

**Measuring Organizational Culture:  
Converging on Definitions and Approaches to Advance the Paradigm\***

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## **Abstract**

Culture is one of the most interdisciplinary constructs in organizational research, drawing insights from a vast range of disciplines including anthropology, psychology, sociology, and economics. Given the interdisciplinary nature of organizational culture, and given the often-lamented lack of a unifying definition of culture, it is not surprising that a variety of measurement tools have been developed and used. But without clear agreement about how organizational culture is defined and measures that emphasize construct validity, it will continue to be difficult to accumulate knowledge and advance our understanding of organizational culture. Recently, researchers have called for a focus on establishing field-wide construct validity for measures of organizational culture to advance the paradigm. In this chapter we address the challenge of defining organizational culture and evaluate measurement options that, considered in conjunction, can increase construct validity and accessibility to relevant data while reducing various biases. Some of these approaches have emerged from innovations in computational power and increases in the availability of relevant digital data.

In writing a chapter about how to measure organizational culture, a necessary starting point is to ask what we mean by organizational culture. This question identifies an inherent challenge, which is that ever since Pettigrew (1979) published his pioneering paper bringing the study of culture into the domain of organizational research, scholars have disagreed about how to define culture, how it should be studied, and, not surprisingly, how to measure it (e.g., Giorgi, Lockwood, & Glynn, 2015). One aspect of culture that makes a unified definition elusive is that it is a truly multi-disciplinary construct. In 1963, leading anthropologists Kroeber and Kluckhohn (1963) reported that there were 164 different meanings for the term “culture” in the anthropology literature alone. And, focusing specifically on the term “organizational culture,” scholars reported 54 different definitions (Verbeke, Volgering, & Hessels 1998). With fields such as anthropology, economics, finance, organizational behavior, sociology, and strategy focusing on culture, the various perspectives inevitably use different lenses in defining what it means.

Scholars have been calling for unifying the culture paradigm in organizational research for some time but that call has recently intensified. In 2014, Denison, Nieminen, and Kotrba highlighted this persistent challenge, noting the lack of a widely shared and agreed upon definition for the term. In 2015, Giorgi and colleagues (p. 3) said that, “...in spite of this renewed interest in culture—or perhaps because of it—research in organization theory has become increasingly fragmented, and with it, a proliferation of definitions and conceptualizations has emerged.” In 2016, Chatman and O’Reilly tracked the fragmented history of culture research and noted the challenge of advancing the domain of culture and accumulating knowledge on a comparable construct without first developing a unified definition and systematic methods that allow comparisons across studies of culture. And in 2019, during the first academic conference devoted entirely to organizational culture (<https://haas.berkeley.edu/berkeley-haas-culture->

[conference/2019-conference-highlights/](#)), scholars across the disciplines of organizational behavior, economics, political science, sociology, and psychology voiced a desire for a unified approach to studying culture since it was not even clear if the different approaches were studying the same phenomenon. As a result, despite the scholarly attention that has been devoted to understanding and measuring organizational culture, the domain is at risk of stagnating and failing to advance without a unified theoretical paradigm.

In this chapter, we briefly trace the progress - and sources of the lack of progress, including fragmentation and inherent challenges - of the organizational culture domain and offer support for a unified definition of organizational culture, which is a prerequisite for developing valid and reliable methods. We then identify the most promising empirical methods to assess culture that emphasize construct validity (ensuring that they are measuring culture and not something else), reduce bias (by addressing the challenges of small sample sizes, demand effects, and socially desirable responding), increase accessibility, and enable the accumulation of knowledge so that a comprehensive and unified theory of culture can emerge.

### **Historical Constraints on the Lack of Progress in the Organizational Culture Domain**

#### **Theoretical Challenges**

Though there were a number of reasons why theory development in the culture domain stalled (Chatman & O'Reilly, 2016), one of the most significant was a set of divisive debates that, while advancing the field in some ways, eventually impeded paradigm development. Many of these debates have been resolved and researchers have called for others to be retired. For example, the culture versus climate debate has been largely resolved, with researchers acknowledging that both constructs are important and distinctive (e.g., Ostroff, Kinicki, & Muhammad, 2012). As compared to culture, climate is defined in terms of aggregated individual

attitudes about specific domains such as safety or customer service (e.g., Schneider, Ehrhart, & Macey, 2013), with researchers focusing on only one climate dimension at a time, rather than profiles of dimensions (e.g., Tucker, Ogunfowora, & Ehr, 2016). This contrasts with organizational culture, which is typically identified as patterns of expectations and behaviors that members share and that are related to one another as a more coherent whole (e.g., Schein, 2010).

The status of the debate about whether culture is better defined as something organizations *are* (an *emic* approach) versus something organizations *have* (an *etic* approach) is more complex. This debate spawned decades of controversy about whether culture could be measured systematically or whether it had to be experienced through deep immersion (Martin, 2002). Advocates of the qualitative approach believe that cultures are unique and only by fully revealing the deep meaning of rituals and symbols can unconscious or implicit beliefs and assumptions be accessed (e.g., Alvesson & Berg, 1992; Martin, 2002). They argue that assuming commonality among organizations may cause researchers to miss key features that are unique to each organization. One critique of the ethno-methodological approach is that focusing on what is unique about each organization precludes the ability to aggregate knowledge and build generalizable theories about organizational culture (e.g., Chatman & O'Reilly, 2016).

### **Defining Organizational Culture**

A potential resolution to the *etic* versus *emic* debate resides in Schein's (2010) foundational and widely accepted conception of organizational culture as consisting of three interrelated layers: (1) underlying assumptions and beliefs (that may be conscious or unconscious), (2) norms and values about appropriate attitudes and behaviors (that may be espoused or real), and (3) artifacts that may reflect these (e.g., symbols and language). Specifically, researchers interested in understanding underlying assumptions and beliefs may

need to immerse themselves in a culture to fully grasp such conscious and unconscious assumptions. In contrast, the other two layers are more accessible through systematic research methods that enable comparisons across organizational cultures. We focus on *norms* that can act as a social control system in organizations because “norms translate into observable behaviors and attitudes which are relevant, and because informants can report on and articulate them, in contrast to the difficulty of surfacing underlying assumptions and beliefs and the ambiguity of cultural artifacts” (Chatman & O’Reilly, 2016: 16).

Researchers have coalesced around the idea that, while many approaches to measuring culture are valuable, such measures must be systematic, replicable, and typically derive from many examples within a sample (e.g., Lu, Chatman, Goldberg, and Srivastava, 2019). With these resolutions emerging, debates that previously divided researchers have receded, paving the way for culture research to advance (Chatman & O’Reilly, 2016). The domain is now poised to develop a robust and unified framework for understanding culture, though even with a shared definition, a number of empirical challenges unique to studying organizational culture must still be addressed.

### **Empirical Challenges to Advancing the Organizational Culture Research Domain**

There are a number of empirical challenges that have stalled research on organizational culture. Some arise from the nature of the construct itself, while others are derived from weaknesses in popular approaches to assessing culture.

**Empirical Challenges Arising from the Nature of the Construct.** Four distinctive features of organizational culture make it challenging to measure. First, organizational culture, identified in terms of patterns of norms that are shared, represents a large set of interrelated attributes (Chatman, 1991; O’Reilly, Chatman, & Caldwell, 1991). The resulting measurement

challenges include creating an approach that informants can use to reliably profile their organization's culture – one that enables an evaluation of the full set of relevant norms and how each relates to the other in relative importance, since culture influences how members of organizations react to competing priorities (Chatman, 1989). Second, assessing culture via shared norms requires parsing these norms into both the content that characterizes the organization but also the structural properties of culture – the extent to which members agree on the relative importance of each norm, and the level of intensity with which each norm is collectively held (Chatman, Caldwell, O'Reilly, & Doerr, 2014). Third, culture exists on many levels – at the national level (Gelfand et al., 2011), the industry level (Chatman & Jehn, 1994), and the group level (e.g., Chatman & Flynn, 2001), but organizational culture requires assessment at the organizational level. Collecting culture data one organization at a time is extremely time consuming and this challenge has surely stifled culture data collection efforts to-date.

Finally, assessing culture can be subject to a set of biases. A primary concern are biases (e.g., social desirability, retrospective rationality) that arise from members of an organization being motivated to make their organization look good to outsiders and themselves when asked to assess their own culture (Chatman, Bell, & Staw, 1986). A second challenge is selection bias since those who choose to respond to culture assessments or comment on their organization's culture may be different from those who choose not to respond. And, finally, beyond attempts to intentionally bias culture assessments, organizational members or outside informants (e.g., Kotter & Heskett, 1992), may have biases that they are unaware of as they assess an organization's culture, such as a lack of information based on their vantage point – by function, tenure, geographic location, or level.

### **Empirical Challenges Derived from Weaknesses in Approaches to Assessing**

**Culture.** The primary weakness of existing scales measuring culture is a lack of construct validity. Chatman and O'Reilly (2016) offer a detailed analysis of the most popular culture assessments and show how many were not originally designed to assess culture specifically and are more likely assessing the murkier construct of organizational effectiveness. This is a problem because the scales may still generate predictive validity (e.g., organizational effectiveness predicts organizational effectiveness), without construct validity (e.g., that culture is causing observed levels of effectiveness).

As one example, the Organizational Culture Assessment Instrument (OCAI), based on the Competing Values Framework (CVF, e.g., Cameron, Quinn, DeGraff, & Thakor, 2006), consists of a survey with six categories (Dominant Organizational Characteristics, Leadership Style, Management of Employees, Organizational Glue, Strategic Emphasis, Criteria for Success) in which respondents distribute 100 points among four items for each category representing the four competing values. The CVF theory suggests that the four core values represent opposite or competing assumptions, with each value being the opposite of the value at the other end of the continuum. However, it is not clear what about the Competing Values Framework is actually competing. Hartnell, Ou, & Kinicki (2011) conclude that, "Results suggest that the CVF's culture types in opposite quadrants are not competing" (p. 687). Of greater concern, however, is the difficulty of ascertaining the construct validity of the OCAI. While culture in the form of norms and values may be part of the CVF model, it also includes the assessment of other constructs such as organizational structure, leadership, organizational practices, agreement, and strategy. This breadth and ambiguity in the construct and its measurement is visible in a meta-analysis of 89 studies using the CVF (Hartnell, et al., 2011).



Although the results show some predictive validity in that different types of cultures are sometimes related to subjective measures of organizational outcomes, the authors conclude that there is only modest support for the nomological validity of the framework and that, “The results suggest that identifying ‘dominant culture’ types may be of limited utility because they do not account for culture’s bandwidth (Hartnell, et al., 2011: 687).” Ostroff and Schulte (2014) also note that although there is an assumption that an internally consistent set of values underlies each of the four culture types, no evidence exists confirming this.

Absent convergent and discriminant validity, it is difficult to distinguish the CVF, and other approaches to culture that are similarly lacking in construct validity, from other related organizational constructs like organizational climate and structure. Culture becomes, at once, many aspects of organizations – everything - and ultimately an indistinct construct - nothing. And, even if organizations can be viewed as inhabiting these cultural types by displaying certain attributes and practices, it is unclear whether an organization inhabits them because they value them *per se*. Thus, though an instrument claiming to measure culture correlating with, say, organizational performance may be useful for confirming to managers that culture is important, insights regarding organizational culture itself are constrained by the lack of construct validity of many prevailing approaches to measuring organizational culture (Chatman & O’Reilly, 2016).

### **Approaches to Measuring Organizational Culture**

Measures of organizational culture need to unequivocally and specifically measure organizational culture, and developing a unified theory of culture is essential to establishing the construct validity of culture measures. Building upon Schein’s (2010) theoretical framework of culture which focuses on assumptions, norms and values, and cultural artifacts, another requirement is that each measure of culture specify the layer it assesses. In evaluating culture

measures below, we focus both on the empirical strengths and weaknesses of each approach, using our list of empirical challenges above as criteria, and on the layer of culture that each purports to measure.

### **An Illustration of Survey Methods Leveraging Informants - The Organizational Culture Profile (OCP)**

One of the most face valid ways to assess culture is to directly ask informants, typically those immersed in the culture, to respond to questions that clearly ask for judgments regarding patterns of norms and behavior within their culture. As an illustrative survey approach, we discuss the Organizational Culture Profile (OCP – Chatman et al., 2014; Chatman, 1991; O’Reilly et al., 1991), one of the most heavily used survey methods for assessing culture (for a comprehensive review of the other popular survey methods, please see Chatman and O’Reilly, 2016).

The OCP, and its focus on soliciting input from knowledgeable informants, was designed explicitly to assess organizational culture. The theory underlying the OCP is that organizational culture is a form of social control and the associated normative social influence that results from the behavioral norms arising within organizations. More specifically, culture is a system of shared values that define what is important and norms - socially created standards that help members interpret and evaluate events and actions - that define appropriate attitudes and behaviors for organizational members (O’Reilly & Chatman, 1996). Chatman and O’Reilly (2016) emphasize the intentional lack of an a priori framework utilized in the construction of the OCP. Instead, they began by identifying a universe of descriptors for culture and then narrowing them down with regards to the categories of generalizability, comprehension, readability,

redundancy, and the relative variance expected for a given descriptor across various organizations (Caldwell, Chatman, & O'Reilly, 2008; Chatman, 1991; O'Reilly, et al. 1991).

The OCP measures three aspects of cultural norms: norm content, norm consensus, and norm intensity (Chatman et al., 2014). Previous discussions acknowledged the uneven emphasis placed upon culture content over culture strength (Harrison & Carroll, 2006) or strength over content as seen through the “culture strength index” (Kotter & Heskett, 1992; Sørensen, 2002). Either way, there had not been a conscious effort to separate these distinct attributes, leading some to conclude that many studies of culture confounded content and strength (Chatman et al., 2014). This raised questions about whether, for example, an innovative culture is the same as a culture in which members do not agree about the relative importance of a comprehensive set of norms within their organization. Parsing culture solves this problem by defining *norm content* as the substance of the cultural norm, or the appropriate behaviors and attitudes described through the norm. In contrast, *norm intensity* is the force with which cultural norms are held, or the degree of salience and the degree to which a norm may be identity defining. And *norm consensus* is the extent to which members agree broadly about an organization’s system of cultural norms (Chatman et al., 2014).

The OCP uses the Q-sort methodology (Block, 1978) in which informants must consider 54 norm statements and allocate them into nine categories ranging from “most characteristic” to “least characteristic” of their organization’s culture. This approach requires informants to implicitly compare each norm statement to every other norm statement to determine which norms are held most and least intensively, providing information about both norm substance and norm intensity (O'Reilly et al., 1991). In this way, the OCP avoids social desirability bias, particularly as compared to a Likert-type scale in which informants could mark the highest

anchor for an unlimited number of items, and has been found to be free of such biases (Chatman, 1991). It also makes it possible for informants to essentially rank order the comprehensive set of norm statements reliably (Chatman, 1991). Agreement in how similarly members prioritize the 54 items is also assessed, and provides a metric for the level of consensus across the comprehensive set of cultural norms (Chatman et al., 2014). Though the range is not infinite, the number of possible configurations of the 54 items is extremely high (Chatman, 1991).

Empirical evidence of the OCP shows that the 54 items cluster into six to eight independent dimensions (e.g., Marchand, Haines, & Dextras-Gauthier, 2013; Sarros, Gray, Densten, & Cooper, 2005). In particular, Chatman and O'Reilly report six dimensions - (1) adaptiveness or innovation, (2) results-orientation, (3) detail-orientation, (4) collaboration or teamwork, (5) customer-orientation, and (6) integrity (Chatman et al., 2014; O'Reilly, Caldwell, Chatman, & Doerr, 2014) - and the six dimensions appear consistent with the dimensions other researchers have identified (Berson, Oreg, & Dvir, 2008; Borg, Groenen, Jehn, Bilsky, & Schwartz, 2011; Detert, Schroeder, & Mauriel, 2000; Tsui, Wang, & Xin, 2006). The OCP has demonstrated predictive validity in person-organization fit research and organizational performance research (e.g., Adkins & Caldwell, 2004; Chatman et al., 2014; Elfenbein & O'Reilly, 2007; Judge & Cable, 1997; Kristof-Brown, Zimmerman, & Johnson, 2005; Sheridan, 1992; Vandenberghe, 1999).

**Critique of Informant Generated Survey Methods for Assessing Culture.** Even though the OCP offers significant face validity in assessing culture, it still suffers from many of the same shortcomings of any self-reported survey measure. These shortcomings must be addressed, including minimizing the effect of social desirability bias on responses, and accumulating adequate data across an organization and across time periods to ensure that the

findings are representative and reliable. Any survey method has the potential to suffer from selection bias if the entire population does not respond – which is typically a challenging goal. And, though informants are typically in a good position to assess the culture of the organizations of which they are members, they may be unaware of aspects of the culture or subject to other biases, such as self-justifying behavioral accounts, or retrospective rationality (Staw, 1981) that make their observations less objective and potentially less accurate. Finally, these methods tend to be labor intensive and typically generate smaller samples of organizations at a slower pace, though researchers have often sampled a large sample of essential firms within targeted industries to control for industry and environment effects and isolate the effects of organizational culture (e.g., Chatman et al., 2014; Chatman, & Jehn, 1994; Sheridan, 1992). That said, a variety of other methods can be used to overcome these shortcomings, which we review below.

### **Computational Linguistics as a Measure of Organizational Culture**

One of the fastest-growing methods of assessing culture is the computational linguistics approach. It has been enabled by major increases in computing capacity and the existence of huge amounts of potentially relevant digital data, which can be used to measure cultural variables such as norms, cultural fit, and enculturation trajectories (e.g., Popadak, 2013; Srivastava, Goldberg, Manian, & Potts, 2017). The computational approach enables analyses that have eluded prior researchers by being, at once, granular, rich, and dynamic. The approach analyzes language use which, unlike surveys, is unobtrusive and more behaviorally-oriented (e.g., Lu et al., 2019), and makes it feasible to track the micro-dynamics of person-culture fit and culture change. Though such tracking was possible using survey methods, it has been significantly more cumbersome because of the frequency with which informants would have to be asked to report on the culture.

Researchers using computational linguistics make a credible claim that language is a useful signal of cultural alignment. Indeed, economists have long viewed language accommodation as a key indicator of cultural assimilation (e.g., Crémer, 1993). Language represents conventions and brings meaning to the surface, at the behavioral level. Organizations develop idiosyncratic conventions that are inevitably embedded in language use among members. Further, language convergence can reflect social distance. These arguments, presented in a variety of papers (e.g., Goldberg, Srivastava, Manian, Monroe, & Potts, 2016; Lu et al., 2019; Srivastava et al., 2017) are helping to build theory that differentiates between cognition and behavior mostly pertaining to person-culture fit (enculturation).

**Analytical Approaches to Using Computational Linguistics to Assess Culture.** A number of data sources and categorization techniques have been used to assess culture. We briefly review studies relying on email data, Glassdoor data, and other publicly available third-party websites that serve as a venue for reviews about various work organizations, and we discuss the methodological approach researchers have used to construct the culture data, both of which are important for judging construct validity.

*Linguistic Inquiry and Word Count (LIWC).* In one study, Lu and colleagues (2019) operationalize behavioral cultural fit as the similarity between an individual's language and her reference groups' using the Interactional Language Use Model (ILUM) (Goldberg et al., 2016, Srivastava et al., 2017). They argue that linguistic similarity can sometimes reflect alignment for non-cultural reasons—for example, two people coordinating on a shared task might use similar language even when they are culturally incompatible. As such, the researchers focus on the similarity of linguistic style between an individual and her reference group. Drawing on previous sociological work on culture (e.g., Doyle, Goldberg, Srivastava, & Frank, 2017), ILUM uses the

well-established and widely used Linguistic Inquiry and Word Count (LIWC) lexicon (Pennebaker, Booth, & Francis, 2007) to measure linguistic style. LIWC is a semantic dictionary that maps words into 64 high-level distinct emotional, cognitive, and structural categories. A comprehensive body of work demonstrates that the linguistic units identified by LIWC relate to a wide and universal array of meaningful psychological categories (Tausczik & Pennebaker, 2010). Using LIWC, the researchers claim to focus on expressions that are inherently cultural, while downplaying linguistic exchanges that are organization- or context-specific or primarily related to functional coordination between organizational members. In offering an example, Lu et al. (2019: 14) suggest that "...[A]n organization with an aggressive and competitive culture...might manifest linguistically in expressions of certainty, negation, and the use of swear words and other forms of non-deferential language. Contrast such a normative environment with one characterized by politeness and the use of tentative and inclusive language, indicating a collaborative and non-confrontational culture. LIWC is specifically designed to capture such culturally meaningful dimensions."

Substantively, Lu et al., (2019) distinguish between person-culture fit based on value congruence (between an individual and their organization) and perceptual accuracy, or a person's ability to accurately identify the organizational. Lu and his colleagues (2019) find that value congruence predicts voluntary departure while perceptual accuracy predicts behavioral fit, or closer language use alignment between the focal individual and her reference group. Even more novel, they show that perceptual accuracy is informed by a focal individual's network. Further, the paper uses multiple methods – both computational linguistics to analyze emails over the course of a year in a mid-sized company, but also OCP data collected from a large representative sample of organizational members. The study shows that the email data and the OCP data align,

offering the first evidence of convergent validity between the linguistic approach and more traditional, validated informant-based survey methods. Finally, as with many of the digital trace data approaches, the authors use machine learning methods to extend the findings longitudinally.

In another study drawing on the same approach, Srivastava and colleagues (2017) define an enculturation trajectory as an individual's temporal pattern of person-culture fit, which they argue can change over time and can precede more significant behavioral changes such as voluntary departure. Srivastava and his colleagues (2017) analyzed 10.24 million internal emails collected over five years in a 650-person organization. The analysis, at its most fundamental level, compares each focal actor's language use to those of her colleagues within the organization. Greater similarity equates to greater fit while less language accommodation signals lower fit. This study confirms what we know from prior research – that those who do not fit with the culture of their organization typically leave (e.g., Chatman, 1991; O'Reilly et al., 1991) – and the temporal frequency of the data enables the researchers to detect precisely when people begin to show signs of disengaging from the organization and ultimately, when they are likely to leave. The approach avoids a host of response biases and is also more substantively rich than typical network analyses, which only detect and analyze ties to others (e.g., frequency of contact).

The logistics involved in creating data sets typically involves collecting emails on a server. The data are cleaned, examined, typically in monthly increments, and each focal individual's language use is compared to a relevant group within the organization (e.g., members of their work group, network ties). These language accommodation scores can then be used to track behavioral manifestations of culture and cultural fit over time (Srivastava et al., 2017), or they can be connected to attainment measures (Goldberg et al., 2016). In either case, the data are granular and open up the possibility of answering questions such as, when is fit typically



established for an organizational newcomer? How does early enculturation influence subsequent performance and longevity in a firm? And what are the markers of voluntary and involuntary departure? Some of these are new questions, while others have been considered before but could not be easily or convincingly answered. Importantly, the consequences of person-culture fit that the computational work to-date reveals correspond to past research using existing methods, primarily survey based, for assessing culture fit. The advantage of this alignment is that it establishes convergence and construct validity of this approach as well as prior approaches, which sets the stage to ask and answer questions that will advance theory development.

*Latent Dirichlet Allocation (LDA)*. The LDA approach is another way of unobtrusively deriving culture-relevant data without imposing research-driven categories on the data (e.g., Puranam, Narayan, & Kadiyali, 2017). LDA is a model of the probabilistic generation of a text corpus, and is able to identify “topics” most commonly present in a set of sentences such as a data set of emails. Each topic is basically a weighted set of words that tend to co-occur. The model is trained on a set of sentences, identifying the most common topics in the training set. Then, the LDA model can be fit to another set of sentences, such as those derived from Glassdoor reviews, to extract information regarding fit or alignment. Corritore, Goldberg, and Srivastava (2019) use this method to examine the causes and consequences of cultural fragmentation. They examined Glassdoor reviews of 492 publicly traded organizations and found support for their hypotheses that only interpersonal cultural heterogeneity undermined coordination and predicted volatility in firm performance, while intrapersonal cultural heterogeneity was associated with increased creativity and patents at the firm level.

In a quest to improve researchers’ ability to “show versus tell,” that is, to minimize the need to justify the interpretations of findings, Marchetti and Puranam (2019) offer a refined

approach to LDA topic modeling, prototypical-text based interpretation (PTBI). Marchetti and Puranam (2019: 3) claim that this approach provides comprehensive rules by which prototypical text sections and topic structure are identified from data extracted from an algorithm. They further identify three advantages to PTBI: (1) it reduces researchers' need to exert judgment in interpreting topics, (2) it offers a guide and framework for "transparently recording the inevitable choices that researchers must make in the process of prototypical text extraction," and (3) it enhances the transparency and replicability of the interpretation process by revealing the selections of prototypical text from the corpus that form the basis for topic interpretation by the researcher. Using Netflix, an organization with a sophisticated and transparent culture, Marchetti and Puranam were able to map the algorithmically induced topics derived from the PTBI method on to the cultural values that Netflix has articulated in publicly available sources, finding high correspondence between the two (42 of 57 unique concepts map onto the seven cultural dimensions they identified for Netflix).

*Other Analytical Methods.* Other researchers have used a combination of methods to derive cultural data from unobtrusive digital sources. In one of the most interesting examples, Popadak (2013) used automated text analysis and data from three websites collecting comments on organizations. The data represented 4,600 firms over a 10-year period, including reviews by more than 1.8 million employees. Popadak's (2013) analysis used 400 million words to construct culture dimensions consistent with those identified by O'Reilly and colleagues (2014): adaptability, collaboration, customer-orientation, detail-orientation, integrity, results-orientation, and transparency. She calculated the normalized dot product between two vectors, which is weighted so that it captures the unique concept in each two set of texts. In short, she created a master text (set of all potential words and phrases for culture) and an aggregate text (aggregated

reviews for a firm). The pool of potential words and phrases (the master texts) is from WordNet, a lexical database of semantic relations, and it is created by considering relatedness (Jiang & Conrath, 1997). The aggregate text is compared to the master text to measure a firm on each of the seven dimensions. Popadak (2013) then used textual similarity to compare the actual words in the online employee reviews (“aggregate text”) with the words in the master list that describe each of seven cultural dimensions.

Popadak’s (2013) analysis relies on regression discontinuity, dividing firms at the closest limit in terms of whether they were supported or not by shareholder votes (51% versus 49%). She found that variations in corporate governance affected the culture of the firm and that culture, in turn, was associated with performance. In particular, firms that closely lost governance elections were more likely to subsequently emphasize being results-oriented and less likely to emphasize being customer-oriented compared to those who closely won their governance elections. And, cultures that emphasized results more intensely and customers less intensely experienced a 1.4% decline in firm value over time.

Similarly, Moniz (2017) collected data from 417,000 employee reviews of 2,300 firms from 2008 to 2015 on Glassdoor. He found that firm value increased among organizations whose culture was aligned to their strategic goals. Using data from the Great Place to Work survey, Guiso, Sapienza and Zingales (2015) have shown that a firm’s stated values are not related to firm performance, but a culture that emphasizes integrity is associated with subsequent performance. And, in a unique sample of 683,052 organizations across 57 countries, Polzer, DeFilippis, and Tobio (2018) are focusing on digitized calendars to examine variations in how many meetings people attend from one organization to the next. This is a truly unobtrusive measure of culture that is not subject to biases inherent in language use, however, the validity of meetings as representing cultural norms or artifacts must still be developed.

**Critiques of the Computational Linguistic Approaches.** These approaches demonstrate an exciting and vital step forward for the organizational culture paradigm. This use of email and Glassdoor data and similar sources to analyze language accommodation is also a useful complement to self-reported culture data. Researchers have argued that language use is a dominant medium through which cultural information is exchanged. On the other hand, the case needs to be made for the validity of language use, particularly email communication or anonymous company reviews collected by third-party organizations, such as Glassdoor, as measures of culture. And, as with all methodological approaches, there are significant weaknesses inherent in these methods that warrant mentioning.

One critique of the linguistic approach is that language use is not the only indicator of culture and culture fit and represents only a narrow slice of behavior. Email is a stylized communication form that likely predetermines how people interact regardless of their organizational culture. People have varying beliefs about the extent to which emails are public or private, and there are multi-level norms (e.g., at the group, organization, professional, and societal levels) governing how people write and comprehend emails. An overreliance on email data may lead to a stilted view of culture. For example, we know that people can feel both more and less restrained as they communicate digitally. Further, these comments are more likely associated with individual attitudes – or the organization’s climate - than with employees who are serving as informants of the culture and reporting on broad patterns of norms. And, email studies to-date have only examined email correspondence within a single firm so their level of analysis is necessarily the individual (or possibly the work unit), which doesn’t optimize for computational approaches which should have the promise of large samples of organizations.

Comments on sites such as Glassdoor and Great Place to Work are subject to significant selection bias, with employees or former employees who have especially strong positive or negative views about the organization being more likely to comment. Indeed, organizations often coach employees to review their organization favorably on such websites and published surveys given the reputational benefits of being reviewed positively.

Qualitative culture researchers would argue that written language is not a particularly rich form of communication and that culture resides in deep assumptions, shared values, and observable behavior (e.g., Martin, 2002). And even quantitative culture researchers might argue that organizational informants are pretty reliable and valid sources for explicit reports on an organization's culture, and that email is, at best, an indirect source of cultural information.

Meeting schedules, as a manifestation of culture, may also be limited in that some organizations may have compliance requirements imposed by regulators or other structural constraints that could lead researchers to draw conclusions about culture that actually arise from other organizational or contextual forces. And, though researchers claim that these approaches to understanding the meaning in emails, reviews of organizations, and meeting schedules are unobtrusive measures of culture, they are still imposing assumptions about the connection between such behaviors and an organization's culture as do researchers who design surveys.

Thus, there is some risk in investing exclusively in language-based data to represent culture and culture fit. Researchers need to both validate and understand how digital trace data fit into the construct of organizational culture and its other manifestations (e.g., dress, beliefs, informants' stated perspective, celebrations, senior leader communications). Finally, the exact theoretical gains that have been derived from these new methodologies are a little harder to judge. The work has not really challenged existing theories of culture, and it hasn't necessarily

brought more clarity to the definition of it, nor identified particularly novel outcomes. What it has done is allow for more fine-grained tests – when does someone start to show signs of departing an organization? How long might it take for merging firms to become productive and integrated? These are valuable and substantial contributions, and the hope is that theoretical advancement will soon occur.

### **Computer Simulations and Laboratory Experiments Manipulating Aspects of Organizational Culture**

Another influential approach to studying organizational culture is computer simulations and computational modeling (Harrison & Carroll, 1991; Carroll & Harrison, 1998; Srivastava, et al., 2017). This method has been less focused on norm content, and more on norm agreement and intensity. For example, researchers have investigated simulated organizations experiencing demographic changes to examine how norm agreement and intensity, and specifically the transmission of culture is influenced by member churn (employee entry and departure) (e.g., Harrison & Carroll, 1991). Harrison and Carroll (2006) proposed that research relying on surveys to assess culture could be complemented by the use of a formal model that theorizes the link between observable factors such as rates of employee entry and turnover. Through the use of a formal model, it becomes possible to better understand the underlying theoretical processes without being constrained by selection bias or identification issues. Through a model consisting of a hiring function, socialization function, and a turnover function, a computer simulation is able to show several characteristics about cultural systems, such as its equilibrium, robustness, and strength during various stages (Harrison & Carroll, 1991).

However, there are challenges in using this approach to draw conclusions about how organizational culture operates. First, there are no real data involved in the simulations. Second,

the computational models rely on realistic assumptions in identifying relevant variables, their likely levels or range, and their relationships to one another. As such, researchers must have some sense, mostly gleaned from empirical investigations of actual organizational cultures, about the relevant variables to specify, their typical levels and range, and their likely relationship to one another. For example, regarding hiring, researchers can examine various levels of under-, optimal, and over-recruiting of new employees or new-recruit diversity, and the varying enculturation levels associated with new recruits relative to existing members and how they affect cultural transmission (Harrison & Carroll, 1991). One of the strengths of the simulation method is in identifying the links between a simulated norm of behavior, various levels of demographic movement within an organization, and the resulting cultural characteristics such as robustness and culture strength.

### **Experimental Approaches to Measuring Culture**

Researchers have examined organizational culture by experimentally manipulating its content (e.g., Chatman, Greer, Sherman, & Doerr, 2019; Chatman, Polzer, Barsade, & Neale, 1998) or focusing on agreement levels about various norms (e.g., Weber & Camerer, 2003). For example, Chatman and colleagues (1998) simulated cultures that either emphasized individualism or collectivism and found that members of collectivistic cultures were more productive and creative when they also represented diverse demographic attributes. And Chatman and colleagues (2019) showed that experimentally manipulated collectivistic cultures caused members to blur demographic differences among them, affecting the quality of group decisions. Weber and Camerer (2003) considered norm consensus to be observed through higher efficiency among newly merged groups.

And, in what can be considered a quasi-field experiment, Martinez, Beaulieu, Gibbons, Pronovost, and Wang (2015) observed an organizational intervention in which both a technical and a culture change solution were used to solve a significant safety issue in a hospital; central line-associated blood stream (CLABS) infections, which are a very serious threat to patients. Martinez and her colleagues (2015) suggested how to conduct analyses that would isolate the effects of culture on measured reductions in CLABS, such as whether a reduction of CLABS was associated with changes in survey-based self-reported norms among employees. By manipulating culture and using random assignment, such experiments (and interventions) can generate enormous causal insight into how culture influences behavior and organizational performance. These designs need not be complex, but empirical analyses must be able to control for alternative explanations of any behavioral change.

### **Conclusions and Future Directions for Measuring Organizational Culture**

Advancing the organizational culture paradigm requires that researchers coalesce around a definition of organizational culture. Organizational culture researchers have increasingly adopted definitions focused on culture as norms (Chatman & O'Reilly, 2016) and have studied norms and artifacts (Schein, 2010). A second requirement is that researchers hold each other accountable for theoretical precision in defining, empirically validating, and articulating a theory of culture including where it comes from, how it operates, and what it produces. Third, paradigm development would benefit by identifying a set of commonly agreed upon problems, and then working systematically to solve those problems. Some examples include understanding the links between culture and other key organizational constructs such as strategy, structure, leadership, and employee composition. A second may focus on how culture is established, transmitted and changes over time, including identifying the leading indicators of change as well as the most



significant enablers and obstacles. And a third might examine unusual combinations of norm content (e.g., high integrity and low transparency, high cooperation and high competition) or of norm content and norm agreement, such as whether strong cultures can also emphasize innovation and avoid inertial thinking. A fourth question might focus on subcultures within organizational cultures, addressing the fragmentation question, and a fifth might focus on the dynamics of person-culture fit.

If researchers could derive this list of big problems, they could then work together to address them, each from their own methodological vantage point. Though it may be difficult to imagine individual research teams conducting full cycle research (Chatman & Flynn, 2005), given the challenges of mastering multiple methodologies, full cycle research could occur at the paradigm level. This is essential because, as we have illustrated above, each of the primary approaches to assessing culture has unique strengths – informant reported surveys are face and construct valid, digital trace data enables large samples, dynamic tracking, and unobtrusive measures, simulations can enable unconstrained tests of relationships among large numbers of variables simultaneously, and experiments allow causal inferences. Each also has distinct weaknesses – informant reported surveys are subject to informant biases and accumulating samples from a large numbers of organizations is effortful, digital trace data are not necessarily indicators of culture and can lack construct validity (and so far, email data has only been used within a single firm), simulations are only as good as the assumptions that they are based on and lack external validity, and experiments can lack external validity and are limited in their generalizability to organizations.

As we hope we have made clear, the *only* way of addressing the inherent weaknesses of each method is to cross-validate them with the other methods. Organizational culture is a central topic

in organizational research and it is viewed as immensely important to managers (Graham, Harvey, Popadak, & Rajgopal, 2017). Our goal has been to lay out a set of methodological options for assessing culture and to urge researchers to accumulate comparable, conceptually valid knowledge and advance our understanding of organizational culture as a paradigm. The path to this goal is obvious; culture must be defined clearly and assessed using multiple measures.

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