



# Firm culture and performance: intensity's effects and limits

Firm culture and  
performance

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## Abstract

**Purpose** – The aim of this paper is to clarify distinct aspects of firm culture, delineate its effects on performance outcomes, and to examine culture intensity on theoretic grounds with attention to its effects and limits.

**Design/methodology/approach** – The study analyzes a data set of 2,657 individual cases that are empirically aggregated into 302 organizational units. Its operationalization of culture intensity derives from distinct culture theory. Hypothesized relations are examined via structural equation modeling and hierarchical regression analysis.

**Findings** – Structural equation modeling results show culture relates positively to cooperation, coordination, and performance. Hierarchical regression analysis results show intensity influences cooperation and coordination directly and does not moderate culture's relations with those outcomes.

**Research limitations/implications** – The large scale empirical study of a broad diversity of firms has advantages over smaller and more targeted studies of lesser generalizability.

**Practical implications** – Firms with cultures of higher intensity can enhance performance indirectly by driving cooperation and coordination directly.

**Social implications** – Culture entails shared values and touches the human side of a firm. Managers can promote a firm's culture to enhance cooperation and coordination outcomes within that firm which, in turn, influence firm performance.

**Originality/value** – This study distinguishes culture from climate on conceptual grounds. Climate strength, an analog of culture intensity, is known to moderate climate's relations with outcomes. By contrast, this study shows that culture intensity has a main effect on outcomes, in line with culture's distinct theoretic bases.

**Keywords** Performance management, Organizational culture

**Paper type** Research paper

## Introduction

Firm culture is regarded quite widely as an important factor of firm performance. It is a concept that touches many internal parts of an organization just as it interfaces with the environment outside an organization. A firm's culture helps managers interpret and initiate firm activities when there are few other cues to guide behavior, even as it informs and shapes a firm's reputation in a market environment. Because of its strong relevance to organizational action, firm culture continues to appear as a functional variable in business studies. It also leads to some of the most interesting and important questions in the domain of business studies (Asif, 2011; Denison, 1996; Ravasi and Schultz, 2006).



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Culture is often discussed when describing firms, but it is a notoriously hard construct to define *sui generis*. In fact, theories of culture have conceptual foundations far outside the domain of the domain of business studies. They derive from the long tradition of anthropological research on shared values and beliefs in communities and how those elements relate directly to internal organizational workings (Conklin, 1968; Redfield, 1952). Research in those traditions entails a diversity of methods such as extended fieldwork residencies and immersion in daily life in order to explain the intricacies of the shared values and assumptions that define culture (Douglas, 1976; Mehri, 2005). Although such shared values and assumptions also exist in today's firms, the qualitative data of traditional culture research can be empirically questionable in business studies, where there is a greater emphasis on quantitative scores and the proper navigation of different empirical levels of analysis (Tett and Burnett, 2003). As such, researchers of firm culture regularly call for appropriate methodological approaches and careful empirical data composition (Gregory *et al.*, 2009; Perrin, 2004; Schein, 1990; Weick, 2006).

Business studies based on culture theory often entail the challenge of how to benefit from culture's non-organizational anthropological heritage when operationalizing it as a construct in the context of organizational factors (Brown, 1995; Glick, 1988; Wilkins and Ouchi, 1983; Zheng *et al.*, 2010). Unlike studying culture in well-defined communities, organizational scholars study its assumptions and beliefs alongside strategies, structures, control systems, technologies, and business models. These latter elements introduce complexities that influence culture scores as they shift in response to the external environment (Lawrence and Lorsch, 1967). The compounded relations and interfaces account for why applying culture theory in business studies can and does open conceptual gaps based on misuse of terms (e.g. culture versus climate), measurement techniques that miss the essence of the construct, and insufficient emphasis on the organizational level of the environment (Ashkanasy *et al.*, 2000). Culture theory must bridge such gaps to explain firm performance because shared values and assumptions are largely outside the scope of most business research (Asif, 2011; Glisson and James, 2002; Gregory *et al.*, 2009; Richard *et al.*, 2009; Schneider *et al.*, 2002).

In this paper, we shed light on these issues via three principal research questions. First, if culture is a distinct construct, then how does it relate to an analogous organizational construct such as climate? Second, what is the best empirical composition of individual scores in culture research? Third, how does the intensity of a culture affect its relations with firm outcomes? To engage these questions, we review culture literature and develop and assess several hypothesized relations.

### **Firm culture in context**

Culture helps explain firm performance despite a remarkable range of definitions for the construct. Scholars universally agree that culture is something largely shared by members. This characteristic makes it anthropological, historical, constructed socially, stable, holistic, and nebulous (Hofstede, 2001; Rousseau, 1990). Culture includes shared values inaccessible to direct observation but positively inferable from statements (Levitin, 1973). Culture represents a pattern of evolved assumptions instilled in members as the way to perceive organizational life (Schein, 1990). It is a collective programming of the mind that distinguishes members of one organization from

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another based on shared values and norms in an organization (Hofstede, 2001; O'Reilly and Chatman, 1996). Culture is also the shared beliefs and behavioral expectations of an organizational unit (Barney, 1986; Cooke and Szumal, 1993; Denison, 1996; Glisson and James, 2002). It is often the creation of the firm's founders even before members choose to adopt its values (Bass and Avolio, 1993, pp. 113-114). Though these definitions are diverse, it is clear that culture is peculiar to a given organization and somewhat inimitable. Its top-down values and shared assumptions are evident in behavioral norms and common experiences of members.

What is the best way to infer shared values and assumptions in organizational research? These elements of culture are tacit and practically invisible to members of firms until those elements clash with conflicting elements, as they often do in a clash of values during mergers and acquisitions (Lodorfos and Boateng, 2006; Schraeder and Self, 2003). Along these lines, business scholars have long observed that members of firms often have dual aspects that influence their behaviors: aspects germane to the organization and other aspects germane to themselves (Barnard, 1938, p. 88). In this sense, culture is a midwife of sorts to organizational behavior, that is, an element uniquely necessary to explain a firm's inimitable human side, such as organizational citizenship behaviors and effective leadership (Appelbaum *et al.*, 2004).

Dual aspects of person and context have long been seen part and parcel to culture. As such, research tends to operationalize them via the aggregation of member-derived scores (Kotter and Heskett, 1992). To parse organizational-based from member-based variance in such data, studies have engaged the empirically knotty task of integrating macro and micro-level data (Chan, 1998; House *et al.*, 1995; Klein *et al.*, 2001). The integration makes empirical composition very important in culture studies (Dwyer *et al.*, 2003). Research on climate, an analogous construct, notes the same integration. However, those studies emphasize attitudes and actions more than values and assumptions (Cooper *et al.*, 2001). As such, climate studies do not trace the elements that are seen as definitional to culture (Asif, 2011; Glisson and James, 2002).

Yet, culture and climate overlap in organizational life. The former originates top-down from upper echelons via artifacts and stories that ascribe meaning to shared member experiences. The latter is instrumental to making sense of the same phenomena, but only in terms of the effect of the organizational system on members (Litwin and Stringer, 1968; Schneider, 1975). As such, climate is more bottom-up. In this way, the two theoretic frames of culture and climate address the same elements while being rooted in distinct but complementary paradigms.

#### *The distinctiveness of culture*

Culture influences sensemaking, collaboration, perspective-taking, and many organizational actions (Weick, 1995; Zohar and Luria, 2004). It is often the best way to explain inimitable firm actions such as innovation and adaptivity that frustrate traditional approaches that assume a central tendencies and known distributions (Naranjo-Valencia *et al.*, 2011). Why is culture a deeper element of firms? One reason is because early founder behaviors function as embedding mechanisms, and initially form a set of cultural values (Bass and Avolio, 1993; Schein, 1990; Stinchcombe, 1965). Indeed, in large firms undergoing change and in many entrepreneurial ventures, early behaviors underlie the values and assumptions that emerge much later (Awasthy *et al.*, 2011; Sørensen, 2002).

Such factors make culture a deeply rooted organizational element that can have powerful effects. When environmental change strains operations, for instance, culture can drive unique adaptations to sustain performance. Thus, although culture is a stable part of can firm, it can enable adaptivity (Sørensen, 2002). Its compounded nature helps signify what a firm values positively (and negatively). Therefore, firm culture can promote robustness to environmental upheaval just as it can drive discontinuous firm action amidst stable environments (Lorsch, 1986; Polzer, 2004).

Whereas culture forms top-down, climates tend to form bottom-up from relationships among members in response to external events (Glick, 1985; Schneider, 2000). As such, a culture may not always align with actual experiences. Indeed, it can clash with them. That is how culture conveys a sense of “what *should be* done” versus “what *is* done” in an organization. Culture is thus ideational in terms of its perspective on organizational life and thereby it drives more proactive organizational behaviors. By contrast, a climate perspective is more phenomenal in terms of its perspective on organizational events. It is more ephemeral and reactive by nature when compared to a pure culture perspective on organizational life.

Culture and climate theory have long been described as overlapping but mutually incomplete and complementary (Asif, 2011; Denison, 1996). However, the relations that this mutual incompleteness and overlap have with questions of empirical method are not often given much attention. Figure 1 depicts this relation, in which the overlap resides at the *meso* level (House *et al.*, 1995). In organizational units, this meso level corresponds to the groups, teams, and departments that make up an organization (Schein, 1990; Siehl and Martin, 1990).

The meso-level of analysis is suitable for empirical culture research that identifies member shared values and relates them to firm outcomes. Such an approach is relevant on practical grounds too, as different organizational units (e.g. marketing or engineering functions; product or geographic divisions) almost always have different leaders, structures, and operations in wholly different environments that generate, in turn, categorically different performance ramifications.

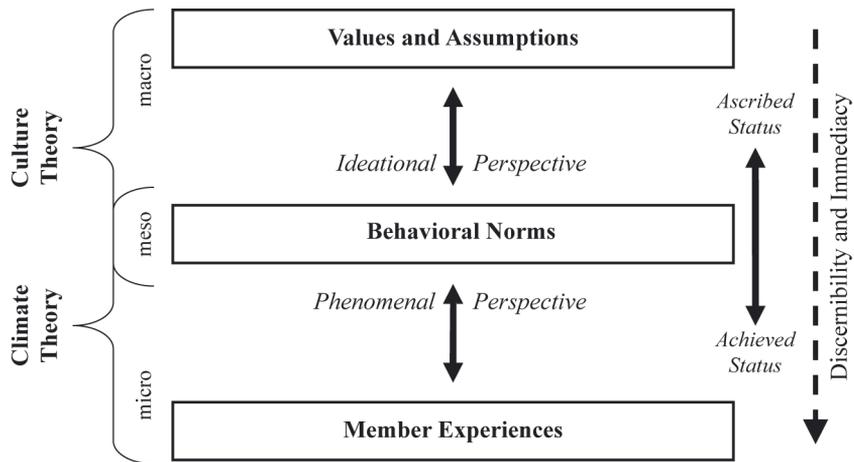


Figure 1.  
Culture and climate  
theoretic frames

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*Summary and hypothesis development*

We intended to identify a particular type of culture known as adaptive and constructive, and link it to specific firm performance outcomes at a meso-level of analysis. We aimed to shed light on the conceptual nature of culture by undertaking empirical composition of scores based directly on its theoretic and conceptual foundations. This methodological approach enabled us to directly assess the importance of culture intensity, which is the degree to which members share a culture or subscribe to its values (Rousseau, 1990). An analogous construct in the climate literature is known as strength (Schneider *et al.*, 2002). In particular, we assessed culture intensity's effect on performance outcomes.

Adaptive and constructive cultures are based on shared values and assumptions pertaining to positive regard of others, performing at high levels, taking risks, and thinking in novel ways (Cooke and Rousseau, 1988). The behavioral norms stemming from these shared values are cooperation among members and coordination among organizational units, departments, and functions (Thompson and Luthans, 1990). These behavioral norms facilitate effective organizational responses to environmental change as well as correct organizational action in the absence of environmental cues. Adaptive and constructive cultures thus drive performance, cooperation, and coordination (Cooke and Szumal, 2000).

An adaptive and constructive culture also promotes a setting of quality interactions and communication, initiative, planning, and the enablement of other members and groups to perform. In firms, these behavioral norms increase the levels of cooperation within units and coordination between units (Glisson and James, 2002).

Constructive cultures drive firm performance by promoting settings in which members take initiative, solve problems, and work together. Challenging goals are common for firms with constructive culture and members also tend to understand firm operations. As such, the assumptions and the behaviors of a constructive culture are germane to firm performance. Our first three hypotheses are based on these established definitional aspects of constructive culture:

- H1.* Constructive culture increases cooperation within organizational units in firms.
- H2.* Constructive culture increases coordination between organizational units in firms.
- H3.* Constructive culture improves the performance of organizational units in firms.

Culture intensity is a meso-level variable that goes beyond individual action and reflects the ascribed nature of a culture's values (Glisson and James, 2002). In other words, intensity refers to common awareness and shared assumptions that are different from the achieved nature of the behavioral norms associated with climate because they are ascribed (Rousseau, 2000). The ascribed nature of culture values implies positive or negative regard for various activities. The fact that such values are shared by members implies a direct effect on meso-level outcomes. Our final two hypotheses reflect this expectation concerning intensity.

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- H4. Culture intensity increases cooperation within organizational units.
- H5. Culture intensity increases coordination among organizational units.

#### *Empirical composition of data*

After developing the five hypotheses and before executing our empirical study, we formulated the best way to operationalize intensity. We noted two important aspects of culture theory vital to undertaking empirical research. First, the difference between shared member perceptions and firm values calls for referent-shift composition of data. Second, unit-level behavioral norms are reliably measurable. They also reflect values and assumptions of a culture, which are not apparent to observers but only gleaned through prolonged experience with them.

Because of the deeper nature of values and assumptions, aggregated individual scores in culture research should observe referent-shift logic explicitly (Hofstede, 1995; Glisson and James, 2002; Rousseau, 1990). This type of operationalization shifts the reference point away from members and toward ascribed values and assumptions reflected in Figure 1. In other words, for instance, survey items in such research do not infer the member attitudes that are relevant to climate research. Instead, they indicate whether the dominant logic of a firm assumes that its members tend to “be spontaneous” or “fit the mold.” It treats culture as something of an organizational personality, as it has long been regarded (Barnard, 1938; Cooke and Szumal, 2000; Hofstede, 2001). That is why, by contrast, climate studies tend to use survey items such as “I feel used up” or “People in our company use opportunities quickly to attain goals” (Ashkanasy and Nicholson, 2003; Baer and Frese, 2003).

When data are captured via referent shift logic, the scores reflect more clearly the values of a firm (Glisson and James, 2002). This operationalization helps ensure that the data are amenable to the examination of culture theory in a way that follows correctly from culture theory’s foundations. As we illustrate in what follows, our method entailed data collection and a study procedure based on referent shift logic.

### **Method**

#### *Sample*

Our study data included sample of 2,657 members of 302 organizational units from a variety of firms. These data were collected to allow the ongoing assessment of the validity and reliability of published organizational culture and performance measures. This exceptionally large sample drew from a cross-section of industries and from firms with specific departments, groups, and other meso level organizational units.

#### *Procedure*

The data collection procedure entailed administration of surveys to all members of the firms in all organizational units and follow up structured interviews with all members. Missing data and scores were negligible due to the nature of the procedure; endorsement of the procedure and local support by the firms and the units allowed us to maximize the response rate.

#### *Measures*

The Organizational Culture Inventory (OCI: Cooke and Lafferty, 1987) includes 120 items that measure lower-order and higher-order cultural values. The measure has

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been used to forecast firm outcomes in many research studies (Cooke and Rousseau, 1988; Draper *et al.*, 1989; Xenikou and Furnham, 1996). Participant scores based on the 40-item OCI constructive scales of humanistic, affiliative, achievement, and self-actualization are aggregated at the meso-level for unit-level scores (House *et al.* 1995; Glisson and James, 2002). The items capture member endorsements of explicit references to assumptions and values of their firm, producing a referent shift away from the member and toward the organization (Cooke and Szumal, 1993).

The OCI items are similar to an adjective checklist and scored on a five-point Likert-type scale ranging from 1 (not at all) to 5 (to a very great extent). The items explicitly instruct respondents to indicate the extent to which the firm values and expects certain behaviors, such as setting challenging yet realistic goals and taking on new and interesting tasks.

We used another instrument to sample performance data, the Organizational Effectiveness Inventory (OEI; Cooke, 1995) to measure individual, group, and firm-level performance outcomes. Its 128 items assess quality, coordination, cooperation, external adaptability, role conflict, job satisfaction, and turnover intention. This instrument uses a variety of five-point Likert-type scales and includes reversed-scored items to control for response biases. We utilized the OEI to delineate meso-level firm outcomes of cooperation, coordination, and performance.

Cooperation was assessed by items targeting member interactions within units such as “you can count on your co-workers when teamwork is needed.” Coordination across units was measured by items such as “your workgroup can rely on other departments to provide you with what you need – when you need it”. Performance was measured via items such as “do you believe the quality of your organization’s products/services meets customer expectations?” Response options for all items were situated in a Likert-type scale that ranged from 1 (disagree) to 5 (agree).

### *Structured interviews*

We rounded out the empirical sample via another method as a third source of data. We undertook structured interviews to ensure fuller assessment of the targeted variables. The structured interviews assessed the construct validity of the self-report measures. Members reflected on the outcomes pertaining to their units. For instance, interviewers assessed the degree to which unit members compete versus cooperate in light of their OEI scores. Structured interview questions pertaining to coordination called for interviewees to comment on the frequency of incompatible requests or incongruent messages between units. Performance questions addressed whether interviewees would choose to do business with their unit and whether its offerings exceeded internal or external client expectations. The structured interview scores were coded identically to the self-report scales, described above, to allow direct comparisons.

## **Results**

We first undertook descriptive analyses to assess data quality and fitness for undertaking main analyses to examine our hypotheses. We found that the distribution of unit membership was mildly skewed positive but roughly normal (skewness index = 0.77). We also found the median unit size to be nine members with a range of three to 24. The average unit size was 8.8 with a standard deviation of 2.55.

From these initial examinations, we structured all of our analyses in terms of two basic phases to carefully ensure the data did not violate analysis assumptions (Cook and Campbell, 1979; Sirotnik, 1980). The first phase entailed descriptive statistics, variable intercorrelations, and within and between unit analyses to warrant the aggregation of scores. After an examination and assessment of those initial examinations, we then moved into the second phase, in which we undertook the main analyses of relations in order to assess our hypotheses.

*Descriptive analyses*

Table I presents frequency counts and percentages for the demographic variables. The demographic items on the self-report measures suffered moderate missing data in 477 cases (18 percent of the sample).

		Frequency	Percentage
Gender	Male	1,235	46.5
	Female	1,013	38.1
	No response	409	15.4
Age	Under 20	17	0.6
	20-29	521	19.6
	30-39	802	30.2
	40-49	635	23.9
	50-59	291	11.0
	60 or over	39	1.5
	No response	352	13.2
Ethnicity	Asian	73	2.7
	African American	252	9.5
	Hispanic	132	5.0
	White	1,710	64.4
	Other	39	1.5
	No response	451	17.0
Education	High School	201	7.6
	Some College	471	17.7
	Associates Degree	229	8.6
	Bachelors Degree	708	26.6
	Some Graduate Work	318	12.0
	Masters Degree	332	12.5
	Doctoral Degree	44	1.7
	Other	17	0.6
	No response	337	12.7
	Annual salary	\$10,000 or less	83
\$10,001 to \$18,000		140	5.3
\$18,001 to \$25,000		326	12.3
\$25,001 to \$35,000		437	16.4
\$35,001 to \$45,000		384	14.5
\$45,001 to \$60,000		235	8.8
\$60,001 to \$75,000		109	4.1
\$75,001 or more		108	4.1
No response	835	31.4	

**Table I.**  
Member-level frequencies  
for demographic  
variables

**Note:** *n* = 2,657

Table II shows member-level correlations between the structured interview scores and the outcome variables (cooperation, coordination, and unit performance). A negligible percentage of data were missing from the structured interviews due to procedural reasons. As shown in Table II, the outcome variables shared the strongest relations with corresponding structured interview dimensions, thus offering validity evidence for cooperation, coordination, and performance scores.

We executed the  $r_{wg}$  procedure to assess agreement among members to warrant aggregation to unit level scores (James *et al.*, 1993). The  $r_{wg}$  values for culture, cooperation, and coordination for all units ranged from 0.72 to 0.97, with an average between 0.81 and 0.88. We also examined between-unit differences using the intra-class correlation coefficient (ICC). The ICC (type 1) estimates the proportion of total between-group variance based on random intercepts. Estimates are generally 0.20 or lower (Bliese, 2000).

In our sample, the ICC estimates for between-unit differences in conjunction with the  $r_{wg}$  estimates for within-unit similarities indicated meaningful score composition as unit-level membership explained significant total variance. Table III shows the ranges and averages of these  $r_{wg}$  coefficients and the ICC estimates.

Table IV presents unit-level descriptive statistics, intercorrelations, and scale reliabilities. These results are highly consistent with past research (Cooke and Szumal,

	Structured interviews		
	Cooperation ( $n = 2,298$ )	Coordination ( $n = 2,350$ )	Unit performance ( $n = 2,301$ )
Cooperation	0.197*	-0.072	0.143*
Coordination		0.302**	0.135
Unit performance			0.243**

**Table II.**  
Quantitative measure and structured interview correlations

**Notes:** \* Significant at  $p < 0.05$ ; \*\* significant at  $p < 0.01$

	Min	$r_{wg}$ Max	Mean	ICC (95% confidence)		
				Lower	Upper	Coefficient
Constructive culture	0.730	0.910	0.830	0.211	0.275	0.241
Cooperation	0.750	0.970	0.880	0.056	0.165	0.107
Coordination	0.720	0.940	0.810	0.147	0.231	0.186

**Table III.**  
Within-group consistency and between-group analysis for

**Note:**  $n = 302$

	Mean	SD	1	2	3	4	5
1 Constructive culture	3.56	0.32	<i>0.92</i>				
2 Culture intensity	0.57	0.18	-0.41	n/a			
3 Cooperation	3.50	0.23	0.19	-0.19	<i>0.84</i>		
4 Coordination	3.08	0.51	0.50	-0.30	0.24	<i>0.80</i>	
5 Unit performance	4.14	0.47	0.50	-0.27	0.39	0.59	<i>0.90</i>

**Table IV.**  
Unit-level descriptives, intercorrelations, and scale reliabilities

**Notes:** All correlations significant at  $p < 0.01$ ; reliabilities appear italicised along the diagonal;  $n = 302$

2000; Glisson and James, 2002). Finally, we modeled the statistical operationalization of intensity after the operationalization of strength in climate research, which uses the inverse of the standard deviations of scores within units (Schneider *et al.*, 2002).

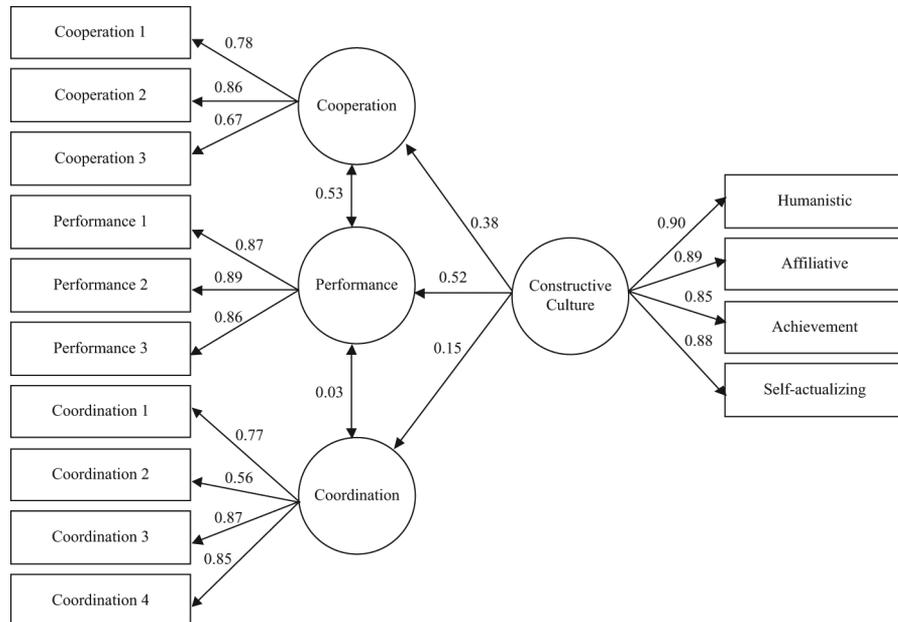
*Main analyses*

Figure 2 presents structural and measurement models used to assess *H1*, *H2*, and *H3* with standardized parameter estimates ( $\beta$ ) and factor loadings for multiple indicators. We used structural equation modeling (SEM) to assess relations between unit-level culture, cooperation, coordination, and performance. The unit-level distributions were mean-centered and approximated multivariate normality. We also estimated non-causal relations between cooperation, coordination, and performance.

We obtained an  $\chi^2/df$  ratio (125.2/71) of 1.76 to indicate that the model reflected the sample data (Byrne, 1998; Carmines and McIver, 1981; Marsh and Hocevar, 1985). The model explained 93 percent of the total variance while assessing hypothesized relations. The average factor loadings of the measurement model were 0.87 for culture and unit performance; 0.77 for cooperation, and 0.76 for coordination.

Table V reports several indices to facilitate thorough evaluation of model fit and several indices that help detect index bias. For example, root mean square residual estimates are sensitive to specified factor covariance structure, whereas estimates of root mean square error of approximation are sensitive to specified factor loadings (Hu and Bentler, 1999). In light of our examinations of all these indices, the observed model fit was clearly acceptable based on conventional criteria (Byrne, 1998).

Table VI reports the  $\beta$  weights for relations between culture and outcomes in terms of unstandardized parameter estimates and standard errors. All estimates were



**Figure 2.** Structural and measurement models with standardized parameter estimates

**Note:** *N* = 274; *df* = 71

significant at  $p < 0.001$  except for culture's relation with coordination ( $p = 0.015$ ). The correlation between coordination and performance was not significant ( $p = 0.03$ ) whereas the correlation between cooperation and performance was significant ( $p = < 0.001$ ). These results provide support for *H1*, *H2*, and *H3*.

We executed a hierarchical regression analysis to assess the effects of culture intensity concurrently as a main effect and a moderator. While undertaking these analyses we observed standard criteria for tests of moderation (Baron and Kenny, 1986). At the first step,  $\Delta R^2$  results replicated the culture effects on outcomes obtained in the SEM analysis. At the second step, intensity exhibited a main effect on cooperation and coordination, thus providing support for *H4* and *H5*.

The final step of our hierarchical regression for the interaction term did not explain significant incremental variance ( $\Delta R^2 > 0.05$ ). Though certainly not a hypothesized effect, such a null finding is congruent with the theoretically-derived expectation that intensity is not a significant moderator of relations between culture and form outcomes. Table VII summarizes these results.

Goodness of fit index	0.931
Adjusted goodness of fit index	0.912
Standardized root mean square residual	0.011
Root mean square error of approximation	0.053
Normed fit index	0.950
Non-normed fit index	0.971
Comparative fit index	0.978
Incremental fit index	0.978

Notes:  $n = 274$ ;  $df = 71$

**Table V.**  
Unit-level model fit

	Outcome	$\beta$	SE
Constructive culture	Cooperation	0.482**	0.086
	Coordination	0.285*	0.122
	Performance	0.525**	0.096

Notes: \* significant at  $p < 0.05$ ; \*\* significant at  $p < 0.01$ ;  $N = 274$

**Table VI.**  
Unstandardized parameter estimates and standard errors

		$\Delta R^2$	Incremental $F$	$p$
Cooperation	M	0.146	51.37 <sup>a</sup>	< 0.01
	SD	0.018	6.54 <sup>b</sup>	< 0.01
	Interaction	0.007	2.38 <sup>c</sup>	ns
Coordination	M	0.249	99.62 <sup>a</sup>	< 0.01
	SD	0.010	3.98 <sup>b</sup>	< 0.05
	Interaction	0.003	1.35 <sup>c</sup>	ns
Performance	M	0.246	97.62 <sup>a</sup>	< 0.01
	SD	0.004	1.74 <sup>b</sup>	ns
	Interaction	0.004	1.46 <sup>c</sup>	ns

Notes: <sup>a</sup>  $df = 1, 300$ ; <sup>b</sup>  $df = 1, 299$ ; <sup>c</sup>  $df = 1, 298$ ;  $N = 302$

**Table VII.**  
Hierarchical regression of performance outcomes on culture

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As Table II and Figure 2 both show, the results of the structured interviews matched the main analysis with respect to a cooperation and performance linkage. These data provide such evidence of construct validity in our study, to be sure, but they also provided uniquely valuable insights into the effects and limits of firm culture. For example, respondents not only provided answers that reflected the OCI and OEI scores for their organizational units, but they did so in ways particular to their organizational units. Our introduction cited the vital importance of qualitative data to culture research and we argued for it on conceptual and theoretical grounds. Here in our findings, the structured interview results exemplify this importance empirically in ways that formal analyses cannot. Whereas our rigorous quantitative approach delineated the essence of constructs by parsing true score and error variances, those findings lack capacity for capturing the particular natures of the firms being examined.

Cooperation and coordination were expressed in different ways depending on the context and, moreover, they related to performance in unique ways, too. For example, one case's structured interviews expressed cooperation in the usage of shared shop equipment when OEI cooperation was high, for instance. Respondents explained how and why cooperation mattered to performance of their particular firm. In this case, it was because cooperation and sharing shop equipment relates directly to the filling of product orders on time for clients.

Similarly, in service firms in our sample, the coordination between marketing and accounting and finance functions is important because some creative solutions undertaken by the marketing unit (e.g. purchased materials, software programs) are unduly expensive for one time usage. For example, in one case, a firm with low coordination scores pursued such solutions, clearly reflecting a non-constructive culture. In line with our quantitative findings, the action did not affect performance because the client received the deliverable. However, the lack of coordination between marketing unit and other units was seen as a function of the firm's culture and, although it did affect cooperation within the specific units, there was a clear coordination and culture linkage to put it in context.

These kinds of rich results and observations require some interpretation by researchers, which we provide in the next section. Yet, as objective results, these qualitative data and findings gave us a stronger and clearer perspective on construct validity. They made theoretically expected relations apparent to us in ways that would be impossible to appreciate if our research was solely quantitative.

### **Discussion**

Our findings supplement the understanding of firm culture in several ways that build on existing research and theory. Our results show that constructive culture raises levels of member cooperation within organizational units, levels of coordination between those units, and unit-level performance. In particular, the SEM results replicate past research on those relations using a large and heterogeneous sample of firms. Our study also contributes some extensions to past work. The hierarchical regression results, for instance, clarify the role of intensity in a way that is distinct to culture theory, as intensity yielded a main effect on cooperation and coordination. By contrast, climate strength, an analog of culture intensity, has been found to moderate such relations in climate studies (e.g. Schneider *et al.*, 2002).

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Our study contributes to distinct definitions of firm culture (Glisson and James, 2002). For example, cultural assumptions can be very subtle if members are not queried about them in an appropriate way (Mehri, 2005). Variance attributable to culture can therefore be attenuated if survey measures do not carefully compose those data (Saffold, 1988). Our study builds on these peculiar aspects of culture research in the hope that future research will continue to distinguish firm culture as a construct with appropriate empirical methods and not generate confusion by confounding it with analogous constructs such as climate (Ashkanasy, 2003).

Our research shows that ideational aspects are vital to culture and share a complementary relation with the phenomenal aspects of climate, as shown in Figure 1. This complementarity, long cited in culture and climate studies, generates theoretically derived ramifications for empirical research. The effects of a culture's values on behavior are less immediate than the effects of climate-driven reactions to external events. Culture conveys essential ideals that are nascent only via sustained shared experiences. These day-to-day experiences of members are "low-fidelity" reflections of a firm's culture, and remain low in immediacy without specific references to the values and assumptions. Those specific references to culture often come from the firm's leadership or members with significant firm experience. By contrast, specific references to a climate can come from almost any member in a firm. This theoretic contrast matters to operationalizing and integrating empirical data. That is, as we illustrated in this study, culture research should explicitly incorporate a referent shift at the item-level.

The meso-level of an organization has dual acquaintance with ideational values and shared member experiences. Our study utilized this level of analysis on purpose, in order to best capture a referent-shift. Where the dominant unit of analysis the individual or the macro-level organization itself, referent shift operationalization would have masked important differences across units that matter to today's firms.

As an aside, it is worth acknowledging here that shared culture perceptions have long been referred to as "intensity" (Rousseau, 1990). That term is more appropriate and distinct to culture theory. "Strength" is a common statistical term anyway, as it is so commonly used to refer to other phenomena, such as the strength of an effect or a relationship, which can create confusion. Moreover, intensity appears to indicate something substantially different than strength. To wit, our findings provide evidence that it is a functional variable with main effects on firm outcomes.

As we examined intensity's linkages with culture, cooperation, coordination, and performance, we found that it relates directly to cooperation and coordination, but not performance. We did not find intensity to moderate any relations between culture and outcomes. We posit on theoretic and empirical grounds that culture intensity influences firm outcomes directly, not interactively. This finding clarifies the effects and limits of culture intensity as it helps distinguish it from climate strength.

Our findings regarding culture intensity shed light on firm relations with the external environment. That is, external conditions can and do influence internal operations and firm performance. However, when a firm culture is intensely held by an organization's members, the culture itself can begin to substitute for the external environment from the perspective of members. Of course, the quality of the interface between firm culture and external culture is important to this dynamic. Our observations when presenting our results, concerning the value of qualitative data in

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culture research, are vital to this consideration. Firm culture is deeply rooted and inimitable; it is particular to a given firm based on that firm's unique structures, strategies, and other organizational elements. To delineate its interface with the external environment, we argue strongly for culture research to always include qualitative data as a useful means to round out any findings based on quantitative data. Indeed, every firm may be unique, but so are every firm's competitors, customers, and the myriad other factors that compose a given firm's environment and situation.

Finally, our study also offers some practical implications for managers in organizations. Of course, managers and leaders already use healthy cultures to promote cooperation and coordination. However, we show that shared perceptions of culture directly affect cooperation and coordination. Managers and leaders may find it useful to frequently refer to their firm's culture. It is not only management decisions that can reflect and promote a firm's values, but also the maximization of awareness and the cultivation of shared perceptions through communication between leaders and members.

#### *Implications and future research*

Our study clarifies theoretic boundaries of firm culture and the effects and limits of intensity as an antecedent of cooperation, coordination, and performance. Our findings offer insights into how to utilize culture in as a strategic weapon in organizational settings. For practicing managers, such insights clarify what focus to on during times of uncertainty. For instance, the shared values that define firm culture can add meaning to member activities undertaken as they perform their jobs. Managers that routinely express those cultural values when communicating with members reinforce the shared and clarify the meaning of member experiences. An intense firm culture can thus account for the difference between an organizational unit that stays cohesive and focused versus one that fractures when the external environment shifts. From a strategic management perspective, the fact that culture intensity tends to have a direct effect on cooperation and coordination has clear practical implications. For one, it can help a firm weather periods of upheaval. But just as well, it can help a leader justify a needed strategic pivot when there is not a clear environmental reason for one.

Given that culture associates mostly with unit-level outcomes, a focus on the meso-level helps delineate linkages with other organizational elements. These delineations can help direct managerial attention amidst uncertainty. Such implications hold promise for elaborating the role of culture and delineating its linkages with performance. The findings of such future research may help explain why some kinds of structures align with certain kinds of cultures. Future research will also delineate how culture drives performance only if combined with certain strategies. For example, variables of structure (e.g. degree of hierarchy) or strategic purpose (e.g. growth orientation) may yield joint effects on the relation between culture and performance that are traceable at organizational and meso levels, but not micro or macro levels.

Culture research ought to operationalize culture in ways that do not rely on *post hoc* aggregation of scores, but instead on careful reference to firm assumptions as being distinct from pure member perceptions in order to achieve a clear referent shift. For instance, members could discuss culture values in a referent shift contexts before completing a culture measure collaboratively to develop a truer unit score. Such an

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innovative approach would blend qualitative and quantitative data, thus sharpening generalizability with heuristic depth. It would also better reflect the rigor of the anthropological research that is basic to culture theory, which we reviewed in the introduction. Such methods could control for level of agreement with greater fidelity than conventional operationalizations of intensity. Reflecting the logic of Figure 1, such research would support the development of hybrid models of firm countercultures in which shared experiences drive emergent norms that rebound against a firm's strategy or structure. The studies would also enjoy the affordances of specifically noting organizational level or positional longevity of members, as those variables account for better appreciation of the evolutionary aspects of a firm's culture.

As noted in the introduction to this paper, our findings suggest implications for the importance of linkages between the external environment and the internal works and performance of firms and the organizational units within them. Like a firm itself, a culture is not divorced from the larger context in which it is embedded. In our study, these linkages were most apparent via the structured interview data, which allowed participants to describe particular actions and elements in specific terms. Such descriptions include external elements, like customers and competitors, which make a firm and its context distinct and unique.

Some characteristics of our sample enabled us to avoid certain methodological issues. For instance, the noted turbulence of culture relations with unit-level outcomes is liable to frustrate results based on small samples (Sørensen, 2002). Our study sample was large. We undertook multivariate methods, combined with our large sample, to mitigate random and systematic error variances. Our SEM approach utilized multiple indicators to allow examination of the structural model while parsing out method variance via the measurement model. However, aspects of our study warrant some caution when interpreting our findings. A cross-sectional research design is less fitting than a true longitudinal one that allows better detection of causality. Such studies are appropriate for culture research, as they take larger stock of a firm's novel values. Multiple measurement points offer greater empirical fidelity and they also help determine if variable interrelations are stable across time. Finally, a cross-sectional research design is not very robust to spuriousness, which may have been a factor in the results for the performance outcomes in our study. We sought to mitigate such sources of error with a large heterogeneous mix of firms and organizational units in our sample. We intend for our contribution to fuel distinct new questions and lines of inquiry in culture research and theory.

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