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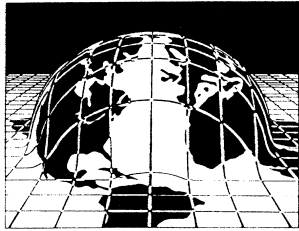*William & Mary*, jeanne.wilson@mason.wm.edu

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PERSPECTIVE

Extending Construal-Level Theory to Distributed Groups: Understanding the Effects of Virtuality

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This Perspectives article seeks to redirect research on distributed (also referred to as virtual) groups, a well-established organizational phenomenon in which group members are separated by one or more forms of distance (e.g., geographic or temporal). Such distances directly affect individual behavior and shape other features of the context that alter group processes (e.g., by forcing groups to adopt new communication tools). Prior research has examined isolated effects of various dimensions of virtuality without considering how these effects on individual behavior and group dynamics might have conceptually related underpinnings. To address this gap, we propose an extension of construal-level theory as a way to link the effects of virtuality through a common mediating mechanism. According to construal-level theory, events or objects that are physically or temporally distant are also distant psychologically and thus are likely to be described in terms of their general characteristics. In contrast, views of more proximal events or objects will be more detailed and nuanced. We develop propositions that illustrate how objective dimensions of distance create psychological distance and how that in turn affects how individuals view and interact with their teammates. We also develop propositions that show how the context of the distributed group (e.g., technology usage) affects this process over time. We compare and link this construal-based approach to alternatives based in theories of computer-mediated communication and social identity, and we thereby show that construal-level theory offers both parsimonious explanations and novel predictions about how and why distance alters perceptions of distributed group members (including oneself). Finally, we consider theoretical and practical implications of construal-level theory for future organization science research and the management of virtual teams.

Key words: distributed groups; virtual teams; construal level; distance
History: Published online in *Articles in Advance* May 23, 2012.

Introduction

Distributed groups have become commonplace in organizations, spawning more than a decade of intensive academic and practitioner inquiry about how colleagues interact across distances to accomplish common goals (e.g., Cramton 2001, Hinds and Bailey 2003, Jarvenpaa and Leidner 1999, O'Leary and Mortensen 2010). This research has established a substantial body of knowledge about the design, emergent dynamics, and outcomes of groups that experience virtuality (for reviews, see Schiller and Mandviwalla 2007 and Webster and Staples 2006). Although scholars differ in the ways

they define and describe "virtuality" (including a preference for other descriptors such as "distributed" or "dispersed" groups), prior research generally focuses on forms of "objective" distance that separate group members as well as features of the distributed group context that often differ from traditional collocated groups (Bell and Kozlowski 2002). *Objective distance* includes the obvious spatial and temporal differences associated with geographic separation of group members as well as other externally observable social differences (e.g., cultural, linguistic). The *context* of distributed groups also includes many features of virtuality, such as heavy reliance on computer-mediated communication,

malleable group memberships, and flexible group boundaries. Although scholars have made great progress in cataloging various dimensions of dispersion (e.g., O'Leary and Cummings 2007) or virtuality (Griffith et al. 2003), our understanding of the effects of virtuality on individual behavior and group dynamics is still limited.

For the most part, prior research has taken one of two approaches to considering the effects of virtuality. The first ignores specific dimensions of virtuality, attributing any differences in group processes or outcomes to the combined effects of multiple dimensions. For example, much of the research on conflict (e.g., Hinds and Bailey 2003) or trust (e.g., Jarvenpaa and Leidner 1999) is set in the context of distributed groups, but it does not directly examine the effects of various dimensions of virtuality. The second approach examines individual dimensions independently, either in isolation or in small groups of constructs. For example, many studies of the effects of temporal separation (time zones) examine its effects in isolation from other constructs (see, e.g., Rutkowski et al. 2007), and a few consider it in combination with one or two other dimensions (see Cummings et al. 2009); however, we lack studies or theories that help us to relate temporal distance to a broad range of other objective dimensions of distance. The few studies that take a more holistic approach by identifying multiple dimensions of dispersion (e.g., O'Leary and Cummings 2007) do not explore how the effects of these dimensions might have conceptually related underpinnings. Thus, we lack a common mechanism to aid in understanding how various dimensions of virtuality might individually and collectively affect individual member behavior, group dynamics, and subsequent group outcomes.

This gap has further consequences for the development of theory: scholars draw on different theories to explain different dimensions of virtuality, the result of which is an increasing fragmentation of theoretical approaches used in the field. The consequent fractured state of research and theory on distributed work has increasingly been cited as an impediment to scientific progress (Raghuram et al. 2010, Schiller and Mandviwalla 2007, Weisband et al. 2005). Therefore, although extant theories provide explanations for certain aspects of the complex dynamics linking virtuality to outcomes in distributed groups, we lack a common underlying mechanism. We believe that new scholarship is needed to address two related issues facing scholars of distributed groups: (1) the lack of a common mechanism that can be used to relate different dimensions of virtuality to their effects on individual behavior, group dynamics, and subsequent outcomes; and (2) the resultant fragmentation of the body of theories on which we draw to explain and predict behavior in distributed groups.

In this article, we contend that construal-level theory can address both these issues by providing a common psychological mechanism that mediates the effects of multiple dimensions of virtuality. We begin with an overview of construal-level theory, which proposes that individuals mentally construe events, objects, or people that are psychologically near them in terms of low-level, detailed, and contextualized features, but construe distant events, objects, or people in terms of high-level, abstract, and stable features (Liberman and Trope 1998, Trope et al. 2007). We then extend construal-level theory to distributed groups by offering sample propositions about the effects of objective distance on psychological distance, which then impacts construal levels and various group outcomes. Next, we offer propositions that show how features of the distributed group context (e.g., technology usage) moderate this process over time. Last, we consider the implications of this extended model for research on construal-level theory and distributed (or virtual) groups.

What Is Construal-Level Theory?

Construal-level theory explains the connection between distance and levels of abstraction that people make in everyday cognition, such as the perception of a distant event or evaluation of a new product (Trope et al. 2007). Central to construal-level theory is the argument that the greater a person's psychological distance from any target (e.g., person, event, object), the more likely that target is to be represented (i.e., construed) at a higher level—in terms of a few general features that convey its essence. In contrast, the closer a person is to a target, the more likely the person is to attend to the target's contextual and incidental aspects. Construal-level theory thus has two key components: the construal levels themselves and the psychological distance that shapes a particular construal level.

Construal Levels and Their Effects

High-level construals reflect the core features of an object (Kivetz and Tyler 2007); they are "abstract, schematic and decontextualized representations that extract the gist from the available information" (Liberman and Trope 2008, p. 1202). For example, construals can represent people by using either relatively abstract personality traits (e.g., "Bob is outgoing") or more concrete action terms (e.g., "Bob met everyone at the party"). Because traits reflect enduring and relatively stable characteristics of a person, they constitute a higher-level construal. Table 1 offers a summary of the conceptualization of high- and low-level construals and of effects found in prior research.

The construal at a given level in turn affects prediction and evaluation (Trope et al. 2007). Construal levels determine whether observations focus more on "the forest" than "the trees" (Smith and Trope 2006, Wakslak et al. 2006) and whether objects will be categorized

**Table 1   Summary of Differences Between High- and Low-Level Construals**

	High-level construals	Low-level construals
Conceptualization		
Basic definition (from Liberman and Trope 2008)	"Abstract, schematic and decontextualized representations that extract the gist from the available information" (p. 1202)	"Concrete, relatively unstructured, contextualized representations that include subordinate and incidental features" (p. 1201)
Description of construals (excerpt from Trope and Liberman 2003, p. 405)	• Abstract • Simple • Structured, coherent • Decontextualized • Primary, core • Superordinate • Goal relevant	• Concrete • Complex • Unstructured, incoherent • Contextualized • Secondary, surface • Subordinate • Goal irrelevant
Effects		
Mental representation		
• Observation: What is "seen" or perceived (Smith and Trope 2006, Wakslak et al. 2006)	• Big picture; gestalt; "the forest"	• Component parts; details; "the trees"
• Categorization (Liberman et al. 2002)	• Create fewer, broad groups of objects	• Create more, narrow groups of objects
• Interpretation of actions (Fujita et al. 2006, Liberman and Trope 1998)	• Focus on *why* the action is performed (superordinate purpose)	• Focus on *how* the action is performed (subordinate means)
• Inference: Explanation of behavior (Henderson et al. 2006, Nussbaum et al. 2003)	• Viewed in terms of abstract dispositions (traits, values, attitudes) of the actor	• Viewed in terms of specific situational factors
Prediction (Henderson et al. 2006)	• Focus on global trend	• Focus on local (temporary) deviation
Evaluation (Trope and Liberman 2000)	• Based on central, goal-related issues • Based on desirability (value of the end state)	• Based on peripheral, goal-irrelevant issues • Based on feasibility (means used to reach end state)

into fewer but broader groups or into more but narrower groups (Liberman et al. 2002). High-level construals lead to interpretations of actions that focus less on *how* and more on *why* an action is performed (Fujita et al. 2006, Liberman and Trope 1998) and lead to inferences about behavior that are dispositional rather than situational (Henderson et al. 2006, Nussbaum et al. 2003). Construal levels also influence the extent to which predictions focus on global trends rather than local exceptions (Henderson et al. 2006) and the extent to which evaluations consider central, goal-related issues rather than peripheral ones (Trope and Liberman 2000). According to construal-level theory, one key variable that influences these levels of construal and their effects is psychological distance (Trope et al. 2007).

Psychological Distance as a Driver of Construal Level
Psychological distance is a "subjective experience that something is close [to] or far away from the self, here

and now" (Trope and Liberman 2010, p. 440). The different ways in which an object might be removed from that egocentric reference point (in time, space, cultural distance) represent different dimensions of objective distance. For example, attending next year's conference—a temporally distant event—cannot be directly perceived, although it can be imagined. Likewise, the experiences of someone in another social group (a socially distant stimulus) cannot be directly experienced but must be construed. It is important to note that research has repeatedly found that as the distance (whether temporal, spatial, or social) from an object increases, people tend to rely on higher-level construals about that object (Trope et al. 2007). This relationship may also be bidirectional; that is, high-level construals may increase psychological distance (Trope et al. 2007). In the context of distributed groups, this means (among other implications) that group members who are separated by geography are likely to construe their distant group members at a higher, more abstract level.

Figure 1   Simplified Process Model of Construal-Level Theory
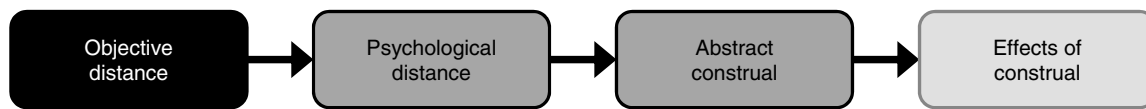
Researchers studying distributed work have conceived of psychological distance for years under various labels: relational proximity (Amin and Cohendet 2004), subjective distance (Coshall and Potter 1987), and perceptions of proximity (Wilson et al. 2008). Construal-level theorists have tended to treat psychological distance as the metaconstruct or underlying dimension for various forms of objective distance (temporal, spatial, social, etc.). Here, we extend construal-level theory to conceptualize psychological distance as the *product*, or the result, of various "objective" forms of distance. In other words, geographic distance does not equal psychological distance; it results in psychological distance. Thus, like others who have studied distributed work, we conceive of psychological distance as the subjective experience arising from objective forms of distance; it is socially constructed by the focal actor(s).

In summary, construal-level theory suggests that objective forms of distance between a person and a target create psychological distance toward the target; that psychological distance leads to higher-level construals about the target; and that high-level construals have effects on how a person perceives, evaluates, and behaves toward the target. Figure 1 illustrates the simplest form of the causal path leading from objective dimensions of distance to construal-driven effects. In the next section, we discuss key predictions of construal-level theory and how they relate to our existing understanding of distributed groups.

Understanding the Effects of Distance in Distributed Groups

The application of construal-level theory to distributed groups provides a number of benefits for the study of distributed work. In this section, we develop propositions that show how construal-level theory helps us to (1) identify a common mediating mechanism underlying the effects of multiple objective dimensions of distance, (2) reinterpret—and in so doing facilitate the integration of—patterns of findings that are already familiar to scholars of distributed work, and (3) anticipate effects not identified by current theories.

Identifying a Common Mechanism Underlying the Effects of Objective Distance

One important contribution of construal-level theory concerns the effects of multiple objective dimensions of distance. Although there have been numerous models of dimensions of distance or virtuality (Bell and

Kozlowski 2002, O'Leary and Cummings 2007), little empirical attention has been paid to how the effects of these dimensions might operate in a similar fashion. Notably, O'Leary and Cummings's (2007) taxonomy of types of distance suggests that multiple different dimensions might affect perceptions of proximity. They do not, however, explore the conceptually related underpinnings of these dimensions.

At the most basic level, spatial and temporal distances—as determined by the physical and relative location of group members—are both likely to increase psychological distance. Although sociocultural differences (e.g., nationality and language) are highly correlated with physical location, they are not perfectly aligned with the geographic distribution of groups—more and more of which are composed of expatriates and foreign nationals. Nonetheless, it is likely that sociocultural differences, too, serve as bases for psychological distance. Research on the effects of different configuration options (O'Leary and Mortensen 2010, Polzer et al. 2006) suggests that, beyond the actual physical location of group members, differences in the relative number of members at each site may also produce psychological distance.

The objective dimensions of distance discussed so far are based on the composition and structure of the group, but differences in member behavior may also serve as dimensions of distance. For example, recent research on firsthand experience—that is, on the extent to which individuals' knowledge of their distant partners' local contexts is based on having been there as opposed to second- or thirdhand information (Mortensen and Neeley 2012)—suggests that group members may systematically differ with respect to direct physical experience with their collaborators. Similarly, members' accessibility (Pinto et al. 1993), which is affected by distribution, is also likely to be inversely related to psychological distance. In this brief list, we have focused on dimensions unique to geographically distributed groups; however, there are numerous other dimensions—along which all groups vary—that may foster psychological distance. Dissimilarity in task or functional background, for example, is the subject of increasing investigation (Randel and Jaussi 2003) and is likely to create psychological distance within groups, regardless of whether they are geographically distributed.

Scholars have noted the difficulty in combining these multiple, qualitatively different dimensions and predicting the resultant effects. According to construal-level theory, however, all these dimensions are likely to affect

distributed group dynamics through the same underlying mechanism: psychological distance. Thus, we build on this mechanism to predict the effects of objective distance on members of distributed groups.

PROPOSITION 1 (P1). *Objective dimensions of distance (spatial, temporal, cultural, linguistic, experiential, etc.) will each increase psychological distance and thus result in higher-level construals.*

This theoretical extension clearly identifies the underlying mechanism (i.e., psychological distance producing higher-level construals) that can conceptually relate the effects of different objective dimensions of distance. Construal-level theory provides a unifying path that translates the multiple dimensions of distance into effects at multiple levels of analysis and over time. In the following sections, we offer predictions about the *effects* of psychological distance and construal. To highlight the linkages between construal-level theory and existing distributed group scholarship, we order our propositions to first consider effects (and alternative theories) that may be more familiar to scholars of distributed work and subsequently suggest effects that have not been anticipated by current theories.

Reinterpreting Effects of Distance: Perceiving Distant Others as Homogeneous

According to construal-level theory, people think more abstractly about those who are psychologically distant than those who are psychologically close. The theory states that, as individuals increase in distance from a target, they will rely more on schematic and "prototypical" information when thinking about the target (Fujita et al. 2006). Because we expect psychological distance to increase with geographic distance, perceptions of geographically distant group members will be more abstract and general than perceptions of more proximal group members (which will tend to be more specific and varied). So, for example, colocated group members might develop highly nuanced views about who in their office could be trusted and under what circumstances, but they are less likely to have such fine-grained views of geographically distant others. Construal-level theory predicts that a group member's view of colocated group members will be more rich and detailed than perceptions of distant teammates, who will be perceived as more unidimensional and homogeneous.

This homogeneity effect is visible both within and across group members. In the case of *within-member homogeneity*, construal-level theory predicts that an individual will see a distant collaborator in general, internally consistent terms. A distant collaborator is likely to be seen positively or negatively as a whole, rather than positively on some dimensions (e.g., strong task performance) and negatively on others (e.g., demanding and

sometimes rude). In the case of *across-member homogeneity*, construal-level theory predicts that all collaborators at a given distant site will be perceived similarly by their distant group members (i.e., as exhibiting similar characteristics or sharing a common goal) rather than some viewed in one light and others in a different light (Henderson 2009). Evidence for within- and across-member homogeneity has been discussed in passing in the literature on distributed groups (e.g., Baba et al. 2004), but neither effect has been explored in depth nor explained by a single theoretical mechanism. Thus, extending construal-level theory to this context leads to the following predictions.

PROPOSITION 2A (P2A). *Individuals will perceive more within-member homogeneity in a distant collaborator than in a local collaborator.*

PROPOSITION 2B (P2B). *Individuals will perceive more across-member homogeneity in distant collaborators than in local collaborators.*

Interestingly, the perception of distant others as more homogeneous has been noted in prior research on distributed work. In that prior work, two different theoretical mechanisms have been used to explain homogeneity effects: the first, which is grounded in theories of technology mediation, focuses on the effects of distance on information and addresses within-member homogeneity; the second, which is grounded in theories of social identity, focuses on the effects of distance on social dynamics and addresses across-member homogeneity. For comparison purposes, we examine how construal-level theory links to these other theories below.

Other Explanations for Within-Member Homogeneity: Mediated Communication Theories. Theories of technology-mediated communication (Daft and Lengel 1984, Sproull and Kiesler 1986, Walther 1992) predict perceptions of within-member homogeneity but for different reasons than construal-level theory. This set of theories predicts that less social information is available to partners whose interactions are mediated by technology. By these accounts, low levels of social information lead to depersonalization (Sproull and Kiesler 1986) or reduced abilities to detect others' individuality (Weisband and Atwater 1999).

In contrast to these information-processing accounts, research on construal-level theory shows that the effects of geographic distance are not fully dependent either on use of communication technology or on lack of social information. Research has found that there is an association between geographic distance and abstraction *even in situations where there is equivalent information about near and distant events* (Henderson et al. 2006) and the social cues are exactly the same (Fujita et al. 2006). So although reduced social information or decreased bandwidth may contribute to the observed effects of

technology-mediated interaction, these are not necessary conditions. Construal-level theory suggests that people evaluate others differently at a distance, even when given exactly the same social information, without the use of communication technology and without even interacting. From a practical standpoint, this means two things: that members assigned to a distributed team start with different construals about each other before they have ever communicated and that geographic distance would affect these perceptions even if communication frequency and the use of technology were held constant (as they might be, for instance, in the case of team members communicating electronically across town versus across the country). Thus, construal-level theory is able to predict the perception of distant others both before and after perceivers have the opportunity to interact with them.

Other Explanations for Across-Member Homogeneity: Links to Social Identity Theory. Scholars of social identity have examined an effect similar to the across-member homogeneity predicted by construal-level theory—out-group homogeneity—but they explain the effect through a different underlying mechanism. Social identity theory explains these effects through similarity (similar category membership or identity). Social identity theorists argue that individuals categorize others as being either similar (in-group) or dissimilar (out-group) to themselves; the results are in-group favoritism and out-group homogeneity. The latter—out-group homogeneity—is characterized by a tendency to see in-groups as having members that are more varied than out-groups (Ostrom and Sedikides 1992). Geographic separation frequently serves as a basis for distinguishing between in-groups and out-groups (Hinds and Mortensen 2005), and for distant group members, the effect may be even stronger because of the absence of individuating cues (Lea and Spears 1992).

Construal-level theory, however, explains variance beyond the effects of familiarity and similarity. In an experiment investigating similarity as an indicator of social distance, participants expressed more interest in receiving information about a socially close target— but this was only true for information about secondary features (e.g., the dress code) and not for information about primary features (e.g., salary), as might be expected with social identity theory. Even when adjusting for liking, the effect of social proximity on the search for low-level construal information remained significant (Liviatan et al. 2008). In a separate experiment, participants in the geographically near condition felt more familiar with, and similar to, actors in a video than did those who thought the actors represented a distant site (as might be expected with social identity theory) (Fujita et al. 2006). However, neither familiarity nor similarity was significantly correlated with the abstractness of

the written descriptions, and adjusting for familiarity and similarity did not affect the results of distance on abstract perception, as might be expected from social identity theory.

Reinterpreting Effects of Distance: Using Trait-Based Explanations for Behavior of Distant Others

According to construal-level theory, the more distance (e.g., spatial, social, temporal) there is between people, the more likely they are to interpret each others' actions as determined by superordinate, primary, and typically trait-based characteristics. Construal-level theory argues that individuals perceive themselves (relative to others) as proximal, which causes them to construe their own behavior at a lower level (resulting in explanations based on local context); conversely, distant others are seen as less proximal, so their behavior is construed at a higher level (with explanations focused on stable traits); see Liviatan et al. (2008). In a series of four experiments, Nussbaum et al. (2003) showed that people are more likely to use high-level construals for others' distant behavior—at least for temporally distant behavior. When attempting to predict distant behavior, participants asked their partners questions such as, "Are you an optimist or a pessimist?" When attempting to predict near-term behavior, participants asked their partners situational questions such as, "Are you hard working *when it comes to studying*?" This tendency to focus on stable traits at a distance was also demonstrated in a series of experiments by Henderson et al. (2006). In these experiments, students were more likely to consider contextual factors when evaluating the behavior of a geographically proximal student than of one who was geographically distant, even when exactly the same information was available about them. Applied to distributed groups, this evidence suggests that behavior at a distance is more likely to be perceived as reflecting underlying traits than the same behavior exhibited by more proximal others.

PROPOSITION 3 (P3). *Individuals will be more likely to use stable, personal traits to explain the actions of distant collaborators than of colocated collaborators.*

Again, as with the perceptions of homogeneity outlined in the prior section, taking a construal-level approach allows us to tie prior findings based in attribution theory to one another and to findings based in other theoretical approaches.

Other Trait-Based Explanations: Links to Attribution Theory. According to attribution theory, when we observe unexpected behavior on the part of other people, our default assumption is that the behavior is the result of the other person's basic character or disposition. This dispositional attribution is only "corrected" if situational information is available (Cramton 2001, Gilbert

and Malone 1995, Jones and Nisbett 1971). Consistent with construal-level theory, this effect is particularly true for unfamiliar (socially distant) others than for familiar (socially close) others (Idson and Miscel 2001). This closely parallels the predictions of construal-level theory, as dispositional attributions are, in effect, higher-level explanations based on stable trait-based criteria, and situational attributions are lower-level explanations driven by characteristics of the specific context. In this way, attribution theory accounts are driven primarily by information constraints.

Yet construal-level theory argues that these attribution effects arise not from a lack of information but rather from psychological distance. Hence, even perceived contextual information about distant others may not lead to low-level explanations for behavior—an important departure from attribution models (which suggest that the availability of situational explanations will increase situational attributions; see Gilbert and Malone 1995). In fact, there is evidence that situational attributions are not dependent on the presence or absence of situational information (Nussbaum et al. 2003). Finally, whereas attribution theory explains judgments about the causes of behavior, construal-level theory explains any cognitive function (e.g., general assessments, the formation of expectations, and the development of preferences) and so casts a broader net.

The sections that follow offer a sampling of predictions from construal-level theory that have not been anticipated by current theories of distributed work.

Discovering Unanticipated Effects of Distance: Construal of the Self

Construal-level theory suggests that distance may influence reflexive perceptions—our perceptions of our own actions and behaviors. As more and more individuals spend time visiting the sites of their distant colleagues, they increasingly face their own experiences within the context of their distant collaborators (see Hinds and Cramton 2008, Mortensen and Neeley 2012). Construal-level theory suggests that we may, in fact, perceive our own prior or future actions and behaviors differently when they occur(ed) at a location other than the one in which we are currently located. According to construal-level theory, the temporal and physical distance between an individual's current context and that in which the behavior occurs would lead that individual to construe the behavior at a higher level. Thus, construal-level theory suggests that we may perceive our own behaviors differently when they occur at a distant location—a perceptual disconnect reflected in the adage, "When in Rome, . . . " and in recent advertisements claiming "What happens in Vegas, stays in Vegas." More broadly, the same effect might be expected arising from other forms of distance, such as within a different cultural context. It is important to note that this dynamic runs counter

to the prediction of social identity theory, under which the self always forms the basis of the in-group. In this way, construal-level theory provides explanations for how individuals think about objects or events in their own lives in ways that may be affected by distance.

PROPOSITION 4A (P4A). *Actors' own behaviors will be construed at a higher level when they occur at a distance than when they occur locally.*

Earlier, we predicted that distance would affect perceptions of others' homogeneity and the use of trait-based explanations for their behavior. Here, we extend those predictions to perceptions of one's own behavior.

PROPOSITION 4B (P4B). *Actors' own behaviors will be perceived with more homogeneity when they occur at a distance than when they occur locally.*

PROPOSITION 4C (P4C). *Actors' own behaviors will be explained using more trait-based explanations when they occur at a distance than when they occur locally.*

Thus, when people are thinking about their behavior at a distance, we expect high-level abstract construals structured around invariant, essential self-attributes. These effects have been demonstrated with temporal distance (Wakslak et al. 2008) but not yet with spatial distance. Extended to physical distance, this means that people are likely to view their more distant behavior in relatively idealistic terms that are consistent with their core identity and values. As a result, negative feedback about behavior at a distant location may be especially difficult to accept or understand. If, for instance, a group member thinks of herself as being achievement oriented but is told that she did not achieve goals on her recent visit to a remote group location, then she would be especially likely to reject that assessment. This may be an additional source of misunderstanding or differences in attribution in distributed groups (Cramton 2001), as well as another source of potential conflict in such groups.

Discovering Unanticipated Effects of Distance: Construal Over Time

Although research on construal-level theory typically uses cross-sectional designs, some predictions can be extended to anticipate how perceptions in distributed groups might change over time; for example, trends and patterns perceived in distant behavior and events are expected to persist for longer than the same patterns perceived in more proximal behavior or events. Nussbaum et al. (2003) showed that participants expected others to behave more consistently in distant future situations than in near-term situations. For instance, students expected that their friends would behave in a more consistently agreeable manner one month in the future versus one day in the future. This expectation of consistent behavior in the distant future reflects a high-level construal

because abstract traits refer to relatively invariant properties of people—that is, properties that should be manifested consistently across different situations. Similarly, Henderson et al. (2006) showed that students were more likely to predict that distant others (New York University (NYU) students visiting a campus in Italy) would behave in a more prototypical fashion than more proximal others (NYU students at the New York campus). When information was provided about the central tendency of an event (average number of hours of sleep per night), their predictions about geographically distant behavior were more affected by whether the behavior resembled the central tendency of the category. Values that are representative of a distribution (i.e., those that are close to the mean) constitute a high-level construal of the distribution. When predicting the behavior of distant others, participants were more likely to rely on the general trend, but when predicting the behavior of proximal others, they were more likely to focus on the exception. If, at a distance, trends and patterns are expected to persist for longer than the same patterns perceived in more proximal behavior or events, then distributed group members should be more likely to solidify early impressions, and those impressions are likely to be stickier (i.e., more resistant to change).

Similar effects have been observed in geographically distributed groups, although an overarching theoretical explanation for the patterns has seldom been given. For example, Cramton (2001) described this pattern in a project team in which an omitted email address caused one team member to ignore the suggestion of another. Even after the problem was corrected, one member blamed the other for ignoring his ideas and causing a power struggle. Cramton (2001, p. 359) noted that "impressions that had formed tended to persist." In fact, there are other indications in the literature on distributed groups that impressions are difficult to change at a distance (Walther et al. 2001), but researchers have not yet provided any theoretical basis for explaining these observations. Construal-level theory suggests that objective distance in time and space leads to more stable perceptions of the distant target because of the more abstract construals promoted by increased psychological distance.

PROPOSITION 5 (P5). *Once established, perceptions of geographically distant others will be more stable than perceptions of more proximal others.*

Having offered several predictions about the effects of distance in distributed groups to illustrate the utility of construal-level theory, we now our turn attention to the broader context in which the construal-level process operates.

Understanding the Effects of Context
In addition to providing distributed work scholars a means to understand the effects of distance, applying construal-level theory to distributed groups can also enrich scholarship on construal-level theory. Scholars of distributed work have noted the importance of emergent context as shaping many of the relationships found within distributed groups. Drawing on this, we explore the role of context as a key moderator of the relationship between the drivers of construal level (spatial, temporal, and other forms of objective distance in the case of distributed groups) and the resultant level of construal.

When construal-level theory has been applied to judgments about people, the research has largely been confined to examining dyadic relationships between one perceiver and one target, typically in isolated situations. Applying construal-level theory to the context of distributed groups opens up research questions at— and helps make connections to—other levels of analysis, amid more realistic contexts. This suggestion is consistent with observations that systematically applying a theory in different settings improves that theory's explanatory power by virtue of delineating its boundaries and broadening its scope (Whetten et al. 2009). A number of contextual factors central to scholarship on distributed work have not typically been examined in prior research on construal-level theory, including group structure and processes, technology affordances, and feedback loops in the context of ongoing organizational relationships. Research on distributed work also provides models that predict which individual, social, and organizational factors are most likely to moderate perceptions of distance (Wilson et al. 2008). For instance, characteristics of the friendship or communication networks in which the individuals are embedded (e.g., closeness or density) may moderate the relationship between spatial distance and psychological distance. In the propositions to come, we develop a more contextualized model of construal by suggesting how group structure, patterns of technology use, and ongoing relationships are likely to affect the relationship between distance and construal level. This model is depicted in Figure 2.

Construal in Context: Group Structure
Extending construal-level theory to distributed groups highlights the important role of group structure and suggests factors that we expect will moderate the relationship between drivers of the construal level and the construal level ultimately achieved. We discuss and suggest propositions for two examples of these moderators: the group's level of interdependence and the stability of membership in the group.

Prior scholarship on distributed groups suggests that the structure of a group's task is likely to indirectly affect the amount of psychological distance that group members experience. The greater the level of task interdependence, the less impact various forms of distance are likely to have on psychological distance and construal levels. Members of highly interdependent groups

Figure 2   Expanded Process Model of Construal-Level Theory Based on Distributed Groups
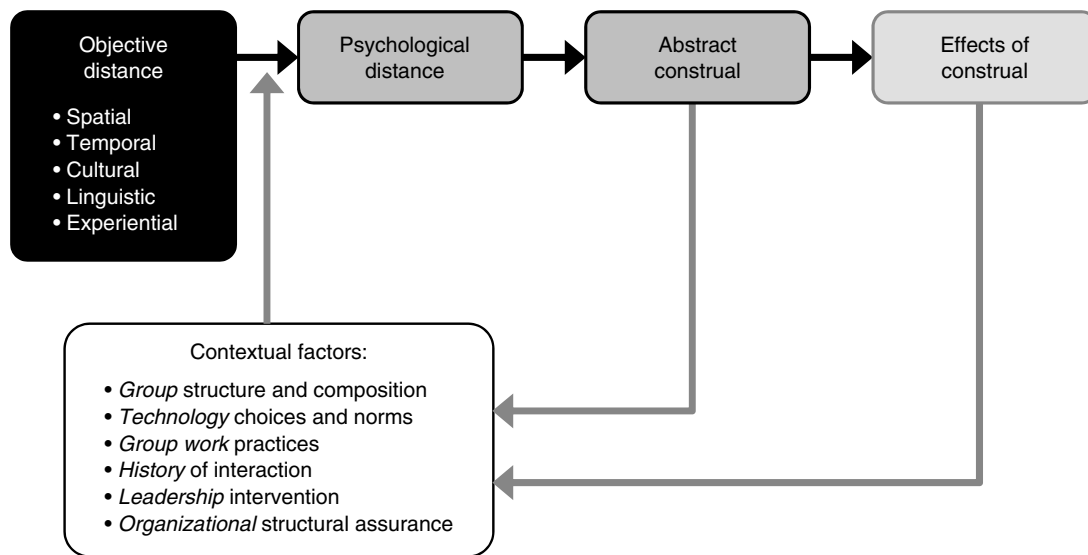
are likely to feel closer regardless of actual physical distance (Fulk 1993).

PROPOSITION 6A (P6A). *Group task interdependence will moderate the relationship between dimensions of distance and psychological distance, such that higher levels of task interdependence will reduce the effect of forms of objective distance on psychological distance and construal levels.*

Although this proposition has not been tested directly, there are indications that levels of task interdependence can be manipulated to improve performance and cohesion in distributed groups (Hertel et al. 2004) and to bridge social distance in diverse groups (Harrison et al. 1998). Given that geographic distance continues to be a problem for coordination (Espinosa et al. 2007), this prediction suggests both additional research and possible practical interventions in distributed groups.

Another structural characteristic that is likely to moderate the relationship between distance and construal levels is the stability of the group's membership. There is increasing recognition that groups are not static entities, but, in practice, experience changes in their membership in dynamic ways (Choi and Thompson 2005). In addition, increased work on multiple overlapping teams highlights the increasing frequency with which group members must switch between groups (O'Leary et al. 2011). We expect that the more stable a group's membership is, the less effect objective distances will have on psychological distance and construal levels. Research has shown that the more people are exposed to each other, the greater their attraction and feelings of closeness (Brockner and Swap 1976). In the context of groups, those composed of familiar members experience greater feelings of closeness than groups of less

familiar members (Flowers 1977), perhaps especially in distributed groups (Wilson 2001). Thus, as more stable groups provide more opportunities for group members to be exposed to one another, stability promotes feelings of closeness, counteracting the effects of objective distance on construal level.

PROPOSITION 6B (P6B). *Stability of group membership moderates the relationship between dimensions of objective distance and psychological distance. The more stable a group is, the less effect objective distance will have on psychological distance and construal levels.*

Construal in Context: Technology Use
Considering construal level in distributed groups also highlights the important role of technology use. The effects of technology are not the result of technology alone but stem from the combination of technology features with organizational arrangements and practices that support their use (Zammuto et al. 2007). It is hard to disentangle the impact of technology features (interactivity, for instance) from the use of those features and the norms that influence that use (Majchrzak et al. 2005). As a result, we predict that the use of technology to communicate with distant partners does not automatically produce more psychological distance and higher level construal. In keeping with an affordance perspective on technology, the possibilities for psychological distance and construal are not given but depend on the intent of the actors engaging in them (Boudreau and Robey 2005). In the context of distributed groups, this means that group choices and norms regarding the use of technology are likely to moderate the relationship between objective distance and the resulting levels of construal. One such choice is technology adaptation.

Technology adaptation involves the acquisition and use of new information and communication technologies (ICTs) or new features of ICTs, the disuse of ICTs, and the modified use of existing features of ICTs (Thomas and Bostrom 2008). Although the effect of technology adaptation on psychological distance has not been studied directly, field studies of technology adaptation suggest that members of groups that adapt technology to fit their needs have higher levels of cooperation (Thomas and Bostrom 2008) and develop mutual expectations in the process of making adaptations (Majchrzak et al. 2000) that can further reduce psychological distance. For instance, we might expect the following.

PROPOSITION 7A (P7A). *Technology adaptation will moderate the relationship between objective distance and psychological distance. The more groups adapt technology to their needs, the less effect objective distance will have on psychological distance and construal levels.*

Technology and group norms also influence the symbolic value of media choice. For instance, O'Leary (2010) started exploring the "distancing" implications of choosing lower-bandwidth media when higher-bandwidth options are available. What does it mean if face-to-face communication is available but I routinely use email or voice-mail messages to communicate? If the choice of lower-bandwidth media accentuates objective distance and contributes to greater psychological distance, construal-level theory predicts that it will also result in higher-level construal. Thus, group members emailing each other instead of picking up the phone to communicate may result in the partners developing especially distant and abstract views of each other. This is consistent with preliminary research results that indicate that it is not the actual bandwidth of the medium that influences psychological distance but the choice of a particular bandwidth when other options are available (Walther and Bazarova 2008). We might therefore expect the following.

PROPOSITION 7B (P7B). *Media choice will moderate the relationship between objective distance and psychological distance. Choosing lower-bandwidth media when higher-bandwidth options are available will increase the effect objective distance will have on psychological distance and construal levels.*

Construal in Context: Feedback Loops

Thinking about construal levels in the context of situated groups also suggests the possibility of interesting feedback loops. In keeping with recent calls for conceptualizing groups as dynamic "input-mediator-output-input" systems (Ilgen et al. 2005), we expect that changes in outcomes will in turn affect perceptions of psychological distance. For instance, if trust declines, it may lead to a negative feedback spiral in which declining trust

results in a sense of increased (psychological) distance and further decreases in trust (Lindsley et al. 1995). Similarly overlooked is the feedback loop between performance and perceptions. Staw (1975) demonstrated that contrary to conventional wisdom, perceptions of group members drive performance; in fact, the performance level of groups changes group members' perceptions of their groups and each other. Specifically, being randomly assigned to a high-performance condition caused group members to rate their groups as more cohesive. Staw's explanation was that individuals use performance as a cue by which they adjust their perceptions of individuals and the group. Indeed, meta-analytic evidence supports this causal direction. Mullen and Copper (1994, p. 222) concluded that "although cohesiveness may indeed lead the group to perform better, the tendency for the group to experience greater cohesiveness after successful performance may be even stronger." Thus, we might expect that good performance results will reduce the effect that objective distance has on psychological distance and construal levels.

PROPOSITION 8 (P8). *Prior group performance will moderate the relationship between objective dimensions of objective distance and psychological distance such that the better the group performs, the less impact objective distance will have on psychological distance and construal levels.*

We have highlighted just a few of the contextual variables that are likely to moderate the relationship between objective dimensions of distance, psychological distance, and ultimate construal levels. Other likely contextual moderators that have been considered in the literature on distributed work include leader behaviors (Weisband 2008) and organizational-level variables such as structural assurance (McKnight et al. 1998).

Discussion

In this section, we discuss the implications of our extension of construal-level theory to the distributed group context. In addition to highlighting unique theoretical insights for both distributed group dynamics and construal-level theory, we first emphasize the value of the theoretical parsimony offered by construal-level theory and the way it integrates with other theories that have been applied to distributed groups. We then consider specific implications for future research and practice.

Theoretical Implications

Theoretical Parsimony and Integration. As already noted, scholars of distributed groups wrestle with gaps in the literature, as reflected in their calls for a more integrative approach to theories of distributed work. Figure 3 illustrates how the causal chain suggested by

Figure 3   Model of Propositions and Relationship of Construal-Level Theory to Other Theories
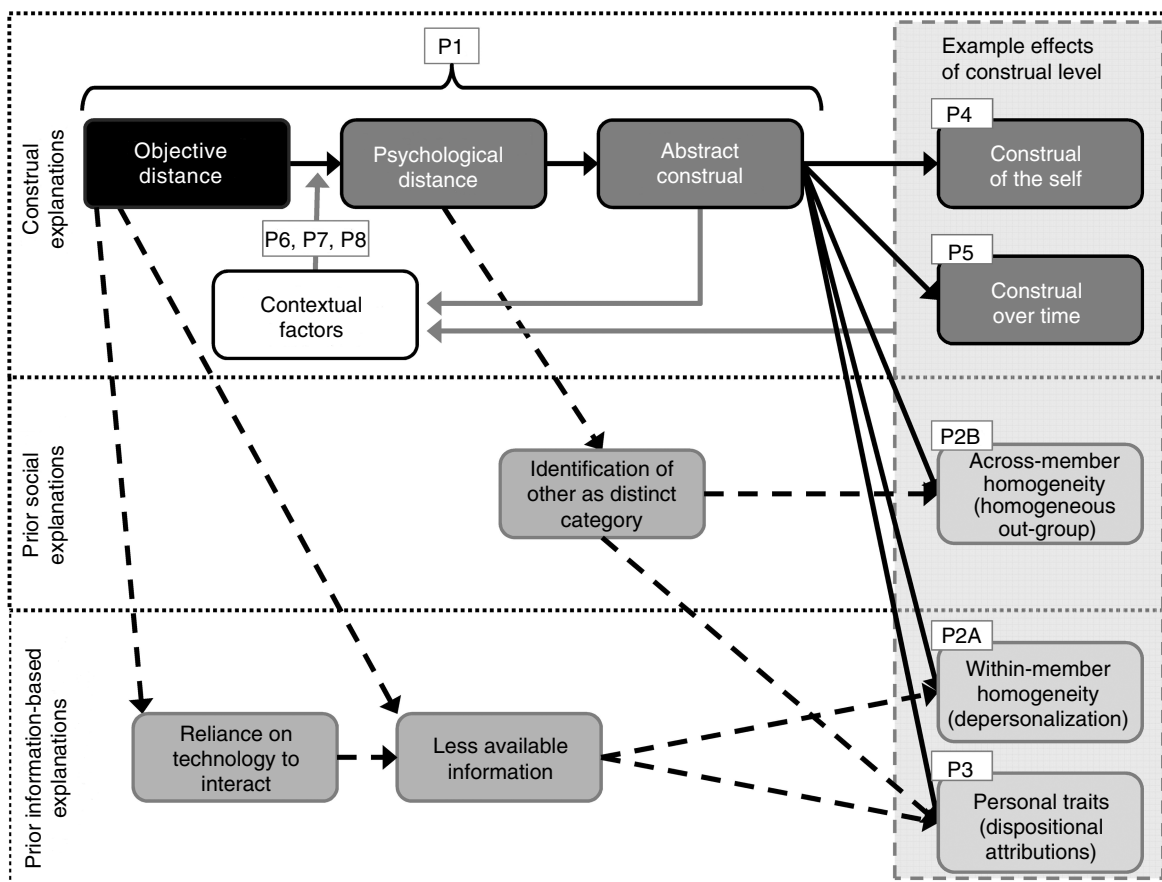
construal-level theory links objective dimensions of distance, allowing us to account for observations that have, until now, required multiple and disparate theories.

We have shown how construal-level theory provides a mechanism to link a wide array of dimensions of objective distance through psychological distance and construal level to behavioral outcomes. In so doing, we have identified a single mechanism underlying the effects of a range of objective dimensions of distance (P1). Such parsimony has long been recognized as a goal for scholarship, encouraging scholars to boil down overly complex theoretical frameworks to simpler ones that can be applied more consistently and widely and with less qualification (Eisenhardt and Graebner 2007). By using construal-level theory to explain a wide range of factors affecting perception and interaction at a distance, we increase theoretical parsimony and facilitate drawing connections across theories, thereby yielding a more comprehensive model of distributed group dynamics.

Doing this goes beyond the mere categorization of those dimensions by providing us with a common framework that can be used to compare their effects and eventually map their patterns of interaction to determine whether the effects of different forms of distance are additive, multiplicative, or compensatory. In this way,

the application of construal-level theory to distributed groups addresses the first of the two previously mentioned gaps in our understanding: the lack of understanding about the mechanisms and characteristics that relate the effects of objective dimensions of distance.

The application of construal-level theory to distributed groups provides a single mechanism that can be used as a basis from which to integrate findings based in differing theoretical approaches. Through a single explanatory mechanism (psychological distance and construal levels), construal-level theory accounts for within-member homogeneity (P2A) predicted by theories of mediated communication, across-member homogeneity (P2B) predicted by social identity theory, and trait-based explanations for behavior (P3) predicted by attribution theory. We view construal-level theory as complementing and in some cases augmenting these other theoretical explanations for distributed group dynamics. Rather than considering construal-level theory as orthogonal to or a substitute for these other theories, we suggest that it may actually help us to better understand the mechanisms that drive them. Take, for example, research that uses social identity theory to explain perceptions of across-member homogeneity in distributed contexts. Scholars using identity theory have generally argued that multiple

sites provide a basis for in-group–out-group distinctions. However, we suggest that—as illustrated in Figure 3—objective dimensions of distance may first drive psychological distance, which serves as the basis for identifying in-groups and out-groups. This basic process thereby helps us build on and refine our understanding of the social identification process in distributed groups.

We have further demonstrated that many dynamics commonly observed in distributed work (e.g., perceptions of inter- and intramember homogeneity) can be predicted by construal-level theory, without relying on mechanisms articulated by other theories (e.g., reduced social information, feelings of similarity). So by providing a means of integrating previously disconnected theoretical explanations for distributed group dynamics, the application of construal-level theory to distributed groups also serves to address the second gap noted previously: the fragmentation of the body of theories on which we draw to explain and predict behavior in distributed groups.

Understanding of Specific Distributed Group Dynamics. Construal-level theory can also account for a variety of patterns of behavior that are reliably observed in distributed work. By providing an alternative explanation for *why* those patterns exist, this theory encourages organizational scholars to examine more closely the causal mechanisms that produce familiar patterns of results. For instance, one finding that is well supported by research on computer-mediated groups is that people develop more positive and specific evaluations of distant partners over time (Walther et al. 1994). Research has shown that group members who communicate electronically, though never meeting face-to-face, become more trusting over time (Wilson et al. 2006); in fact, within a span of three meetings, members of electronic groups trust each other as much as members of face-to-face groups do. From the perspective of theories of technology-mediated communication, this finding has been attributed to the effects of uninhibited remarks and slower accumulation of social information in distributed groups. But when viewed from a construal-level standpoint, these effects can be explained as distant partners developing more specific construals about each other, thereby decreasing psychological distance and increasing trust. This latter interpretation is consistent with another argument from construal-level theory: that not only does psychological distance affect construals but also changing construals can affect psychological distance (Fujita et al. 2006).

A second consistent observation about distributed work is that distant group members have difficulty sharing knowledge and developing an accurate idea of "who knows what" within the group (Cramton 2001). This finding has been attributed to the failure to appreciate group members' local context at a distance and to challenges in trusting distant group members, but construal-level theory explains the result by positing that distant

members are more likely to see the forest than the trees. At a distance, then, members have difficulty perceiving the low-level, detailed, and contextualized features of their fellow group members' knowledge structures that would enable construction of an effective transactive memory system. According to construal-level theory, even if distant group members were provided with those contextual details, distance would still lead them to focus on the forest. This suggests a complementary mechanism underlying these effects—one based not on the availability of contextual information but on individual members' perceptions and cognition.

In both of the cases just described, there is considerable agreement on the outcomes or patterns of behavior in distributed work. What differs are the explanations. Construal-level theory offers a single causal explanation for each of these findings from the literature on distributed groups, which also presents opportunities for researchers investigating distributed phenomena, such as setting up tests of the competing explanations for the agreed-upon effects. Construal-level theory encourages scholars of distributed work to examine more carefully the mechanisms that produce patterns of behavior. This is consistent with other arguments for more mechanism-based theorizing (Davis and Marquis 2005). Construal-level theory redirects our attention to mechanisms as "an intermediary level of analysis in between pure description and story-telling, on the one hand, and universal social laws on the other" (Hedstrom and Swedberg 1998, p. 6).

Beyond addressing the aforementioned gaps in our theories and theorizing, the application of construal-level theory to distributed groups suggests a number of areas of inquiry that have not been anticipated by current theories. These include propositions about the effects of distance on self-perceptions (P4A, P4B, and P4C) and the effect of construals over time (P5). In this way, the application of construal-level theory to distributed groups broadens the scope of research on distributed groups.

Extensions to Construal-Level Theory. Similarly, applying construal-level theory in the context of distributed work allows us to develop a richer model of construals. Based on research in distributed groups, we suggested a number of factors at the group level (P6A and P6B), at the level of technology affordances (P7A and P7B), and through feedback loops in construal (P8) that enrich basic construal-level theory. Applying construal-level theory in the context of distributed groups also opens up theoretical questions about gradients of distance. It is easy to imagine moderate levels of psychological distance and correspondingly intermediate levels of construal. Most empirical work on construal-level theory has involved laboratory manipulations of distance, so the treatments of distance and construal have

tended to be categorical or dichotomous. Yet applying this theory in the context of distributed groups raises questions about whether, for instance, group members would gradually come to have more concrete construals of fellow group members as psychological distance decreases over time.

Implications for Future Research

Beyond a general call for additional theoretical and empirical research on construal-level theory in the context of distributed work, we offer two specific suggestions for future research: to investigate nonlinear relationships and to study distance as an enabler of distributed work.

Investigate Nonlinear Relationships. One of the primary advantages of construal-level theory is that it gives us a mechanism (psychological distance) that can be used to investigate the patterns of relationships between the various forms of objective distance that the literature invokes. Organization scholars can pursue questions about when certain dimensions of virtuality interact in nonadditive ways. Scholars have suggested that cultural differences interact with geographic distance to produce greater alienation than might be expected by the simple combination of the two forms of distance (Cramton and Hinds 2005). At the same time, certain dimensions of difference are likely to override the effects of others. We might expect, for example, that low levels of cultural distance may compensate for temporal distance in groups. The existence and nature of such compensatory effects remain to be tested. By focusing on psychological distance, organizational researchers can also test for threshold effects. For instance, linguistic distance may only produce significant psychological distance when spatial distance reaches a particular threshold.

Study Distance as an Enabler. A focus on construal levels also redirects researchers to consider the advantages of working at a distance. The literature on distributed groups has tended to focus almost exclusively on the disadvantages of distance (Olson and Olson 2000). Construal-level theory provides a neutral and perhaps more balanced approach. It broadens our view of distance and specifically opens up the consideration of the positive consequences of distance. According to construal-level theory, psychological distance results in higher-level construals, which can yield many benefits for individuals, groups, and organizations. Higher-level construals are not simply more impoverished or vague than lower-level construals, but they focus instead on the essence of the stimuli (Trope and Liberman 2010). Hence, psychological distance should theoretically enable a large range of global assessments (as captured in the expression "seeing the forest for the trees").

Construal-level theory offers predictions about the possible advantages of distance and its attendant high-level construals, advantages that include an increased ability to detect patterns, focus on core goals and values, and concentrate on the big picture. Another possibility is that distance and the associated abstract construals improve creativity. We know that temporal distance results in more creative answers in brainstorming tasks (Förster et al. 2004) and spatial distance results in more original responses and more solutions to problems requiring creative insight (Jia et al. 2009). Theoretically, when an abstract construal is adopted, broad categories become salient, and typical examples of the categories come to mind. Hence, a high-level construal will evoke a wider array of possibilities and associations with the problem, leading to creativity. In contrast, it is analytic thinking and the application of logical rules that improve under conditions of proximity and concrete construal (see Derryberry and Reed 1998). In extending this insight to distributed work, we might expect telecommuters to be more creative in solving problems that occur at a central office. Construal-level theory indicates that these positive effects have been present all along, but the perspectives shaped by available theories have prevented scholars from seeing the possibilities.

Implications for Practice

Among the many potential practical extensions and implications of construal-level theory for distributed groups, managers can, of course, influence group dynamics by using one dimension of distance (e.g., functional similarity) to offset other dimensions that may be harder to change (e.g., geography) (Gibson et al. 2011). Another practical issue that has been debated in the literature is how leaders can manage virtual team members at a distance (Staples et al. 1999, Weisband 2008). How leaders perceive events and group members at a distance could certainly affect the leaders' appraisals of performance. If distributed leaders think of distant team members in more abstract and global terms, then it seems likely that this will also affect how information about those team members is stored and retrieved from memory. By extension, we should expect that their memory of proximal behavior or events will be more detailed than memory of distant behavior or events (even when leaders had the same original information about both types). This suggests that leaders of virtual teams would be more susceptible to making "halo" errors in their evaluation of geographically distant group members than of more proximal members. So not only would leaders need to help team members develop more accurate impressions and attributions, but they would also need to be aware of potential biases in their own decision making.

Another interesting possibility is that there are individual differences in the tendency to use high- or low-level construals (Levy et al. 2002). Because the level of construal affects psychological distance (Fujita et al. 2006), people who are predisposed to make low-level

construals may be uniquely suited to work at a distance. These individuals would be more inclined to feel close to their distant team members and thus more likely to evaluate them in the same way that they evaluate more proximal colleagues (perhaps as a result of empathy or emotional intelligence). Furthermore, people inclined to make low-level construals might make especially good leaders of virtual teams, because they would be less inclined to engage in the dispositionalism that comes with geographic distance (Henderson et al. 2006). In contrast, team members inclined to draw high-level construals might be better suited to help the team identify trends and patterns—to help it see the forest for the trees.

Conclusion

Construal-level theory challenges our thinking about why we have observed certain phenomena in distributed groups and suggests new patterns of results that we should expect. Applying construal-level theory in the context of distributed work also helps us address the growing number of calls for integration, as scholars have argued that "the time is right for researchers to broaden the scope by bringing in theories from completely new areas" (Schiller and Mandviwalla 2007, p. 41). As these authors noted, "Rather than continue forward in a fragmented manner it may make sense to consolidate what we have learned in one or a few combinatory theories" (p. 42).

Although we have extended the theory to make predictions in the context of virtual teams, it may explain phenomena in other forms of distributed work (e.g., telecommuting, expatriate assignments, any form of cross-national cooperation) as well. Construal-level theory is a compelling alternative means to explain perceptions, judgments, and evaluations in any context where spatial, temporal, cultural, or other forms of distance are important features of the environment.

Acknowledgments

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