publically held corporations, is not the only way that firm performance can be conceptualized and measured (Miller, Washburn, & Glick, 2013). Future research might examine different norm content/intensity combinations in predicting other indicators of performance such as employee commitment and longevity, organizational survival, and avoidance of lawsuits.

One of the strengths of the OCP approach is that culture consensus and adaptability intensity are determined objectively. That said, it would be useful to understand the extent to which objective estimates of culture strength correlate with subjective assessments of strength (e.g., asking informants directly about consensus and intensity).

Finally, future research might work to uncover the sources of cultures that embrace adaptability. Given the apparent advantages of emphasizing the adaptability norm in the context of high cultural consensus, understanding how and when adaptability emerges would be useful. Sources such as CEO personality, founding principles (Baron et al., 2001), and key organizational events may be worth investigating.

Conclusion

In a recent review of organization climate and culture, Schneider et al. (2013, p. 369) observed that the speed with which culture “became the darling of the management consulting world... presented some issues because academics were not quite sure about what culture was and what it represented—and even whether it was appropriate to try to link organizational culture with the financial success of corporations.” Whether or not the popularity of culture in management was the cause, we agree that the academic focus on developing a precise conceptual definition, one that parses culture into component but distinct parts, was truncated.

Our study attempts to reinvigorate an academic focus on the construct of organizational culture. In parsing culture into relevant components and then considering them together, we offer evidence that a strong culture is not necessarily a disadvantage even in turbulent environments. Instead, whether culture strength is an advantage or disadvantage depends on *both* the content and strength of the culture, and as such, culture consensus, norm content, and intensity can usefully be identified in studies of organizational and group culture. Firms with higher levels of consensus across many norms, as well as an intensive emphasis on adaptability that may promote conformity without the inertial effects of uniformity, performed better financially over a volatile three-year period.

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