

## ARTICLES

# Relations in Practice: Sorting Through Practice Theories on Knowledge Sharing in Complex Organizations

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We examine practice theories concerned with knowledge sharing in complex organizations to distinguish common trends and variations in this complex body of work. We suggest that an analytical framework highlighting the relational thinking in practice theories can serve as a tool to sort through the literature on knowledge sharing. First, we delineate a relational framework consisting of seven attributes associated with a practice theory. Second, we use this framework to analyze a narrow set of practice theories represented by three seminal works on communities of practice. Third, we compare and contrast the relational dynamics found in the three seminal works in regard to how they conceptualize knowledge sharing within and across communal boundaries.

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With the intensification of competition and the development of various forms of distributed and virtual modes of work, many scholars have turned their attention to knowledge sharing across groups and organizational boundaries. Extensive fieldwork on the socially situated nature of knowing has led to a broad recognition that knowledge sharing is a complex process that goes beyond the mere

transfer of abstract bodies of knowledge (Boland & Tenkasi, 1995; Engeström, 1999; Hutchins, 1995; Lave, 1988; Lave & Wenger, 1991; Suchman, 1987). These scholars approach knowing as situated in communities of practice or activity systems. More recently, a number of scholars have studied the problems associated with the sharing of knowing across communities of practice or activity systems (Orlikowski, 2002). These include the use of boundary objects (Carlile, 2002, 2004; Star, 1989), boundary practices and processes (Wenger, 1998), cross-communal forums (Boland & Tenkasi, 1995), translators and knowledge brokers (Brown & Duguid, 1998), and the engagement in knotworking (Engeström et al., 1999). The proliferation of concepts describing cross-communal boundaries leaves more questions open than answered. Even within the relatively narrow field of researchers taking a practice or activity theoretical perspective as their point of departure, we find it difficult to draw clear lines among the different theoretical positions, compare their theoretical contributions, and use their constructs as foundations for future research. For instance, it is not clear what distinguishes knowledge sharing across communities of practice from within a community of practice. More critically, do the practices that support knowledge sharing across community boundaries also facilitate knowledge sharing within a community?

Yet as social scientists we can recognize that this disorder may be the breeding ground for a new, and perhaps better, order. If one scrutinizes closely the present body of practice theories on knowledge sharing in complex organizations, one may even discern within it the shape of the

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new order to come. That is what we propose to do in this article. We argue that at the core of any practice theory one finds a particular analytical approach, which may be labeled “relational” thinking. This is neither a theory nor a method in itself, but rather, a loosely structured framework or scaffold around which various of practice theories and methods are being developed.

In order to understand the significance of this relational thinking, or even conceive what is meant by the term, we must take our point of departure in how scholars traditionally have presented the unifying core of a practice theory. For instance, Bourdieu (1977) and Giddens (1979) maintain that an emphasis on practice allows us to overcome the dichotomy between person and world, subjectivism and objectivism, that has long haunted the social sciences. The split between subjectivism and objectivism has led to two theoretical constituencies that rarely account for each other (Bradbury & Lichtenstein, 2000). Those scholars who focus on the individual, his or her knowledge, actions, intentions, or goals, leave the nature of the “world” or environment relatively unexplored. Those in the other set emphasize the world and its structures, while individuals and social structures are assumed to exist as uniform entities.

McDermott (1993) provides a helpful metaphor in conceptualizing such a dualistic approach to the subject–world relation. The objective world is a container for subjects, and subjects are containers for the culturally given knowledge. As a bowl contains the soup, “it shapes the contours of its contents; it has its effects only at the borders of the phenomenon under analysis. The soup does not shape the bowl, and the bowl most certainly does not alter the substance of the soup” (McDermott, 1993, p. 276). The two entities, the bowl and the soup, world and subject, or subject and knowledge, are believed to be analytically separated and studied on their own without doing violence to the complexity of the situation. In other words, the subjectivism–objectivism dichotomy builds on a “substantialist view” dividing the world into an array of insular entities neatly separated from one another (Bourdieu, 1984).

A substantialist approach treats the properties attached to agents or social groups as forces independent of the relationships with which they act and exist. Such theories often tend to reify attributes of individuals or groups by detaching them from their social and historical contexts. This often takes place, as substantive attributes are easier to identify or more convenient to count and so are assumed to be concrete or more “real” than relational attributes.

Practice theory sidesteps a “substantialist view” and bridges the subjectivism–objectivism dichotomy because in practice the subject and the world combine and recursively interact (Giddens & Bourdieu). A focus on social practice emphasizes the relational interdependencies between subject and object, person and world, individual and

community, or community and network. But in the process of opposing a “substantialist view,” we claim, a practice theory introduces a particular type of “relational thinking” with consequences reaching far beyond merely breaking down the subjectivism–objectivism dichotomy.

In the relational thinking found in practice theory, subjects, social groups, networks, or even artifacts develop their properties only in relation to other subjects, social groups, or networks. Like points or lines in a geometric space, social objects derive their significance from the relations that link them, rather than from the intrinsic features of individual elements (Swartz, 1997). For instance, important features of a community of practice are not intrinsically features of that group, but rather those features obtain analytical significance only in relation to and by way of contrast to other communities of practice over time.

Practice theory goes a step further than other theories focusing on interactions or relations. It looks not only at the recursive dynamics of a given relation but places everyday practice as the locus for the production and reproduction of relations. This creates a dynamic theory that proves helpful in breaking down problematic dichotomies imposed by non-relational theories. The split between subjectivism versus objectivism (Bourdieu, 1977; Giddens, 1979) is only one among many thorny dichotomies demolished by practice theories, including history versus unfolding interaction (Lave, 1993), means and ends (Lave, 1988), agent and artifacts (Haraway, 1991; Latour, 1986), and mental and manual labor (Barley, 1986; Barley & Tolbert, 1997; Brown & Duguid, 2001).

Lave and Wenger’s (1991) theory of situated knowledge in communities of practice illustrates this relational approach well. They argue that knowledge does not exist as well-defined bodies in the form of rules or abstract models with intrinsic features. A body of knowledge cannot be understood in and of itself, allowing it to be transferred unchanged from one context to another, without changes to its properties. Thus knowing and learning are constructed by relations among people engaged in an activity (Lave & Wenger, 1991). Relational thinking allows them to recast action in such a way that structure and process, mental representation and skillful execution interpenetrate in everyday practices.

In summary, we intend to delineate the relational thinking shared among practice theories and apply this approach to knowledge sharing in organizations. We do so by first developing the seeds of an analytical framework attempting to capture this relational thinking. Specifically, we intend to draw attention to the factors that help us specify the relational dynamics embedded in individual practice theories. Second, we apply this framework to a narrow set of practice theories represented by three seminal works on communities of practice by Lave and Wenger (1991), Wenger (1998), and Brown and Duguid (1991, 1998, 2001). We analyze the particular relational thinking found in those

theories and discuss the consequences they have for our understanding of knowledge sharing within and across communities of practice. Finally, we discuss the significance of our analysis for practice-oriented research on knowledge sharing in complex organizations.

### CHARACTERIZING THE RELATIONAL THINKING IN PRACTICE THEORIES

Our characterization of relational thinking in this section proceeds from our own struggles over the past few years to discern some order in the thick brush of practice theories dealing with knowledge sharing in organizations. Staying true to the process of sorting through this literature, we present our findings as a loosely structured analytical framework including seven relational characteristics and accompanying questions, which we find helpful when examining and distinguishing practice theories (see Table 1). The first three factors are elaborations of earlier work by Carlile (2002, 2004). Our sequencing of the seven characteristics reflects a pragmatic approach. The first four attributes strive to portray the particular relational focus of a practice theory. We start with elements

that practice theories share with other social theories (e.g., characterizing the differences and dependencies among social phenomena). The subsequent characteristics gradually add elements typical to practice theories. This sequence allows us to not only compare practice theories but also contrast seminal work with its later adaptation to see what relational attributes survive in the process. The fourth factor—identifying the relational force(s)—somewhat overlaps with the first three factors. However, we find some redundancy helpful when untangling the complex theoretical frameworks presented by practice theories. The fifth factor points out an often-unintended consequence of relational thinking, which becomes important when dissecting category definitions in a practice theory. Factors six and seven explicitly concern “practice” and its role in a relational perspective. One could argue that specifying the empirical practices, factor six, constitutes a required first step when analyzing any practice theory. We did not choose this approach in an attempt to facilitate comparative analysis across practice theories and, in the process, to transcend traditional introductions to a practice theory.

### Differences Characterizing the Relation

A first step in characterizing the particular relational force embedded in a specific practice theory entails delineating the *differences* around which the relationship builds. For instance, does a particular theory highlight the differences in work practices among apprentices and master cooks in a community of practice or the differences in the practices performed by two engineering communities with different functional roles in an organization? One may be particularly interested in characterizing the differences in the knowledge and perspectives a group of design engineers and a group of production engineers bring forth when discussing a prototype during a meeting.

Merely highlighting such differences, however, does not distinguish a practice theory from a “substantialist view.” One could argue that all theoretical constructs differentiate among elements. As pointed out by Saussure (1959) and Foucault (1970), among many others, it is the fact that we differentiate one thing from another entity that provides an entity with a distinctive meaning and identity. Highlighting the differences allows us to set apart one entity from other entities (Zerubavel, 1991). One could argue that the soup and bowl in McDermott’s case exist in a relationship to one another. However, a practice theory promotes a more dynamic relational thinking where the boundaries between the different entities are not predefined.

Elements can be organized differently depending on how we partition our reality. Staying with the culinary metaphors, we can argue that a practice theory focuses on the act of carving. That is how we make distinctions in our social world through our practices. In Zerubavel’s

TABLE 1

Seven attributes of relational thinking in practice theories

Relational attributes of a practice theory	Questions clarifying the relational attributes
1. Differences characterizing the relation	What are the differences associated with a relation?
2. Dependencies characterizing the relation	What are the dependencies associated with a relation?
3. Changes characterizing the relation	What are the potential changes we find in the differences and dependencies associated with the relation?
4. Identifying the relational force(s)	Where does the author introduce the notion of power?
5. Blurring category boundaries	What concepts converge?
6. Specifying the empirical practices	What is taken to be the <i>active unit</i> ? What is the <i>temporal organization of action</i> ? What <i>kinds of actions</i> are taken to be analytically central?
7. Historically constituted relations versus emerging relations	Where do scholars place themselves in the continuum between <i>historically constituted relations</i> and <i>emerging relations</i> ?

word “It is important to see the knife for what it is and not to be fooled into thinking that entities are the way they are just because the knife happened to cut it up that way” (Zerubavel, 1991, p. 61). A practice theory focuses on the knife, the way we carve up reality and make distinctions through our everyday practices. In short, a practice theory does not assume reality made up of insular chunks unambiguously separated from one another by sharp divides. Rather, reality is assumed to be vague, with blurred edge, and in shades of gray. A practice theory concerns itself with how people through everyday activities divide up this gray matter.

### Dependencies Characterizing the Relation

A practice theory assumes dependencies among the different elements that we carve out through our actions. For instance, to understand the differences in apprentices’ and the masters’ knowing in a community of cooks, a practice theory strives to understand the dependencies that constitute the relationship between those newcomers and the old-timers. Likewise, the different knowledges held by the design and production engineers, respectively, are interdependent. The members of each community may be highly committed to and invested in their knowledge, as it allows them to solve specific problems or highlight important issues for the community. However, the knowledge developed by the design engineers is not indifferent or inconsequential to members in the production engineers’ community but develops in dependency with the perspectives promoted by the production engineers. In short, if we want to further specify the relational thinking associated with a practice theory and be able to distinguish different practice theories from one another it becomes important to delineate the dependencies a particular practice theory highlights in the relationship among the entities studied, whether it is the knowledge enacted by different groups, or the relation between agent and artifacts (Haraway, 1991; Latour, 1986) or mental and manual labor (Barley, 1986; Barley & Tolbert, 1997; Brown & Duguid, 2001).

### Changes Characterizing the Relation

Practice theories build on a process thinking, where the particular relations in focus and the differences and dependencies characterizing those relations change over time. Action has an emergent quality resulting from the continual tension and feedback between heterogeneous elements of everyday life, whether external events or internal representations (Keller & Keller, 1993, p. 127). Actors never fully control their practices, which continually get influenced by the vagaries of the physical and social world. Likewise, the relations constituted by those practices and their differences and dependencies are continually being

revised. Thus, practice theories attempting to describe the relations among apprentice and master cooks will include a stand on the particular direction and character of change found in that relationship. The question becomes, what changes do we highlight in the differences and dependencies in the social relations among the newcomers and old-timers? Likewise, theorizing about the differences and dependencies in the knowledge among production and design engineers, we must assume that those relations undergo continuously refinement and/or revision through the interactions among the two communities and other internal and external forces. In short, characterizing the relational thinking advanced by a particular practice theory includes presumptions about change.

### Identifying the Relational Force(s)

Authors often do not state up front from what relations they build their particular practice theory, which makes comparisons across researchers difficult. Due to the richness of their empirical examples, researchers typically highlight several clusters of differences, dependencies, and change processes without clearly articulating where they place their main emphasis or spell out the connections among those relational forces. The notion of power can often serve as a helpful tool for identifying the relational force(s) at play in a particular practice theory.

Historically, scholars within sociology and anthropology have privileged the assumption that the most important forms of action or interaction for analytical purposes are those that take place in asymmetrical and unequal power relations. Why these types of relations are assumed to be central to any given system can probably be traced back to a Marxist influence from the 1970s (Ortner, 1984). Bourdieu’s writings stand as a classic example. He analyzes cultural practices structured relationally around binary oppositions such as high/low, distinguished/vulgar, pure/impure, and aesthetic/useful (Swartz, 1997). This strong emphasis on asymmetrical relations often goes hand in hand with descriptions of conflictual relations. For instance, Lave (1993) argues that the heterogeneous, multifocal character of situated activity implies that conflict is a ubiquitous aspect of human existence. People come together in a situation knowing different things, bringing different interests and experiences from other situations (Lave, 1993, p. 15). Uniformity of knowledge, opinion, or belief is not taken as a given. Rather, it is assumed that such shared knowledge and beliefs result from imposed conformity or build on complexly shared relations to larger historically constituted social forces. Yet a practice theory does not necessarily lead to a left-leaning theory, as noted by Brown and Duguid (2001); other types of relations can equally well be placed under the analytical magnifying glass.

Given the long tradition of emphasizing asymmetrical relations and conflicts, we find that one often can pinpoint the particular relational thinking underlying a practice theory by how the author introduces the notion of power. For instance, Giddens defines power as “can, is able to, powers” (Giddens, 1984). Power is a relational force, not a possession; it does not explain anything in and of itself. Power can be affirmed only by being executed and is integral to action. In short, to ferret out the relations underlying particular practice theories one can often use discussions of power as a compass. It becomes a helpful tool when specifying the differences, dependencies, and change processes constituting a particular practice theory.<sup>1</sup>

### Blurring Category Boundaries

A consequence of the relational process thinking promoted by a practice theory is that the boundaries among categories often blur. A practice theory assumes that categories are forged out of blurred-edged social phenomena constantly produced and reproduced through everyday practices. It becomes problematic to clearly delineate core concepts and existing boundaries among concepts that are easily called into question. In contrast, it does not pose a great challenge to clearly delineate concepts within a “substantialist view,” where the properties associated with individual concepts are defined independently of the relationships in which they exist.

Some scholars celebrate this effect, and in other instances the blurring seems unintended. Lave (1993), for instance, notices that a theory of situated learning renders the distinction between “learning” and “change” meaningless. In Giddens’s writings we observe that he provides nearly equivalent definitions of knowledge and power. He defines power as “can, is able to, or powers” (Giddens, 1976, p. 110) and knowledge or knowing as “inherent in the capability to ‘go on’ within the routines of social life” (Giddens, 1984, p. 4). Giddens does not seem to notice this, or at least he does not celebrate the point as Foucault does with his notion of power/knowledge (Foucault, 1980). Haraway (1991) and Latour (Latour & Woolgar, 1986) explicitly use a practice theory to do away with the distinction between agents and artifacts.

Breaking down these dichotomies also means that social systems, such as communities of practice, are not divided into units like culture and organization, but rather are depicted as a seamless whole (Ortner, 1984), ecologies (Bowker & Star, 1999; Brown & Duguid, 1999, 2000), or communities of communities of practice (Brown & Duguid, 2001). The analytical effort is not to explain one chunk of a system by referring to another chunk (e.g., how structure determines individual actions), but rather to explain one system as an integral whole by referring to specific relations or asymmetries unfolding in practice. To put

it differently, social groups in a relational practice theory are aggregates of common life chances, but not necessarily “real” social groups (Ortner, 1984).

A community of practice is not defined in and of itself (or certain essential characteristics of its members), but through the relations shaped by its practices. Communities of practice are thus probabilistic constructs that should not necessarily be conflated with reality. This obviously makes it difficult to delineate a community of practice, a fact that we clearly see in the literature on the subject. Lave and Wenger, for instance, state that they leave the concept “largely as an intuitive notion . . . which requires a more rigorous treatment” (Lave & Wenger, 1991, p. 42). The boundaries of the community are not given by the definition of the term itself but by the community participants’ empirical practices.

### Specifying the Empirical Practices

If evolving everyday practices define the boundaries of practice theory concepts, as in the case of a “community of practice,” then it becomes paramount to specify the empirical practices presented by a particular theory. We need to understand how individual scholars define practice in order to understand the explanatory power of the framework. The fluidity of the notion of practice itself complicates this task. A “practice” can be anything people do.

Three questions help us specify what particular empirical practice scholars use as the foundation for their theoretical constructs (Ortner, 1984). First, what is taken to be the active unit? This can be historical individuals or social types or groups. As we show shortly, the particular empirical practices in focus will specify the level of analysis pursued. Is it practices that highlight individual formations of identity (Wenger, 1998), or communally distributed knowledge (Lave & Wenger, 1991; Brown & Duguid, 1991), or larger networks of practice stretching across communal and organizational boundaries (Brown & Duguid, 2001)?

A second set of questions concerns the temporal organization of action. Bourdieu focuses on relatively short-term moves in his early work from Algeria. Actor-network theories, in comparison, describe long-term practices involved in the enrollment and mobilization of actors around specific problems, goals, and actions. Third, what kinds of actions are taken to be analytically central? Is it the mundane, routine activities of a tailor, or an involved and improvisational sharing of narratives and war stories among technicians?

### Historically Constituted or Emergent Relations

The task of specifying the empirical practices introduced by a practice theory is further complicated by the fact that

“practice” can signify both a root task structured to help people learn to work and the unfolding work itself (Brown & Duguid, 2001)—that is, both the structure of work and the ongoing structuring of work. We can also express this Janus quality as a continuum between historically constituted relations and emergent relations.

In our attempt to build a framework that allows us to distinguish practice theories, it becomes important to know to what degree a practice theory stresses (1) the historically constituted relations among participants and their unfolding practices or (2) the emergence of relations through ongoing interaction. At one end of the continuum we find theories that start with the historically emergent contradictions that characterize the relations between subjects and the world. Artifacts, institutional arrangements, and long-standing relations within or across communities of practice take center stage in an understanding of participants unfolding practices and thus their production and reproduction of these larger structures. Different possibilities for actions, power, and interests are ubiquitous. Any particular practice is socially constituted and given meaning by its location in socially and historically generated systems of activity (Lave, 1993). Consequently, social formations such as communities of practice must be defined largely through studies of how they reproduce and produce certain historically constituted relations. Marxist-inspired practice theorists, such as Bourdieu, Engeström, and, as we show shortly, Lave, often take this as a point of departure.

At the other end of the continuum we find scholars giving prominence to the productive rather than the reproductive aspects of practice. Their focus lies on interpersonal relations among coparticipants in social interaction. Contexts or communities of practice are constructed as people organize themselves to attend to the ongoing challenges of social interaction. A context is not so much something into which someone is put, but an order of behavior of which one is a part. At this end of the continuum we find phenomenological writers such as McDermott (1993) and ethnomethodologists (Suchman, 1987, 1995). Lave (1993) summarizes these two perspectives on practice theory by pointing to how they answer the same questions but with different emphases on how relations are produced or reproduced in practice. One explores “how it is that people *live* in history; the other probes for how it is that people live in *history*” (p. 21).

In concluding this section, we want to stress that the relational thinking found at the heart of a practice theory creates a particular dynamic and open-ended approach with leeway for quite different formulations. A process-oriented approach to relations evoked by practice and an emphasis on conflicts and power dynamics result in rather fluid constructs, which can be difficult to clearly define. Thus, a practice perspective does not necessarily translate into a unified analytical starting point. For example,

a commitment to a practice theory does not mean a single theoretical position on the question of knowledge and knowledge sharing, or even one definition of “communities of practice.”

The seven attributes just outlined represent a first attempt to identify a common ground among practice theories, as well as their differences. Our approach has been pragmatic and guided by our interest in comparing and contrasting different practice perspectives on knowledge sharing in complex organizations. Thus, the seven attributes do not constitute a complete framework but rather a scaffold supporting work in progress. So far, we have predominantly been engaged in a search for common trends within a large body of theories. No single practice theory has been exhaustively outlined or discussed in itself; rather, we have highlighted themes insofar as they relate to the larger trend of thought with which we are concerned. Our goal is to elucidate relational thinking, cutting across individual theories in the hope that it will bring clarity to knowledge sharing in organizations. In the following section we attempt to compensate for the lack of particularity by turning our attention to three seminal works on communities of practice.

### THREE SEMINAL WORKS: ANALYZING RELATIONAL APPROACHES TO KNOWLEDGE SHARING IN COMPLEX ORGANIZATIONS

We began this article by suggesting a level of disintegration or confusion among studies of knowledge sharing within complex organizations, even within the subfield of scholars taking a practice theoretical perspective as their point of departure. We also claimed that one could find scattered over the landscape the elements of a trend (i.e., a relational thinking) that seems to point toward some coherence as well as some possible fault lines. In this section we seek to support this claim by using our relational framework to analyze specific theories on knowledge sharing in organizations. By doing so we hope to assess the adequacy of our relational framework in comparing practice theories and its ability to sort through theories on knowledge sharing.

Among the broad range of possible practice theories concerned with knowledge sharing in organizations (e.g., Barley & Tolbert, 1997; Boland & Tenkasi, 1995; Ciborra & Andreu, 2001; Engeström, 1999; Engeström et al., 1999; Knorr Cetina, 1999; Orlikowski, 2002) we narrow our focus to the particular subfield known as “communities of practice.” This strategy offers us a relatively bounded space within which we can make comparisons across individual scholars. Furthermore, the literature on communities of practice was influential when the topic of knowledge sharing in organizations gained momentum in the early 1990s. Within the literature on communities of practice, we select three seminal works—Lave and Wenger (1991), Wenger

(1998), and Brown and Duguid (1991, 1998, 2001). Lave and Wenger (1991) introduced the notion of communities of practice. Wenger (1998) significantly extended his early work with Lave by emphasizing the notion of identity and introduced an important cross-communal perspective to the discussion. Brown and Duguid (1991, 1998, 2001) brought the term to the organization studies field and the broader business community. All three have been quoted extensively in subsequent publications, among both scholars focusing narrowly on communities of practice and researchers concerned more broadly with knowledge sharing in organizations.

We examine these seminal works independently. Each analysis follows the same basic two-step structure: (1) A brief introduction of the seminal work leads into a relational analysis of its practice theoretical approach. Our analysis follows the sequence of the seven relational attributes summarized in Table 1, starting with the differences highlighted by the theory and ending with a discussion of historically constituted or emerging practices emphasized in the framework. We use *italics* to highlight the particular relational characteristic we are discussing. (2) In a separate section we present what our analysis has revealed about the strengths and weaknesses of the particular practice theory in terms of knowledge sharing in organizations. Here, we highlight the last two relational attributes concerning practice.

It should be noted that we do not strive for formal content analyses. Our examination does not proceed from some hypothetical external point; we hope to grasp key elements of each theory, which should resonate with the intentions of the original authors and their followers. However, we do not intend to provide exhaustive descriptions of each seminar work. The various dimension of each seminal work are discussed insofar as they relate to the larger relational trends with which we are concerned.

### **Lave and Wenger: Community-Based Approach to Knowledge Sharing**

Lave and Wenger (1991) originally developed the notion of communities of practice out of an empirical interest in apprenticeship as an alternative to school based learning. They drew on five studies of apprenticeship in Western and non-Western societies: of Vai and Golan tailors in Liberia, Mayan midwives in the Yucatan, U.S. navy quartermasters, non-drinking alcoholics, and U.S. supermarket meat cutters. These empirical choices shape to a large extent their theorizing about knowledge and learning practice. All the settings characterized stand out as relatively small communities with a fairly low division of labor. One gets a sense of a 19th-century organization of work: relatively tight-knit groups with a relatively small dependency on other more specialized practices or groups.

The paramount relational force of their theory centers on the *differences* or tension between being an outsider or newcomer and being an insider to a set of practices, that is, on the process of becoming part of a shared practice. Apprentices embark on a trajectory toward gaining membership in a particular community. In this process they build *dependencies* between themselves and established members of the community by gradually becoming indispensable to the production and reproduction of the group. Apprentices are not mere observers; through their engagement in more and more activities they learn what constitutes the practices of the community. The differences and dependencies of this relationship also specify the direction of *change* as a community-based trajectory.

Lave and Wenger name this process “legitimate peripheral participation,” essentially becoming an “insider.” Newcomers start by participating in a practice, or set of practices, that makes them legitimate members of the community. As newcomers gradually master these peripheral practices, their legitimacy increases within the community. They do not merely learn about practice, they become practitioners. Socially, newcomers move centripetally toward the center of the community (full membership) as they increasingly identify with the community’s practices. They are on an inbound trajectory.

Lave and Wenger’s use of the notion of *power* also points toward a focus on this inbound trajectory of change. Power relations are spelled out in terms of “access” and “transparency” of the activities, processes, and artifacts of the community allowed by old-timers in the community. The tension lies in the structuring of newcomers’ access and the transparency they are granted. Likewise, the *blurring of category boundaries* relates to the core relational dynamic, that is, legitimate peripheral participation. For instance, learning and change, as noted earlier, become next to synonymous when seen in the light of the newcomers’ legitimate peripheral participation and their movement toward becoming more embedded in the practices of the community. Studying how a community structures its legitimate peripheral participation helps us understand the individual apprentices’ learning trajectories and general changes associated with a community’s production and reproduction.

Routine *practices* take center stage in Lave and Wenger’s empirical analysis of apprenticeship. Given the dynamics of a practice perspective, this does not refer to some preordained culture-sharing entity, but rather includes what other members do: what everyday life is like; how masters talk, walk, work; what other learners do and what they need to do to become full participants. The different apprenticeship studies referred to by Lave and Wenger describe slightly different temporal organization of practice. Hutchins’s (1991) research, for instance, analyzes the minute unfolding of practices by quartermasters

on a naval ship, whereas Jordan ..(1989) describes practices as they unfold over longer stretches of time among midwives. In general through, Lave and Wenger (1991) focus on practices as they evolve in newcomers' community-centered trajectory of change.

In emphasizing the newcomers' inbound trajectories in communities of practice, Lave and Wenger (1991) stress the *reproductive and historical dimension* of practice and thus leave the improvisational and unfolding aspects of practice largely unillustrated in their empirical analysis. In fact, Lave and Wenger (1991) suggest that we delineate communities of practice in historical terms, based on their reproductive circles. They argue that if the place of knowledge is within communities of practice, the question of learning must be addressed within the developmental cycles of that community. This reproductive cycle (i.e., legitimate peripheral participation) becomes a diagnostic tool to distinguish among communities of practice.

*Independent and Unconnected.* The prominence of a practice's reproductive aspects has several consequences for how we use the notion of communities of practice to study knowledge sharing in complex organizations. Newcomers' inbound trajectories toward full participation in the community take precedence over other forms of trajectories that may involve many communities. The danger, thus, in this particular framework developed by Lave and Wenger (1991) is that it depicts communities of practice as largely independent and unconnected. The 19th-century sense of work given by the empirical examples of apprenticeship does not force the two authors to include more than one community of practice in their analysis. The relatively small communities of craftsmen and manual workers do not demand a multcommunal perspective, as do modern organizations linked up to the rest of the world through various forms of information technology. When studies look at more than one community they often analyze these one at a time, emphasizing their profound differences in modes of communication and ways of organizing participation and knowledge. See, for instance, McDermott's study of children's learning disabilities (1993) or the Thorensen (1995) and Naslund (1995) studies of learning and use of information technology within multiple communities of practice.

### **Wenger: Identities Across Communities of Practice**

Turning to Wenger's 1998 book *Communities of Practice: Learning, Meaning, and Identity*, we see a continuation of many themes delineated in Lave and Wenger, but we also find important elaborations in the relational thinking associated with how he deals with knowledge sharing in organizational settings. To understand this shift we focus on his discussion of identity.

Identity often plays a key role in sociocultural theories on learning. A theory of situated learning is no different because learning and knowing involve the whole person (Lave & Wenger, 1991, p. 53). We do not solely learn facts about the world; we develop an ability to act in the world in socially recognizable ways. This turns knowing into complex social processes that involve the acquisition of identities and reflect both how a person sees the world and how the world sees the subject. In everyday life it is thus difficult and often unnecessary to determine exactly where the sphere of the individual ends and where the sphere of the collective begins. Knowing and learning mirror the social contexts in which a person learns and puts his or her knowledge into use. Activities, tasks, functions, and understandings are part of a broader system of relations where a person becomes a member of a group with interdependent participants.

Wenger (1998) places a particularly strong emphasis on the concept of identity. He dedicates half his book to the notion of how people negotiate ways of being a person in a context. According to Wenger, practice inevitably deals with the profound issue of how to be a human being in relation to other people. The formation of communities of practice, in fact, "is the negotiation of identities" (Wenger, 1998, p. 150). Let us briefly summarize Wenger's comprehensive discussion of the topic by means of our relational framework.

The core *differences* constituting our identity fall, according to Wenger (1998), along the two abstract dimensions of time and space. The person must incorporate not only a past and a future in the present process of learning particular practices; the person also needs to negotiate a nexus of multimembership across several communities. People's engagement across communities requires them to negotiate the differences in knowledge coming from differently situated perspectives into their identity formations. In Wenger's words:

We all belong to many communities of practice, to some in the past, to some currently; to some as full members, to some in more peripheral ways. Some may be central to our identities; some incidental. Whatever their nature, these various forms of participation all contribute in some ways to the production of our identities. (Wenger, 1998, p. 165)

By approaching identity both over time and space (i.e., multcommunal perspective) Wenger avoids focusing solely on the person's autobiographical work, where one considers identity as merely stretching over the temporal dimension of an individual's past-present-future path. In particular, theories emphasizing the narrative structure of identity (Giddens, 1991) and the person's negotiation of its complexity easily neglect the cross-communal infrastructure of social practices. These scholars impose a beginning, middle, and end to disjointed events in the plotting



of a story and the construction of identity in time (Dreier, 1999). In these cases, the invested nature of knowledge and contested nature of practice among multiple participants easily fall out of our analytical apparatus when we turn our attention to people's tinkering with their self-narratives. It is too easy to focus on the self and a person's search for a seamless story in an otherwise heterogeneous life.

Wenger introduces the core *dependencies* of his relational theory of identity as a "social ecology of identity," which involves three dimensions: participation/nonparticipation, modes of belonging, and identification in communities versus ownership of meaning. At its root this broad framework greatly elaborates the ideas underlying Lave and Wenger's (1991) notion of "legitimate peripheral participation," insofar as it draws attention to a person's relative position with regard to communities of practice. Power is no longer just expressed in the relation between newcomers and old-timers, but also in the tension between people's identification with a community versus their ability to control what communities they belong to and define the knowledge and meanings ascribed to the activities and objects of the community.

*Change* falls along the dimensions laid out by the core dependencies. The potential for change and, thus, new knowledge is given by a person's various peripheral or marginal positions with regard to several communities; learners combine different modes of belonging through their engagement and alignment with practices in multiple communities. This makes learning and changes in knowledge a process of social reconfiguration through which people alter their participation in a nexus of communities in which they have ownership in the communal knowledge. In the end, Wenger seems, if not to fuse identity and practice, then to *blur the category boundaries* between practice and identity, shifting the focus from practice to identity as the fundamental building block in a social theory of learning and knowing (Wenger, 1998, p. 156). He argues that by using the notion of identity we avoid the simplistic subject/world dichotomy without doing away with the distinction. We notice that "practice" plays the same defining role in a practice theory.<sup>2</sup> As a core relational term, "identity" should specify the differences, dependencies and change between the subject and the world. Not surprisingly, Wenger (1998, p. 20) discusses the notion of *power* only in chapters on identity. It is also here that he specifies the differences, dependencies, and changes that define a person's practices/identity.

By building his notion of identity on a relational foundation Wenger avoids many of the pitfalls associated with the concepts in the broader literature. For instance, the organizational literature on communities of practice has, to some degree, picked up on the notion of identity. These writings generally start with the premise that when people work together, they inevitably form small informal

networks of relationships. These go beyond formal organizational patterns and build instead on proximity, personal attraction, and common background among the members. However, the notion of identity easily loses its position in a relational framework and solely defines the similarities among individuals (i.e. the set of characteristics by which people are recognized). Galagan (1993) and Stewart (1996), for instance, argue that people do not just work together in communities; they often socialize together and in many cases start to look and talk like each other.

*Identities and Knowledge Sharing Across Communities.* For the purpose of our interest in knowledge sharing in complex organizations Wenger clearly introduces a multicomunal perspective. He distinguishes between a perspective of practice, which highlights communities, and a perspective of identity, which highlights a person's negotiation of a nexus of multimembership. Wenger does not elaborate on these communities' differences, interdependencies, nor on the changes dependencies may generate. When picturing the relations among communities Wenger uses Venn diagrams that posit the relative overlap of two communities as a way to represent their degree of difference (Wenger, 1998).

The dynamic relations among multiple communities of practice emerge only with the introduction of identity in Wenger's framework. It is here that we see the dependencies expressed as power relations played out in a person's configuration of his or her identity of participation. However, these discussions of multimembership remain abstract with little support from examples of *empirical practices*. Wenger presents only general examples and draws little from his ethnographic work among insurance claim processors. One reason for this may be that his empirical study focused its attention on one community and not the movements or interactions among two or more settings. The types of empirical practice he highlights compare to the ones found in Lave and Wenger (1991). The individuals constitute the active units as they engage in routine work practices over the course of their career in one community.

One can only hypothesize that as Wenger's theoretical framework developed from individual communities to the multicomunities level he did not have a chance to go back and gather more empirical data. The result is that we do not get a good sense of the types of tensions and dependencies in cross-communal relations and the changes they generate. Tensions lie with the individual and his or her struggle with the negotiation of an identity, not primarily with the community of practice. Wenger notes several times that communities can be the breeding ground for social venom, yet we get little sense of this tension in his examples of claim processors' shared practices, mutual

help, and general reflection on their work life in relation to other aspects of their being.

The lack of empirical examples of practices makes it difficult to specify where this theory is on the continuum between *historically constituted* and *emerging structures*. Wenger's empirical examples of insurance claim processors' daily practices emphasize the routines of their daily work and how they become part of those structures. In other words, the empirical data seem to demonstrate a concern for the reproduction of relations. Yet his theorizing about identity and how people negotiate their memberships in a multicomunal world points toward an interest in the ongoing production of new knowledge and social relations. To straddle both the productive and reproductive aspects of social relations is not problematic. The dissonance emerges when these empirical data only seem to give texture to one end of the continuum.

In brief, Wenger's profound theory of learning turns the differences, dependencies, and changes fueling the production and reproduction of knowledge into a personal matter, not an issue lying at the core of a community of practice or a community of communities of practice (i.e., the organization). Wenger has good reasons for this focus. With a social theory of learning that emphasizes the person's trajectories of change, it makes sense to choose a level of analysis that calls attention to the person. Furthermore, identity as discussed here stresses a person's agency, a dimension easily overlooked when focusing on cross-community relations.

For our purposes, that is, investigating knowledge practices in a nexus of communities of practice, identity can become a liability if it moves to the center stage, diverting our attention from the negotiation and improvisation that produces and reproduces cross-communal relations embedded in objects, ends, divisions of labor, and institutional forms of participation. Organizational members' investment in their identities clearly plays a central role in complex cross-communal relations, but an overemphasis on this process could blind us to the ongoing power relations in communities of practice, as well as the invested nature of knowing and learning as it unfolds among a group of participants across contexts. Wenger's work contains many insights pointing to a social theory of knowledge in regard to cross-communal relations; we just have to dig them out from a narrative built around the notion of identity.

### **Brown and Duguid: Sharing Practices Within or Across Shared Practices**

By far the most widely adopted approach to situated knowledge and communities of practice within the organizational literature stems from Orr (1996) and Brown and Duguid's (1991, 1998, 1999, 2000, 2001) adaptation of Lave and Wenger's work. The overall theoretical per-

spective remains the same, but new empirical data shift our attention to two relational forces. One focuses on the sharing of knowledge within communities of practice; the other encompasses knowledge sharing across communities of practice. In their more recent publications (Brown & Duguid, 1998, 2001) one can find these two relational forces differentiated in the distinction between "sticky" versus "leaky" knowledge. Building on the notion of situated knowledge, Brown and Duguid (2001) describe how knowledge rides along the rails laid out by shared practices. Where people share practices, such as within a community of practice, knowledge flows easily. In situations where people do not engage in the same practices, knowledge sharing tends to become a sticky affair. People engaged in different practices tend to maintain different assumptions, outlooks, and interpretations of the world, and different ways of making sense of their encounters (Brown & Duguid, 1998, p. 96). Most strongly, we encounter sticky knowledge within organizational boundaries where a division of labor, and hence of practices, and a division of knowledge balkanize the different communities of practice. In the following analysis we discuss the two relational dynamics separately, starting with knowledge sharing within shared practices such as a community of practice. To accommodate the discussion of two relational forces we change the sequence of our analysis. In regard to the first relational force, we start by characterizing the empirical practices in focus—where Brown and Duguid place themselves on the continuum between historically constituted and emerging structures; then we discuss the first five relational attributes, followed by a subsection about how this approach has been used by applied literature on knowledge sharing. In our analysis of the second relational force we follow the regular sequence, attributes one through seven.

*Sharing Practices Within Shared Practices: Community Knowledge.* Brown and Duguid replace apprentices' and insurance claim processors' everyday routine practices with Orr's ethnographic study of Xerox service technicians' engagement in knowledge-sharing *practices* (Orr, 1996). Specifically, Brown and Duguid (1991, 2001) emphasize how Orr's technicians create and share narratives over and about troublesome copy machines. Facing novel problems, the technicians join forces in diagnosing problems through narration; the integration of various facts of the situation is accomplished through a conversation. In their search for inspiration, they tell stories. These stories generate a sufficient interplay between memories, tests, the machines' responses, and the technicians' ensuing insights that lead to diagnosis and repair. Stories also act as repositories of accumulated wisdom among the technicians. The knowledge produced thus emerges out of a collective effort around a shared practice. This form of

social construction is highly situated and highly improvised (Brown & Duguid, 1991, p. 47). It is through the collaborative and continual development of these practices that a shared meaning for interpretation of complex activities gets formed, transformed, and transmitted. We also notice a shift in the *temporal organization of actions* from the structure of daily work activities and their changes over months and years to minute analysis of how technicians interweave their evolving repair of a copy machine with their narrative about these activities. The *active unit* in Brown and Duguid's analysis leans toward the community and deemphasizes the individual.

In Brown and Duguid's approach we also see a shift in emphasis from *historically constituted structures* toward *emerging structures*. It is the value of continuously evolving, socially distributed knowledge that seems to tie community members together in Brown and Duguid's analysis and thus to define the boundaries of the community. We find a comparable emphasis on the productive aspects of practice in workplace studies such as Barley and Tolbert (1997) and Orlikowski (1992) that build on Giddens's (1984) structuration theory or the more recent organizational literature on improvisation (Barrett, 1998; McGinn & Keros, 2002; Miner et al., 2001; Weick, 1998). It is in the everyday unfolding of practice that new structures continuously emerge, such as socially distributed repositories of knowledge embedded in technicians' war stories. We should notice that this does not mark a rejection of reproductive forces, history, or structure. The technicians' sharing of narratives not only produces new knowledge, but also maintains and reproduces existing distributed knowledge, providing highly effective loops for insights into the continuous process of problem identification, learning, and knowledge production.

The question remains: Around which relations do the technicians' shared practices build? It is not the issue of access and transparency among newcomers and old-timers. Brown and Duguid (1991) describe the subtle differences, dependencies, and changes occurring within a shared practice. People engaged in a shared practice draw on separate experiences and do not form an entirely homogeneous group given their various backgrounds and experiences. These *differences* allow community members to engage in a task by complementing each other's activities in an unfolding improvisation. *Dependencies* develop as participants provide for one another social "affordances" that scaffold knowledge creation in practice (Cook & Brown, 1999). The telos of *change*, then, centers around the expansion of the distributed knowledge base, the production of novel activities, and the continuous molding of a shared perspective, which reflects the local condition of their shared practice.

Recently, Brown and Duguid (2001) extended this idea by introducing the notion of networks of practice. Brown

and Duguid raised the level of analysis from the closely shared practices of community members to broader and more loosely shared practices of professions, occupational networks, or epistemic cultures (Knorr Cetina, 1999). Within these networks, too, we find a fine differentiation of practices creating complex "ecologies" of knowledge (Brown & Duguid, 2000).

*Losing a Relational Perspective.* The idea of sharing practices within communities of practice has proven immensely popular within both the academic and practitioner-oriented organizational literature in comparison with the notions of legitimate peripheral participation and identity. The literature celebrates the direct and extensive sharing among community members collaborating directly, using each other as sounding boards, and learning from each other in lunch-room conversations, across cubical walls, or on other informal occasions (Galagan, 1993; Marshall et al., 1995; Smith, 1997; Stewart, 1996). These exchanges range from the mundane information needed by someone on the fly or small behavioral instructions during a particular activity, to more elaborate and ongoing sharing of narratives. Some authors emphasize the use of information technology as an integral part of the sharing (Erickson, 1997; Gardner, 1998; Manville & Foote, 1996; Marshall et al., 1995; Smith, 1997; Stewart, 1996).

Brown and Duguid's (2001) notion of "networks of practice" tends to fit these descriptions of virtual and computer-mediated sharing practices better than the more narrow terms of "communities of practice." An overarching focus on sharing practices in the broader literature, however, often loses sight of the thorny relational thinking forming the foundation of a practice theory. In these cases the notion of a "shared practice" shifts from being a relational term to becoming a self-contained category, a container for particular self-explanatory characteristics of a community. Even in Brown and Duguid's (1991, 2001) case it is difficult to find much reference to *power* relations when it comes to how Orr's service technicians interact. We do not get a sense of the potential conflicts or contradicting interests that may exist side by side with the sharing of war stories and repair know-how. In doing so, they end up reproducing a notion of community developed in the English language depicting a coherent group of people organized around a set of shared characteristics and opposed to larger social formations. In Williams's words:

Community can be the warmly persuasive word to describe an existing set of relationships, or the warmly persuasive word to describe an alternative set of relationships. What is most important, perhaps, is that unlike all other terms of social organization (state, nation, society etc.) it seems never to be used unfavorably, and never to be given any positive opposing or distinguishing term. (Williams, 1983, p. 76)

The neglect of a relational thinking often translates into an overly romantic interpretation of communities of practice, as illustrated by Stewart:

Perhaps most intriguing, communities of practice are responsible only to themselves. No one owns them. There's no boss. They are like professional societies. People join and stay because they have something to learn and to contribute. The work they do is the joint and several property of the group—*cosa nostra*, "our thing." (Stewart, 1996, p. 174)

We lose sight of any contested practices and are left with a picture of what must be close to a managerial utopia where employees do not need supervision nor surveillance, but generate their own motivation, build group responsibility, and set goals in a desire to work more effectively, learn, and improve their work performances (Hamel & Prahalad, 1996; Handy, 1996; Stewart, 1996).

*Sharing Practices Across Shared Practices: Canonical Versus Noncanonical Practices.* Brown and Duguid (1991, 2001) bring forth a second relational force, which lies between communities or networks that do not share practices. From this perspective, we find that organizations embrace communities with fundamentally *different* practices, each presiding over local knowledge. In some situations these shared practices within a community or networks will lead to different "epistemic cultures" (Knorr Cetina, 1999) housed under the same organizational roof. Among the large number of potentially interesting cross-communal relations, Brown and Duguid focus on the differences most pertinent to management. In their early work the authors emphasize the differences between canonical and noncanonical practices (Brown & Duguid, 1991). This translates into the difference between an espoused practice of an organization and the actual practices of its different communities. On the one hand, we find the *opus operatum*, the canonical view, which tends to see actions in terms of the task alone and does not include the process of doing the task. The *modus operandi*, on the other hand, involves the way the task looks to someone who works on it over time and space. This highlights the constantly changing conditions of work, which force community members to improvise practices that rarely map onto the canonical practices.

The *dependencies* are seen from a managerial perspective as choices between letting individual communities specialize and innovate versus coordinating and refining the relations among existing knowledge in the organization. Management faces the challenge of facilitating the relationship between its own canonical views of the organization with the innovative work, changing practices, and emerging new knowledge of individual communities. An organization's competitive edge, and hence management's success, depends on its ability to coordinate the different

practices and knowledge across these many communal divisions. To make and market inventions involves coherent systems of complementary knowledge presiding in different communities of practice. Managements, then, find themselves in the precarious position where they have to make trade-offs between coordinating differences among communities and letting each community explore, specialize, and develop new innovative processes based on their unfolding noncanonical practices.

Innovation, and thus *change*, largely springs from this tension between canonical and noncanonical practices, according to Brown and Duguid (1991, p. 50). Community members pioneer new practices as they continue to develop a rich, fluid, noncanonical worldview in order to bridge the gap between their organization's official view and the challenges of their daily work conditions. By ignoring preset rules and traditions, the social construction of a community of practitioners can produce new ways to solve problems. The change process in focus, then, involves the ways organizations manage to coordinate knowledge across these divisions better than their competitors.

We notice that the asymmetrical relations among groups embedded in the canonical versus noncanonical distinction points us toward the notion of *power* as a central relational force. In Brown and Duguid's (1991) early work the tension between canonical and noncanonical practices largely translates to a description of how managerial practices, espoused perspectives, and abstract accounts stifle the technicians' noncanonical practices. Building on Orr's (1996) ethnographic material, Brown and Duguid take the perspective of the service technicians and how they feel squeezed by a community of managers who do not seem to comprehend their daily work conditions and improvisational practices. In their more recent work, Brown and Duguid (1998, 2001) further develop this perspective to encompass the relationship between multiple communities within an organization. The *blurring of categories* seems in this relational force to involve power and innovation. It becomes difficult to distinguish the power plays managers must engage in to mediate canonical and noncanonical practices and the process that spurs innovative new products and services.

Jumping to the seventh relational attribute, the continuum between *historically constituted* and *emerging structures*, one could further argue that the distinction between canonical and noncanonical mirrors the distinction between the reproduction of historically constituted structures and the production of new innovative practices. Brown and Duguid approach the management of organizations as a struggle to mediate historically constituted practices within and across communities with the continuous emergence of new non-canonical practices.

Turning to the *empirical practice* introduced by Brown and Duguid, one should notice they do a much better job

describing the noncanonical practices and how they face off with the canonical practices. Largely thanks to Orr's (1996) work we get a good sense of the improvisational practices of the service technicians and how they struggle to avoid the constraining pressure from management's canonical practices. In contrast, Brown and Duguid offer few examples of how managers go about integrating the knowledge and practices of their organization's diverse communities. They largely rely on anecdotes of past managerial failures—for instance, how Xerox managed to neglect significant innovations coming out of its Palo Alto Research Center.

Here the community or networks take on the role of active units and the temporal perspective extends to long-term organizational innovation processes. Furthermore, we are left with few empirical examples of what the relations among communities of practice within an organization look and feel like from the perspective of the non-managerial employee. We get the sense that organization members, apart from management, predominantly concern themselves with developing and refining their communal knowledge and epistemic cultures, paying little attention to the practices of other communities. Brown and Duguid (1998, 2001) hint at the positive effects of translators, boundary brokers, and boundary objects in negotiating the epistemic differences among communities that do not share practices. These are introduced as essential tools in the coordination among epistemic cultures within an organization's division of practice and knowledge, yet we do not get a sense of the concrete dependencies that drive these negotiations and the stakes that organization members bring forth when engaging in such boundary practices. In short, we argue that Brown and Duguid offer an intriguing account of knowledge sharing in cross-communal relations. Yet they suffer some of the same shortcoming as Wenger (1998), in the sense that most of their empirical examples emphasize practices within individual communities of practices. We are left craving good empirical examples describing cross-communal relations.

## CONCLUSION

It has been our intention to find some order in the practice-oriented literature on knowledge sharing in organizations. Specifically, we have been interested in the ability of practice theories to understand knowledge-sharing issues both within and across organizational communities. We wanted to see if an analytical framework highlighting the relational thinking in practice theories could serve this objective. Our analysis of three seminal works represents a first attempt to assess the usefulness of such an analytical tool.

Table 2 summarizes the four relational forces found in the three works under discussion. At first glance the numerous relational dynamics seems overwhelming. Nev-

ertheless, underneath all the various relational dynamics described by the three works we find a common thread. Our analysis suggests that all three build their constructs on a particular relational thinking. This shared platform includes a basic understanding of knowledge in organizations. Knowledge does not exist as well-defined bodies in the form of abstract models and rules. People's knowing and learning cannot be separated from the specific social relations produced and reproduced through practice, making knowledge a complex and problematic concept. Yet relational thinking offers a way to approach the seemingly boundless mass of possible social relations and practices in which knowledge resides.

Each seminal work selects not only specific knowledge sharing practices to study but also a relation or set of relations in which it studies those practices. In other words, the notion of "practice theory" or "community of practice" could mislead one to thinking that "practice" constitutes the unifying element across the three works. We have argued that "practice" is just one element. A particular perspective on social relations constitutes the other key element. What unifies the various practice theories on knowledge sharing is the way they not only select specific practice to study but also choose to study this practice with regard to a limited set of relations characterized by specific differences, dependencies, changes, and power dynamics. In short, we can characterize the relational thinking cutting across the three seminal works as, on the one hand, unifying, an approach to practice (i.e., attributes 6 and 7) and, on the other hand, a way to characterize the social relations produced and reproduced through those practices (i.e., attributes 1–5).

Our analysis suggests that one finds at least four relational perspectives across the three seminal works. One is represented by Lave and Wenger's (1991) notion of legitimate peripheral participation and another is embedded in Wenger's (1998) discussion of identity. Brown and Duguid's work operates with two relational forces captured by their notions of community knowledge and canonical versus noncanonical practices. We let our interest in knowledge-sharing practices both within and across community boundaries guide our comparison of these four relational perspectives.

Lave and Wenger (1991) focus on the relation between newcomers and old-timers, and, in particular, how issues of access to and transparency of communal practices shape the newcomers' trajectory toward more legitimate participation. Wenger (1998) maintains the same general interest in access and transparency but shifts the focus to the individual and his or her identity formation. The main relational forces are between an individual's past and future knowledge and his or her different types of membership in various communities. We notice that Wenger's emphasis on the individual's perspective allows him to introduce a

TABLE 2

Summarizing the analysis of the four relational forces found in the three seminal works

Four relational forces (& key concepts): Relational Attributes:	Lave and Wenger (Legitimate Peripheral Participation)	Wenger (Identity)	Brown and Duguid I (Community knowledge)	Brown and Duguid II (Canonical versus non-canonical)
1. Difference	Newcomer vs. Old-timer participation	As part of their <i>identity</i> people negotiate (1) past and future differences in knowledge/learning and (2) membership in different communities	Small variations in experiences and knowledge	Canonical vs. noncanonical practices
2. Dependencies	Newcomers gradually become indispensable to the production and reproduction of community	(1) Participation vs. nonparticipation; (2) modes of belonging; (3) identification vs. ownership of meaning	Dependency on other's knowledge (community knowledge)	Dependency between canonical coordination of communities and noncanonical community practices
3. Change (direction of change outlined by differences and dependencies)	Community-based trajectory from newcomer toward old-timer	Potential for change given by a person's (1) various peripheral positions; (2) combination of modes of belonging; (3) types of engagement and identification	Expansion of distributed knowledge	Innovation emerges out of the differences and dependencies between canonical and noncanonical practices
4. Power	Newcomers' access to and transparency of community practices	People's identification with community vs. their ability to control their belonging to and meanings of the community	Not specified	Managements' struggle with local communities over canonical and noncanonical practices
5. Blurring category boundaries	Learning and change	Identity and practice	Not clear	Innovation and power
6. Empirical practices: (a) active unit; (b) temporal organization; (c) kinds of activities	(a) Individual is the active unit (b) Length of career within community (c) Routine work practices	(a) Individual is the active unit (b) Length of career within community (c) Routine work practices	(a) Small groups of service technicians (b) Rhythm of daily work (c) Narratives and daily swork improvisation	(a) Communities and networks (b) Long-term organizational innovation (c) Not specified
7. Historically constituted or emergent structures	Historically constituted and reproductive practices	Empirical examples emphasize reproductive practices; theory includes productive practices	Empirical examples emphasize productive and improvisational practices	Empirical examples emphasize productive practices; little description of reproduction

multicommunal perspective, in contrast to Lave and Wenger's intracommunal viewpoint. Further, Wenger argues that people develop their participation in not one but multiple communities of practice. As individuals we negotiate the gravity fields of several communities as we reproduce our existing modes of participation and engage in new social relations. Sharing across communities becomes in Wenger's (1998) formulation a more complex endeavor as people negotiate their participation, identification, and ability to control their belonging to a nexus of communities. Nevertheless, issues of access and transparency remain relevant relational forces both within and across communities.

In contrast, Brown and Duguid (1991, 2001) suggest that knowledge sharing within and across communities engages radically different relational forces. One is leaky; the other sticky. Within their communities we do not seem to find issues of access and transparency but rather small differences in knowledge among peers, which spur mutual support and the development of a communal knowledge repertoire. We get no sense of conflicts or different interests among community members. In contrast, relations across communities become laced with power issues, and the development of new knowledge is caught up in a tension between conservative canonical practices and emerging noncanonical practices.

To understand these different accounts of knowledge sharing within and across communities, we may turn our attention to where the authors place themselves on the continuum between historically constituted and emergent structures and the types of empirical practices used to describe the relational forces. Lave and Wenger (1991) and Wenger (1998) emphasize the historically constituted structures, whereas Brown and Duguid build their relational focus around emerging social structures. Moreover, Lave and Wenger (1991) and Wenger (1998) operate with the individual as the active unit engaged in routine work practices. Temporally, they study practices as they change over the course of a person's career in one community. In contrast, Brown and Duguid make small groups of people the active unit when describing intracommunal relations. Larger organizational communities and networks become the unit when theorizing about intracommunal relations. The temporal perspective follows the daily rhythm of work in their description of intracommunal relations but shifts to long-term organizational innovation when describing intercommunal relations. In short, we find that the relational forces evoked by Lave and Wenger (1991) and Wenger (1998) remain comparable, whereas Brown and Duguid (1991, 2001) base their analysis of knowledge sharing within and across communities on different practices.

Yet the four descriptions of knowledge sharing summarized so far may not be mutually exclusive. For instance, we could hypothesize that Orr's service technicians restrict

newcomers' access to their work and only gradually allow them full participation in their work and knowledge sharing. We recall that both Wenger's (1998) and Brown and Duguid's descriptions of cross-communal relations hinge on weak empirical material. Their data predominantly describe intracommunal dynamics. This discrepancy probably has methodological roots. Historically, ethnography and other field research methods, typically used by practice theorists, have favored intracommunal studies. Empirical work on cross-communal relations is in short supply, partly due to the difficulties of setting up and coordinating studies involving more than one setting. Only in the past decade have we seen initiatives to develop methodologies for multisited studies (Clifford, 1997; Gupta & Ferguson, 1999; Markus, 1987).

Wenger's (1998) and Brown and Duguid's (1991, 2001) lack of empirical examples highlights another important conclusion to draw from our analysis. The relational thinking found in practice theories poses such a dynamic and open-ended approach that empirical practices play an important role in specifying the relational forces at play. Without good empirical examples to ground the theoretical constructs, a framework ends up lacking explanatory power and quickly becomes overly abstract. Yet a practice theory delineates the relations studied through people's actions; without a good understanding of those actions, it becomes difficult to understand the relations they produce and reproduce.

Beyond the ability to specify common trends and differences among practice theories, our framework helps us distinguish relational approaches from theories adopting "substantialist views." We find that the relational thinking embedded in the three seminal works often gets distorted when adopted by other scholars or practitioners. Specific knowledge-sharing practices tend to become regarded as properties of a community and not rooted in fluid social relations. This often results in overly optimistic descriptions of communities as the solution to any knowledge-sharing problem faced by an organization. One easily falls in this trap, as we tend to take the things we can count and observe as given, forgetting the fluidity of social relations and the structures they constitute.

All this being said, more work lies ahead if we want to refine the relational framework presented here. First, we have developed our relational framework in dialogue with a limited set of practice theories. Using the seven relational attributes to analyze other practice theories concerned with knowledge sharing in organizations is the first step in extending our relational framework (Barley & Tolbert, 1997; Boland & Tenkasi, 1995; Carlile, 2002, 2004; Ciborra & Andreu, 2001; Engeström, 1999; Engeström et al., 1999; Knorr Cetina, 1999; Orlikowski, 2002; Østerlund, 2003; 2004). It would also be worthwhile to look beyond the organizational literature and include comparisons of other

practice theories—for instance, the sprawling body of work inspired by an actor-network approach. Third, we have stayed away from the analysis of empirical data in this article and maintained the discussion on the abstract level of theory building. We hope that the relational thinking outlined here will inspire empirical analysis of knowledge-sharing practices in organizations and ultimately guide future data gathering. When facing a complex organizational problem, the seven relational attributes may guide our inquiries by delineating the consequences of emphasizing some practices and social relations over others. The questions outlined in Table 1 serve as a stepping-stone. A lot of work remains to be done.

## NOTES

<sup>1</sup>It is interesting to notice that when practice theorists criticize each other they often claim that the counterpart does not look at power or does not develop the notion of power far enough. Such a critique can often be translated into a quest for highlighting other relational forces. In other words, the attacker wishes to give prevalence to one type of relations over another.

<sup>2</sup>At times Wenger also talks about identity of practice/participation. In these situations the notion of identity seems to mirror not so much practice but communities of practice, with the difference being that the focus is shifted from the collective to the person (Wenger, 1998, p. 219).

## REFERENCES

- Barley, S. R. 1986. Technology as an occasion for structuring: Evidence from observation of CT scanners and the social order of radiology departments. *Administrative Science Quarterly* 31:78–108.
- Barley, S. R., and Tolbert, P. S. 1997. Institutionalization and structuration: Studying the links between action and institution. *Organization Studies* 18:93–117.
- Barrett, F. 1998. Creativity and improvisation in jazz and organizations: Implications for organizational learning. *Organization Science* 9:605–622.
- Boland, R. J., and Tenkasi, R. V. 1995. Perspective making and perspective taking in communities of knowing. *Organization Science* 6:350–372.
- Bourdieu, P. 1977. *Outline of a theory of practice*. Cambridge: Cambridge University Press.
- Bourdieu, P. 1984. *Distinction: A social critique of the judgment of taste*. Cambridge, MA: Harvard University Press.
- Bowker, G. C., and Star, S. L. 1999. *Sorting Things Out: Classification and its consequences*. Cambridge, MA: MIT Press.
- Bradbury, H., and Lichtenstein, B. M. 2000. Relationality in organizational research: Exploring the space between. *Organization Science* 11:551–564.
- Brown, J. S., and Duguid, P. 1991. Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation. *Organization Science* 2:40–57.
- Brown, J. S., and Duguid, P. 1998. Organizing knowledge. *California Management Review* 40:90–111.
- Brown, J. S., and Duguid, P. 1999. Organizing knowledge. *Reflections: The SoL Journal on Knowledge, Learning, and Change* 1:28–44.
- Brown, J. S., and Duguid, P. 2000. *The social life of information*. Boston: Harvard Business School Press.
- Brown, J. S., and Duguid, P. 2001. Knowledge and organization: A social-practice perspective. *Organization Science* 12:198–213.
- Carlile, P. R. 2002. A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization Science* 13:442–455.
- Carlile, P. R. 2004. Transferring, translating and transforming: An integrative framework for managing knowledge across boundaries. *Organization Science* 15:558–568.
- Ciborra, C. U., and Andreu, R. 2001. Sharing knowledge across boundaries. *Journal of Information Technology* 16:73–81.
- Clifford J. 1997. Spatial practices: Fieldwork, travel, and the disciplining of anthropology. In *Anthropological locations: Boundaries and grounds of a field science*, ed. A. Gupta and J. Ferguson, 185–222. Berkeley: University of California Press.
- Cook, S. N., and Brown, J. S. 1999. Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science* 10:373–390.
- Dreier, O. 1999. Personal trajectories of participation across contexts of social practice. *Outlines: Critical Social Studies* 1:5–32.
- Engeström, Y. 1999. Expansive visibilization of work: An activity-theoretical perspective. *Computer Supported Cooperative Work* 8:63–93.
- Engeström, Y., Engeström, R., and Vahaaho, T. 1999. When the center does not hold: The importance of knotworking. In *Activity theory and social practice: Cultural-historical approaches*, ed. S. Chaiklin, M. Hedegaard, and U. J. Jensen, pp. 345–374. Aarhus: Aarhus University Press.
- Erickson, T. 1997. Social interaction on the net: Virtual communities as participatory genre. In *Communities of practice: A review of the literature*, ed. John Sharp, March. <http://www.tfriend.com/cop-lit.htm> (accessed June 20, 2004).
- Foucault, M. 1970. *The order of things: An archaeology of the human sciences*. London: Tavistock.
- Foucault, M. 1980. *Power/knowledge*. New York: Pantheon Books.
- Galagan, P. 1993. The search for the poetry of work. *Training & Development* 47:33–37.
- Gardner, D. 1998. Lotus gets real. *InfoWorld* 20:50.
- Giddens, A. 1976. *New rules of sociological method: A positive critique of interpretative sociology*. London: Harper & Row.
- Giddens, A. 1979. *Central problems in social theory: Action, structure, and contradiction in social analysis*. Berkeley: University of California Press.
- Giddens, A. 1984. *The constitution of society: Outline of a theory of structuration*. Cambridge, UK: Polity Press.
- Giddens, A. 1991. *Modernity and self-identity: Self and society in the late modern age*. Cambridge, UK: Polity Press.
- Gupta, A., and Ferguson, J. eds. 1999. *Culture, power, place: Explorations in critical anthropology*. Durham, NC: Duke University Press.
- Hamel, G., and Prahalad, C. K. 1996. *Competing for the future*. Boston: Harvard Business School Press.
- Handy, C. 1996. *Beyond certainty: The changing worlds of organizations*. Cambridge: Harvard Business School Press.
- Haraway, D. 1991. *Simians, cyborgs, and women: The reinvention of nature*. New York: Routledge.
- Hutchins, E. 1991. Organizing work by adaptation. *Organization Science* 2:14–39.



- Hutchins, E. 1995. *Cognition in the wild*. Cambridge, MA: MIT Press.
- Jordan, B. 1989. Cosmopolitical obstetrics: Some insights from the training of traditional midwives. *Social Science and Medicine* 28:925–944.
- Keller, C., and Keller, J. D. 1993. Thinking and acting with iron. In *Understanding Practice: Perspectives on activity and context*, eds. S. Chaiklin and J. Lave, pp. 125–143. Cambridge: Cambridge University Press.
- Knorr Cetina, K. 1999. *Epistemic cultures: How the sciences make knowledge*. Cambridge, MA: Harvard University Press.
- Latour, B. 1986. Visualization and cognition: Thinking with eyes and hands. *Knowledge and Society: Studies in the Sociology of Culture Past and Present* 6:1–40.
- Latour, B., and Woolgar, S. 1986. *Laboratory life: The construction of scientific facts*. Princeton, NJ: Princeton University Press.
- Lave, J. 1988. *Cognition in practice: Mind, mathematics, and culture in everyday life*. New York: Cambridge University Press.
- Lave, J. 1993. The practice of learning. In *Understanding practice: Perspectives on activity and context*, ed. S. Chaiklin and J. Lave, pp. 3–34. Cambridge: Cambridge University Press.
- Lave, J., and Wenger, E. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Manville, B., and Foote, N. 1996. Harvest your workers' knowledge. *Datamation* 42:78–82.
- Markus, M. L. 1987. Toward a "critical mass" theory of interactive media universal access, interdependence, and diffusion. *Communication Research* 14:491–511.
- Marshall, C. C., Shipman, F. M., and McCall, R. J. 1995. Making large-scale information resources serve communities of practice. *Journal of Management Information Systems* 11:65–86.
- McDermott, R. P. 1993. The acquisition of a child by a learning disability. In *Understanding practice: Perspectives on activity and context*, ed. S. Chaiklin and J. Lave, pp. 269–305. Cambridge: Cambridge University Press.
- McGinn, K. L., and Keros, A. T. 2002. Improvisation and the logic of exchange in socially embedded transactions. *Administrative Science Quarterly* 47:442–73.
- Miner, A., Bassoff, P., and Moorman, C. 2001. Organizational improvisation and learning: A field study. *Administrative Science Quarterly* 46:304–337.
- Naslund, T. 1995. *Computers in context—But which context?* Presented at Third Decennial Conference, Computers in Context: Joining Forces in Design, Aarhus, Denmark.
- Orlikowski, W. J. 1992. The duality of technology: Rethinking the concept of technology in organizations. *Organization Science* 3:398–427.
- Orlikowski, W. J. 2002. Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science* 13:249–273.
- Orr, J. E. 1996. *Talking about machines: An ethnography of a modern job*. Ithaca, NY: ILR Press.
- Ortner, S. B. 1984. Theory in anthropology since the sixties. *Comparative Studies in Society and History* 26:126–166.
- Østerlund, C. 2003. Documenting practices: The indexical centering of medical records. *Outlines: Critical Social Studies* 2:43–68.
- Østerlund, C. 2004. Mapping medical work: Information practices across multiple medical settings. *Journal of the Center for Information Studies* 5:35–43.
- Saussure, F. 1959. *Course in general linguistics*. New York: Philosophical Library.
- Smith, M. A. 1997. Voices from the WELL: The logic of the virtual. In *Communities of practice: A review of the literature*, ed. J. Sharp, March. <http://www.tfriend.com/cop-lit.htm> (accessed June 20, 2004)
- Star, S. L. 1989. The structure of ill-structured solutions: Boundary objects and heterogeneous distributed problem solving. In *Readings in distributed artificial intelligence*, eds. M. Huhn and L. Gasser, pp. 37–54. Menlo Park, CA: Morgan Kaufman.
- Stewart, T. A. 1996. The invisible key to success. *Fortune* 134:173–176.
- Suchman, L. A. 1987. *Plans and situated actions: The problem of human-machine communication*. Cambridge: Cambridge University Press.
- Suchman, L. A. 1995. Making work visible. *Communications of the ACM* 38:56–65.
- Swartz, D. 1997. *Culture and power: The sociology of Pierre Bourdieu*. Chicago: University of Chicago Press.
- Thorensen, K. 1995. *Design for heterogeneity*. Presented at Third Decennial Conference, Computers in context: Joining Forces in Design, Aarhus, Denmark.
- Weick, K. 1998. Improvisation as a mindset for organizational analysis. *Organization Science* 9:540–555.
- Wenger, E. 1998. *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Williams, R. 1983. *Keywords: A vocabulary of culture and society*. New York: Oxford University Press.
- Zerubavel, E. 1991. *The fine line: Making distinctions in everyday life*. Chicago: University of Chicago Press.