

**Fitting In or Standing Out?  
The Tradeoffs of Structural and Cultural Embeddedness\***

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**Abstract**

A recurring theme in sociological research is the tradeoff between fitting in and standing out. Prior work examining this tension has tended to take either a network structural or a cultural perspective. We instead fuse these two traditions to develop a theory of how structural and cultural embeddedness jointly relate to individual attainment within organizations. Given that organizational culture is hard to observe, we develop a novel approach to assessing individuals' cultural fit with their colleagues in an organization based on the language expressed in internal email communications. Drawing on a unique data set that includes a corpus of 10.25 million email messages exchanged over five years among 601 employees in a high-technology firm, we find that network constraint impedes, while cultural fit promotes, individual attainment. More importantly, we find evidence of a tradeoff between the two forms of embeddedness: cultural fit benefits individuals with low network constraint (i.e., brokers), while network constraint promotes attainment for those with low cultural fit.

## INTRODUCTION

Is it better to fit in with or stand out from others? This core social dilemma pervades, but is often implicit in, sociological research (e.g., Goffman 1986; Simmel 1950). Whether in the schoolyard (Fine 1979) or the boardroom (Kunda 2006), people frequently confront the tradeoffs of complying with or deviating from the expectations of their peers. Recent work, particularly studies of individual attainment in organizations, has tended to examine this tradeoff from two distinct vantage points: one primarily *structural* and the other predominately *cultural*.

A consistent theme in the former line of work is that excessive structural embeddedness can have adverse consequences for individual career success. Perhaps the most commonly studied form of structural embeddedness is network constraint—the quality of having contacts who also have ties to one another. Across a wide range of organizations, the absence of constraint—or network brokerage—has been linked to career outcomes such as higher compensation (Burt 1992), greater upward mobility (Podolny and Baron 1997), and increased job satisfaction (Seibert, Kramer, and Liden 2001). In other words, standing out from others structurally can have positive career consequences.

Separately, a burgeoning literature has theorized about, and studied the implications of, cultural variation for individuals and their careers (Rivera 2012; Van Maanen and Barley 1984). In particular, organizational scholars have investigated the effects of cultural fit, in the form of normative compliance, on career outcomes such as job satisfaction and commitment (e.g., Chatman 1991; O'Reilly, Chatman, and Caldwell 1991). Across a variety of empirical settings, this work has demonstrated the benefits individuals accrue when they fit in culturally (for a review, see Kristof-Brown, Zimmerman, and Johnson 2005). That is, whereas standing out

structurally is often advantageous, fitting in with others culturally generally yields career benefits.

Other accounts are more nuanced, acknowledging that individuals face conflicting pressures to fit in to or stand out from the pack (Brewer 1991; Phillips and Zuckerman 2001). Previous work has suggested that this tension is best resolved by either choosing a position that is optimally poised between integration and distinctiveness (Leonardelli, Pickett, and Brewer 2010) or by shifting one's level of conformity over time—initially adopting a compliant identity to gain acceptance and then donning a more nonconforming identity that highlights one's distinctiveness from others (Zuckerman et al., 2003).

With few exceptions, these two bodies of scholarship—one focused on network sources of advantage and the other on cultural fit—have remained largely disconnected from one another. The former has tended to emphasize the information-based benefits of brokerage but paid relatively little attention to its potential identity-based costs. By contrast, the latter has focused on the advantages of having a social identity that hews to the normative expectations of colleagues but tended to overlook its relationship with actors' network positions.

In contrast, we fuse these two literatures and propose a novel theoretical account of how the tension between fitting in and standing out can be resolved. Building on Zukin and DiMaggio (1990), we argue that people can be simultaneously embedded within their organization in two conceptually distinct ways: structurally and culturally. Previous accounts have identified mechanisms such as social influence and homophily that create mutually reinforcing linkages between structural and cultural embeddedness (Carley 1991; DellaPosta, Shi, and Macy 2015). We extend this rationale and contend that career benefits accrue to people who are embedded in one of these dimensions and disembedded in the other. Stated differently, the informational

returns to spanning structural holes are greater for those who fit culturally with their colleagues in the organization, while individuals who are structurally embedded—that is, have high levels of network constraint—can enjoy the benefits of cultural distinctiveness. Thus, career success is, in part, a two-dimensional balancing act of structural and cultural embeddedness.

We test this hypothesis using a unique dataset that includes detailed personnel records—including employee start dates, exit dates, nature of exit (voluntary or involuntary), and managers' ratings of employee performance—as well as a corpus of 10.25 million emails exchanged over a period of more than five years among 601 employees in a U.S.-based technology firm. We propose that email archives can provide a window into both network structure and an important facet of culture—the extent to which the language people use within their organizations conforms to the linguistic style of their colleagues. Email metadata enable us to locate individuals over time within network structure and assess the extent to which they occupy structurally constrained network positions (Burt 1992; Kleinbaum 2012). Computational linguistic techniques allow us to translate the unstructured natural language of email content into a novel measure of cultural fit. In sum, we consider whom people communicate with to assess their structural embeddedness and how they communicate with these colleagues to derive a measure of their cultural embeddedness.

We then assess how network constraint, cultural fit, and the interaction between these two dimensions of embeddedness relate to two distinct indicators of attainment: the hazard of experiencing involuntary exit from the firm (i.e., negative attainment) and the likelihood of receiving a favorable performance rating (i.e., positive attainment). Together, our findings illuminate how structure and culture operate independently and in tandem to shape career

outcomes and illustrate that the benefits and disadvantages of structural and cultural embeddedness are inherently contingent on one another.

## **THEORY**

### **Fitting In or Standing Out: The Tradeoffs of Embeddedness**

People constantly face cross-pressures to integrate with, and distinguish themselves from, the social groups to which they belong (Brewer 1991). Although this tension is by no means unique to organizations, resolving it is particularly challenging in organizational settings where members are often evaluated for their individual performance, while their productivity typically depends on interpersonal coordination. This tradeoff of fitting in versus standing out is what sociologists—following Granovetter’s (1985) influential popularization of the term—often implicitly invoke when referring to the concept of embeddedness. Though the vast majority of this literature treats embeddedness primarily through a network prism (Krippner and Alvarez 2007), people are, in fact, embedded into their social worlds along multiple social dimensions.<sup>1</sup>

Following Zukin and DiMaggio (1990), we distinguish between two forms of embeddedness. *Structural embeddedness* relates to the configuration of interpersonal networks and the extent to which individuals are anchored in tightly-knit social communities. *Cultural embeddedness* references the extent to which individuals share similar norms and taken-for-granted assumptions about appropriate behavior with those around them and how these shared understandings shape their interactions with others. We use the terms “integration” and “assimilation” to denote structural and cultural embeddedness, respectively. As we discuss below, the tension between fitting in and standing out is a recurring (if mostly implicit) theme in work that examines the link between structural and cultural embeddedness and individual

attainment.<sup>2</sup> It relates to the extent to which one is integrated, or assimilated, with one's colleagues in an organization. These tradeoffs are considered explicitly in the arguments we develop below.

### **Structural Embeddedness and Attainment in Organizations**

The tradeoff between integration and differentiation has long animated social network research. Granovetter's (1973) classic distinction between strong and weak ties, which has dominated sociological work on social networks over the last four decades, echoes this tension. As Burt (1992) points out, whereas members of tightly knit circles tend to develop strong ties with one another, weak ties more commonly connect people who are otherwise embedded in different social worlds. The relative benefits of occupying positions of network brokerage versus closure have been a major focus in recent scholarship on social networks.<sup>3</sup>

A preponderance of empirical evidence demonstrates that structural embeddedness—in the form of network constraint—is negatively associated with individual attainment (for a recent review, see Burt, Kilduff, and Tasselli 2013). Occupying such brokerage positions confers information-based advantage: because brokers bridge otherwise disconnected parts of the social network, they have access to valuable, non-redundant information. Abundant empirical evidence shows that organizational actors who span structural holes tend to receive greater compensation, are more highly regarded by their peers, and are more likely to generate better ideas than their colleagues who operate in more constrained networks (Burt 1992).

While the structural position of brokerage confers a variety of benefits, it can also come at a price. Being anchored in multiple social worlds also implies projecting an incoherent social identity (Podolny and Baron 1997). Moreover, network closure engenders trust because it facilitates enforcement of behavioral norms through peer sanctioning (Coleman 1988; Reagans

and McEvily 2003). Consequently, when there is uncertainty about an actor's skills or intentions (Podolny 2001) or the quality of her output (Fleming, Mingo, and Chen 2007), brokerage can become a liability rather than an advantage. Moreover, diversity comes at the expense of tie intensity and depth, which can in turn stymie access to novel information (Aral and Van Alstyne 2011) and impede the transfer of complex knowledge (Hansen 1999). The benefits of brokerage also depend on an actor's context (for a review, see Pachucki and Breiger [2010]): the returns to brokerage decrease as the number of peers engaged in the same work as the focal individual increases (Burt 1997).

### **Cultural Embeddedness and Attainment in Organizations**

Just as there are tradeoffs associated with structural embeddedness, so does cultural embeddedness entail both benefits and costs. Before explicating these tradeoffs, we first define what we mean by cultural fit. Sociological consensus on the definition and foundational elements of culture has been elusive (Small, Harding, and Lamont 2010). Nevertheless, most accounts recognize that culture rests on taken-for-granted, shared understandings that relate to deep-rooted beliefs and assumptions about the world, as well as to normative and procedural agreements that enable interpersonal coordination (DiMaggio 1997; Patterson 2014). Our conceptualization of cultural fit focuses on the latter: the extent to which organizational members' behaviors are normatively compliant.<sup>4</sup>

Whereas the extant literature on organizational culture has tended to conceptualize cultural fit with respect to the organization as a whole (e.g., Rivera 2012; Schein 2010), we focus on the extent to which individuals fit in culturally with their interlocutors in an organization. This set of interaction partners is determined in part by positions in formal and semiformal structure—for example, the job roles that people occupy or the work groups and task forces to which they



are assigned—and in part by the informal relationships they choose to form (Biancani, McFarland, and Dahlander 2014). Because semiformal and informal relations tend to span formal organizational subunits (Srivastava 2015), these interaction partners are typically drawn from a wide cross-section of the organization. Our conceptualization of cultural fit allows for the possibility of cultural differentiation or fragmentation within the organization and does not assume that the various subcultures that exist within the organization map directly onto its formal subunits (Martin 1992). Moreover, it mirrors our approach to conceptualizing structural embeddedness: both network constraint and cultural fit relate to one's local embeddedness within the organization.

Scholarship on organizational culture tends to highlight the benefits of cultural assimilation for organizational outcomes. Individuals who fit in culturally are expected to achieve greater attainment for a variety of reasons. First, culture can serve as an alternative to formal mechanisms of control. Those who have effectively internalized shared normative expectations are more likely to behave in ways that align with and contribute to the organization's strategic goals (Schein 2010). Second, culture functions as a form of tacit knowledge that facilitates seamless task coordination among organizational members (Weber and Camerer 2003). In addition, individual cultural attachment to an organization instills motivation and a sense of shared destiny (Baron and Kreps 2014). Those who are more culturally invested in the organization are therefore more likely to be committed to its success (O'Reilly, Chatman, and Caldwell 1991), and those who are culturally incompatible with their friends at work tend to experience dissatisfaction with their jobs (Krackhardt and Kilduff 1990). Thus, employers recognize the advantages of cultural assimilation and, through a process that is

sometimes tacit and driven by emotion, hire on the basis of cultural matching (Rivera 2012; Rivera 2015).

At the same time, there exist forces that push individuals to differentiate themselves culturally from their organizations. These forces are both internal and external to the individual. For example, studying a technology firm similar in some respects to the one that serves as our research setting, Kunda (2006) reports that organizational members, especially those in the lower ranks of the formal hierarchy, are torn between their identification with the company and a need to assert their independent identities through acts of cultural resistance. Rather than being denounced, however, public displays of dissent are often embraced as acts of authenticity that ritually reenact group boundaries and commitment.

The need for differentiation is not only driven by a desire for distinctiveness but also by the internalization of others' expectations. Work in economic sociology demonstrates that actors who enact culturally nonconforming identities are generally devalued by others because of their lack of a clear social identity (e.g., Goldberg, Hannan, and Kovács 2016; Hsu and Hannan 2005). Yet cultural noncompliance can still be a risk worth taking because it can result in disproportionate rewards. Innovative breakthroughs, for example, emerge from unconventional combinations of ideas (Fleming 2001). Although such combinations are sometimes received with suspicion, devaluation is replaced by enthusiasm when audience skepticism is overcome. Actors who already enjoy favorable reputations have more latitude to engage in cultural noncompliance. Famous chefs, who are granted the artistic license to erode established cuisine categories, illustrate this ability to overcome audience skepticism (Rao, Monin, and Durand 2005).

### **Baseline Accounts of Structural and Cultural Embeddedness and Attainment**

The tension between fitting in and standing out is implicitly woven into these sociological accounts of structural and cultural embeddedness. They are, however, usually latent narratives. In fact, most previous studies of brokerage and cultural fit have overlooked the fitting-in-versus-standing-out tension by assuming that the advantages of being on one end of the embeddedness continuum outweigh the benefits of being on the other end.

Although recent work has highlighted various scope conditions and contingent effects of brokerage, structural accounts have overwhelmingly tended to emphasize the information-based advantages that come with spanning structural holes. Brokers are assumed to benefit because of their privileged access to information. Cultural accounts, on the other hand, have highlighted the identity benefits of cultural conformity. This is particularly true in organizational contexts, where actors are engaged in highly interdependent and non-routine activity. Although they may seek to have their contributions viewed by others as unique and difficult to replace, people in organizational settings face stronger pressures to don culturally legitimate identities that facilitate coordination with their colleagues (de Vaan, Stark, and Vedres 2015).

Thus, considered independently, one would expect that structural embeddedness will retard attainment, while cultural embeddedness will promote it. Existing literature therefore suggests two baseline hypotheses:

**Baseline Hypothesis 1: Employees with higher levels of structural embeddedness will experience lower levels of attainment.**

**Baseline Hypothesis 2: Employees with higher levels of cultural fit will experience higher levels of attainment.**

### **A Theory of Balanced Embeddedness and Attainment in Organizations**

More nuanced theoretical perspectives acknowledge that standing out or fitting in embodies tradeoffs. One prevailing view is that people will seek to occupy positions that are optimally distinctive (Brewer 1991). In other words, people will seek positions that strike a balance—within a given dimension of embeddedness—between fitting in and standing out.<sup>5</sup> Work in this vein either implies an inverted U-shaped relationship between embeddedness and individual attainment such that those located at the sweet-spot will maximize their performance. A second common perspective assumes that the tradeoffs between standing out and fitting in can be resolved by varying embeddedness temporally.

Consistent with the former view, network studies have provided evidence for the benefits of occupying positions that—in different respects—straddle network integration and brokerage. Vedres and Stark (2010), for example, argue that entrepreneurial teams that connect cohesively embedded members from distant groups—a network topology that they call a “structural fold”—exhibit high performance. In a study on the garment industry, Uzzi (1999) similarly found that firms with a blend of embedded and arm’s length ties outperform those that are on either end of the brokerage-closure continuum. Likewise, Uzzi and Spiro (2005) reported that creativity peaks in Broadway when the structure of production teams and the overall network of collaboration between artists are poised between cohesion and brokerage.

Similarly, cultural research acknowledging the tension between standing out and fitting in has mostly focused on the tradeoff between identity conformity and distinctiveness. In the realm

of consumer marketing, for example, Chan, Berger, and Boven (2012) reported that consumers resolve the conflict of assimilation by conforming to the cultural scripts associated with their social identities in the choice of salient product features and by seeking uniqueness in the choice of more marginal features. Similarly, scientists whose novel findings are anchored in conventional scientific knowledge, but who also combine scientific knowledge in unique ways, have the greatest impact through their work (Uzzi et al. 2013).

Research in the second vein emphasizes the role of time in diffusing the tension between fitting in and standing out. Taking a structural viewpoint, Burt and Merluzzi (2016), for example, contend that network advantage can be optimized when actors oscillate between positions of network closure and brokerage over time. On the cultural dimension, work espousing the “two-stage valuation” mechanism argues that actors who initially conform to categorical codes establish recognition and legitimacy and, at later stages, can reap the rewards of distinctiveness through categorical noncompliance (Zuckerman 1999; Zuckerman et al. 2003).

In general, the prevailing approaches to studying brokerage and cultural fit—(1) those that implicitly disregard the fitting-in-versus-standing-out tension, and those that solve it through (2) the assumption of an optimal position or (3) intertemporal balance—explore structural and cultural embeddedness in isolation from one another.<sup>6</sup> Each approach is thus fragmentary. The first tacitly resolves the standing-out-or-fitting-in tension by assuming that one position is, ultimately, inherently better than the other. It privileges either the informational benefits of structural disembeddedness or the identity advantages of cultural embeddedness. The second and third imply that actors have to compromise on the potential benefits of standing out or fitting in—whether by finding an optimal position or by transitioning between positions temporally—

because they need to offset each position's inherent downsides. In specific empirical contexts, it is not readily obvious when such a balance is achieved.<sup>7</sup>

In contrast, we argue for the value of considering the interpenetration of the two dimensions of embeddedness and suggest that organizational members can resolve the dual pressures to fit in with and stand out from others by offsetting the advantages (and downsides) of structural embeddedness against those of cultural embeddedness. Previous research on the interrelationships between network structure and culture has highlighted the role of social influence and homophily as mechanisms that connect the two spaces. Whereas prior work has emphasized the ways in which structural embeddedness can lead to greater cultural embeddedness and vice versa (Carley 1991; DellaPosta, Shi, and Macy 2015), we instead focus on the ways in which being embedded in one dimension and disembedded in the other can enable actors to occupy unique positions that confer career advantages. Such actors can reap the informational advantages of structural brokerage by counterbalancing them with the identity benefits of cultural conformity or realize the potential returns to cultural distinctiveness because they are buffered by the integration benefits of structural cohesion.

Figure 1 depicts our conceptual framework. The axes represent the two dimensions of embeddedness. Quadrants I and III represent the two possible extremes: *Doubly Embedded Actors* and *Disembedded Actors*. Individuals in these positions are either relative outsiders—both structurally and culturally—or deeply integrated and assimilated into their locales within the organization. Neither of these positions adequately resolves the fitting-in-versus-standing-out tension. *Doubly Embedded Actors* enjoy the advantages of a coherent social identity that confers acceptance and trust within the organization. At the same time, their structural position makes them less likely to produce valuable innovations or gain access to non-redundant information,

while their cultural lack of distinctiveness makes it difficult for their contributions to be recognized as unique and irreplaceable. *Disembedded Actors* are at greater risk of producing novel ideas and of having access to unique information; however, because their identities do not conform to colleagues' expectations, whatever novelty they produce is likely to be regarded with suspicion and disregard by their peers.

**\*\*\*Figure 1 about here\*\*\***

In contrast, Quadrants II and IV represent positions that strike a better balance between fitting in and standing out because they represent embeddedness in one dimension and disembeddedness in the other. We propose that their occupants will achieve higher levels of attainment than those in positions that are disembedded or doubly embedded.

*Assimilated Brokers* (occupants of Quadrant II) enjoy the informational benefits of brokerage, while their enculturation buffers them from experiencing the deleterious identity effects of being perceived as untrustworthy or nakedly self-serving. As Krackhardt (1999) points out, brokerage can become a liability when the network cliques on the two ends of the network bridge being traversed impose inconsistent normative and role expectations. Such conflicting expectations can lead to identity imbalance, affecting both an actor's self-perception, as well as how she is evaluated by her peers (Bearman and Moody 2004). Relative to *Disembedded Actors*, *Assimilated Brokers* are more likely to enjoy the rewards of spanning structural holes through the projection of a multivocal identity that diffuses identity incongruence (Padgett and Ansell 1993).

On the other end, *Integrated Nonconformists* (those in Quadrant IV) occupy a structural position of network closure and a cultural position of distinctiveness. Although their structural constraint does not expose them to as many non-redundant ideas as their counterparts who are brokers, it facilitates trustworthy and information-rich relationships. These nonconforming

individuals are therefore more likely to introduce unconventional and potentially valuable ideas, and, by virtue of their position of network cohesion, eschew the penalties associated with such behaviors. Indeed, experimental evidence suggests that normatively noncompliant behavior is perceived as a signal of competence and commitment as long as the individual in question enjoys status parity with her peers (Ridgeway 1981). Compared to *Doubly Embedded Actors*, we expect that *Integrated Nonconformists*' contributions are more likely to be perceived as distinctive and therefore as valuable.

Overall, our arguments suggest:

**Main Hypothesis: There will be a tradeoff between the two forms of embeddedness such that: (1) cultural fit will promote (inhibit) attainment for individuals with low (high) network constraint, and (2) network constraint will promote (inhibit) attainment for individuals with low (high) cultural fit.**

#### **LANGUAGE AS A WINDOW INTO INDIVIDUAL-LEVEL CULTURAL FIT**

Although the literature on organizational culture is vast, the conceptions of, and methods used to study, culture in the extant literature also have significant limitations. This is the case for three main reasons. First, much of the work on organizational culture has focused on cultural content and its consequences for group effectiveness. These studies investigate which values and beliefs and what forms of cultural enactment are conducive to superior organizational performance (Hartnell, Ou, and Kinicki 2011; Hofstede et al. 1990; Schein 2010). Yet a focus on cultural content necessarily orients the researcher toward the norms and taken-for-granted understandings that are shared by organizational members while tending to neglect the points of divergence.



Second, even scholars who do not take a content approach to the study of organizational culture have tended to focus on differences among, rather than within, organizations. A common theoretical framework in this vein relates to the distinction between strong and weak organizational cultures. Sørensen (2002), for example, uses survey data to compare cultural strength across a variety of firms and demonstrates that strong cultures contribute to performance in non-volatile industries where organizational consistency is key to success. Related work in the economics literature shows how cultural homogeneity in the form of shared beliefs can lead to faster coordination but also to less experimentation and information collection, thereby contributing to culture clash when two firms that are internally homogeneous but different from each other merge (Van den Steen 2010). Heterogeneity in cultural fit at the individual level is easier to theorize about with abstract mathematical models that treat enculturation as a continuous variable. Even in such studies, however, cultural variation has mostly been explored relative to its impact on organizational, as opposed to individual, outcomes (Harrison and Carroll 2006).

Finally, research that emphasizes how individuals vary in cultural assimilation and considers its consequences for their careers has tended to rely on self-report measures that often provide relatively coarse-grained indicators of cultural fit. For example, the Organization Culture Profile (OCP) assesses cultural fit using the Q-sort method (O'Reilly, Chatman, and Caldwell 1991). Respondents are first asked to force-rank a set of cultural values. Cultural fit is calculated by correlating each individual's ranking to the firm's culture, which is induced from the average Q-sort ranking produced by key informants within the organization. Although this technique represented a breakthrough in the study of organizational culture when it was introduced and has since left an influential mark, it also has some important limitations.

OCP and other self-report measures tap into individuals' espoused values. Yet there is often a discrepancy between the values that individuals profess to support and those that guide their behavior (Schein 2010). For example, Srivastava and Banaji (2011) found in an organization with a culture emphasizing norms of collaboration that self-reports of individuals' orientations toward collaboration had no relation to the pattern of collaborative networks they formed within the organization. By contrast, an indirect measure of collaborative tendencies that tapped into implicit, automatic forms of cognition was positively related to boundary-spanning collaborative networks.

Self-reports of cultural fit often rely on cultural categories that are defined by the researcher or a small group of organizational elites and may not reflect the categories that matter to rank-and-file employees. Moreover, these approaches often make the simplifying but frequently invalid assumption of cultural homogeneity across the various subgroups that exist within organizations (Martin 1992). Finally, these methods can also be time-consuming to implement and only provide a snapshot of individuals and the organization at one point in time. Researchers must implement them repeatedly to observe how an individual's cultural fit changes over time. Doing so can have unintended consequences—for example, inducing respondent survey fatigue that in turn erodes data quality.

We propose that the language through which organizational members communicate with their colleagues can provide a novel window into an important facet of cultural fit. We begin with the premise that language is central to how organizational members negotiate, codify, and uphold the norms and taken-for-granted understandings that constitute organizational culture. The way in which people use language provides a window into the semantic categories with which they construe meanings out of their daily experiences (DiMaggio 1997; Jackendoff 2002;

Patterson 2014). Consistent with this notion, experimental studies of organizational culture—for example, about the consequences of cultural conflict following the merger of two firms—have used language as the means to operationalize culture (Weber and Camerer 2003). In a similar vein, Carley and colleagues (1992) develop a semi-automated technique to measure cultural similarity, or shared mental maps, within a work group from the concepts, and the relationships among concepts, that materialize in textual responses to open-ended survey questions. Although this approach also represented a methodological advance when it was introduced, it is cumbersome to implement, requires researcher input to define which concepts to filter, and operates in the context of a well-defined and bounded work group. It is therefore not well-suited to deriving time-varying indicators of how well individuals fit culturally with their colleagues in an organization.

In contrast, our empirical strategy assesses cultural fit based on the content of internal email messages exchanged over time among organizational members. Although this approach is not without limitations—for example, it does not consider language expressed in face-to-face or telephone interactions or culture as manifested in physical artifacts and other nonlinguistic forms—it overcomes many of the disadvantages of traditional self-report measures. First, it derives measures of culture and cultural fit based on the natural language that people use rather than values or beliefs they choose to communicate to researchers. Thus, it is less susceptible to impression management and social desirability bias that can plague self-report measures. Second, most organizations maintain archives of past email communications, which can be readily downloaded and used to construct time-varying measures of cultural fit. Finally, the categories of language used to assess culture can come from the data itself or from well-

established linguistic dictionaries (Pennebaker et al. 2007) and are therefore less susceptible to biases or blind spots on the part of researchers or organizational elites.

In light of these advantages, recent years have seen an upwelling of research that employs the techniques of computational linguistics to measure underlying social processes through natural language. For example, McFarland, Jurafsky, and Rawlings (2013) show that rituals of romantic courtship exhibit distinct linguistic signatures, and Danescu-Niculescu-Mizil et al. (2012) demonstrate how linguistic accommodation between interlocutors can reveal their relative status. Building on and adapting these techniques to the context of formal organizations, we conceptualize cultural fit as the linguistic distance between a focal individual and a reference group within the organization. We define the reference group as the subset of organizational members with whom a focal individual communicates by email in a given period—in our case, a given month. Cultural fit is simply the inverse of linguistic distance from the reference group. Those whose vocabularies are aligned with the reference group, we argue, are more normatively congruent with their interlocutors.

Our approach is similar to that employed by Danescu-Niculescu-Mizil et al. (2013), who study linguistic dynamics in two online beer enthusiast communities, but is adapted to suit an organizational context. Danescu-Niculescu-Mizil et al. (2013) demonstrate that individuals' propensity to adapt to evolving linguistic norms relates to their level of attachment to the community. Users initially align their language with that of the community, but they eventually cease to adapt to new vocabulary as they near the end of their active involvement in the community. Whereas Danescu-Niculescu-Mizil et al. (2013) use cross-entropy-over-bigram language models to compute linguistic distance, our data exhibit greater topical and linguistic variation and thus require a different language model. Moreover, while the cross entropy

approach assumes homogenous linguistic norms shared by all members of the community, ours allows for greater linguistic variation within the organization. It also accounts for the fact that, at any given time, people are in communication with only a subset of individuals in the organization and that it is normative conformity with these individuals (rather than with the organization as a whole) that has consequences for a person's cultural fit and attainment in the organization.

## **METHOD**

### **Empirical Setting and Data**

A mid-sized technology firm served as our research site. The company was organized functionally into departments, including operations, technology, sales, marketing, engineering, human resources, and legal. Conversations with the firm's senior leaders and own observations led us to conclude that the firm had cultivated a strong corporate culture, which emphasized innovation, rapid growth, collaboration, and an energizing work environment. These cultural tenets were distilled in widely disseminated artifacts such as company brochures, shared with all prospective and newly hired employees, and reinforced in communications from senior management and through employee recognition programs.

The company provided us access to the complete corpus of electronic messages—including not only metadata but also content—exchanged among the 601 full-time employees who were employed at the firm between 2009 to 2014. Although they lack the nonlinguistic cues and gestures that facilitate face-to-face communication, email messages still require the use of semiotic tactics that enable people to interpret one another's intentions (Menchik and Tian 2008). In other words, emails contain important cultural content. Email meta-data also provide a

window into changing network structure (Kleinbaum, Stuart, and Tushman 2013; Kossinets and Watts 2006; Srivastava 2015). Electronic communication networks generally correspond to those derived from network surveys but have some important advantages. For example, surveys are susceptible to recall bias, whereas emails reveal actual communication flows (Quintane and Kleinbaum 2011).

To understand the specific norms and practices governing email use in this particular organization, we interviewed the company's Director of Human Resources. As she reported, "We have a very heavy email culture around here. We use it for all kinds of information dissemination—updates from senior management, communication between managers and their staff, and even personal messages. In fact, the line between professional and personal messages blurs all the time.... We are not big on text messaging. Usually texts are just alerts—like 'I am in a meeting right now.' Then, when the meeting is over, we go back to our desks and send the substantive message by email. Of course, phone calls can be important, but most of our communication is through email. The only thing you wouldn't find in emails is highly confidential information from senior management. That kind of communication is more likely to happen in a town hall meeting where nothing is written down." In sum, this interview, together with our own observations of communication within the company, supported the use of email-based measures of network structure and cultural fit.

To protect employee privacy and company confidentiality, we agreed to a number of restrictions in working with the email data.<sup>8</sup> Our resulting data set included approximately 10.25 million messages. In addition to email data, we obtained human resource records that included employee age, gender, and tenure.<sup>9</sup>

## Dependent Variables

The human resource records also identified all employees who had departed from the company, the date of their departure, and the nature of the exit—voluntary or involuntary. Voluntary exits do not provide a clear indicator of attainment since employees can choose to leave for a variety of reasons—for example, because their progress has stalled out within the company or because they have been poached by a competitor following a period of stellar performance. By contrast, involuntary exits provide a sharper signal of (negative) attainment. Although people with solid performance can sometimes experience involuntary exit when business conditions deteriorate, a person is at greatest risk of experiencing involuntary exit when his performance is weak. Thus, our first dependent variable, *Involuntary Exit*, is set to 1 in the month a person experiences involuntary exit and to 0 otherwise.

In addition, for a subset of the observation period—2011 to 2013—we obtained the performance ratings that employees received from their managers. The rating system changed somewhat during this period. In 2013, the company adopted a rating system that ranged from 1 (does not meet expectations) to 4 (exceeds expectations). For consistency, we transformed ratings from prior years when a different scale was used into this four-point scale. Consistent with how the company itself defined effective performance, we constructed an indicator, *Favorable Rating*, which is set to 1 for employees who received a rating greater than or equal to 3 and represents our second attainment measure.<sup>10</sup>

Importantly, both our dependent variables reflect not self-perceptions but rather a focal employee's attainment based on others' perceptions and evaluations. Organizational members experience involuntary exit, or receive low performance appraisals, when their peers and managers perceive their contributions to be unsatisfactory.

### Independent Variables—Structural Embeddedness

Our measure of structural embeddedness is Burt's (1992) widely used *Network Constraint*<sup>11</sup>:

$$C_i = \sum_j (p_{ij} + \sum_q p_{iq}p_{qj})^2, i \neq q \neq j$$

where  $C_i$  is network constraint on person  $i$ ,  $p_{ij}$  is the proportion of person  $i$ 's network activity spent directly on person  $j$  (as reflected in the proportion of emails sent to that person), and the second summation represents the proportion of person  $i$ 's network activity spent indirectly on person  $j$ . Intuitively, constraint depends on three factors: size, density, and hierarchy. Constraint is high when a person has few contacts and those colleagues are connected to one another either directly—that is, in a dense network—or through a central mutual contact—that is, in a hierarchical network.

### Independent Variables—Cultural Embeddedness

We derive the cultural fit measure in two steps. First, we use the Linguistic Inquiry and Word Count (LIWC) lexicon (Pennebaker et al. 2007) to code each email relative to a predefined set of cognitive, semantic, and emotional categories. Introduced more than two decades ago, LIWC has become a well-established and widely used framework for detecting categories of meaning and linguistic style in natural text (Tausczik and Pennebaker 2010). Table A-1 in the Appendix lists these categories. The categorization process entails analyzing free text and assigning weights for categories such as “anxiety” or “leisure.” Formally, a LIWC category  $l$  is a set of words. An email message  $m$ 's weight for a LIWC category  $l$  is the total number of words  $w$  in  $m$  such that  $w \in l$ . These counts are normalized into a conditional distribution over categories.<sup>12</sup>



Next, for each individual  $i$  for an observation window  $t$  (which we define as one month), we divide the set of email messages into outgoing and incoming messages and map each set of messages into a probability distribution over the LIWC categories, resulting in distributions  $O_{it}$  and  $I_{it}$  respectively. We use the Jensen-Shannon divergence statistic (Lin 1991) to measure the difference between these two probability distributions. Let  $\mathcal{L}$  be the set of LIWC categories. The Kullback-Leibler divergence is defined as

$$KL(O \parallel I) = \sum_{l \in \mathcal{L}} O(l) \ln \frac{O(l)}{I(l)}$$

and measures the divergence of distribution  $O$  from  $I$ . The Jensen-Shannon divergence is a smoothed and symmetric transformation of Kullback-Leibler, which is defined as:

$$JS(O \parallel I) = \frac{1}{2} KL(O \parallel M) + \frac{1}{2} KL(I \parallel M)$$

where  $M = \frac{1}{2}(O + I)$ . The Jensen-Shannon divergence equals zero when the two distributions are identical and increases as they diverge. We define individual  $i$ 's cultural fit at time  $t$  as the negative log transformation of her distance from her interlocutors in that period<sup>13</sup>:

$$CF_{it} = -\ln(JS(O_{it} \parallel I_{it}))$$

Intuitively,  $i$ 's cultural fit measures the extent to which the semantic categories in her outgoing messages correspond to the categories in her incoming messages. The more the emails she sends that exhibit different stylistic, topical, and emotional characteristics than the ones she receives, the lower her cultural fit. Note that our choice of  $i$ 's interaction partners as the reference group means that we measure her fit relative to the set of people with whom she chooses to, or is required to, communicate, given the job role to which she is assigned. Moreover, we use raw distributions, rather than weighting inversely by the frequency of interaction with different partners. In other words, our measure of cultural fit represents the

extent to which a person is culturally aligned with the people with whom she corresponds on a frequent basis, rather than with the average person in her department or in the organization more broadly. Our choice of the reference group has two advantages. First, it accounts for potential cultural variability within the organization. Second, it measures the extent to which an actor is culturally assimilated with her active interaction partners, whom she is primarily dependent on for productivity and who are most likely to evaluate her performance. Figure 2 depicts the distribution of this variable. Consistent with view that structure and culture represent distinct but interconnected dimensions on which a person can fit in or stand out, the correlation between *Network Constraint* and *Cultural Fit* is relatively low ( $r = -0.12$ ).

To help validate this measure of cultural fit, we conducted a supplemental analysis using a publicly available data set: the Corpus of Contemporary American English (COCA; <http://corpus.byu.edu/coca/>). Appendix B reports these results, which indicate that TV and radio shows broadcast by the same network are more culturally similar to one another (based on our measure of cultural fit) than are shows broadcast by different networks.

**\*\*\*Figure 2 about here\*\*\***

In sum, we have three main independent variables. We test Baseline Hypothesis 1—that structural embeddedness impedes attainment—with *Network Constraint*. Baseline Hypothesis 2—that cultural embeddedness promotes attainment—is tested using *Cultural Fit*. Finally, we assess the Main Hypothesis—that the effects of structural and cultural embeddedness on attainment will be contingent upon one another—by considering the interaction term, *Network Constraint*  $\times$  *Cultural Fit*.<sup>14</sup> In the analyses reported below, both measures of embeddedness are standardized for ease of interpretation.

## Control Variables

We include as a control another well-established network structural variable: *Network Centrality*, which is based on an individual's eigenvector centrality. This measure has been shown to correspond to an individual's power and status in the organization (Bonacich 1987; Rossman, Esparza, and Bonacich 2010) and therefore should affect access to resources and perceptions of productivity. As is often the case, *Network Constraint* and *Network Centrality* are moderately correlated ( $r = -0.24$ ). To rule out the possibility that our results are influenced by multicollinearity between network measures, we also estimate models that exclude *Network Centrality*. In addition, we include an indicator, *Manager*, which is set to 1 for employees who have direct reports. Finally, in models that do not include individual fixed effects, we control for employee age, age-squared, gender, and departmental affiliation.

## Estimation

We estimate two sets of models that correspond to the two dependent variables. First, we model the rate of involuntary exit, or the "hazard rate," as:

$$h(t) = \lim_{\Delta t \downarrow 0} \frac{\text{prob}(t \leq T < t + \Delta t | T \geq t)}{\Delta t}$$

The hazard rate can be interpreted as the instantaneous probability that a person experiences involuntary exit at time  $T$  between times  $t$  and  $t + \Delta t$ , given that she was at risk of experiencing involuntary exit at time  $t$ . Because our theoretical aims are not related to time dependence, we estimate semiparametric proportional hazard models (Cox 1972). The model is specified as:

$$\log h(t) = a(t) + \mathbf{B}'\mathbf{X}$$

where  $h(t)$  is the hazard rate,  $a(t)$  is any function of time, and  $\mathbf{B}$  is a vector of parameters describing the effects of covariates  $\mathbf{X}$ . Cox's (1972) method of estimating such models obviates

the need to specify  $a(t)$ . Only the part of the hazard rate that does not depend on time is parameterized (Popielarz and McPherson 1995).

Second, we estimate fixed effect conditional logit models in which the dependent variable is *Favorable Rating*. Although based on fewer observations, these models account for time-invariant unobserved heterogeneity among employees—for example, stable personality traits, past work experiences, and communication skills—that might be endogenously related both to attainment and to structural and cultural embeddedness. Because they control for unobserved heterogeneity, these models estimate the effects of within-person variance in network constraint or cultural fit on performance evaluations and therefore afford a more conservative test of the hypotheses.

## RESULTS

### Main Results

Table 1 reports descriptive statistics, and Table 2 provides correlations among the main variables of interest. Table 3 reports results of Cox proportional hazard rate models based on our first measure of (negative) attainment: involuntary exit. Coefficients are reported as hazard ratios: coefficients greater than one indicate increased risk of exit, while coefficients less than one suggest decreased risk. Models 1 to 3 test the baseline hypotheses, with Models 1 and 2 corresponding to separate tests of Baseline Hypotheses 1 and 2, respectively, and Model 3 testing both simultaneously. Models 4 and 5 test the Main Hypothesis, with Model 5 including both *Network Constraint* and *Network Centrality*. We exclude *Network Centrality* from Models 1 to 4, to demonstrate that the results are not driven by multicollinearity between network measures.

\*\*\*Table 1 about here\*\*\*

**\*\*\*Table 2 about here\*\*\***

Unsurprisingly, *Age* is positively associated with an increased hazard of involuntary exit throughout these models; the  $Age^2$  coefficient is significant in Model 1 and marginally significant in Models 2 through 5, implying a weak curvilinear relationship between age and the risk of involuntary exit. *Female* is not significant in Models 1 through 5, suggesting that, when structural and cultural variables are taken into account, gender is inconsequential for negative attainment in the form of involuntary exit.<sup>15</sup>

Consistent with Baseline Hypothesis 1—that structural embeddedness is negatively related to attainment—*Network Constraint* is significant in Model 1, with a hazard ratio greater than one. When network and cultural variables are included in the same model (Model 3), however, the positive effect of network constraint on involuntary exit is no longer significant, suggesting that the effects of constraint on attainment are moderated by cultural fit.

In contrast, Baseline Hypothesis 2—that cultural embeddedness in the form of linguistic fit with interlocutors in the organization is positively related to attainment—is supported whether or not network variables are included in the model (Models 2 and 3). As expected, *Cultural Fit* is highly significant, with a hazard ratio less than one. The effect is substantial: an increase in one standard deviation in cultural fit is associated with a reduction in the hazard of involuntary exit by slightly more than fifty percent.

Models 4 and 5 provide a test of our Main Hypothesis—that the effects of structural and cultural embeddedness on attainment are contingent upon one another such that: (1) cultural fit is associated with higher (lower) attainment for individuals with low (high) network constraint, and (2) network constraint is associated with higher (lower) attainment for individuals with low (high) cultural fit. Consistent with this expectation, the interaction term *Network Constraint* ×

*Cultural Fit* is significant, with a hazard ratio greater than one, regardless of whether *Network Centrality* is included (Model 5) or excluded (Model 4) as a control.

\*\*\*Table 3 about here\*\*\*

Figure 3 provides a graphical representation of the effect. For individuals who are either at the median level of constraint or who are brokers (i.e., at the 10<sup>th</sup> percentile of constraint), there is a strong negative association between cultural fit and the hazard ratio of involuntary exit. This negative relationship is especially steep for the latter. In our terminology, *Assimilated Brokers* fare better than *Disembedded Actors*. In fact, a broker who is two standard deviations below the mean on cultural fit (identified as a *Disembedded Actor* in Figure 3) is at a risk of involuntary exit that is an order of magnitude times greater than that of a comparably structurally disembedded broker who is two standard deviations above the mean (identified as an *Assimilated Broker*). The hazard of involuntary exit for those at median or below median levels of constraint drops below one only when their cultural fit is at or above mean levels. In other words, only those who are culturally assimilated with others appear to reap the advantages of structural brokerage.

By contrast, cultural fit becomes an obstacle for those who are embedded in constrained networks (i.e., at the 90<sup>th</sup> percentile). This effect is also very substantial: a structurally constrained employee who is two standard deviations above the mean on cultural fit (identified as a *Doubly Embedded Actor* in Figure 3) is over three times more likely to be involuntarily terminated than a similarly constrained co-worker who is two standard deviations below the mean on cultural fit (identified as an *Integrated Nonconformist* in Figure 3). Thus, *Integrated Nonconformists* fare better than *Doubly Embedded Actors*.

\*\*\*Figure 3 about here\*\*\*

For comparison, Models 6 through 8 in Table 3 replicate the analyses using the other type of exit—voluntary—that is less directly tied to attainment and is more directly influenced by self-identification with the reference group of colleagues. Modeled separately, *Network Constraint* is associated with an increase in the hazard of voluntary exit (Model 6) while *Cultural Fit* is associated with a decrease (Model 7); however, these effects are no longer significant when structural and cultural variables are included in the same model (Model 8). Importantly, the interaction term *Network Constraint*  $\times$  *Cultural Fit* is not significant. Taken together, the results from Table 3 provide support for our Main Hypothesis and establish that these effects pertain specifically to (negative) attainment in the form of involuntary exit rather than to any kind of exit.

We turn next to considering the second measure of attainment: the likelihood of a person receiving a favorable performance rating. These results are reported in Table 4. Because performance ratings were only available for a subset of individuals and for portion of the observation period, and given that they are collected only on an annual basis, the sample for these models is considerably smaller than that used for the hazard models.<sup>16</sup> Recall also that we estimate fixed effect models, which identify the effects of structural and cultural embeddedness on attainment based on within-individual variation. These models afford a more conservative test of hypotheses since they account for unobserved heterogeneity; however, they lack the statistical power of the hazard models. Again, from all models except the last, we exclude *Network Centrality* to rule out the possibility that our results are driven by collinearity between network measures.

Models 1 through 3 assess the Baseline Hypotheses, with the first two models testing the effects of structural and cultural variables separately, and the latter combining them. *Manager* is

consistently significant and positive, suggesting that promotion into a managerial position boosts a person's chances of receiving a favorable performance rating. *Network Constraint* is, as expected, negatively associated with favorable performance, but significantly so only when modeled together with cultural embeddedness. *Cultural Fit*, on the other hand, is significant and positively predictive of a favorable performance evaluation whether modeled separately (Model 2) or together with *Network Constraint* (Model 3). In other words, we find partial support for Baseline Hypothesis 1: increases in constraint reduce the likelihood of receiving a favorable performance rating—but only in some specifications. By contrast, we find more consistent support for Baseline Hypothesis 2: as people become more culturally embedded within the organization, they experience higher levels attainment.

**\*\*\*Table 4 about here\*\*\***

Our main models of interest are Models 4 and 5, which include the interaction term, *Network Constraint*  $\times$  *Cultural Fit*. In both cases, the interaction between *Network Constraint* and *Cultural Fit* is negative and significant. In sum, models based on the second measure of attainment—favorable performance ratings—provide additional support for our Main Hypothesis.

Figure 4 provides a graphical representation of the interaction effect. For individuals at the median level of constraint, there is a steep, positive relationship between cultural fit and attainment. This effect is even more pronounced for those with low constraint (i.e., brokers). We again find that *Assimilated Brokers* do better than *Disembedded Actors*. The benefits of brokerage drop dramatically below mean cultural fit, reduced from an almost one hundred percent predicted probability of receiving a favorable performance evaluation to roughly eighty percent for individuals whose cultural fit is two standard deviations below the mean.



By contrast, there is a negative relationship between cultural fit and attainment for employees who are highly constrained. The predicted probability of receiving a favorable evaluation for a constrained actor who is two standard deviations above the mean on cultural fit is close to 0, while it is nearly 50% for a constrained actor who is two standard deviations below the mean on cultural fit.<sup>17</sup> As with the hazard models, the analyses based on performance ratings also indicate that *Integrated Nonconformists* are more likely to reach high levels of attainment than *Doubly Embedded Actors*.

\*\*\*Figure 4 about here\*\*\*

### **Robustness Checks**

Appendix C contains the results of supplemental analyses designed to assess the robustness of our results and rule out plausible alternative explanations. Tables C-1 and C-2 report results based on an alternative measure of cultural fit that does not rely on the LIWC categories but instead defines fit relative to the thousand most frequently used words by a focal actor in the corpus. These analyses help to establish that our results are not an artifact of the choice to use LIWC categories. Tables C-3 and C-4 report the results of additional robustness checks that demonstrate that our results remain consistent when we operationalize cultural fit differently and are not driven by: (a) our choice of reference group; (b) communication with supervisors; or (c) communication mediated through email distribution lists.<sup>18</sup>

### **DISCUSSION**

Our findings provide support for, and add nuance to, the prevailing narratives in the sociological and organizational literatures about the consequences of brokerage and cultural fit. On the one hand we reproduce two fundamental findings, which served as our Baseline

Hypotheses: that, evaluated independently, structural brokerage and cultural assimilation are associated with greater attainment, all else equal. In most specifications, we reproduce the finding—which has by now almost become axiomatic in the literature—that network constraint is associated with lower levels of attainment. This is especially pronounced in Figure 4, which shows that highly constrained individuals generally perform poorly compared to their peers, except at very low levels of cultural fit. Across specifications, we also find a robust and substantial positive association between cultural fit and attainment, all else equal.

Our results also demonstrate, however, that considering the two dimensions of embeddedness independently can lead to an overestimation of the benefits of structural brokerage and the costs of low cultural fit. Actors occupying positions of network constraint do not always underperform brokers. Rather, as Figure 3 illustrates, constrained actors with very low cultural fit (two standard deviations below the mean)—that is, *Integrated Nonconformists*—have a predicted hazard of experiencing involuntary exit that is about five times less than the hazard experienced by comparably unassimilated brokers—*Disembedded Actors* in our terminology. “People with networks rich in structural holes” as Burt (2005: 18) argues, “are the people who know about, have a hand in, and exercise control over more rewarding opportunities.” In the absence of the trust and reputation afforded by network closure, however, capitalizing on such opportunities requires a social lubricant. We propose that cultural fit can serve as just such an emollient.

In fact, differences in the predicted probability of receiving a favorable performance rating (Figure 4) across low, median, and high levels of constraint vary dramatically by cultural fit. Thus, the nearly taken-for-granted negative relationship between constraint and attainment

may just represent the special, albeit not uncommon, case of individuals who are “typical” in their level of cultural fit with their immediate peers in the organization.

In a similar vein, low cultural fit is generally detrimental for attainment, including for people at the median level of constraint and for those with low constraint (brokers). By contrast, having low levels cultural fit actually seems to benefit highly constrained individuals—presumably because it enables them to stand out from their structurally overlapping crowd.

Work on attainment in organizations has overwhelmingly focused in recent years on the structural underpinnings of individual career success. It has tended to treat culture as epiphenomenal of, and therefore secondary to, structure, assuming that individuals who span structural holes necessarily bridge between groups with different beliefs and normative arrangements and that such brokers are adept at enacting different social identities (Burt, Kilduff, and Tasselli 2013). While this may often be the case, it is not necessarily so. In fact, our findings suggest that not all brokers are *Assimilated Brokers*; some, at least, are *Disembedded Actors*. Similarly, among those with high levels of cultural fit, it is useful to distinguish *Integrated Nonconformists*, who can reap the rewards of being culturally different, from *Doubly Embedded Actors* who are indistinguishable from their peers

What are the mechanisms that lead *Integrated Nonconformists* and *Assimilated Brokers* to fare better than their counterparts who are not embedded in one dimension and disembedded in the other? In line with previous work on social networks and economic sociology, we posit that the effects of network position on attainment operate primarily through the channel of information access (both direct access by the focal actor and indirect access through his or her alters), whereas the effects of cultural fit on attainment are mostly related to an identity channel that affects how an actor is perceived by others. That is, networks influence an actor’s productive

output, while cultural fit affects how this productivity is perceived and valued by others.<sup>19</sup> When properly aligned, these two channels can complement, rather than counteract, one another.

Brokers have access to varied and novel information, but they are short on trust and reputation; a stable and congruent cultural identity is useful for offsetting this shortage. Positions of network closure, on the other hand, provide interactional consistency and facilitate a wide informational bandwidth; under such circumstances, cultural uniqueness can become a reputational asset and a signal of competence, rather than a liability.

Unfortunately, our data do not allow us to directly test these mechanisms. We do not measure employees' quality of output independently of how they are evaluated by others. Thus, we cannot differentiate between channels that directly affect productivity and those that affect peer perceptions. Previous work suggests that structural processes also have identity ramifications, whereas cultural processes affect information exchange. Networks function both as pipes and as prisms (Podolny 2001), while culture is part and parcel of how co-workers coordinate tasks and is therefore central to the realization of interpersonal complementarities in organizations (Weber and Camerer 2003). These nuances might lead to the development of additional hypotheses about why the interaction between structural and cultural embeddedness is consequential for attainment in organizations.

## **CONCLUSION**

For decades, a central, though mostly implicit, tension that has energized sociological research on topics as diverse as job search (Granovetter 1973), creativity (Fleming, Mingo, and Chen 2007), immigration (Portes and Sensenbrenner 1993), political voting behavior (Liu and Srivastava 2015), and scientific production (Foster, Rzhetsky, and Evans 2015) concerns the dual

pressures that people face to fit in with or stand out from others. These research strands have mostly examined structural and cultural processes in isolation from one another. Structural accounts have predominantly focused on the tension between brokerage and closure; cultural accounts on the tension between conformity and distinctiveness. We have argued that these different accounts are, in fact, two sides of the same coin: they are the structural and cultural manifestations of the challenge of balancing social belongingness with differentiation, which, we contend, stands at the heart of what Granovetter (1985) termed the “problem of embeddedness” three decades ago.

We integrate these otherwise disparate bodies of research by developing a theory of the tradeoffs associated with two distinct forms of embeddedness: structural and cultural (Zukin and DiMaggio 1990). In our account, neither form of embeddedness is subservient to the other. Rather, building on previous work, we theorize that each operates autonomously to influence individual attainment. But we also propose a novel conceptual pathway for individuals to resolve the fitting-in-versus-standing-out tension. Unlike prevailing theories that assume people resolve the tension by either finding a sweet spot of optimal distinctiveness (Brewer 1991) or by transitioning between fitting in and standing out over time (Burt and Merluzzi 2016; Zuckerman et al. 2003), we argue that people can gain advantage by occupying a position that is embedded in one domain and disembedded in the other. Consequently, we posit that the effects of structural and cultural embeddedness are inherently contingent on one another.

Analyses of personnel records and a unique corpus of email messages exchanged among employees in a U.S.-based technology firm lent strong support for our theory. Transforming email metadata into network structural measures and employing computational linguistic

techniques to translate the unstructured natural language of email communications into a novel measure of cultural fit, we found evidence of a tradeoff between the two forms of embeddedness.

Although sociological research such as the present study frequently relies on empirical patterns observed in a particular organization (e.g., Petersen, Saporta, and Seidel 2000), care must always be taken in generalizing from such work. The organization we studied was typical in many respects of U.S.-based, mid-sized technology firms; however, it remains unclear how the patterns we observed would vary across different types of organizations—for example, those that vary in the strength of their culture (Sørensen 2002), in the degree of heterogeneity that exists among the subcultures of the departments and functions they house (Dougherty 1992), or in the nature of the relationship between individual performance and organizational success (Jacobs 1981). We would conjecture that our findings are not limited to organizations or to professional attainment. Rather, we anticipate that the contingent advantages of structural and cultural embeddedness should play out similarly in social settings that are not strictly organizational. Replications of our approach across these varied contexts would help identify the contingencies and boundary conditions of the theory we have developed.

Although our models of individual attainment based on performance ratings included individual fixed effects that accounted for time-invariant, unobserved heterogeneity, we acknowledge that our empirical approach cannot rule out threats to causal identification from other forms of endogeneity (e.g., unobserved attributes of individuals that change over time and are associated with network constraint or cultural fit). Given that random assignment of individuals to structural positions of varying constraint or to differing levels of cultural fit is typically infeasible in organizational settings, future research will likely need to take advantage of exogenous changes—for example, stemming from an unanticipated restructuring (Srivastava

2015)—to more firmly pin down the causal relationships among network constraint, cultural fit, and individual attainment.

These limitations notwithstanding, our work makes a number of noteworthy contributions, both substantive and methodological. Our theoretical fusion of work on social networks and on the cultural underpinnings of economic action makes contributions to both literatures. First, it brings fresh insight to research on the contingent effects of structural brokerage (e.g., Podolny 2001; Reagans and McEvily 2003; Vedres and Stark 2010). For example, previous work has found that the advantages of brokerage are contingent on the number of a broker's peers engaged in similar work (Burt 1997), or on the extent to which that national and organizational culture is collectivist (Xiao and Tsui 2007). By contrast, our work highlights that the returns to brokerage depend on an individual's level of cultural fit with the peers she communicates with by dint of the structural position she occupies within the firm. This finding is consistent with and enriches our understanding of earlier work on the characteristics of boundary spanning individuals in organizations. Tushman and Scanlan (1981), for example, point to the importance of “informal internal linkages”—acquired through transfers and rotations across different parts of the organization—and a “professional orientation” that propels individuals with high perceived competence into boundary spanning roles. We suspect that these linkages and orientations are manifestations of cultural fit, which enable individuals to successfully traverse formal organizational boundaries.

Similarly, our approach sheds new light on work in economic sociology that focuses on the contingent effects of categorical conformity (e.g., Ferguson and Hasan 2013; Hsu, Hannan, and Koçak 2009; Leung 2014; Smith 2011). For the most part, these studies have found that, while categorical noncompliance is conventionally frowned upon, culturally nonconforming

actors who already enjoy a prestigious reputation (e.g., Rao, Monin, and Durand 2005) or who have established their legitimacy in a field (e.g., Zuckerman et al. 2003) are more likely to be perceived as path blazing than as deviant. Here too our work highlights that the returns to cultural noncompliance depend on one's structural position: those ensconced in tight-knit networks are more likely to benefit from culturally unconventional behavior.

Methodologically, this study also has important implications for research that seeks to characterize and systematically measure different facets of culture (e.g., Goldberg 2011). In contrast to prevailing self-report methods (e.g., O'Reilly, Chatman, and Caldwell 1991) or text mapping tools (e.g., Carley and Palmquist 1992), we develop an analytical approach to measuring cultural fit over time using email data which, while drawing on cultural content to infer cultural similarity among individuals, takes a distributional approach to culture that is ultimately content-agnostic (Harrison and Carroll 2006). We neither theorize about nor model the implications of the cultural meanings being exchanged among organizational members; rather, we examine how these meanings are distributed to derive measures of cultural variance within the organization.

This technique can, in principle, be replicated with relative ease and limited cost in any organization that maintains email archives. Prior research in this vein has used email metadata (Kleinbaum, Stuart, and Tushman 2013; Kossinets and Watts 2009; Srivastava 2015) or the mapping of individuals to email distribution lists within an organization (Liu, Srivastava, and Stuart 2016) to characterize different facets of individuals' structural position. Studies that utilize email content, rather than just metadata, remain quite rare—typically because of the difficulty of gaining research access to information that is often considered proprietary and sensitive and the challenge of installing adequate safeguards to protect employee privacy and company



confidentiality. Those that exist have used email message content to derive measures of information diversity (Aral and Van Alstyne 2011) but stopped short of using these data to measure facets of culture and cultural fit. In this regard, the present work may represent a substantial methodological advance.

Access to readily available, time-varying measures of cultural fit opens up several avenues for future research that are both conceptually important and practically relevant. For example, one could use such data to address questions such as: (1) What kinds of individuals (based on observable, pre-hire characteristics such as their job application materials) are most likely to enculturate successfully into an organization? (2) What kinds of employees are best suited to different forms of internal mobility (e.g., transfers and rotations across departments or geographic units)? (3) In an organizational restructuring, which organizational subunits would be easier or harder to combine or separate based on considerations of cultural compatibility? and (4) In the interorganizational context, how culturally compatible are two firms that are contemplating merging or forming a joint venture or alliance? The present study represents but an initial foray into questions such as these.

We conclude by returning to Granovetter's (1985) manifesto on embeddedness. As many have commented (e.g. Portes and Sensenbrenner 1993: 1321; Uzzi 1996; Zukin and DiMaggio 1990), although embeddedness has been a useful construct for rethinking neoclassical economics, it nevertheless suffers from theoretical vagueness. In building on these commentators' work, we have attempted to inject additional conceptual precision to the term by drawing the distinction between structural and cultural embeddedness and by explicating the tradeoffs inherent within each form of embeddedness and in their intersection. We have also developed an analytical approach to operationalize the two forms of embeddedness as a system

of measures that would appear to have widespread applicability. Ultimately, we hope that, by recasting the problem of embeddedness as balancing the tensions of fitting in and standing out, this work will help reinvigorate this concept's analytical purchase and thereby advance the enduring sociological project of uncovering the interplay between structure and culture.

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Figures and Tables

Figure 1: Two Dimensions of Embeddedness

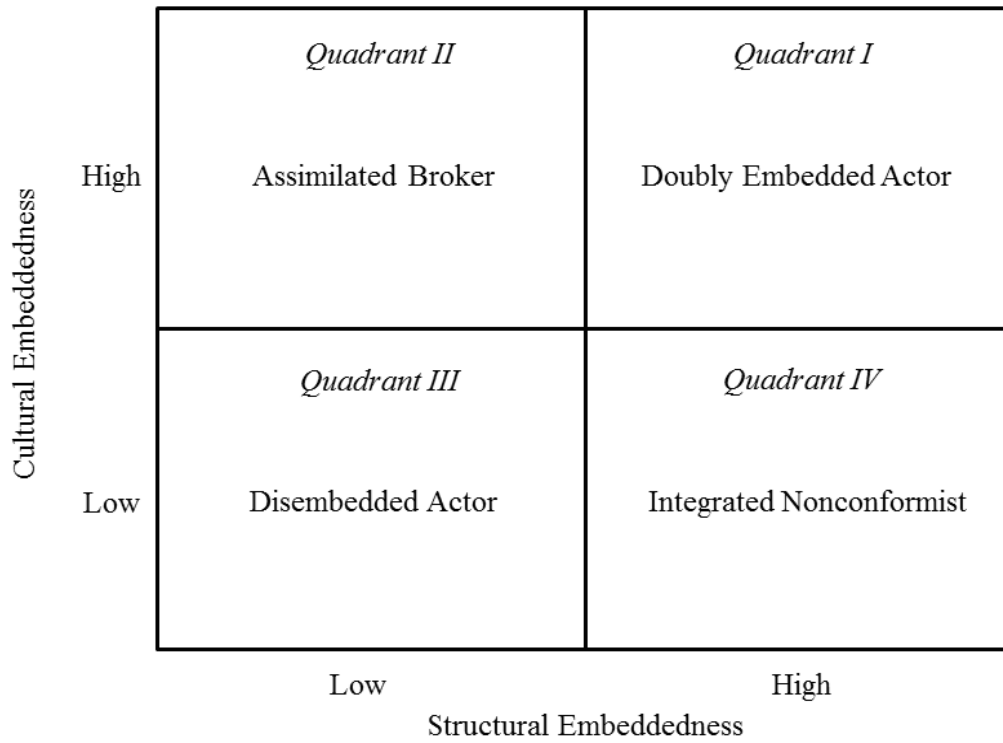
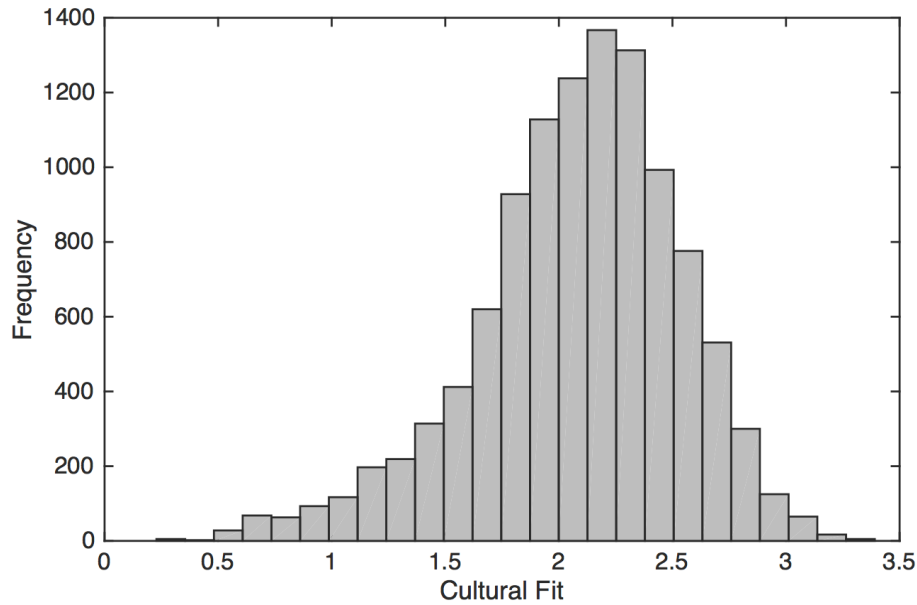
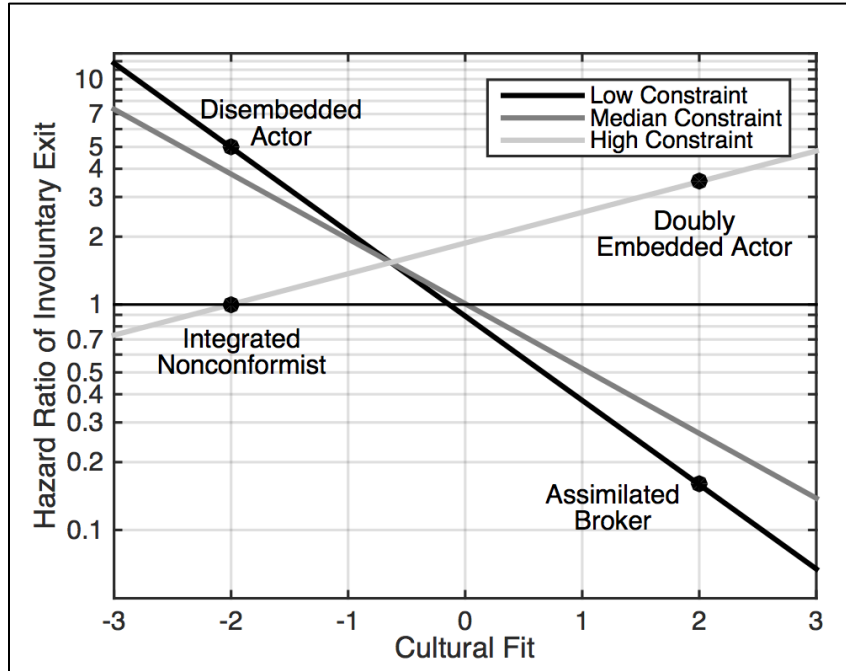


Figure 2: Distribution of Raw Cultural Fit Measure

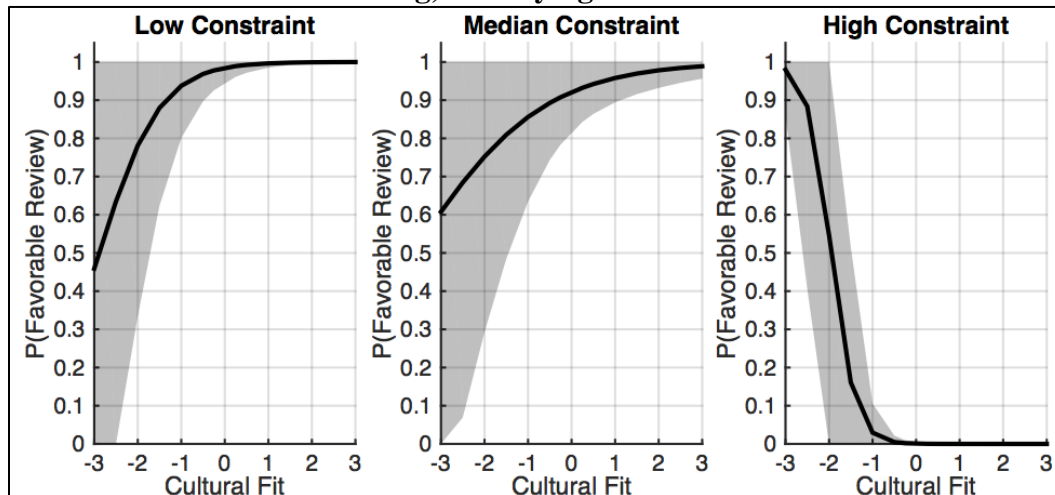


**Figure 3: Marginal Effect of Cultural Fit on the Hazard Ratio of Involuntary Exit, at Varying Levels of Network Constraint**



Notes.—The x-axis represents the number of standard deviations a person is from the mean level of cultural fit. Low constraint corresponds to the 10<sup>th</sup> percentile, and high constraint to the 90<sup>th</sup> percentile. Hazard ratios are calculated relative to an individual with mean values for all control variables. The y-axis is logarithmically scaled. For illustration, we have identified positions that correspond to the four ideal types of actors in our framework.

**Figure 4: Marginal Effect of Cultural Fit on the Predicted Probability of Receiving a Favorable Performance Rating, at Varying Levels of Network Constraint**



Notes.—The x-axis represents the number of standard deviations a person is from the mean level of cultural fit. Low constraint corresponds to the 10<sup>th</sup> percentile, and high constraint to the 90<sup>th</sup> percentile. Probabilities are calculated assuming mean values for control variables, and assuming that individual fixed effects are zero. Gray shades correspond to 95% confidence intervals.

**Table 1: Descriptive Statistics**

Variable	Observations	Mean	Standard Deviation	Min.	Max.
Age (at time of entry)	601	33.2	9.71	19.8	66.8
Tenure (months)	601	19.6	15.5	1	89
Manager	601	0.245	0.430	0	1
Female	601	0.331	0.471	0	1
Exited	601	0.373	0.484	0	1
Exited—Voluntary	601	0.148	0.355	0	1
Exited—Involuntary	601	0.225	0.418	0	1
Favorable Rating	480	0.748	0.435	0	1
Network Centrality	12722	0.063	0.050	0	0.577
Network Constraint	12722	0.198	0.234	0.002	2
Cultural Fit	10924	2.083	0.453	0.228	3.39

Notes.—*Network Centrality*, *Network Constraint* and *Cultural Fit* are calculated on a person-month basis. The other measures are calculated at the person level over the complete window of observation. Performance ratings were missing for 121 individuals.

**Table 2: Correlation Matrix**

Variable	(1)	(2)	(3)	(4)	(5)
(1) Age					
(2) Female	0.068				
(3) Manager	0.214	-0.009			
(4) Network Centrality	0.133	0.039	0.141		
(5) Network Constraint	-0.048	0.050	-0.133	-0.249	
(6) Cultural Fit	0.076	0.020	0.259	0.316	-0.120

**Table 3: Cox Proportional Hazard Models of Exit by Type of Exit—Involuntary and Voluntary**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Involuntary	Involuntary	Involuntary	Involuntary	Involuntary	Voluntary	Voluntary	Voluntary
Age	1.232*** (3.36)	1.260* (2.53)	1.266** (2.58)	1.229* (2.21)	1.303** (2.66)	0.816** (-3.03)	0.955 (-0.42)	1.042 (0.37)
Age <sup>2</sup>	0.998** (-2.68)	0.998 (-1.79)	0.998 (-1.84)	0.998 (-1.47)	0.998 (-1.95)	1.002** (2.79)	1.001 (0.39)	0.999 (-0.40)
Female	1.065 (0.36)	1.196 (0.71)	1.208 (0.74)	1.194 (0.69)	1.452 (1.36)	1.100 (0.45)	1.796 (1.88)	2.084* (2.29)
Manager	0.514* (-2.09)	1.087 (0.19)	1.119 (0.25)	1.126 (0.27)	1.811 (1.27)	0.785 (-0.60)	0.989 (-0.02)	1.448 (0.77)
Network Centrality					0.205*** (-3.39)			0.355* (-2.47)
Network Constraint	1.412*** (5.60)		1.177 (0.78)	1.717* (2.41)	1.667 (1.31)	1.562*** (7.20)		1.667 (1.51)
Cultural Fit		0.446*** (-6.85)	0.447*** (-6.74)	0.499*** (-5.58)	0.676** (-2.71)		0.599*** (-4.20)	0.763 (-1.88)
Network Constraint × Cultural Fit				1.572** (2.70)	2.143** (3.07)			1.060 (0.34)
Department Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12722	9885	9885	9885	9885	12722	9885	9885
chi2	68.751	95.936	97.325	101.331	107.630	94.257	40.303	55.299
ll	-935.012	-358.065	-357.851	-355.590	-339.022	-635.695	-232.992	-225.549

Notes.— Coefficients reported as hazard ratios; t-statistics in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

**Table 4: Fixed Effects Conditional Logit of Favorable Performance Rating**

	(1)	(2)	(3)	(4)	(5)
	Favorable Rating	Favorable Rating	Favorable Rating	Favorable Rating	Favorable Rating
Manager	3.724** (2.73)	3.593* (2.53)	3.408* (2.26)	3.384* (2.04)	3.351* (2.05)
Network Centrality					-0.130 (-0.13)
Network Constraint	-2.309 (-1.80)		-4.243* (-2.43)	-5.622** (-3.13)	-5.682** (-3.08)
Cultural Fit		0.925* (2.15)	1.236* (2.57)	-0.011 (-0.02)	0.004 (0.01)
Network Constraint × Cultural Fit				-2.518** (-2.82)	-2.526** (-2.82)
<i>N</i>	185	166	166	166	166
pseudo <i>R</i> <sup>2</sup>	0.149	0.133	0.215	0.244	0.244
ll	-56.818	-51.925	-47.014	-45.294	-45.284

Notes.— t-statistics in parentheses. Robust standard errors. All models include individual fixed effects. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

## APPENDIX A: Measuring Cultural Fit with LIWC

We code the textual exchange among the individuals contained in our dataset using the LIWC lexicon and apply our newly developed measure of cultural fit to these coded data. Our approach to measuring cultural fit can be applied to any method of textual categorization, and, as we demonstrate in Appendix C, our findings are robust to applying our approach to raw word counts (though using raw words counts results in a noisier measure). The LIWC framework is detailed in Table A-1. Because it relies on linguistic function words such as pronouns, prepositions and adverbs and generic content categories, it provides several advantages for the purpose of measuring cultural fit.

First, by using the LIWC framework, we preclude the possibility that our measure of cultural fit is disproportionately driven by terminology that is task-specific. Such task-specific terms would be biasing our measure toward functional coordination among organizational members, rather than their cultural congruence. Second, the LIWC lexicon's reliance on linguistic function categories is specifically designed to capture an individual's linguistic style. Linguistic style is a salient form of normative compliance and is distinct from the content being exchanged. For example, two interlocutors may be discussing the same topic, with one person using swear words and the other choosing not to use such terms. Such an interaction is culturally incongruent, even if topically aligned. Finally, the various generic content categories contained in the LIWC framework potentially tap deeper value systems and cultural orientations, insofar as they are reflected in normative language use (e.g., religious terminology, tendency to express certainty or doubt, legitimacy of expressing sadness, etc.).

Overall, our approach is agnostic to the cultural content being exchanged, such that different individuals might be determined to have similar levels of cultural fit even if the content

and styles of their conversations are different. What matters are these individuals' levels of alignment with their respective sets of interlocutors, as reflected in their word distributions over LIWC categories.

**Table A-1: Linguistic Inquiry and Word Count Framework (Pennebaker et al. 2007)**

<i>Category</i>	<i>Examples</i>	<i>Words In Category</i>
Total function words		464
Total pronouns	I, them, itself	116
Personal pronouns	I, them, her	70
1st pers singular	I, me, mine	12
1st pers plural	We, us, our	12
2nd person	You, your, thou	20
3rd pers singular	She, her, him	17
3rd pers plural	They, their, they'd	10
Impersonal pronouns	It, it's, those	46
Articles	A, an, the	3
Common verbs	Walk, went, see	383
Auxiliary verbs	Am, will, have	144
Past tense	Went, ran, had	145
Present tense	Is, does, hear	169
Future tense	Will, gonna	48
Adverbs	Very, really, quickly	69
Prepositions	To, with, above	60
Conjunctions	And, but, whereas	28
Negations	No, not, never	57
Quantifiers	Few, many, much	89
Numbers	Second, thousand	34
Swear words	Damn, piss, fuck	53
Social processes	Mate, talk, they, child	455
Family	Daughter, husband, aunt	64



<i>Category</i>	<i>Examples</i>	<i>Words In Category</i>
Friends	Buddy, friend, neighbor	37
Humans	Adult, baby, boy	61
Affective processes	Happy, cried, abandon	915
Positive emotion	Love, nice, sweet	406
Negative emotion	Hurt, ugly, nasty	499
Anxiety	Worried, fearful, nervous	91
Anger	Hate, kill, annoyed	184
Sadness	Crying, grief, sad	101
Cognitive processes	cause, know, ought	730
Insight	think, know, consider	195
Causation	because, effect, hence	108
Discrepancy	should, would, could	76
Tentative	maybe, perhaps, guess	155
Certainty	always, never	83
Inhibition	block, constrain, stop	111
Inclusive	And, with, include	18
Exclusive	But, without, exclude	17
Perceptual processes	Observing, heard, feeling	273
See	View, saw, seen	72
Hear	Listen, hearing	51
Feel	Feels, touch	75
Biological processes	Eat, blood, pain	567
Body	Cheek, hands, spit	180
Health	Clinic, flu, pill	236
Sexual	Horny, love, incest	96
Ingestion	Dish, eat, pizza	111
Relativity	Area, bend, exit, stop	638
Motion	Arrive, car, go	168
Space	Down, in, thin	220

<i>Category</i>	<i>Examples</i>	<i>Words In Category</i>
Time	End, until, season	239
Work	Job, majors, xerox	327
Achievement	Earn, hero, win	186
Leisure	Cook, chat, movie	229
Home	Apartment, kitchen, family	93
Money	Audit, cash, owe	173
Religion	Altar, church, mosque	159
Death	Bury, coffin, kill	62
Assent	Agree, OK, yes	30
Nonfluencies	Er, hm, umm	8
Fillers	Blah, I mean, you know	9

Notes.— Accessed on May 8, 2015 from <http://www.liwc.net/descriptiontable1.php>.

## APPENDIX B: Validating the Cultural Fit Measure using the Corpus of Contemporary American English (COCA)

To help validate our measure of cultural fit, we conducted a supplemental analysis using a publicly available data set: the Corpus of Contemporary American English (COCA; <http://corpus.byu.edu/coca/>). In particular, we extracted for 2010-2012 the entire “spoken” sub-corpus, which consists of speech fragments from television and radio shows. When processed using our tokenization procedure, the sub-corpus yields 10,279,669 tokens. Of these, 6,486,282 can be mapped to one or more LIWC categories, resulting in 20,153,399 LIWC category tokens. We then grouped speech fragments by the 51 shows in the corpus, with show samples ranging in length from 9,759 to 1,746,629 LIWC tokens.

We anticipate that each network—for example, Fox or NPR or CNN—will have its own distinctive culture such that two shows broadcast by the same network will have higher levels of cultural fit with each other than will two shows broadcast by different networks. To assess whether our measure does indeed provide a window into the cultural congruity of same-network shows, we constructed a dyad-level data set of the cultural fit between each pair of shows. We then estimated an ordinary least squares regression of cultural fit on an indicator that is set to 1 when two shows are broadcast by the same network and to 0 otherwise. To account for the non-independence of observations (given that each show appears in many dyads), we implemented two-way clustering of the standard errors (Cameron, Gelbach, and Miller 2011; Kleinbaum, Stuart, and Tushman 2013).

Table B-1 reports this analysis. Consistent with our expectation, *Same Broadcast Network* is a positive and significant predictor of cultural fit. This result is especially striking because the LIWC conversion eliminates or obscures the obvious linguistic markers for individual networks (e.g., the network name, most proper names). The analysis suggests that our

cultural fit measure is sensitive to subtler stylistic and interactional cues. We believe that these results help to establish the face and construct validity of the measure (using a data set available to anyone for replication purposes).

**Table B-1: Regression of Cultural Fit on Same Broadcast Network**

	(1) Cultural Fit
Same Broadcast Network	0.312** (3.42)
Constant	-4.901*** (57.58)
<i>N</i>	1378
<i>F</i>	38.8
<i>R</i> <sup>2</sup>	0.0274

Notes.— *z* statistics in parentheses; two-way clustering of standard errors to account for non-independence of observations; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

### APPENDIX C: Robustness Checks

We conducted further analyses to evaluate the robustness of our findings to alternative measures of cultural fit. To begin, rather than considering Jensen-Shannon divergence between the probability distributions of incoming and outgoing messages over a vector of LIWC categories, we instead assessed divergence over a vector of the thousand most popular words used by the focal actor across the entire corpus. This measure has the advantage of using categories that emerged naturally within this particular empirical setting; however, it is a noisier measure than the one based on LIWC categories (see Appendix A for more details).

Table C-1 reports comparable models to those in Table 3 using this alternative measure of cultural fit. Table C-1 largely replicates the results reported in Table 3. In Model 1, *Network Constraint* is positively associated with negative attainment in the form of involuntary exit, whereas *Cultural Fit* is negatively associated with involuntary exit in Model 2. When both measures are included together (Model 3), *Network Constraint* is no longer significant. In support of the Main Hypothesis, *Network Constraint*  $\times$  *Cultural Fit* is positive and significant in Models 4 (without *Network Centrality* as a control) and 5 (with *Network Centrality* as a control),

Table C-2 reports models using the alternative measure of cultural fit and is comparable to Table 4. *Network Constraint* is of the expected sign but not significant in Model 1, and *Cultural Fit* is of the expected sign but not significant in Model 2. In Model 3, which includes both terms, *Network Constraint* is negative and significant. In Models 4 (without *Network Centrality* as a control) and 5 (with *Network Centrality* as a control), the interaction term, *Network Constraint*  $\times$  *Cultural Fit*, is negative and significant. Thus, there is again support for the Main Hypothesis. Together, the analyses reported in Tables C-1 and C-2 indicate that our results are not an artifact of the particular method we used to operationalize *Cultural Fit*.

To further establish the robustness of the results reported in Tables 3 and 4, we estimated models with three other variants of the cultural fit measure. First, to account for the possibility that the sorting of people into networks (i.e., their particular set of interaction partners in a given month) might bias our estimates of the effects of cultural fit on career outcomes, we derived a measure of cultural fit in which the reference group was not a focal actor's interlocutors in a given month but rather all employees in the firm except for the focal actor. Table C-3 (Models 1-2) and Table C-4 (Models 1-2) report these results. In both cases, the main effect of this alternative cultural fit measure is significant and of the expected sign. In the hazard model of involuntary exit (Table C-3, Model 2), the interaction between network constraint and cultural fit is also significant and of the expected sign. In the performance model (Table C-4, Model 2), the interaction is of the expected sign and marginally significant. We note, however, that this alternative measure of cultural fit is not as sensitive to cultural heterogeneity within the firm compared to the one that uses the reference group of a focal actor's interaction partners. We therefore chose to use the latter in the main models.

Second, to account for the possibility that our results do not indicate the importance of cultural fit in general but instead simply reflect a subordinate's ability to successfully manage impressions with his or her supervisor, we developed an alternative measure of cultural fit that attempts to remove a focal actor's communication with his or her supervisor. The data set we obtained from the company did not identify each employee's supervisor. So we instead used the following procedure to infer each employee's supervisor. First, we identified each employee's membership on one of three email distribution lists: managers, directors, and executives. (These represented categories of rank within the organization in ascending order.) Next, we assumed

that a person's supervisor was the individual at the next highest rank with whom she communicated most frequently in a given month. Recognizing the imperfections of this procedure, we then derived a cultural fit measure in which we removed the identified supervisor from a focal actor's reference group. Results based on this measure are reported in Table C-3 (Models 3-4) and Table C-4 (Models 3-4) and are largely consistent with those in the main tables; however, *Network Constraint*  $\times$  *Cultural Fit* is marginally significant in Table C-3, Model 4 and both *Cultural Fit* and *Network Constraint*  $\times$  *Cultural Fit* are marginally significant in Table C-4, Models 3 and 4 respectively (where, due to the individual fixed effects specification, we have a significant decrease in statistical power). These results demonstrate that cultural fit matters not only for subordinate-supervisor relations but for interactions with a broader set of colleagues (whose judgments of the focal actor presumably also shape how a supervisor evaluates the actor).

Finally, a question arises as to whether our main findings are driven by communication mediated through email distribution lists. For example, perhaps people more deliberately seek to fit in with others when they are sending a message to a company-wide listserv but do not make such attempts when sending messages to individual recipients. In our data, most messages sent via distribution lists were targeted to a small number of recipients. For example, lists containing five members accounted for the greatest number of distribution list messages. By contrast, large lists (e.g., those with 40 or more members), which might represent venues for more deliberate forms of impression management, accounted for a relatively small fraction of messages sent. Given these patterns, it seems unlikely that distribution list communication is primarily responsible for generating the main results we document. Still, to assess the robustness of our findings, we derived a very conservative measure of cultural fit that excludes *all* distribution list

communication. Results based on this measure are reported in Table C-3 (Models 5-6) and Table C-4 (Models 5-6). The models based on involuntary exit (those reported in Table C-3) are consistent with those reported in Table 3. In the performance models (those reported in Table C-4), the main effect of the alternative cultural fit measure is positive and significant; however, the interaction between network constraint and cultural fit is not significant. It is, however, important to note that this alternative measure of cultural fit excludes over 30% of emails that are sent to distribution lists. It seems likely that the majority of these emails represent signal (e.g., messages sent to moderately sized project teams) rather than just noise. Taken together, these supplemental analyses help establish the robustness of our findings to plausible alternative explanations.



**Table C-1: Cox Proportional Hazard Models of Exit by Type of Exit—Involuntary and Voluntary, Using Alternative Measure of Linguistic Fit (Top 1000 Words)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Involuntary	Involuntary	Involuntary	Involuntary	Involuntary	Voluntary	Voluntary	Voluntary
Age	1.232*** (3.36)	1.244* (2.40)	1.246* (2.42)	1.220* (2.14)	1.309** (2.69)	0.816** (-3.03)	0.948 (-0.50)	1.042 (0.36)
Age <sup>2</sup>	0.998** (-2.68)	0.998 (-1.71)	0.998 (-1.73)	0.998 (-1.47)	0.998* (-2.02)	1.002** (2.79)	1.001 (0.43)	0.999 (-0.41)
Female	1.065 (0.36)	1.245 (0.86)	1.250 (0.87)	1.227 (0.79)	1.460 (1.38)	1.100 (0.45)	1.879* (2.04)	2.056* (2.29)
Manager	0.514* (-2.09)	1.312 (0.60)	1.328 (0.62)	1.346 (0.65)	1.949 (1.44)	0.785 (-0.60)	1.171 (0.32)	1.493 (0.82)
Network Centrality					0.258** (-3.17)			0.437* (-2.10)
Network Constraint	1.412*** (5.60)		1.081 (0.37)	1.684* (1.98)	1.763 (1.36)	1.562*** (7.20)		1.339 (0.64)
Cultural Fit (Top 1000)		0.366*** (-8.18)	0.367*** (-8.09)	0.417*** (-6.75)	0.546*** (-4.43)		0.473*** (-5.96)	0.571*** (-3.39)
Network Constraint × Cultural Fit (Top 1000)				1.503* (2.06)	1.856* (2.49)			0.941 (-0.26)
Department Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	12722	9885	9885	9885	9885	12722	9885	9885
chi2	68.751	130.110	130.561	126.583	122.990	94.257	55.479	65.376
ll	-935.012	-348.522	-348.473	-347.184	-333.982	-635.695	-226.874	-221.926

Notes.— Coefficients reported as hazard ratios; t-statistics in parentheses. Linguistic fit measure based on a mapping of words not over the LIWC categories but rather over the thousand most popular words used by the focal actor across the entire corpus. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

**Table C-2: Fixed Effects Conditional Logit of Favorable Performance Rating, Using Alternative Measure of Linguistic Fit (Top 1000 Words)**

	(1)	(2)	(3)	(4)	(5)
	Favorable Rating	Favorable Rating	Favorable Rating	Favorable Rating	Favorable Rating
Manager	3.724** (2.73)	3.760* (2.57)	3.665* (2.49)	3.610* (2.24)	3.648* (2.33)
Network Centrality					0.167 (0.17)
Network Constraint	-2.309 (-1.80)		-3.462* (-2.07)	-5.129** (-2.99)	-5.039** (-2.79)
Cultural Fit (Top 1000)		0.445 (1.04)	0.442 (0.85)	-0.475 (-0.86)	-0.488 (-0.89)
Network Constraint × Cultural Fit (Top 1000)				-2.108* (-2.49)	-2.087* (-2.41)
<i>N</i>	185	166	166	166	166
pseudo <i>R</i> <sup>2</sup>	0.149	0.109	0.180	0.206	0.207
ll	-56.818	-53.331	-49.106	-47.535	-47.516

Notes.— t-statistics in parentheses. Robust standard errors. All models include individual fixed effects. Linguistic fit measure based on a mapping of words not over the LIWC categories but rather over the thousand most popular words used by the focal actor across the entire corpus. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

**Table C-3: Cox Proportional Hazard Models of Involuntary Exit—Additional Robustness Checks**

	<u>Cultural Fit:</u> <u>All Other Employees</u>		<u>Cultural Fit:</u> <u>Without Supervisor</u>		<u>Cultural Fit:</u> <u>No Distribution Lists</u>	
	(1) Involuntary	(2) Involuntary	(3) Involuntary	(4) Involuntary	(5) Involuntary	(6) Involuntary
Age	1.213** (2.82)	1.353*** (3.96)	1.229** (2.60)	1.341** (3.25)	1.240** (2.65)	1.341** (3.17)
Age <sup>2</sup>	0.998* (-2.12)	0.997*** (-3.31)	0.998 (-1.91)	0.997** (-2.63)	0.998* (-1.99)	0.997** (-2.58)
Female	1.244 (1.14)	1.607* (2.29)	1.105 (0.44)	1.436 (1.47)	1.174 (0.71)	1.422 (1.47)
Manager	0.510 (-1.75)	1.072 (0.17)	0.591 (-1.14)	0.875 (-0.29)	0.664 (-0.93)	1.051 (0.11)
Network Centrality		0.169*** (-5.62)		0.191*** (-4.42)		0.206*** (-4.62)
Network Constraint		1.638* (2.40)		1.376 (0.93)		1.616 (1.70)
Cultural Fit	0.535*** (-7.65)	0.735** (-3.22)	0.619*** (-4.20)	1.008 (0.04)	0.583*** (-5.68)	0.899 (-0.62)
Network Constraint × Cultural Fit		1.585** (2.88)		2.164 <sup>†</sup> (1.91)		2.222* (2.39)
Department Controls	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	11831	11831	11100	11100	11003	11003
chi2	95.187	121.423	60.755	75.726	77.618	102.944
ll	-722.926	-675.330	-505.684	-476.590	-506.256	-474.877

Notes.— Coefficients reported as hazard ratios; t-statistics in parentheses. Models 1 and 2 use a variant of cultural fit based on the reference group of all employees in the firm except for the focal actor. Models 3 and 4 use a variant of cultural fit based on the focal actor's interlocutors but removing the focal actor's assumed supervisor. Models 5 and 6 use a variant of cultural fit that is based on person-to-person messages only (i.e., excluding approximately 30% of messages sent via distribution lists). <sup>†</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

**Table C-4: Fixed Effects Conditional Logit of Performance Evaluation—Additional Robustness Checks**

	<u>Cultural Fit:</u> <u>All Other Employees</u>		<u>Cultural Fit:</u> <u>Without Supervisor</u>		<u>Cultural Fit:</u> <u>No Distribution Lists</u>	
	(1) Favorable Rating	(2) Favorable Rating	(3) Favorable Rating	(4) Favorable Rating	(5) Favorable Rating	(6) Favorable Rating
Manager	3.350 <sup>**</sup> (2.69)	3.094 <sup>*</sup> (2.31)	3.568 <sup>*</sup> (2.40)	3.412 <sup>*</sup> (2.19)	3.756 <sup>*</sup> (2.32)	3.630 <sup>*</sup> (2.00)
Network Centrality		-0.362 (-0.40)		-0.408 (-0.40)		-0.227 (-0.26)
Network Constraint		-4.122 <sup>*</sup> (-2.21)		-3.671 <sup>*</sup> (-2.28)		-4.897 <sup>*</sup> (-2.57)
Cultural Fit	0.654 <sup>*</sup> (2.16)	-0.255 (-0.46)	1.024 <sup>†</sup> (1.89)	0.421 (0.65)	1.376 <sup>*</sup> (2.42)	0.550 (0.49)
Network Constraint × Cultural Fit		-2.084 <sup>†</sup> (-1.94)		-1.512 <sup>†</sup> (-1.73)		-2.219 (-0.84)
<i>N</i>	175	175	175	175	172	172
pseudo <i>R</i> <sup>2</sup>	0.128	0.200	0.126	0.184	0.190	0.267
ll	-55.067	-50.524	-55.216	-51.556	-50.270	-45.526

Notes.— t-statistics in parentheses. Robust standard errors. All models include individual fixed effects. Models 1 and 2 use a variant of cultural fit based on the reference group of all employees in the firm except for the focal actor. Models 3 and 4 use a variant of cultural fit based on the focal actor's interlocutors but removing the focal actor's assumed supervisor. Models 5 and 6 use a variant of cultural fit that is based on person-to-person messages only (i.e., excluding approximately 30% of messages sent via distribution lists). <sup>†</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; two-tailed tests.

## Endnotes

<sup>1</sup> “Embeddedness” is a theoretically charged term that has been used by sociologists in myriad ways (Krippner and Alvarez 2007). Whereas Granovetter (1985), and later Zukin and DiMaggio (1990), use it to denote, very broadly, that economic processes are contingent on social context, we conceptualize embeddedness as one’s degree of anchoring in a social context. As Uzzi (1996) points out, Granovetter’s programmatic statement suffers from conceptual vagueness; our purpose here is neither to critique it nor elaborate upon it. Rather, we follow Uzzi (1996; 1997) and others (e.g., Portes and Sensenbrenner 1993) by operationally treating embeddedness as the strength of one’s social embedding. Unlike these authors, we highlight both the structural and cultural dimensions of embeddedness.

<sup>2</sup> Although we use the same language of “fitting in” and “standing out” for both dimensions, we recognize that these terms mean different things in the structural versus cultural realms. Following Carley (1991), we argue that the two realms are interrelated such that the same terms can be used to describe embeddedness on both dimensions. For example, someone who becomes more structurally embedded (fitting in structurally) might learn to adopt the linguistic style of his network partners (fitting in culturally) or might instead try to distinguish her linguistic style (standing out culturally) so her ideas and contributions are noticed and appreciated by others. In other words, choices of fitting in or standing out in one dimension have implications for the positions people will seek to occupy in the other. We thank an anonymous reviewer for prompting us to clarify this point.

<sup>3</sup> Closure is the theoretical construct of interest, while constraint is the corresponding measure. For ease of exposition, we use the two terms interchangeably.

<sup>4</sup> Such compliance may be merely conventional or reflect a more fundamental agreement in assumptions about the world (what Douglas [1986] calls “institutions”; see also Pinker [2007]). Importantly, it may be interpreted by peers as an indication of the norms that guide a person’s behavior and the extent to which they are aligned with those of others around the focal individual. Our assumption is that normative compliance is both a reflection and a cultural signal of one’s strength of membership in a “thought community” (Zerubavel 1997).

<sup>5</sup> Although optimal distinctiveness is a psychological theory concerned with the individual motivations underlying self-identification with particular social groups, we extend its rationale to apply more broadly to the informational and identity-based consequences of fitting in with or standing out from one’s colleagues in an organization.

<sup>6</sup> Of course, sociologists have debated the culture-structure interplay extensively (e.g. Sewell 1992, Emirbayer and Goodwin 1994). Previous work has examined the cultural meanings associated with network ties (McLean 1998, Zelizer 2011), as well as how cultural repertoires facilitate, or impede, network formation (Erickson 1996, Lizardo 2006). Nevertheless, the implications of one’s structural and cultural positions on attainment (or other outcomes of interest) have been mostly studied independently of one another.

<sup>7</sup> For example, there is no conceptual answer to the question of how to achieve the optimal mix of “embedded” and “arm’s length” ties (Uzzi 1996). Similarly, extant theory provides no specific insight about when an actor has gained sufficient legitimacy to have the latitude to deviate from the conforming constraints of typecasting and thus enjoy the benefits of distinctiveness (Zuckerman et al, 2003).

<sup>8</sup> In particular, we agreed to four restrictions. First, we only analyzed messages exchanged among the firm’s employees—that is, we excluded all messages exchanged with external parties. Second, we dropped all messages that were exchanged among the seven executive team members. We included, however, messages that executive team members exchanged with individuals outside the executive team. A third restriction involved the legal department: we excluded any message exchange involving one of the company’s attorneys. Fourth, the raw data were extracted from company archives and stored on secure research servers that we purchased and had installed at the firm. After applying our natural language processing algorithms on the raw data, we deleted message content and all identifying information about employees.

<sup>9</sup> Because the company had only recently installed a human resource information system, data on department affiliation and hierarchical rank were not available on a consistent basis. We therefore relied on email distribution lists to fill in these missing data. For example, the company maintained distribution lists for all employees who supervised the work of other employees. We identified an employee as a manager if he or she belonged to one of these distribution lists in a given month. Because the outcome of interest is attainment—as indicated by involuntary exit and performance rating—we eliminated temporary employees and summer interns from the analyses because their exit dates were often pre-determined and because they typically did not receive formal performance ratings. Similarly, the company maintained distribution lists for its various departments. We again used membership in these lists to identify an employee’s departmental affiliation in a given month. In certain cases, employees belonged to multiple departmental lists in a given month—perhaps because they belonged to one department but worked very

closely with another. In such cases, we coded an employee as belonging to both departments since there was no way to identify the primary departmental affiliation.

<sup>10</sup> Although the underlying performance rating variable is continuous, variation in the measure partly reflects the transformation we performed (changing some observations from a 10-point scale to a 4-point scale) rather than meaningful changes in year-to-year performance. Thus, we consulted with the company to identify the performance threshold in each year that corresponded to a favorable rating and chose this cut-point as the basis of our dichotomous variable. Given the transformation, it was not appropriate to use the underlying continuous measure as a dependent variable. We thank an anonymous reviewer for prompting us to clarify this point.

<sup>11</sup> We use the term “structural embeddedness” in characterizing brokerage versus constraint to parallel the language used for cultural fit; however, we acknowledge that the term introduces some ambiguities depending on how one conceptualizes embeddedness. For example, a person might be considered to have low embeddedness not because she is structurally autonomous but rather because she is structurally marginal without serving as a bridge. We acknowledge that structural embeddedness does not perfectly describe the continuum between brokerage and constraint but retain the term for ease of exposition. It is also worth noting that Burt’s (1992) earlier work on brokerage emphasized the advantage that an actor derives from monopolizing pathways between other actors, while his later work focused on the advantage an actor gains from having access to information from a wider range of sources. The first view might favor the use of betweenness centrality as a measure of structural embeddedness, while the latter is more consistent with the constraint measure that we opted to use. We thank an anonymous reviewer for clarifying these points.

<sup>12</sup> We used a variety of methods to remove textual headers and footers from emails and to remove non-informative stop words such as “the.”

<sup>13</sup> We log transform the distance to account for its skewed distribution. *Cultural Fit* is only defined for individuals who exchange at least twenty messages in a given month. So, for example, if an employee enters the organization near the end of month or departs at the start of the month, *Cultural Fit* for that employee is likely to be missing for that month. For such reasons, the sample size drops in models that include this variable.

<sup>14</sup> Based on median values of *Network Constraint* and *Cultural Fit*, we identified the percentage of employee-month observations that fell into each of the four categories of our conceptual framework. The breakdown was as follows: Assimilated Brokers (33%), Integrated Nonconformists (23%), Doubly Embedded Actors (17%), and Disembedded Actors (27%).

<sup>15</sup> We suspect that both age and gender are related to one’s capacity for cultural assimilation and structural integration but do not explore this further in this study.

<sup>16</sup> Because performance evaluations are conducted once a year, we transform monthly network and cultural variables into yearly variables by averaging them by person-year. Moreover, because these models include person fixed effects, they only apply to individuals for whom yearly performance is observed at least twice and who experience a change in performance evaluation. Fixed traits such as gender and age cannot be estimated in these models.

<sup>17</sup> Figure 4 depicts slopes for the median person in the sample. For managers (result available upon request), the negative effect of cultural fit for individuals with high constraint is more pronounced and statistically significant.

<sup>18</sup> To establish that our results are not driven by a handful of cultural deviants or outliers, we conducted a supplemental analysis. First, we identified the LIWC categories that are most consequential for cultural fit. Next, for the top two categories (swear words and religion), we identified the individuals who were outliers in the use of these terms (i.e., at or above the 99<sup>th</sup> percentile in the probability of using these terms). Twelve individuals were identified in this manner (six outliers in the use of swear words and six in the use of religious terms). We then re-estimated the models in Tables 3 and 4 after excluding the twelve outliers and obtained comparable results.

<sup>19</sup> Of course, output and perceptions are highly intertwined—productivity depends on one’s ability to communicate effectively with others, which in turn is shaped by how one is perceived. Nevertheless, we believe it is useful to think of these two channels—information access and identity—as analytically distinct.