How Practice Matters: A Relational View of Knowledge Sharing

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Abstract. This paper addresses the issue of knowledge sharing practices in complex organizations. The authors propose that a refined understanding of the relational thinking underpinning practice theories is required if we want to further our comprehension of knowledge sharing and distinguish existing approaches. Knowledge sharing, we argue, is defined by the specific differences and dependencies in practices existing within or across communities. Changes in those differences and dependencies leads to the formation of new knowledge. Specifying the differences, dependencies and changes provides the first analytical step in understanding knowledge sharing as it takes shape in and across communities of practice. The authors apply this relational perspective to probe the discrepancies and complementarities among three seminal approaches to knowing within and across communities of practice.

Introduction

With the intensification of competition, 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 issue that goes beyond mere transfer of abstract bodies of knowledge (Suchman 1987, Lave 1988, Lave & Wenger 1991, Boland & Tenkasi 1995, Hutchins 1995, Engeström 1999). These

scholars approach knowing as situated in communities of practice or activity systems. More recently, a number of these scholars have studied the problems associated with the sharing of knowing across communities of practice or activity systems (Orlikowski 2002, Carlile 2002). These include the use of boundary objects (Star 1989, Carlile 2002), boundary practices and processes (Wenger 1998, Carlile 2003), cross-communal forums (Boland & Tenkasi 1995), translators and knowledge brokers (Brown & Duguid 1998) or the engagement in knotworking (Engeström et al., in Preparation). The proliferation of concepts describing cross-communal boundaries leave more questions open than answered. For instance, it is not clear what distinguishes knowledge sharing across communities of practice from within a community of practice. More critically, does the practices that support knowledge sharing within a community also facilitates knowledge sharing across community boundaries?

In this paper, we wish to take a first step towards developing a framework that allows us to compare our understandings of knowledge sharing from within to across communities of practice. To accomplish this, we approach the common theoretical stand unifying these theories. We claim that a relational thinking lies at the heart of practice theory and ask what relation scholars highlight in their theories of knowledge sharing. To develop our framework we will apply a relational thinking to three seminal works that examine knowledge sharing from a communities of practice perspective (i.e., Lave and Wenger 1991,; Duguid and Brown 1991, Wenger 1998). To conduct this examination of knowledge sharing we focus on three relational properties. First, what are the differences embedded in the knowledge sharing relation? Second, what are the dependencies associated with the knowledge sharing relation? Third, when knowledge sharing takes place, what changes do we find in those differences and dependencies?

We start out by characterizing the particular relational thinking found in practice theories and, in particular, work on communities of practice. We draw attention to the critical factors that help us specify those relational dynamics. With these in hand we then approach the three seminal works on communities of practice by Lave & Wenger (1991), Wenger (1998), and Brown & Duguid (1991, 1998, 2001).

Relational Knowing in Practice

Relational thinking lies at the heart of practice theory and creates a particularly dynamic and open-ended approach with leeway for quite different formulations. Different scholars generally focus on different types of relations. 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. In

order to compare different approaches to knowledge sharing and learning we need to specify the relational thinking that lies at the heart of practice theory.

In a relational thinking, subjects or social groups develop their properties only in relation to other subjects or social groups. 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). Likewise, 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.

Relational thinking opposes itself to a "substantialist view" of social reality (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 (Carlile et al. 2003).

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 produces a dynamic theory that proves helpful in breaking down problematic dichotomies imposed by non-relational theories. For example, the split between subjectivism versus objectivism (Bourdieu 1977, Giddens 1979), history versus unfolding interaction (Lave 1993), means and ends (Lave, 1988), agent and artifacts (Haraway 1991, Latour 1986) mental and manual labor (Barley 1986, Barley & Tolbert 1997, Brown & Duguid 2001).

The primary type of dichotomy opposed by practice theory involves the split between person and world, subjectivism and objectivism. This split has lead to two theoretical constituencies that rarely account for each other (Bradbury & Lichtenstein 2000). Those who focus on the individual, his or her knowledge actions, intentions, or goals leave the nature of the "world" or environment relatively unexplored. Others emphasize the world and its structures, while individuals and social structures are assumed to exist as uniform entities. Practice theory bridges the subjectivism-objectivism dichotomy because in practice the subject and the world combine and recursively interact (Giddens and Bourdieu). A focus on social practice emphasizes the relational interdependencies between subject and object, person and world. Lave & Wenger's (1991) theory of situated knowledge in communities of practice illustrates this relational approach well. Knowledge does not exist as well defined bodies in the form of rules or abstract models with intrinsic features. They argue that knowing and learning are relations among people engaged in an activity (Lave & Wenger 1991). Relational thinking

allows them to rethink action in such a way that structure and process, mental representation and skillful execution interpenetrate in everyday practices.

When considering the number of dichotomies that the various practice theories address, we begin to see the potential number of relations that could become important when studying knowledge sharing in complex organizations. In what follows, we highlight five factors helping us to clarify the relational dynamics of various practice theory approaches to knowledge sharing (see Table 1).

1	Bridging subjective knowing and objective structures	Where do scholars place themselves in the continuum between *historically* constituted relations and *emerging* relations?
2	Blurring category boundaries	What *concepts converge*?
3	Identifying the relational force(s)	Where does the author introduce the notion of *power*?
4	Characterizing the relations	What are the *differences*, *dependencies*, and potential *changes* associated with a relation?
5	Specifying the empirical practices	What actions are considered analytically central?

Table 1 – Five Analytic Factors in Specifying a Practice Based Approach to Knowledge Sharing

The Janus Head of Practice

The relational nature of practice theory is best expressed in its inherent duality: a focus on both structure and structuring. This Janus quality allows it to bridge the dichotomies between objective structure and subjective knowing. As noted by Brown & Duguid (2001), practice signifies both work itself and root tasks structured to help people learn to work. This does not leave us with an unproblematic and straightforward notion of practice theory. Different scholars generally place slightly different emphasis on the continuum between the two poles.

1. Bridging subjective knowing and objective structures

When building a framework for studying relations among communities of practice we need to be aware of how particular scholars place themselves on the continuum between primarily stressing 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 highlight the *historically* constituted *relations* between persons engaged in

socioculturally constructed practice and the context or community of practice. This perspective starts 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 theories, such as Bourdieu, Engestrom, and, as we will see shortly, Lave, often take this as a point of departure.

At the other end of the continuum we find scholars giving prominence to productive rather than 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 ethnomethologists (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"* (ibid.: 21).

2. Blurring category boundaries

A consequence of the particular relational thinking promoted by a practice theory is that the boundaries among categories often blur. Some scholars celebrated 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' 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) and knowledge or knowing as "inherent in the capability to 'go on' within the routines of social life" (Giddens 1984). 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, Brown & Duguid 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); rather the effort is 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 & Wenger, for instance, state that they leave the concept "largely as an intuitive notion…which requires a more rigorous treatment" (Lave & Wenger 1991: 42). The boundaries of the community are not given by the practice theory itself. As we have noticed a practice theory does not necessarily lead to a unified analytical stand. This, however, does not mean that all its parts have equal analytical significance. Different scholars will stress different factors. This leads to the last three factors introduced on Table 1.

3. Identifying the relational force(s)

Identifying the specific relation(s) highlighted by a given researcher constitutes the next step in defining and comparing practice theories. However, authors often do not state up front from what relations they build their particular practice theory, which makes identifying the connections across researchers difficult to make. Within sociology and anthropology, historically scholars 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 seventies (Ortner 1984). Bourdieu's writings stand as a classic example of this as he analyzes cultural practices structured relationally around binary oppositions such as high/low, distinguished/vulgar, pure/impure, and aesthetic/useful (Swartz 1997). Yet, a practice theory does not necessarily lead to a left leaning theory as noted by Brown & Duguid (2001); other types of relations can equally well be placed under the analytical magnifying glass.

Given the long tradition of emphasizing asymmetrical relations we find that one often can pinpoint the particular relational thinking underlying a practice theory by how the author introduces the notion of power. Power, in a practice

theory, clearly highlights relational thinking. As we saw in Giddens' definition above, 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.[1]

4. Characterizing the relations

Spelling out the relational forces often reveals the contribution and limits of specific research approaches. Building on Carlile's (2002, 2003) relational approach to knowledge we characterize practice-based relations along three intersecting dimensions (differences, dependencies and change). A relational approach to knowledge and practice stresses the importance of understanding the *differences* among things and the consequences of these differences. For instance, knowledge developed within a community of practice can be seen as geared to make a particular effect or solve specific problems for its community members. These people are committed to and invested in their knowledge as hard-won outcomes. Equally important, knowledge developed by one community is not indifferent or inconsequential to members in another community. People's practices and their knowledge often exist in a *dependency* relationship to the practices and knowledge of other communities. In some cases these interdependent differences generate negative consequences that must be identified and resolved. A body of knowledge cannot be understood in isolation nor transferred from one social context to another without changes to its properties. It is defined by the social relations in which it exists and the differences and dependencies that characterize those relations. Equally important are *changes* among actors and their practices. The transformation of existing knowledge can only come about by changing the differences and dependencies in existing social relations.

5. Specifying the empirical practices

An analysis of the relational aspects is not complete without a closer look at the empirical practices emphasized by a practice theory. A practice can be anything people do. Consequently, a closer look at the empirical practices presented is often needed to understand the explanatory power of the framework. For instance, given the flexibility of a relational practice framework it is the empirical data that delineates a community of practice. First, what is taken to be the active unit? This can be historical individuals or social types or groups. As we will see shortly, the

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[1] 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.

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 in his early work from Algeria, focuses on relatively short-term moves. 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?

In summary, to develop a practice theory that describes how knowledge is shared across a broad set of circumstances one must specify the particular relations focused on and the actual empirical practices that help demarcate these relations. In what follows we will apply this analytic approach to a discussion of three seminal writings on communities of practice: Lave & Wenger (1991), Wenger (1998) and Brown & Duguid (1991, 2001).

Community-based approach to knowledge sharing

Lave & 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: Vai and Golan Tailors in Liberia, Mayan Midwives in the Yucatan, US navy quartermasters, non-drinking alcoholics, and US supermarket meat cutters. These empirical choices shape to a large extend their further 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 with relatively tight groups with a relatively low dependency on other more specialized practices or groups.

The paramount relational force of the theory centers on the *differences* or tension between being an outsider or newcomer and being an insider to a set of practices. The authors focus on the process of becoming part of a shared practice. Apprentices embark on a trajectory towards 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 & Wenger name this process "legitimate peripheral participation," essentially becoming an "insider." Newcomers start by participating in a practice, or set of practices, which 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 towards the center of the community (full membership) as they increasingly identify with the community's practices. They are on an inbound trajectory.

Lave & Wenger's use of the notion of power also points towards 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.

Routine practices take up center stage in Lave and Wengers' 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 & Wenger describe slightly different temporal organization of practice. Hutchins' (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 & Wenger (1991) focus on practices as they evolve in the newcomers community-centered trajectory of change.

In emphasizing the newcomers' inbound trajectories in communities of practice Lave & Wenger (1991) stress the reproductive and historical dimension of practice and thus leave the improvisational and unfolding and productive aspects of practice largely un-illustrated in their empirical analysis. In fact, Lave & Wenger suggest that we delineate communities of practice in historical terms, based on their reproductive circles (1991: 100). 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 because it emphasizes community-based trajectories of change. Newcomers' inbound trajectories towards 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 & 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 multi-communal perspective, as do modern organizations linked up to the rest of the world through various forms of information technology. A new focus on relational forces and practices as they unfold within the boundaries of a community of practice has largely been translated to the broader use of the term. 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 Thoresen (1995) Naslund's (1995) studies of learning and use of information technology within multiple communities of practice. To do Lave and Wenger justice we need to mention that in more recent publications they both expand their focus to participants' trajectories in and across multiple communities of practice. Let us now turn to Wenger's (1998) perspective on communities of practice.

Identity

Identity often plays a key role in socio-cultural theories on learning. A theory of situated learning is no different because learning and knowing involve the whole person (Lave & Wenger 1991: 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, as well as 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 the whole person learns and puts their 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.

The broader 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. An emphasis on identity, however, poses two potential problems. First, 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.

Secondly, theories on identity often lose sight of the spatial dimension of a person's social being. By focusing on the person's self-biographical work one easily ends up considering identities as merely stretching over the temporal dimension of an individual's past-present-future path (i.e. their trajectory). In particular, theories emphasizing the narrative structure of identity (Giddens 1991) and the person's negotiation of its complexity easily neglect spatial dimension of social practices, i.e. its cross-communal infrastructure. One imposes a beginning, middle, and end to disjointed events in the plotting of a story and the construction of identity in time (Dreier 1999). Eventually, the invested nature of knowledge and contested nature of practice among multiple participants easily falls 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 (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: 150). Nevertheless, he escapes the danger of losing the spatial dimension of learning and knowing by turning identity into a *relational* term playing much the same role as practice.

In the end, Wenger seems, if not to fuse identity and practice, then to shift focus from practice to identity as the fundamental building block in a social theory of learning and knowing (Wenger 1998: 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 very same defining role in a practice theory.[2] As a core relational term "identity" should specify the differences, dependencies and change between the subject and the world. Not surprisingly, Wenger (1998: 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. Let us briefly summarize his comprehensive discussion of the topic.

The core *differences* constituting our identity fall 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; they also need to negotiate a nexus of multi-membership across several communities. People's

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[2] 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, the difference being that the focus is shifted from the collective to the person (Wenger, 1998: 219).

engagement across communities requires them to negotiate the differences in knowledge coming from differently situated perspectives which get expressed and worked out in people's identities. 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: 165).*

Wenger introduces the core *dependencies* of his relational theory of identity as a "social ecology of identity," which involves three dimensions: participation/ non-participation, modes of belonging, and identification in communities versus ownership of meaning. At its root this broad framework greatly elaborates the ideas underlying Lave & Wenger's (1991) notion of "legitimate peripheral participation," in so far as it draws attention to a person's relative position in regard to communities of practice. Power is no longer just expressed along 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 in 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 identification to a nexus of communities in which they hold more or less ownership in the knowledge and meanings used.

Wenger clearly introduces a multi-communal perspective. He distinguishes between a perspective of practice, which highlights communities, and a perspective of identity that highlights the person's negotiation of a nexus of multi-membership. 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 their identity of participation. However, these discussions of multi-membership remain abstract. Wenger presents only general examples and draws little from his ethnographic work among insurance claim processors. One reason for this may be that the study focused its attention on one community and not the movements or

interactions among two or more settings. 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 lay with the individual and his or her struggle with the negotiation of an identity, not primarily with the community of practice. Wenger assures us 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.

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 laying at the core of a community of practice or a communities 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, i.e. investigating knowledge practices in a nexus of communities of practice, identity can become a liability if it moves to the center stage as it diverts 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 over-emphasis on this process could blind us to the ongoing power relations in communities of practice and 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.

Sharing Practices Within 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 & Duguid's (1991, 2000 a, b) adaptation of Lave & Wenger's work. The overall practice theoretical perspective remains the same, but new empirical data shifts our attention to other relational forces. Apprentices' everyday routine practices are replaced with Orr's ethnographic study of Xerox service technicians' engagement in knowledge sharing practices (Orr 1996). Specifically, Brown & 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 among memories, tests, the machine's 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 collective effort around a shared practice. This form of social construction is highly situated and highly improvised (Brown & Duguid 1991: 47). It is through their collaborative and continual development of these practices that shared meaning for interpretation of complex activities gets formed, transformed, and transmitted.

In Brown & Duguid's approach we see a shift in not only the types of practices the analysis highlights, but also a shift in emphasis from reproductive practices (i.e. becoming part of a community and its practice) towards productive practice (i.e. improvising new solutions to novel problems). In short, we move along the relational dimension between history and lived interaction. The former demarcates a community of practice primarily by its reproductive cycles; the latter defines a community of practice around its improvised extension of activities within and beyond existing practices. It is the value of continuously-evolving, socially-distributed knowledge that seems to tie community members together in Brown & Duguid's analysis. We find a comparable emphasis on the productive aspects of practice in workplace studies building on Giddens' (1984) structuration theory (Barley & Tolbert 1997, Orlikowski 1992). 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. Rather Brown & Duguid point to two other types of tensions feeding the production of new knowledge within a shared practice. First, Brown & 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 & Duguid (2001) extend this idea by introducing the notion of networks of practice. Brown & Duguid raise 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-focused 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 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. 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' 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).

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).*

We lose slight 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).

Cross-Communal Relations: Canonical vs. Non-Canonical Practices

Brown & Duguid (1991, 2001) themselves escape the pitfall of losing practice by bringing forth a second relational force, which lies between communities or networks that do not share a practice. In their more recent publications (2001) this relation is cast as the difference between "sticky" versus "leaky" knowledge. Following the concept of situated knowledge Brown & Duguid (2001) describe how knowledge rides along the rails laid out by shared practices. Where practices are not shared we find different assumptions, outlooks and interpretations of the world, and different ways of making sense of our encounters. Knowledge sticks to communities (or networks) sharing practices and leak beyond community boundaries only when the practices underlying it become common in other places. Most strongly, we see these differences within organizational boundaries where a division of labor, hence of practices, and knowledge balkanize the different communities of practice.

From this perspective, we find that organizations embrace communities with fundamentally different practices, each presiding over local knowledge. However, we are left with the question of how these communal practices differ empirically, apart from being merely different in terms of their practices (Brown & Duguid, 2001). In their early work on communities of practice Brown & Duguid (1991: 41) hint at some possible differences among an organization's community of communities. The authors' narrow in on the relation between *canonical* and *non-canonical* practices. 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 that forces community members to improvise practices which rarely map onto the canonical practices. The tension between canonical and non-canonical practices largely translate into the difference between managerial practices and perspectives versus non-

managerial community practice that are subject to the espoused perspectives and abstract accounts of their leaders. Often resulting in a tension between the knowledge and practices of a community of managerial practitioners who develop an outlook that does not comprehend the daily work conditions of their subjects. Other communities find that their daily work inevitably involves tricky interpolations between abstract accounts and situated demands. We notice that by drawing attention to asymmetrical relations among different groups Brown & Duguid also raise issues of power as a relational force central to many theories of practice.

Innovation, and thus change, largely springs from this tension between canonical and non-canonical practices according to Brown & Duguid (1991: 50). Community members pioneer new practices as they continue to develop a rich, fluid, non-canonical 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. In their more recent work Brown & Duguid (1998, 2001) further develop this perspective to encompass the relationship between multiple communities within an organization. Organizations, in contrast to networks, deliberately embrace communities with fundamentally different practices, presiding over a particular division of labor, and hence of practice and knowledge. Communities with different practices have "different assumptions, different outlooks, different interpretations of the world around them, and different ways of making sense of their encounters" (Brown & Duguid 1998).

Management faces the challenge of facilitating the relationship between their own canonical views of the organization with the innovative work, changing practices, and emerging new knowledge of one specific community. Organizations' competitive edge and hence management's success, depends on their 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 non-canonical practices. Management must weigh the effects of their synchronizing canonical systems versus letting each community further develop separately.

Seen from a relational perspective, we notice that Brown & Duguid most clearly articulate differences, dependencies and change among communities from a management perspective. Organizations embrace a number of different "epistemic cultures" (Knorr Cetina 1999) developed within the shared practices of particular communities and networks. 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. The *change* process in focus, then, involves the ways organizations manage to coordinate knowledge across these divisions better than both their competitors and the marketplace.

What Brown & Duguid's work does not cover are the differences, dependencies, and changes among communities in the organization that do not necessarily fall along the canonical/non-canonical divide. We are left with little sense of the differences, dependencies, and changes as they develop between communities within an organization, nor what they look like from the perspective of communal members. From Brown & Duguid's analysis we get the sense that organizational members, apart from management, predominantly concern themselves with developing and refining their communal knowledge and epistemic cultures with little concern for the practices of other communities, apart from management's colonizing perspectives. Brown & 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 organizational members bring forth when engaging in such boundary practices. In short, our analyses calls for a further exploration of the *dependencies* and *changes* characterizing the relations across shared practices.

Conclusion: Knowing the relations in practice

We have attempted to find a perspective that allows us to describes knowledge sharing practices across a broad set of circumstances in a complex organization, claiming that approaching theories on communities of practice as relational theories offers a first important step in this direction. This relational thinking goes to the core of practice theories and helps us understand the specific relations around which knowledge sharing takes form. Analysing three seminal works on communities of practice we show that early formulations emphasized intra-communal knowledge sharing relations, whereas more recent work include cross-communal perspectives, though in a somewhat elusive form. Equally important, our analysis points out that the relational core of a knowledge sharing theory easily falters. When that happens, we lose our ability to understand cross-communal dynamics whether these are embedded in virtual organizations, supply chain management, or B2B relationships. We end up instead with a perspective that focuses on the storage and retrieval of explicit knowledge represented in information systems. Knowledge becomes an object shared within and across

community boundaries without consequence for the community in which it originated. A relational approach, in contrast, stresses that knowledge matters for all the involved parties. Technologies facilitating such sharing cannot be seen as mere vessels transporting bodies of knowledge across community boundaries. They become important grounds on which communal relations get defined and changed.

What *differences* characterize knowledge-sharing relations in communities of practice?
What *dependencies* characterize these differences in communal practices?
What *changes* do we find in the differences and dependencies within or across communities?

Table 2 – Examining the relational nature of knowledge sharing

We have suggested three central questions when laying open the knowledge sharing relations (see Table 2). One starts out probing for the differences in knowledable practices, allowing for the description of the dependencies among specific constituencies that motivates the knowledge sharing. The dependencies help one understand why community members often associate their hard-won knowledge with certain stakes. Knowledge sharing, or the implementation of new information systems, is not just a matter of communication within or across communities. Shareing knowledge requires community members to resolve the dependencies that exist between them. Each party may have to alter his or her own knowledge in order to allow for the sharing. In other words, sharing often leads to changes in the differences and dependencies among communities. Obviously, calling attention to the differences, dependencies and changes taking place in communal relations constitutes only a first small step towards a comprehensive framework on knowledge sharing. Yet, it offers a good staging ground to develop empirical analyses of knowledge sharing that untangle the entwined nature of knowledge, communities, and technology.

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