Divergence amidst Volatility: Cultural Fragmentation and the Dynamics of Organizational Culture *

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Abstract

Some organizational cultures become increasingly fragmented when consensus among members about the norms and beliefs guiding work breaks down. Given the benefits of cultural cohesion for coordination and productivity, cultural fragmentation can dampen firm performance and have deleterious effects on member morale and well-being. Yet, the determinants of cultural fragmentation and the broader dynamics of how organizational cultures change over time are poorly understood. When is cultural fragmentation in organizations most likely to emerge? Building on schema- and norm-based cultural models suggesting that divergent interpretations and behaviors among individuals can result in fragmented cultural beliefs, this paper proposes that such divergence is more likely when organizations exhibit increasingly volatile performance. Members can exhibit varied interpretations and behavioral responses during these volatile, uncertain, and highly ambiguous periods. Support for this proposition is found using a language-based model of organizational culture derived from employee reviews on the career intelligence website Glassdoor, which facilitates measuring cultural fragmentation over time for a diverse sample of nearly 500 publicly-traded firms. The implications for understanding the origins of cultural fragmentation, the dynamics of organizational culture, and the relationship between culture and firm performance, are discussed.

Keywords: culture, organizations, cultural sociology, social norms

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Central to many conceptions of culture in organizations and societies is that meanings and beliefs are *shared* among members, resulting in a *cohesive* culture that unifies individuals around a common social order (Berger and Luckmann, 1966; Eliasoph and Lichterman, 2003). The degree of cohesion, or the extent to which individuals subscribe to a common set of beliefs and hold similar normative expectations, is a central factor delineating "stronger" cultures from "weaker" ones. Stronger, more cohesive cultures feature powerful norms and belief systems that exert considerable influence on individuals' cognition and behavior, while weaker, more fragmented cultures have looser norms that are not broadly endorsed by most individuals, and thus have limited impact on thought and action (Chatman and O'Reilly, 2016; Gelfand et al., 2011). While the implications of cultural cohesiveness are broad, research focusing on contemporary organizations generally finds benefits of cultural cohesion for firms in facilitating coordination among individuals and enhancing the commitment and motivation of organizational members.

But despite the benefits of cultural cohesion for organizations, some organizational cultures become increasingly fragmented when the unified social order breaks down. Martin's (1992) study of a large, multinational corporation revealed that at times the organization's culture exhibited evidence of integration and cohesiveness, but at other times appeared highly fragmented as members exhibited disagreement about the norms and beliefs guiding work and behavior within the company. Organizational life is replete with stories of cultures in seeming disarray, wherein previously strong, cohesive cultures experience increasing fragmentation (Cameron and Quinn, 2011), giving rise to an industry of business gurus selling the keys to cultural transformation and revitalization. Yet, the determinants of cultural fragmentation and the broader dynamics of organizational culture are poorly understood. Under what conditions should we expect the emergence of cultural fragmentation in organizations?

Prior work leaves researchers with an impoverished understanding of the dynamics of cultural fragmentation and organizational culture more broadly. One factor contributing to the lack of progress is that the most common method of measuring cultural cohesiveness versus fragmentation

in organizations - member surveys - is ill-equipped for tracking cultural fragmentation over time for a broad, diverse sample of organizations. The lack of large-scale longitudinal data on cultural fragmentation has prevented researchers from resolving important theoretical ambiguities, one being the potentially endogenous relationship between cultural fragmentation and performance outcomes in organizations and other social groups. For example, Sørensen (2002) shows using cross-sectional data that firms with weaker, more fragmented cultures exhibit more volatile performance. However, he acknowledges the possibility of reverse causation if cultural fragmentation increases when the firm is performing more haphazardly than usual, a context that may make it more difficult for members to achieve consensus about the beliefs and behaviors guiding work and bolstering performance.

Additionally, this empirical limitation is accompanied by a deeper theoretical problem. Extant work often assumes that cultural fragmentation is a static construct that is fixed early in an organization's life (O'Reilly et al., 2014; Baron and Hannan, 2002; Johnson, 2007), and that relative cohesion is sustained by cultural socialization and transmission processes that are unwavering and decontextualized from individuals' interpretations and behaviors (Harrison and Carroll, 2006). In contrast to this assumption of cultural stasis and persistence, this paper argues that a more dynamic, emergent model is needed in order to understand how cultural cohesion could break down and fragmentation could arise within organizations. Corporate culture research has largely neglected a growing perspective in cultural sociology and psychology (sometimes referred to as a "cultural fragmentation" perspective (Vaisey and Lizardo, 2016)) which proffers that not only are shared normative ideas and beliefs cultivated through enculturation and interpersonal transmission, but also fostered from the bottom-up when individuals interpret their environments and behave in similar ways (DiMaggio, 1997; Morris et al., 2015). As such, the development and maintenance of shared cultural conventions in social groups can be stymied when members diverge in their interpretations of environmental cues and behave differently.

Building on Sørensen's (2002) speculation, this paper proposes that cultural fragmentation is more likely when firms experience increasingly volatile performance, precisely because cognitive

and behavioral divergence is more prevalent during such uncertain, ambiguous, and "unsettled times" (Swidler, 1986). Such divergence can manifest during periods of heightened performance volatility through a number of conceptually distinct mechanisms, with important implications for understanding the origins of cultural fragmentation, the dynamics of organizational culture, and the complex relationship between culture and group performance outcomes.

I test the link between firm performance volatility and divergent cultural beliefs using a novel, language-based measure of cultural fragmentation in organizations (Corritore et al., 2019). The measure is constructed using a common natural language processing tool that identifies cultural content in employee reviews of nearly 500 publicly-traded firms on the career intelligence website Glassdoor.[1] This method analyzes the language that employees use when describing their organization to others to measure the level of disagreement among employees about the norms and beliefs guiding work within the firm, and allows me to collect longitudinal data on cultural fragmentation for a large, diverse sample of organizations. I find support for the core proposition.

CULTURAL FRAGMENTATION

Culture is commonly defined as a system of shared meanings that forms as a social group works to integrate members and overcome the challenges of adapting to the external environment (Pettigrew, 1979). Such meanings include deeply-held, often implicit assumptions about the world and the nature of reality, as well as more explicit normative conventions, expectations, behaviors, and beliefs (Schein, 2010). Prior research has explored how individuals perceive, subscribe to, and behave in accordance with elements of the broader culture in which they are embedded (O'Reilly, 1989; Van Maanen, 1991; Srivastava et al., 2017).

Most conceptions of culture in organizations and broader societies emphasize that what makes culture a supra-individual phenomenon is that meanings are shared among individuals, such that

[1] Accessible at https://www.glassdoor.com.

members hold common beliefs, share value orientations, and recognize and adhere to similar norms and expectations. For example, American society can be understood as cohering around ideals of individualism (ex. "pull yourself up by your bootstraps"), freedom, and political liberalism (Lipset, 1990), ideas that are purportedly recognized and broadly endorsed by its members. Similarly, employees of Southwest Airlines are thought to recognize, subscribe to, and behave in accordance with a set of common ideas about the most appropriate and effective ways to approach work within the company: bring a fun-loving attitude to work, dedicate oneself to outstanding and unique customer service, treat fellow employees like family, etc.[2] Organizations strive to maintain cultural cohesion by selecting members perceived as compatible with and willing to embody ideas and beliefs central to the organization (Rivera, 2012), and by engaging in socialization efforts to communicate consistent cultural messages and inculcate employees (Kunda, 2009).

However, cultures need not be highly cohesive, and can instead be characterized as more or less fragmented. Debate continues over to what extent the United States has in recent decades devolved from a nation of unity to one of fragmentation and contestation along a variety of cultural dimensions (Gelman, 2009; Fischer and Mattson, 2009). Discourse proclaiming consensus around core American values may mask substantial heterogeneity in opposing cultural logics, such as liberalism, republicanism, and ethnoculturalism, that individuals employ to understand the country (Smith, 1999). Different demographic and ideological groups in the United States exhibit divergent attitudes and views, not only surrounding contentious political and moral issues (Baldassarri and Gelman, 2008), but also with regards to seemingly innocuous habits and tastes that can nonetheless reinforce deeper cultural divisions and in some cases undermine cooperation and collective action (DellaPosta et al., 2015).

Similarly, some organizational cultures are more fragmented than others. For example, Southwest Airlines' competitors have purportedly struggled to unite their employees around a set of widely-shared normative beliefs and attitudes about work, and as such have failed to mitigate the

[2]https://careers.southwestair.com/culture

competitive advantage that Southwest enjoys on account of its cultural cohesion. While many contemporary companies claim that employee behavior is guided by shared cultural principles such as innovation and integrity, these proclamations generally fail to predict differential outcomes at the firm level, casting doubt as to whether these cultures are as cohesive as advertised (Guiso et al., 2015).

Influential theoretical perspectives on culture and social action have delineated stronger, more cohesive cultures from weaker, more fragmented ones based on the extent to which individuals think and act in accordance with a common set of beliefs and normative expectations. Notably, Gelfand and collaborators have pursued a broad-ranging research program examining the role of cultural "tightness" versus "looseness" in structuring the influence of norms and belief systems on various facets of behaviors in different social settings (Gelfand et al., 2011; Gelfand, 2018). Whether at the societal or organizational level, tight cultures are highly cohesive in that normative ideas are widely acknowledged and strongly influence thought and behavior, such that deviance is severely punished. Gelfand and company argue that these strong norms developed as social coordination devices to help collectives survive recurrent environmental threats. In contrast, loose cultures feature weak and less prominent and constraining social norms, and nonconformity is common and tolerated.

In management literature, variance in cultural cohesion versus fragmentation is incorporated into the concept of cultural strength. Organizations with strong cultures feature norms and values that are widely shared and strongly held among members (O'Reilly and Chatman, 1996). The degree of consensus among members about important norms and values is a central factor delineating stronger and weaker organizational cultures. This emphasis on interpersonal cohesion versus fragmentation is reflected in common measures of cultural strength. Most prominently, the Organizational Culture Profile (OCP) survey identifies strong culture organizations as those in which members sort a set of general norm statements similarly to their peers, indicating more agreement about the norms that are most versus least characteristic of the company (O'Reilly et al., 1991; Chatman and Jehn, 1994).

In distinguishing organizational cultures that are more or less fragmented, it is important to note that cultural fragmentation in terms of competing beliefs about how work is done in an organization is not synonymous with heterogeneity along other lines, such as race, gender, or functional expertise. Independent of other types of heterogeneity or diversity, an organization can be more culturally cohesive or more culturally fragmented in the extent to which members exhibit agreement or disagreement about how work is or should be done. Indeed, heterogeneous attitudes are more correspondent with demographic differences early in a group's life, but later decouple as cultural conventions develop (Harrison et al., 1998).

WHY CULTURAL FRAGMENTATION MATTERS

Cultural fragmentation can be understood as members having divergent views or beliefs about how work is or should be done within the organization, such that the organization lacks widely shared norms of common and appropriate behavior. Consider Martin's (1992) study of a large, multinational organization. She found that employees recognized that the company espoused commitments to egalitarianism, innovation, and employee well-being. Nevertheless, she uncovered substantial evidence of fragmentation in the extent to which members subscribed to these characterizations of the organization, with many disagreeing about whether the company lived up to these ideals in the way work was actually organized and executed. Martin's research was landmark in revealing that organizations can be sites of active cultural contestation and fragmentation as individuals work to evaluate cultural ideas vis-á-vis their own interpretative frames and unique experiences (cf. DiMaggio, 1997). Studying cultural fragmentation is consistent with a distributive approach to culture research, which focuses on understanding how heterogeneity in cultural beliefs impacts behavior in organizations independent of the content of specific beliefs (Harrison and Carroll, 1991; Corritore et al., 2019).

While cultural cohesiveness versus fragmentation in social groups has broad implications, re-

search focusing on formal organizations generally finds benefits of cultural cohesion for firms in facilitating coordination among individuals (Chatman and O'Reilly, 2016; Fiol, 1994). Work in this vein posits that shared cultural conventions often serve to facilitate interaction and enhance coordination among group members, and that divergent beliefs and norms lead to inefficiencies and confusion (Weber and Camerer, 2003; Crémer, 1993). For example, compared to two employees following similar norms, an employee working according to norms of speed, autonomy, and a willingness to make mistakes will not coordinate as well with a colleague working in accordance with norms emphasizing deliberateness, caution, and precision.

Correspondingly, organizations with more fragmented cultures are thought to be at a performance disadvantage relative to firms with more cohesive cultures, as exemplified most prominently by work investigating the relationship between cultural strength and performance outcomes (Sørensen, 2002; Denison and Mishra, 1995). The interpersonal disagreement characteristic of more fragmented cultures is thought to inhibit coordination by leading to goal misalignment (Kreps, 1996) and behavioral inconsistency (Gordon and DiTomaso, 1992), reducing the quality and efficiency of organizational processes. Moreover, exerting social control over members may be more difficult and costly in culturally fragmented organizations (O'Reilly and Chatman, 1996). Strong cultures may also provide companies a sustained competitive advantage because complex cultural systems may be difficult capabilities for competitors to replicate (Rivkin, 2000).

In addition to dampening performance at the firm level, culturally fragmented organizations are also thought to be less effective at fostering member commitment and motivation, which can lead to personal estrangement and interpersonal conflict (Jehn et al., 1999; Schneider et al., 2013; Martin, 1992). Recent work finds that cultural cohesion with ones workplace peers can boost individual achievement, especially for members with less advantageous social network positions (Goldberg et al., 2016), and is associated with reduced turnover (Srivastava et al., 2017).

While some suggest that cultural fragmentation might benefit firms operating in more dynamic environments by aiding organizational learning and change (Lant et al., 1992; Denison, 1984), em-

pirical support for these propositions is weak. For example, Sørensen (2002) theorized that the negative effects of cultural fragmentation on firm performance are mitigated in volatile industry environments, but he ultimately found unclear evidence for this assertion. Concordant with prior work, Corritore et al. (2019) find that cultural fragmentation negatively impacts firm performance, but it is organizations whose members agree about a broad, diverse set of cultural ideas that exhibit both profitability and a greater capacity for creativity and innovation. All in all, the available evidence suggests that cultural fragmentation poses a real problem for organizations trying to foster coordination among members and bolster motivation and satisfaction.

THE DYNAMICS OF CULTURAL FRAGMENTATION

Despite the dangers of cultural fragmentation, when and why organizational cultures might fragment over time is poorly understood. The little empirical work examining organizational culture longitudinally emphasizes culture's persistence by focusing on the relative stability of the content of specific norms or logics. For example, organizational ecologists find that founders establish organizing blueprints denoting how the organization selects, motivates, controls, retains, and coordinates work among members, and that these models lock-in behaviors, structures, and policies that persist even after the founder departs (Baron and Hannan, 2002; Baron et al., 1996, 1999). Core norms and values established early in an organization's life are thought to be relatively invariant and reflective of founding members' predispositions and/or environmental conditions at the time of founding (O'Reilly et al., 2014; Johnson, 2007).

However, culture is rarely static (Kotter and Heskett, 1992), and there is some evidence that organizational cultures can fragment such that consensus among members about the most important beliefs and norms guiding work breaks down. One form of fragmentation is when the lived reality of work in the organization starts to diverge from the cultural ideas trumpeted by top leaders. Martin (1992) found that at times the organizational culture seemed unified around espoused norms

and beliefs supporting equalitarianism, innovation, and employee well-being, while at other times some members expressed serious doubts as to whether these normative ideals actually captured real attitudes and behavior within the organization. Similarly, Pamphile and Ruttan (2017) find variance in the correspondence between the cultural values that organizations proclaim and the values reported by employees on the ground in anonymous comments. Additionally, Cameron and Quinn (2011) uncovered evidence of cultural fragmentation and dynamism while studying Meridian Bancorp. The company originally developed a cohesive culture with a clan-like, family ethos, but the culture later fragmented when members exhibited disagreement over whether this ethos remained as behavior within the organization became more competitive and results-driven.

Others have argued that organizational cultures somewhat predictably oscillate between states of relative cohesion and fragmentation (Bartunek, 1984). For example, Jönsson and Lundin (1976) characterize cultural conventions as "myths" that facilitate integration and action, but which are later questioned during ambiguity-inducing crises. Similarly, Martin (1992) suggests that environmental jolts can produce confusion, uncertainty, and ambiguity within organizations, provoking cultural differentiation and fragmentation.

Organizational life is replete with other stories of cultures in seeming disarray, wherein cultural cohesion seemingly devolves into fragmentation. For example, Aetna's historical cultural focus on a concern for patients and employee pride purportedly lost salience and eroded in the late 1990s, especially when the company pivoted towards managed care practices designed to reduce claims costs. Despite recognition that "cultures do evolve over time–sometimes slipping backward, sometimes progressing" (Katzenbach et al., 2012), researchers have little to offer about the determinants of fragmentation and the broader dynamics of organizational culture.

One reason for the paucity of theoretical development on cultural dynamics is that quantitative studies have relied on costly and unwieldy survey methods, making it difficult to track cultural changes over time for a large, diverse sample of organizations. For example, one of the most prominent survey instruments, the Organizational Culture Profile (OCP), has helped produce important

insights about person-organization cultural fit (O'Reilly et al., 1991), culture and firm performance (O'Reilly et al., 2014), and cultural differences within and between industries (Chatman and Jehn, 1994). However, it is time-consuming and complex to administer, requiring multiple members from each organization to sort a set of 54 norm statements. Consequently, studies using it typically rely on a relatively small sample of organizations and measure culture at only one point in time (ex. O'Reilly et al., 2014). Other survey-based measures suffer from notable limitations as well. For example, (Kotter and Heskett, 1992) developed a cross-sectional cultural strength measure for firms in different industries, but strength is assessed only indirectly based on outsiders' perceptions (Burt et al., 1994; Sørensen, 2002).

But more importantly, stagnation in efforts to understand the dynamics of organizational culture is also due to a deeper theoretical problem. Research on corporate culture overwhelming adheres to a static conception of culture, which predicts that an organization's observed level of cohesion versus fragmentation will be highly persistent over time (Kotter and Heskett, 1992; Harrison and Carroll, 2006; O'Reilly et al., 2014). Cultural stasis is maintained through the matching of persons to organizations based on cultural fit (O'Reilly et al., 1991; Rivera, 2012), and the reliable transmission and maintenance of cultural beliefs via socialization and enculturation processes (Harrison and Carroll, 2006). Culturally cohesive organizations are presumed to devote more resources to or be more effective at selecting compatible members and/or enculturating (Sørensen, 2002).

This conception is not without merit; it accurately captures our understanding, for example, about how organizational cultures maintain some semblance of stability amidst member turnover due to newcomers' susceptibility to enculturation (Harrison and Carroll, 1991). However, assumptions underlying this perspective about how organizational members acquire and maintain cultural beliefs make it difficult to account for cultural dynamics, such as the emergence of increased cultural fragmentation. For instance, this static model assumes that cultural beliefs primarily trickle down from leaders through peers, and that members passively acquire and internalize these beliefs but never question or deviate from them. In this way, it is akin to older theories of cultural inter-

nalization that treat individuals as "cultural dopes" who unquestioningly assimilate towards the dominant cultural orientation of the broader social group (Garfinkel, 1967; Talcott, 1951).

A major problem with this static conception is that it predicts that cultural systems at the macro-level will be static and self-replicating, which is difficult to reconcile with the rapid cultural changes commonly observed in social groups (Morris et al., 2015; Weber and Dacin, 2011). As such, the assumption that organizational members are passive receptors of cultural ideas has been criticized by sociologists studying culture and cognition (Swidler, 1986; DiMaggio, 1997; Srivastava et al., 2017; Lu et al., 2018; Mobasseri et al., 2017; Koppman et al., 2016), and psychologists studying cultural dynamics in collectives through the lens of social norms (Morris et al., 2015; Chiu et al., 2010). Instead of passively acquiring fixed beliefs, individuals in social systems are increasingly seen as active agents who interpret stimuli and construct action using their varied and complex cultural repertoires, and who quickly develop new attitudes and behaviors in accordance with their shifting perceptions of others.

FROM CULTURAL STASIS TO DYNAMISM

There is growing evidence across disciplines that cultures at more macro-levels can change as a result of individuals' varying interpretations of salient events and behaviors at a more micro-level (Morris et al., 2015; DiMaggio, 1997; Swidler, 1986). In contrast to "oversocialized" accounts, which portray individuals as passive receptors of enculturation who uniformly internalize beliefs transmitted via peers, a more dynamic perspective posits that individuals can exhibit highly variable cultural responses based on the particular cognitive lenses through which they notice, observe, and interpret events and behaviors around them. In this way, the degree of stability or change in individuals' cultural beliefs is attributable to both the schematic organization of cultural representations in their minds, as well as the nature of cues emanating from the social environment that can trigger variable cultural responses (DiMaggio, 1997). Importantly, this dynamic perspective offers a prediction

about when cultural fragmentation is most likely to emerge in organizations: cultural fragmentation can develop when members exhibit divergent interpretations of salient events and/or are exposed to divergent behaviors.

Findings from two research streams suggest that increasingly divergent interpretations and behaviors presage cultural fragmentation in organizations. The first is constructivist or schema-based theories that focus on the multiplicity of cognitive lenses that individuals can use to interpret and make sense of ambiguous environmental information (Leung and Morris, 2015). Perhaps most prominent is work on cultural toolkits, which posits that rather than acting in lockstep with deeply-ingrained, internalized cultural values, individuals interpret events and construct action using a variety of cultural "tools," or cognitively-accessible scripts (Swidler, 1986). Organizational members often exhibit considerable variation in the content and breadth of their toolkits, given that they intersect multiple institutional contexts each with their own cultural idiosyncrasies and orientations (ex. different institutions, professions, occupations, national and ethnic identities, other organizations, etc.) (Corritore et al., 2019). Schema-based theories suggest that individuals within an organization can exhibit varied responses to ambiguous environmental cues, attributable to differences in the content and structure of their accessible cognitive schema.

Consider Glynn's (2000) study of the Atlanta Symphony Orchestra strike. Cultural fragmentation surfaced in part because members with varying cultural toolkits interpreted the same event through different interpretative lenses. Ambiguity surrounding the causes of the organization's success prompted sharp disagreement among members over the organization's cultural identity – musicians interpreted the orchestra's success as attributable to a love of world-class music, while administrators saw it as contingent on strong marketing and sound financial management. Similarly, Zbaracki and Bergen (2010) found that the marketing and sales departments of a manufacturing firm held conflicting mental models about how to price products so as to maximize profit. During routine operations, the two departments successfully coordinated to make minor price adjustments, but this latent disagreement surfaced and undermined coordination when a major reduction in pro-

duction costs called for substantial pricing changes.

A second research stream focused on the dynamics of social norms suggests a complementary link between divergent interpretations and behaviors and cultural fragmentation. Intersubjective approaches argue that, especially during times of ambiguity, individuals' normative beliefs about common and appropriate attitudes and behaviors in a group arise increasingly from their perceptions of the thoughts and behaviors of other group members (Leung and Morris, 2015; Paluck and Shepherd, 2012). Like toolkit theory, this work asserts that individuals' cognitive representations are highly unstructured, which provides the opportunity for cues emanating from the social environment to play a prominent role in driving thought and behavior. Shared cultural conventions often emerge bottom-up as individuals notice, make inferences from, and are influenced by regularities in thought and behavior in their social environment (Zucker, 1977). Perceptions that behaviors are common makes members more likely to infer that such actions are also normatively approved by leaders and peers (Eriksson et al., 2015). In addition, behavior often begets the formation of cultural beliefs that are congruous with that behavior (Cialdini, 1993; Schlenker, 1982; O'Reilly and Chatman, 1986).

Take, for example, Turner and Rindova's (2012) examination of work among waste collection crews. They found that shared understandings among coworkers developed not through top-down socialization, but from the consistent performance of routines that led tacit agreements about how to coordinate work to emerge from the bottom-up. Interaction and behavioral consistency fostered strong collective norms.

The key insight is that divergent behavioral responses to ambiguous environmental cues can inhibit consensus about the norms and beliefs guiding work within an organization. Divergent behaviors prevent individuals from inferring, learning, and agreeing upon norms. Consider a hypothetical organization in which some teams react to ambiguous sales figures by focusing on increasing product differentiation, while others react by streamlining production processes to lower costs. These divergent reactions and ensuing behaviors would make it more difficult for members

as a whole to arrive at agreement about the normative ideals and behaviors that characterize the organization.

Taken together, these research tracks suggest a dynamic conception of organizational culture that can account for the emergence of cultural fragmentation. They are united by a common insight: environments or contexts featuring common interpretations and behaviors foster cultural cohesion, while those accompanied by or promoting divergent interpretations and behaviors foretell cultural fragmentation. But what do these lower-level processes imply about the systematic pattern of cultural fragmentation that we should expect at the organizational level? In other words, in what contexts would we expect the greatest potential for cognitive and behavioral divergence among organizational members? The following section unpacks this paper's core proposition: that the divergent interpretations and behaviors presaging cultural fragmentation are more likely when organizations experience periods of heightened performance volatility.

FIRM PERFORMANCE VOLATILITY AND CULTURAL FRAGMENTATION

Performance is not only an organizational outcome, but also an important input in many organizational processes (Greve et al., 2003; Beckman et al., 2004; Staw, 1975; March and Sutton, 1997). Prior work shows that performance volatility, or highly variable performance over time, is associated with decision makers' perceptions of uncertainty (Lang and Lockhart, 1990; Bourgeois, 1985), and that organizations attend to such signals by attempting to reduce uncertainty (Thompson, 1967; Hannan and Freeman, 1984). For example, Beckman et al. (2004) operationalize the uncertainty facing organizations using firm-specific performance volatility, and find that volatility is predictive of firms broadening their interorganizational networks. Following in this tradition, this paper proffers that firm performance volatility is also predictive of cultural fragmentation. All else equal, I expect that individuals within a firm that is performing more variably will on average exhibit more cognitive and behavioral divergence than individuals within a firm performing more reliably.

Sørensen (2002) speculated that cultural fragmentation could be in some way related to performance volatility, suggesting that it may be more difficult for members to achieve consensus about key norms and values relating to what the firm does and the reasons for its success when the firm is performing in a volatile manner. This reasoning echoes Schein's (1990) work on the emergence of organizational culture, in which he theorizes that shared cultural conventions form as an organization learns how to solve problems related to internal cohesion and external adaptation. He writes, "Only those beliefs and values that can be empirically tested and that continue to work reliably in solving the group's problems will become transformed into assumptions" (pp. 26). Importantly, consistent performance feedback is key – "When a solution to a problem works repeatedly, it comes to be taken for granted. What was once a hypothesis supported only by a hunch or a value, gradually comes to be treated as a reality" (pp. 27-28). Just as performance volatility may inhibit a firm's ability to learn how to survive and grow because feedback is seemingly noisy and inconsistent, a similar logic may apply to cultural adaptation: if performance feedback is noisy (i.e. highly variable), then there may be inconsistent cultural responses, and the development of shared cultural norms could be undermined.

I argue that firm performance volatility could be associated with increasingly divergent interpretations and behaviors through at least three conceptually distinct, but not necessarily mutually exclusive, channels. First, periods of increased performance volatility often reflect times of heightened ambiguity and uncertainty about the organization's ability to adapt to its environment and the efficacy of current organizational processes (Beckman et al., 2004). Ambiguity exists when events or situations can be interpreted in multiple ways, and manifests when different people develop competing interpretations of the same phenomenon (Weick et al., 2005; Weick, 1995). For example, Srivastava (2015) studied a highly ambiguous organizational restructuring that was interpreted differently across individuals. Ambiguity can prompt individuals with varying cultural toolkits to exhibit divergent interpretations that result in disparate behaviors.

The ambiguity that members experience during periods of heightened firm performance volatil-

ity is akin to Swidler's (1986) notion of "unsettled times," or periods of social upheaval that feature competition between competing cultural ideologies. Periods of increased volatility can also function as environmental jolts that surface latent tensions in peoples' belief systems, akin to breaching experiments that illuminate differences in thought and behavior that go unnoticed during more routine periods (Bonikowski, 2016). Divergent interpretations of ambiguous environmental signals presaged cultural fragmentation in Glynn's (2000) aforementioned study of the Atlanta Symphony Orchestra strike. Similarly, ambiguous events can fragment cultural understandings if members call into question previously taken-for-granted elements of an organization's identity (Corley and Gioia, 2004; Ravasi and Schultz, 2006), or make interpretations using different cognitive frames (Kaplan, 2008).

Such arguments are broadly consistent with Martin's (1992) association between ambiguous contexts and the proliferation of a multiplicity of cultural attitudes and beliefs. She paints the world of contemporary organizations as filled with juxtaposing symbols, issues, and actions, which are often interpreted quite differently by different individuals. Cultural differentiation and fragmentation in her accounts are in part attributable to "inconsistent interpretations of cultural manifestations" (pp. 142).

The second channel by which firm performance volatility could be associated with increasingly divergent interpretations and behaviors is directly through the performance outcomes themselves. Volatile performance outcomes amount to noisy and ambiguous feedback about an organization's efforts to adapt to the external environment, outcomes which are subject to analysis and interpretation by organizational members (March and Sutton, 1997; Staw et al., 1981). For illustration, imagine an organization implementing a new strategic initiative, and experiencing volatile performance in the ensuing periods. Such ambiguous feedback makes it difficult for members to make sense of the efficacy of the initiative, and could lead members with diverse cultural toolkits to interpret the feedback in different ways, undermining cultural cohesion.

Lastly, increasingly volatile firm performance could reflect a breakdown in coordination or rou-

tine patterns of behavior within an organization. Coordination breakdowns are not synonymous with widespread dysfunction; internal changes such as entering a new market can impede coordination (Beckman et al., 2004). Nevertheless, such breakdowns are by definition characterized by divergent behavior which can undermine the development of strong norms.

Consider the multinational company that Martin (1992) studied. Egalitarian norms were widely shared early in the organization's life, as reflected in the firm's decentralized decision making processes. However, the organization shifted over time towards more top-down, hierarchical decision making, which led to coordination challenges as well as substantial disagreement over whether egalitarian norms continued to guide behaviors across the organization.

All in all, these arguments suggest that, relative to periods of more stable performance, periods of increased performance volatility should be associated with greater potential for interpretative and behavioral divergence and increased cultural fragmentation.

MAIN PROPOSITION: *Periods of heightened firm performance volatility portend increased cultural fragmentation.*

Evidence of this relationship would constitute an important first step towards understanding the origins of cultural fragmentation, a consequential phenomenon that received considerable attention when synthesized by Martin (1992), but one that has not been expounded upon theoretically or empirically. It would also pave the way for future work that probes the limitations of static conceptions of organizational culture in service of developing dynamic models that can account for systematic cultural changes over time.

A LANGUAGE-BASED MEASURE OF CULTURAL FRAGMENTATION

In operationalizing cultural fragmentation, this paper builds on a growing body of work that analyzes the language used by members as a way to study organizational culture (Corritore et al., 2019; Goldberg et al., 2016; Srivastava et al., 2017). It adopts a measure of cultural cohesion versus fragmentation used previously by Corritore et al. (2019) in their examination of how interpersonal and intrapersonal cultural heterogeneity impact firm performance. Consistent with the expectation that cultural fragmentation inhibits individual commitment and motivation and hampers interpersonal coordination, that paper shows that cultural fragmentation is associated with decreased firm performance as measured by return on assets.

The cultural fragmentation measure is premised on the idea that cultural signatures can be detected in the language that members of groups and organizations use (Bail, 2012; Gamson and Modigliani, 1989; Pinker, 2007; Cremer et al., 2007). By analyzing the linguistic content of employees' descriptions of their organization to others, natural language processing tools can identify cultural topics mentioned by each employee. Given a set of topics (ex. the culture is collaborative, the culture is entrepreneurial, etc.) that members use to characterize culture, cultural fragmentation is defined as the dissimilarity of topics mentioned across individuals within a given time period. An organization exhibits greater cultural fragmentation when individuals diverge in their characterizations of the culture.

This language-based measure takes advantage of the increasing amounts of review text written by employees on the Internet to measure cultural cohesion versus fragmentation longitudinally for a large, diverse sample of organizations, a task that is prohibitively time-consuming and expensive using surveys. An additional advantage is that the method does not require researchers to make potentially biased assumptions about which topics employees consider germane to culture. Instead, cultural topics are identified from employees' explicit cultural references, detailed in the method section below.

METHOD

Data Sources and Sample

The data include all organization reviews written by employees in the United States from January 2008 to July 2015 on the website Glassdoor. With an estimated 17 million unique users per month, Glassdoor is a prominent career intelligence website that attracts a diverse audience primarily as a job search platform. Employee's identities are authenticated by Glassdoor, but they otherwise remain anonymous, making the reviews less susceptible to bias related to employer retribution. Text reviews are either unsolicited or contributed by users in exchange for unlimited site access. Reviewers describe what it is like to work at the organization, and these characterizations capture employees' perceptions of the norms and beliefs that motivate work within the company. Figure 1 is an example review. These data are seeing increased use by researchers studying corporate culture (Corritore et al., 2019; Popadak, 2013; Moniz, 2016; Ji et al., 2017).[3]

The sample is restricted to: 1) publicly-traded companies that have available data in Compustat; and 2) firms with at least 50 employee reviews in one or more quarters so as to ensure that there are enough reviews to measure cultural fragmentation. A small number of reviews were later dropped from this sample because they did not contain at least five words that were weighted by the topic model used to identify cultural topics. Only firm/quarters with at least 25 reviews were used in the analysis. The analytical sample contains 512,246 reviews across 492 organizations. All predictors are lagged by one quarter to partially alleviate concerns of reverse causality.

Measures-Dependent Variable

Constructing a measure of cultural fragmentation involves three steps: 1) training a topic model to identify a set of cultural topics across all reviews on the site, 2) fitting that model to reviews in the

[3]Notably, Popadak (2013) found that the cultural characteristics of organizations described in Glassdoor review text are highly correlated with prominent survey-based methods of measuring organizational culture.

analytical sample to identify which cultural topics an employee is discussing in each review, and 3) measuring cultural fragmentation for each firm/period by calculating the dissimilarity of cultural topics mentioned by employees in reviews during that period.

A challenge in analyzing this type of free response text is identifying which content is germane to organizational culture. The goal is to identify the linguistic signatures of cultural norms and beliefs that characterize work within an organization. For example, an organization may emphasize deliberateness, caution, and precision over speed, autonomy, and a willingness to make mistakes. Employees describing such an organization are expected to use words and phrases that describe and expound upon these normative conventions.

Many prior methods of measuring organizational culture require researchers to a priori define a general set of cultural dimensions that are purportedly inclusive of the cultures of many firms (O'Reilly et al., 1991). In contrast, this method uses an inductive approach to identify those topics that employees across all firms in the data collectively consider germane to organizational culture. The key assumption made is that when employees write about corporate culture, they sometimes explicitly use the word "culture" or a synonym, and sometimes do not. Regardless, the presence of a culture synonym is a label that indicates a given phrase contains content relevant to culture.

First, a training dataset is constructed of the nearly one million sentences or phrases across all employee reviews on the Glassdoor website that contain the word "culture" or a synonym.[4] Each phrase is treated as a vector of unigram counts, or a "bag of words," which assumes that topical content can be identified from word frequencies regardless of word order (Blei et al., 2003).

A Latent Dirichlet Allocation (LDA) topic model is then used to identify a set of cultural topics observed in the text (see the appendix for technical details). The intuition behind LDA is that it identifies clusters of words that tend to co-occur in the same phrase across many different phrases, such that semantically meaningful cultural topics are identified based on the frequent co-occurrence of these word clusters. In accordance with Corritore et al. (2019), the LDA model

[4]The synonyms are environment, atmosphere, attitude, climate, value, philosophy, and belief.

is tuned to identify a set of 500 culture topics. Outputting a large number of topics ensures that conceptually meaningful distinctions between cultural topics are teased apart.[5] Alternate measures are highly correlated and the results consistent using different numbers of topics (i.e. 25, 50, 100, and 250). The appendix includes checks assessing the face validity of the identified cultural topics.

Next, the trained LDA model is fit to reviews in the analytic sample to identify the cultural topics discussed by employees. Based on unigram counts, each review is assigned a topic probability distribution that denotes the distribution of the cultural topics mentioned in the review. Figure A1 is a stylized illustration of this process. The LDA model predicts that two reviews with dissimilar topic probability distributions contain different cultural content.

Lastly, the dissimilarity of the cultural topics mentioned across employees for a given firm/period is assessed. Each review i is represented as a probability distribution p indicating the relative proportion of each cultural topic c estimated as present in the review text. Cultural fragmentation for a given firm/quarter is defined as the mean Jensen-Shannon (JS) divergence between the LDA probability distributions for all unordered pairs of reviews i, j for that firm/quarter, formally:

$$A = \frac{\sum_{i,j} JS(p_i, p_j)}{\sum_{i,j}}, \text{ for all } \{i, j \mid i < j\} \tag{1}$$

where the JS-divergence between the two probability distributions is defined as:

$$JS(p_i, p_j) = \frac{1}{2} KL(p_i, M) + \frac{1}{2} KL(p_j, M) \tag{2}$$

[5]Leading research on LDA models finds that, after some point, adding additional topics merely "nibbles away" at existing topics rather than fundamentally altering the topic distribution. Consequently, it is common practice to use more topics rather than fewer when identifying all relevant topics in a text corpus (Wallach et al., 2009, p. 8).

and where $M = \frac{1}{2}(p_i + p_j)$ and $KL(p_i, M)$ is the Kullback-Leibler divergence of M from p_i:

$$KL(p_i, M) = \sum_{c \in C} p_i(c) \log_2 \frac{p_i(c)}{M(c)} \tag{3}$$

JS-divergence is an entropy based measure that is particularly well-suited for measuring the distance between the sparse, power-law distributions that are typically observed in natural language processing (Corritore et al., 2019; Goldberg et al., 2016; Srivastava et al., 2017). Figure 2 estimates the distribution of the standardized cultural fragmentation measure, and shows that it is roughly normally distributed.

Measures-Firm Performance Volatility

Following prior work, I use firm stock price variability to measure firm performance volatility (Beckman et al., 2004; Bloom et al., 2007; Stein and Stone, 2013). Stock price is highly salient to organizational members because it reflects investors' assessments of companies' future earnings prospects and is related to decision makers perceptions of uncertainty (Lang and Lockhart, 1990). For each firm/quarter, variability over the past 12 months in the firm's monthly closing price is captured by calculating the coefficient of variation, and taking the natural log to account for skewness. The coefficient of variation is the ratio of the standard deviation of prices to the mean price.

Analytic Strategy and Estimation

I use firm fixed effect models to model within firm changes in cultural fragmentation, which control for time-invariant firm characteristics that could impact the association between performance volatility and cultural fragmentation. This is particularly important because there could be time-invariant cultural content, or particular norms or beliefs, that make some cultures more resistant to fragmentation than others. The sample of observations with complete data is highly unbalanced due to the availability of enough Glassdoor reviews to compute the cultural fragmentation measure over time. Consequently, all models are estimated on firms with at least three quarterly observations to ensure there is enough within-firm variance to estimate the fixed effects.

The models include several controls. The log of the number of employee reviews for a given firm/quarter is controlled for because the cultural fragmentation measure is sensitive to the number of reviews used to calculate it. Firm size is controlled for using the log of total assets, and the number of business segments in which the firm operates is included as a control to account for structural segmentation that could affect fragmentation. Performance level is also controlled for using return on assets and closing stock price. Finally, all models include year and quarter fixed effects.

RESULTS

Main Results

Tables 1 and 2 show summary statistics and bivariate correlations, respectively. Table 3 reports results that provide support for the core hypothesis: firm performance volatility is positively associated with cultural fragmentation across specifications. As expected, the cultural fragmentation measure increases with the number of Glassdoor reviews. Additionally, an increase in structural segmentation as measured by the number of business segments increases observed fragmentation.

The inclusion of additional controls has little impact on the firm performance variability coefficient, however. The fully specified Model 3 predicts that a one standard deviation increase in the logged volatility measure predicts an approximately 0.05 standard deviation increase in cultural fragmentation. While small (and given the difficulty in assessing the magnitude of changes in a linguistic distance measure), this effect size is comparable to the estimated effect of adding an additional business unit to the firm.

Robustness Checks

Three robustness checks were conducted. First, I measured firm performance volatility using an alternate method that separates monthly variation in the stock price from the slope of the estimated linear price trend. The results are substantively identical using this alternate measure, suggesting that it is volatility rather than linear performance increases or decreases that are driving the results.

Second, I explored the possibility that an omitted time-varying factor is creating a spurious association between firm performance volatility and cultural fragmentation. Alternate models leverage one potential source of exogenous variation that arguably only impacts cultural fragmentation through its impact on firm performance volatility: industry performance volatility. Industry level volatility shocks can induce volatility in a focal firm's performance that is plausibly exogenous to the firm. I defined industry performance volatility as the log of the mean coefficient of variation over the past 12 months of closing stock prices for each firm in a focal firm's industry (with industry defined as two digit SIC code). Table 4, Model 1 models firm performance volatility as a function of industry performance volatility. Net of other covariates, industry performance variability is a strong predictor of firm-specific performance variability, and significantly increases the variance explained by the model. Model 2 estimates a reduced form instrumental variables regression, which substitutes firm performance volatility with industry performance volatility as a predictor.[6] The coefficient for industry performance volatility is positive and marginally significant. Model 3 esti-

[6]While a reduced form model cannot provide a point estimate for the magnitude of firm performance volatility's effect on cultural fragmentation, a statistically significant coefficient for the instrument is evidence that firm performance volatility has a causal effect of some magnitude, provided the exclusion restriction is valid.

mates a two-stage instrumental variable regression. Once instrumented for, the coefficient on firm performance volatility increases in magnitude but falls to marginal significance. Taken together, these models provide some evidence that an obvious omitted variable is not driving the core result. The drop in statistical significance may be attributable to the language-based fragmentation measure's noisiness, but it is difficult to say definitively. Alternative instruments, such as fluctuations in oil prices and currency exchange rates that induce volatility for firms in some industries more than others, might provide more precise estimates. Another possibility is that parceling off the endogenous portion of the variation in firm performance volatility might be in some part obscuring the effect of interest, such as a set of firm-specific factors (ex. coordination breakdowns) driving cultural fragmentation. Additionally, there is room for refinements in the precision of the language-based fragmentation measure.

Third, since the employees who write Glassdoor reviews were not selected through random sampling, the appendix includes robustness checks exploring whether the selection of employees into writing reviews is biasing the results. The checks help assuage concerns that changes in the number or composition of reviews during periods of higher firm performance volatility are impacting the main results.

DISCUSSION AND CONCLUSION

This article seeks a better understanding of the emergence of cultural fragmentation in organizations, a phenomenon that Martin (1992) brought to the fore, but which is poorly understood despite the negative ramifications for organizations and their members. The paper asks: under what conditions should we expect organizations to experience cultural fragmentation? It leverages a novel language-based measure of cultural fragmentation to overcome the challenge of tracking changes in organizational culture for a large, diverse sample of organizations.

Prior work at the organization level largely assumes that the degree of cultural cohesion versus

fragmentation is static, established by founding conditions early in an organization's life, and dutifully maintained by the reliable transmission of cultural values and attitudes from leaders and peers to new members (Harrison and Carroll, 2006; O'Reilly et al., 2014). In contrast, this paper argues that this stasis perspective is at odds with advances in schema- and norms-based models of cultural influence and change, which imply that fragmentation can emerge over time within organizations from the bottom-up when individuals diverge in their interpretations and behaviors of ambiguous events. The paper finds support for the proposition that such divergence is most likely found in formal organizations when firms experience performance volatility, or "unsettled times" (Swidler, 1986), during which ambiguity and uncertainty are heightened.

The Emergence of Cultural Fragmentation

The finding that organizational cultures experience predictable fragmentation is an important contribution to theories that challenge the notion that cultures are by definition highly cohesive meaning systems. While prior work has investigated variance in cultural cohesion versus fragmentation between organizations (Sørensen, 2002; Gelfand et al., 2011), this paper develops a novel account of how cultural cohesion can vary within organizations over time. Furthermore, the paper taps work on cultural toolkits and social norm dynamics, "cultural fragmentation" perspectives that are highly influential in broader cultural sociology and psychology (Vaisey and Lizardo, 2016), to develop a dynamic model of corporate culture. This integration is fruitful because, in addition to advancing understanding of the diverse ways in which individuals interact with cultural ideas, cultural fragmentation has real consequences for an organization's ability to function productively and efficiently as a coherent social system. My hope is that this paper inspires a line of work investigating the range of factors that might facilitate cultural cohesion versus fragmentation in formal organizations and other social groups.

Developing an understanding of the contexts presaging cultural fragmentation is also important for leaders trying to manage, maintain, or strengthen culture. Despite popular recognition that

many organizational cultures lose their salience and devolve from cohesion to fragmentation, social science provides little guidance about the determinants of this phenomenon. This paper offers leaders a warning about the challenge of fostering cultural cohesion during periods of heightened ambiguity and uncertainty. It suggests the conditions under which cultures might be more robust and self-sustaining, versus when they might be more fragile and benefit the most from direct management. Future research could extend prior work in examining the most effective ways for leaders to foster cultural cohesion by minimizing divergent responses to ambiguity (Kunda, 2009; O'Reilly and Chatman, 1996).

The Dynamics of Organizational Culture

This article makes an important contribution in developing and finding evidence in support of a dynamic conception of organizational culture, and calls into question theories presuming cultural stasis that have been difficult to empirically test (O'Reilly et al., 2014). It answers the call by cultural sociologists (DiMaggio, 1997) and psychologists (Morris et al., 2015) to begin developing a theoretical understanding of cultural dynamics in social groups that can more convincingly account for rapid cultural change. Rather than organizations mechanistically reproducing culture over time, this paper suggests culture evolves organically as organizations work to facilitate internal cohesion and adapt to the external environment (Schein, 2010). Future work could move beyond theorizing about cultural fragmentation and study the broader dynamics of cultural change as new norms and practices propagate within and between organizations.

The paper also makes a useful empirical contribution in demonstrating how a language-based measure of cultural fragmentation can be used to overcome some of the methodological barriers to measuring cultural change over time in organizations. It demonstrates that the language that members use when describing their group is a useful reflection of deeper cultural beliefs and conventions. Similar methods should only become more useful over time as platforms like Glassdoor become more widely used and amass more data. Future work could use similar longitudinal metrics

to evaluate other factors potentially impacting cultural cohesion, such as voluntary versus involuntary leadership turnover. Additionally, the models in the paper indicate that an increase in structural segmentation, namely the addition of an additional business unit to the firm, is also associated with heightened cultural fragmentation. An interesting line of inquiry for corporate strategy scholars might be to examine the factors affecting whether diversification, such as mergers and acquisitions, puts more or less strain on cultural cohesion (Weber and Camerer, 2003).

Culture and Unsettled Times

This article invokes Swidler's (1986) notion of settled versus unsettled times in theorizing how periods of heightened performance volatility associate with increased cultural fragmentation. As such, it offers one way of operationalizing this broad distinction between periods of social stability versus upheaval in the context of formal organizations, and complements work focused on specific events that create ambiguity within companies (Srivastava, 2015). The paper proffers that unsettled periods provide opportunities for divergent interpretations, competition between cultural perspectives, and ultimately fragmentation.

Unpacking how culture influences individual action during unsettled times, as well as the consequences of such non-routine periods for cultural cohesiveness, has important theoretical implications for understanding cultural dynamics. While periods of ambiguity and uncertainty might lead to more cultural fragmentation in the near term, they might also provide an opportunity for cultural unification in the long-term. Unsettled times could constitute "weak situations" that provide room for cultural ideas to sustain action amidst uncertainty (Mischel, 1977). In fact, culture is often posited as an antidote to uncertainty, which suggests cultural influence could heighten during uncertain periods (Geertz, 1978). Malinowski (1944) theorized that cultural conventions develop as functional solutions to environmental uncertainties. For example, cultural ideas about providence provide people with comfort about life's uncertainties (Zelizer, 1978). There is ample opportunity for future work to examine not just how culture operates during unsettled periods, but also how

such periods shape dominant cultural understandings over longer time periods.

The Relationship between Organizational Culture and Performance

Prior work largely posits that culture is an organizational attribute that impacts firm performance, not unlike other firm level characteristics such available resources or employee knowledge. However, this study provides evidence of a more complex, endogenous relationship between culture and firm performance. This finding highlights that culture is a somewhat unique firm level characteristic because it is extremely intangible – it is only sustained in large part as beliefs residing inside people's heads that motivate and guide action and behavior. Van den Steen (2010) taps into this intuition in modeling organizational members as agents who revise their cultural beliefs about the firm's capabilities as they observe performance outcomes. One implication is that, contrary to accounts of cultural stasis, cultures seem more malleable as collective beliefs evolve in response to the organization grappling with adapting to the external environment. However, performance feedback can be a noisy signal of a firm's true capabilities. This raises the interesting possibility that cultural beliefs are a powerful coordination device not because they are necessarily accurate characterizations of the organization, but rather merely because they are shared and provide a common framework that people can use to motivate action. An open question, then, is how these collective perceptions change when confronted with disconfirmatory information. Cultural beliefs may function as a type of self-fulfilling prophecy that unite an organization, but may also be a house of cards that easily crumbles when illusions about the organization are shattered.

Developing an understanding of the fragility of cultural beliefs has important implications not just for theories of cultural stasis versus dynamism, but also for leaders trying to leverage culture to gain an advantage over competitors. Strong, cohesive cultures are thought to be a promising source of sustained competitive advantage given their complexity and because they may be difficult to replicate (Rivkin, 2000). However, they may also in some cases be more fragile than previously assumed, especially when organizations experience periods of uncertainty and ambiguity.

LIMITATIONS AND FUTURE DIRECTIONS

This study has a number of limitations, some of which point to topics for future research. First, the results associate periods of heightened firm performance volatility with increased cultural fragmentation, but the study is not designed to pinpoint the precise mechanisms driving the result. Future research at lower levels of analysis could unpack the pattern of cultural change observed in this paper. For example, a longitudinal study at the team level might be able to tease apart how ambiguous performance signals versus broader conditions of ambiguity impact the development of cultural cohesion within social groups.

Another limitation is that the limited time horizon of the data largely precludes an examination of the long-run temporal dynamics of cultural fragmentation. While periods of performance volatility are associated with subsequent increases in cultural fragmentation, an open question is whether such volatility has a long term impact on the culture. One intriguing possibility is that increased cultural fragmentation is a disruptive but ultimately necessary step towards a firm adapting to a changing environment. For example, Kaplan (2008) discusses how environmental uncertainty, while initially disruptive and evoking divergent interpretations, can provide an opportunity for members to rally around a new cognitive frame. This possibility is particularly interesting given work on cultural evolution in broader societies that posits that cultures with strong norms develop over time as a functional response to repeated exposure to environmental threats and resource challenges (Gelfand et al., 2011). As platforms like Glassdoor become more widely used and accumulate more data over time, employee reviews could be leveraged to better understand the long-term dynamics of corporate culture.

Third, the data in this paper are only suitable for analyzing members' intersubjective cultural perceptions, i.e. the normative beliefs and behaviors that individuals perceive as widespread in the culture (Chiu et al., 2010). Such higher order beliefs have long been the focus of research inves-

tigating how cultural consensus and strong norms impact coordination and other organizational outcomes (Chatman and O'Reilly, 2016). However, fragmentation along other dimensions, such as over members' personal beliefs or preferences about work, might have distinct consequences for individuals and the broader organization (Lu et al., 2018). Future work could examine cultural dynamics with regards to these different types of cultural beliefs.

Finally, although robustness checks indicate that the findings are not driven by shifts in the kinds of employees who post reviews during periods of performance volatility, I cannot fully rule out the possibility that reviewer selection is biasing the culture measure. I leave it to future research to comprehensively examine selection into employee reviews. For example, researchers could use survey tools to randomly sample employees at firms included in the Glassdoor data, and ask them to review their firms using the same questions.

CONCLUSION

This study opens the door for a new focus on the study of change and dynamism in organizational culture, including the dynamics of cultural fragmentation. Researchers have hitherto lacked an understanding of how culture changes over time at the organizational level, due both to empirical limitations of existing methods and questionable theoretical assumptions that have privileged a view of organizational culture as static rather than dynamic. This study establishes a novel link between firm performance volatility and cultural fragmentation, providing some of the first insights into the contexts in which organizational cultures can exhibit systematic fragmentation.

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FIGURES

Figure 1: Example of a Glassdoor Employee Review

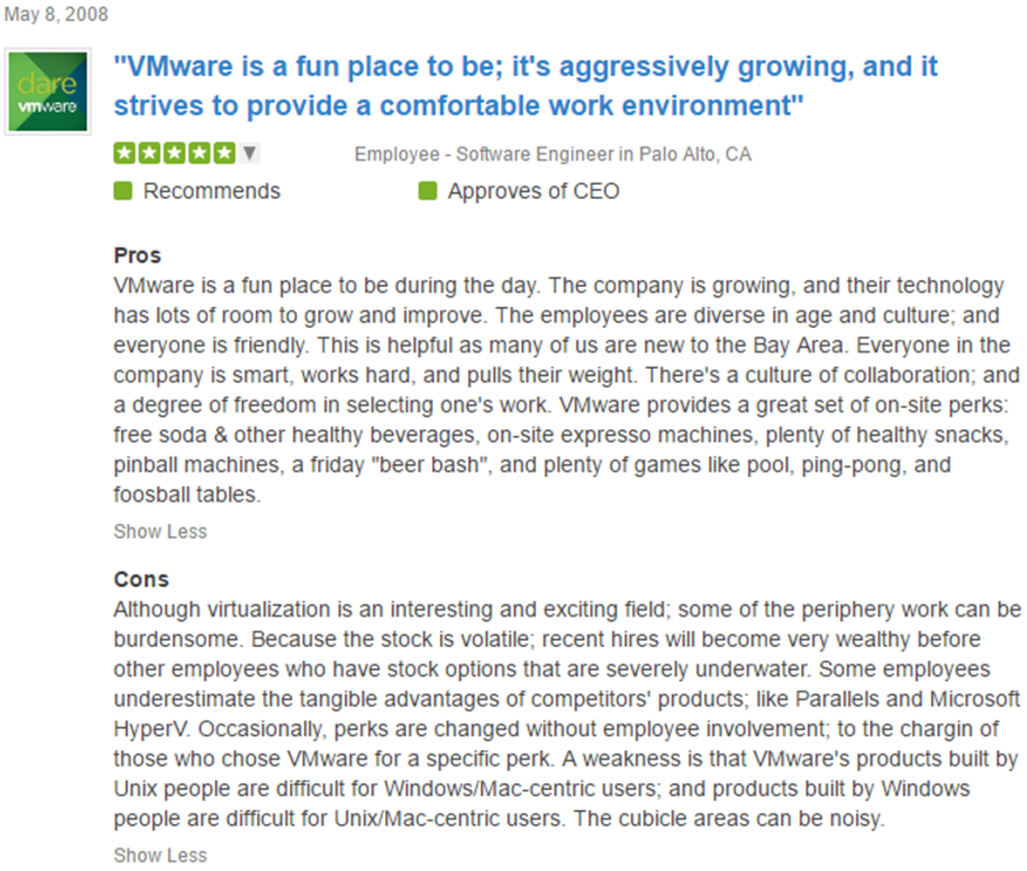
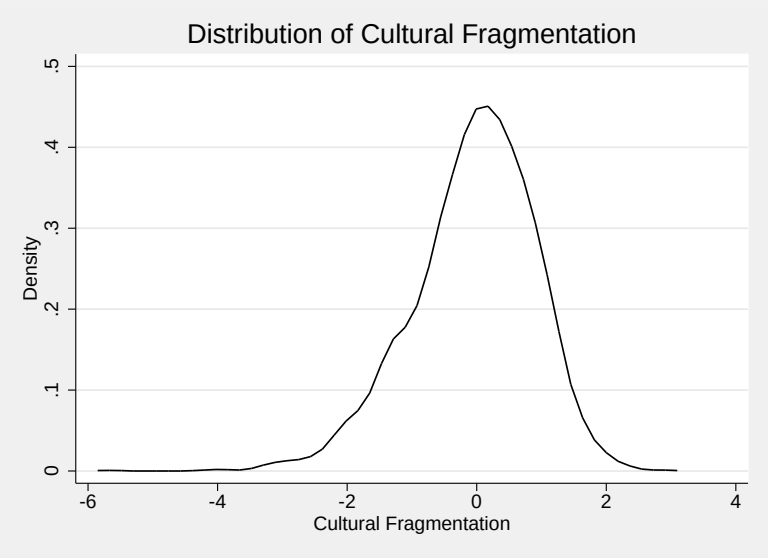


Figure 2: Distribution of Cultural Fragmentation Measure



TABLES

Table 1: Summary Statistics

	mean	sd	min	max
Cultural Fragmentation	-0.05	0.94	-5.69	2.93
Firm Performance Variability	-2.37	0.58	-4.20	0.32
Industry Performance Variability	-1.82	0.24	-2.57	-0.87
Log # Reviews	4.66	0.67	3.26	7.41
Lag Log Assets	10.05	1.69	5.68	14.56
Lag # Business Segments	4.31	2.76	1.00	19.00
Lag Stock Price	65.40	85.21	1.11	1170.38
Lag ROA	1.61	2.61	-52.42	20.70
Observations	2734			

Table 2: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Cultural Fragmentation	1							
(2) Firm Performance Variability	-0.12***	1						
(3) Industry Performance Variability	-0.17***	0.24***	1					
(4) Log # Reviews	0.037	-0.056**	-0.084***	1				
(5) Lag Log Assets	0.38***	-0.20***	-0.039*	0.17***	1			
(6) Lag # Business Segments	0.26***	-0.13***	0.099***	0.056**	0.42***	1		
(7) Lag Stock Price	-0.011	-0.057**	-0.083***	0.058**	0.069***	-0.024	1	
(8) Lag ROA	-0.15***	-0.17***	0.022	0.093***	-0.065***	0.033	0.19***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Firm Performance Variability and Cultural Fragmentation

	(1)	(2)	(3)
Firm Performance Variability	0.078**	0.081**	0.081**
	(2.62)	(2.80)	(2.79)
Log # of Reviews	0.11**	0.096*	0.096*
	(2.80)	(2.40)	(2.38)
Lag Log Assets		-0.047	-0.059
		(0.57)	(0.67)
Lag # of Business Segments		0.050***	0.049***
		(3.90)	(3.77)
Lag Stock Price			0.00025
			(0.84)
Lag ROA			-0.0015
			(0.33)
Constant	-1.85***	-1.51^{+}	-1.39
	(8.50)	(1.86)	(1.59)
Year FEs	yes	yes	yes
Quarter FEs	yes	yes	yes
Firm FEs	yes	yes	yes
Firm/Quarters	2734	2734	2734

Absolute t statistics in parentheses
Standard errors clustered by firm
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: IV Models

	(1) Firm Var. (Stage 1)	(2) Fragmentation (Reduced Form)	(3) Fragmentation (Two Stage)
Firm Performance Variability		0.19^{+}	0.22^{+}
		(1.85)	(1.84)
Industry Performance Variability	0.87^{***}		
	(8.37)		
Year FEs	yes	yes	yes
Quarter FEs	yes	yes	yes
Firm FEs	yes	yes	yes
Other Covariates	yes	yes	yes
Firm/Quarters	2734	2734	2734

Absolute t statistics in parentheses
Standard errors clustered by firm
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Model 1 is the first stage estimate for the instrumental variable (IV) regression in model 3. Industry Performance Volatility appears to be a strong instrument. Inclusion of the instrument in the first stage model increases the F statistic from 14.4 to 25.8; Staiger and Stock (1997) argue an increase of five or greater is evidence of sufficient strength.

Appendix A

Detecting Cultural Topics Using Latent Dirichlet Allocation

All analyzed text was first preprocessed according to standard text analysis conventions. Common stop words and punctuation were removed, word order was dicarded, and the unigrams were stemmed using the Porter stemming algorithm.

To train the Latent Dirichlet Allocation (LDA) model, a document-term matrix was constructed in which the rows were 904,613 distinct phrases observed across all available reviews in the data that contain the word "culture" or a close synonym (i.e. environment, atmosphere, attitude, climate, value, philosophy, belief), and the columns were the 3,870 most popular unigrams (4000 initial words minus proper nouns). LDA models the probabilistic generation of a text corpus. Documents are represented as mixtures of topics, with each topic modeled as a probability distribution over words (Blei et al., 2003). The topics outputted by the LDA model have face validity as having cultural relevance. Table A1 shows the highest weighted words for four randomly selected and four handpicked topics. The words suggest plausible cultural dimensions, such as a commitment to quality production, an entrepreneurial environment, rewards for high performance, and an easygoing workplace.

After identifying cultural topics using this training set, the LDA model was fit to the reviews in the analytic sample. Figure A1 is a stylized illustration of how LDA assigns a review to a mixture of multiple culture topics. Table A2 shows the firms that score the highest and lowest in cultural fragmentation in the business services industry. Table A3 decomposes the variance in the cultural fragmentation measure between industries, within industries, and within firm. A notable 40% of the variance occurs within firms.

Figure A1: Stylized Example of LDA's Mixed Membership Topic Assignment

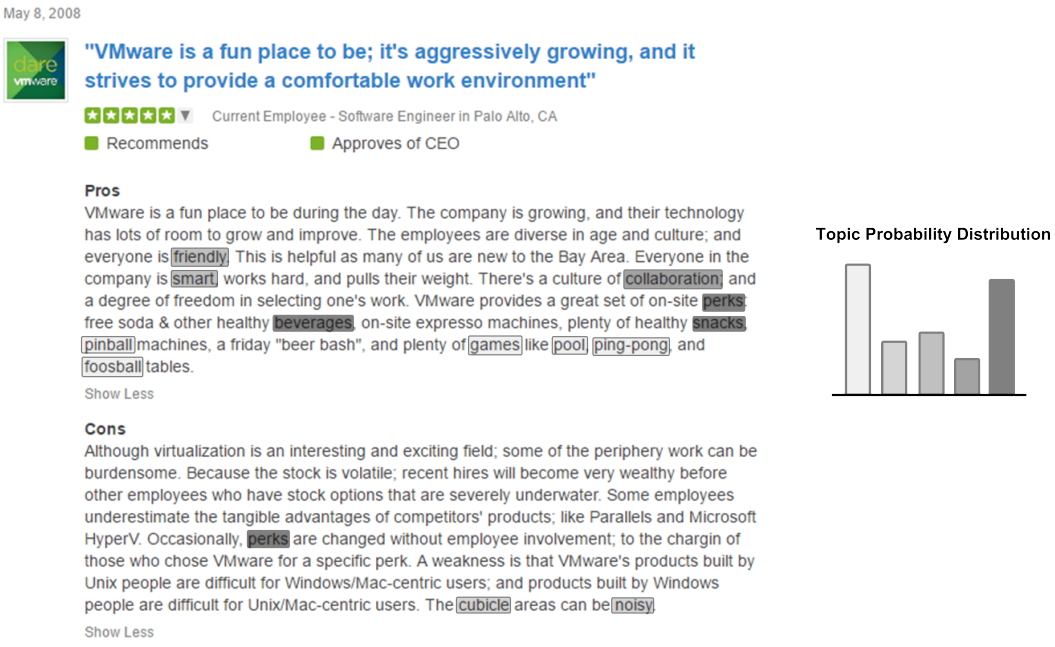


Table A1: Highest-Weighted Words for Select LDA Culture Topics

Selected Topic #	**Words**
10	qualiti product high produc deliv commit counter deliveri emphasi quantiti speed result output compromis highest assur expect deliver content outcom sacrif emphas bean cost craft creat sloppi
16	entrepreneuri thrive initi spirit dynam motiv collabor starter creativ individu passion empow suit unstructur structur ideal autonomi succeed entrepreneur mindset autonom ambigu flourish
33	travel opportun world countri meet experi chanc interact abroad global multicultur visit oversea airlin reloc deploy flight foreign adventur airport
35	social fun event activ interact lot frequent aspect regular includ bond scene gather anti respons network regularli outing media committe host justic conduct consciou mingl introvert societi awkward outgo
Random Topic #	**Words**
473	perform reward recognit recogn incent individu consist mediocr contribut resul
415	compani exist virtual anymor bought parent basic built longer sold
399	fun cowork great cool amaz outgo hang toy lightheart easygo brilliant train hip
481	challeng work interest reward present demand inher tackl workplac

Table A2: Business Service Firms with Lowest/Highest Cultural Fragmentation Scores, 2008-2015

	Large Firms	**Small Firms**
Lowest Cultural Fragmentation	Amdocs	National Instruments
	Facebook	Sapient
	Wipro	Cornerstone OnDemand
Highest Cultural Fragmentation	Xerox	Kelly Services
	SAP	Convergys
	Paypal	TeleTech

Notes: Restricted to firms with at least 3 quarterly observations. Large and small firms delimited by industry median size.

Table A3: Variance Decomposition of Cultural Fragmentation Measure

By Total Variation	**Cultural Fragmentation**
Within Firms	40%
Within Industries	32%
Between Industries	28%

Glassdoor Data Details and Reviewer Robustness Checks

Employees reviewing their company are required to enter both positive ("pro") and negative ("con") comments. Since the cultural fragmentation measure was designed to identify the general cultural dimensions mentioned by employees without regard to valence (ex. the culture is collaborative, entrepreneurial, etc.), the combined pro and con text was used when training and fitting the topic model. The highest-weighted words for each LDA topic confirm that the model identifies topics that are largely agnostic with respect to valence.

Most individuals come to Glassdoor first and foremost to search for jobs rather than to post a review. Glassdoor uses a "give to get" model to solicit reviews from users. In order to receive unlimited access to the site's content, users are required to submit an anonymous employer review or salary and benefits information. Recent research finds that this method mitigates ratings bias by reducing the prevalence of extremely positive and negative reviews (Marinescu et al., 2018).

However, since the employees who write Glassdoor reviews were not selected by random sampling from the population of firm employees, a concern is that systematic variation in the number or composition of reviewers is driving the observed associations between firm performance volatility and cultural fragmentation. I examined the robustness of the results to selection of employees into writing reviews by modeling within-firm variation in the number and composition of reviews as a function of firm performance volatility.

Table A4 shows within-firm models of the number and composition of reviews used when calculating the cultural fragmentation measure. I examined reviewer composition using the percentage of reviews in a given firm/quarter written by employees in managerial positions as opposed to front line workers, as indicated by non-missing job title information. Specification 1 shows that the number of Glassdoor reviews does not vary as a function of performance variability. Specification 2 shows that firm performance variability is associated with a higher percentage of managers in the reviewer sample. However, inclusion of percentage manager as a control in the main models has

virtually no impact on the findings.

Table A4: Review Sample Composition

	(1) Log # Reviews	(2) % Managers
Firm Performance Variability	0.026	0.0062*
	(1.44)	(2.30)
Log # of Reviews		0.0049
		(1.03)
Lag Log Assets	0.18*	-0.0060
	(2.57)	(0.57)
Lag # Business Segments	0.027**	-0.0032**
	(2.89)	(2.97)
Lag ROA	-0.0043	0.00011
	(1.00)	(0.20)
Lag Stock Price	0.00024	-0.000000053
	(0.85)	(0.00)
Constant	2.13**	0.42***
	(3.07)	(4.05)
Year FEs	yes	yes
Quarter FEs	yes	yes
Firm FEs	yes	yes
Firm/Quarters	2746	2746

Absolute t statistics in parentheses
Standard errors clustered by firm
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$