A Nonreductionist View of Knowledge

Product Development in the Pharmaceutical Industry

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Complexity theory serves as a label for a number of theories, ideas, and research programs that are undertaken in scientific disciplines such as biology, mathematics, chemistry, and physics (Rescher, 1996). The emergence of an organization theory based on complexity theory has enabled new views on organizational activities. A few applications of complexity theory include studies of organizational transformation (Macintosh & Maclean, 1999), corporate strategy (Stacey, 1995), organization culture (Frank & Fahrbach, 1999), and organization design (Levinthal & Warglien, 1999). Complexity theories of organizations emphasize the importance of nonlinear models (Anderson, 1999; Morel & Ramanujam, 1999; Cillier, 1998). In addition, some writers have emphasized the common themes in postmodernism and complexity in terms of the departure from fixed and atemporal foundations for social systems (Cillier, 1998; Chia, 1998; Tsoukas, 1998). Complexity theory and postmodernism thus underscore the distribution of resources on a single plane rather than being transcendental categories.

This article aims at examining the notion of knowledge from the nonlinear, nonreductionistic perspective put forth by complexity theory. It is hoped that problematizing the notion of knowledge will open up a more pluralist view on what knowledge is and how we can make use of it.

Knowledge has been pointed out as one of the main organizational resources (Liebeskind, 1996; Spender, 1996; Choo, 1998). For instance, Grant (1996: 375) argues that “the primary role of the firm, and the essence of organizational capability, is the integration of knowledge.” This view has been widely embraced in the management literature; knowledge management and knowledge creation are two of the key concepts in present management writings (Blackler, Crump, & McDonald, 1999: 68). Knowledge is a complex notion that contains various explicit, tacit, personal, group-oriented, technology-based components (Blackler, 1995). In brief, knowledge management has directed more interest toward positioning knowledge as an important production factor vis-à-vis other organizational resources and capabilities, rather than grappling with the broad variety of ontological, epistemological, and methodological problems that the notion of knowledge and the use of knowledge imply.

In general, knowledge management literature demonstrates a preference for what Mair (1999) has referred to as a “reductionist epistemology,” wherein a complex system is reduced to its individual components. The reductionist epistemology is based on three assumptions about knowledge and knowledge creation: (1) the assumption of the possibility of iconic representation, (2) the idea of singular bodies of knowledge, and (3) the assumption of the ability to separate cognitive and intellectual capabilities from emotions and beliefs. Taken together, the reductionist view of knowledge has been very successful in identifying and enabling an understanding of what knowledge is. The reductionist view of knowledge as a bundle of separated capabilities and skills is pervasive; in most cases, the notion of knowledge is metaphorically thought of as a tool that can be applied to cases. This article argues that the reductionist view of knowledge could be complemented by other models and theories on how knowledge is used within organizations and firms. Rather than seeing a particular knowledge as univocal, encapsulated, and distinguished from other bodies of knowledge, knowledge could be conceptualized as a number of interrelated and intertwined processes, trajectories, and paths of thinking and acting (Seufert, von Krogh, & Bach, 1999). A nonreductionist view of knowledge examines knowledge as being a texture of various interrelated skills, experiences, knowhow, and perspectives.

KNOWLEDGE IN THE MANAGEMENT LITERATURE

Strategic management has increasingly departed from industry-oriented analyses, the so-called structure-conduct-performance perspective on organizational performance (Bain, 1958; Porter, 1980, Young, Smith, & Grimm, 1996), and directs interest toward an understanding of how intraorganizational and interorganizational resources, assets, and capabilities serve to produce competitive advantages and favourable market positions (Barney, 1991; Mahoney & Pandian, 1992). The most recent tendency is to recognize knowledge—the totality of personal, interpersonal, and organizational cognitive, intellectual, and emotional resources—as being the prime mover in creating and sustaining competitive advantage (Conner & Prahalad, 1996; Choo, 1998; von Krogh, Roos, & Kleine, 1999).

As opposed to mechanistic-rationalistic theories of organizations where firms are conceived of as being merely a bundle of resources that are coordinated and integrated under a single management team in order to reduce transaction costs or to solve agency problems, the knowledgebased view of the firm emphasizes the tacit, ambiguous, personal, and relational resources of organizations. Organizations based on knowledge creation and knowledge exploitation are always more than the sum of their parts (Galunic & Rodan, 1998). Powell (1998: 228) says that
In addition, Teece (1998: 75) claims that

the essence of the firm is its ability to create, transfer, assemble, integrate, and exploit knowledge assets. Knowledge assets underpin competencies, and competencies in turn underpin the firm’s product and service offerings to the market.

The *raison d’être* of the firm is therefore not only to reduce costs in the procurement, coordination, and use of a set of resources, but equally to enable the development, creation, and extension of an existing body of knowledge. In the words of Kogut and Zander (1992: 384):

 firms exist because they provide a social community of voluntaristic action structured by organizing principles that are not reducible to individuals.

Firms serve as arenas in which knowledge differentiates, intertwines, and reconfigures. The development of knowledge internal to the firm rests on what Kogut and Zander (1992) refers to as the firm’s “combinative capabilities:” “New learning, such as innovations, are products of a firm’s capability to generate new applications from existing knowledge” (Kogut & Zander, 1992: 391). The knowledge management perspective of the firm implies a set of managerial problems.

One of the most frequent domains of investigation is the relationship between what is referred to as tacit and explicit knowledge (Baumard, 1999; Nonaka & Takeushi, 1995; Nonaka, 1994). Explicit knowledge denotes all knowledge that can be articulated, illustrated, codified, and represented in formal documents and manuals; tacit knowledge is personal knowledge than cannot easily be represented and transferred. Tacit knowledge includes perspectives, perceptions, beliefs, attitudes, and values (Fahey & Prusak, 1998). How tacit knowledge could be used by organizations remains a source of problematization and theorizing. Even though the notion of tacit knowledge is widely recognized in the knowledge management literature, knowledge management theory rests on a realist epistemological position. Fahey & Prusak (1998) argue that much knowledge management literature takes an “information technology approach” to knowledge, wherein information is used as a stock that can be captured, stored, retrieved, and transmitted between organizations, organization units, and individuals (cf. Liebeskind, Oliver, Zucker, & Brewer, 1996; Hargadon, 1998; Hargadon & Sutton, 1997).

This realistic (in the philosophical meaning) view of intellectual faculties such as thinking, perception, emotions, and so forth implies that knowledge is metaphorically thought of as a stock from which resources are used. Knowledge is generally seen as a body of knowhow, capabilities, experiences, and other tangible intellectual capabilities that could be used as any production factor; it is “out there,” available for various sorts of managerial operations and interventions. The stock metaphor of knowledge is problematic inasmuch as it implies a set of ontological, epistemological, and methodological problems that in their consequences have managerial implications. These problems are related to the reductionist epistemology that is subscribed to in knowledge management, which in turn derives from the problem of separating management as pure science (*episteme*) from management as a practice (*techne*).

Organization theory and management science are always set to disentangle and dismantle the relationship between what in Greek philosophy are called *episteme*, *techne*, and *phronesis* (Baumard, 1999: 53). *Episteme* is universal knowledge, knowledge that is tempospatially independent and generally applicable and valid. *Techne* refers to skills, capabilities, and knowhow and is more down to earth, contextbounded, and practical than *episteme*. Finally, *phronesis* is commonly referred to as practical reason (see Townley, 1999; Habermas, 1968), i.e., singular, idiosyncratic experiences and skills that enable practices.

The lines of demarcation between *episteme*, *techne*, and *phronesis* are particularly cumbersome to draw in an academic discipline (e.g., management science) that credits itself with producing practical, applicable models and tools for industry and organizations. It is often complicated to make clear-cut ostensible definitions of *knowledge-as-episteme* and *knowledge-as-techne*. This general problematic is present in the knowledge management literature: the contributors often fail satisfactorily to outline their ontological, epistemological, and methodological positions and assumptions, and their ambitions in terms of practical utility. In many cases, contributors to the knowledge management literature take the shortest, reductionist route between a theoretical concept and practical activities, and thus risk reducing a multifaceted, complex, and, at least to some extent, ambiguous body of thought to a set of singularities. A nonreductionist view of knowledge may contribute alongside other meaningful perspectives on knowledge.

**REDUCTIONIST EPISTEMOLOGY AND KNOWLEDGE IN ACTION**
KNOWLEDGE AND ICONIC REPRESENTATION

The idea of representation is one of the major controversies in social science and western metaphysics (Rorty, 1980). The transcendental tradition of thought, firmly resting on Platonist philosophy, assumes binary differences such as between reality and appearance, truth and opinion, original and copy (Bell, 1998; Hayden, 1998). The notion of representation designates the ability of a concept or word, number or algorithm, or graphic illustration, to serve as a fixed, unambiguous, and valid picture mirroring an underlying, existing reality. In transcendental thinking, a concept serves to represent an entity, an event, or a substance that exists independent of our awareness or knowledge. In empiricist philosophy, the notion of representation is fundamentally different (see Deleuze, 1994). Since empiricist thought does not assume a split between what our senses register and a transcending reality, the notion of representation is employed in a different way. Representations become tools that could help us in everyday life activities, rather than being mirrors of eternal realities outside of our experiences and life worlds.

In knowledge management, the idea of representation is most obvious in terms of communication and information dissemination. Communication and communication systems such as IT and written material are widely conceived of as being capable of transmitting adequate information. The idea of communication rests on stable and fixed categories that are generally taken for granted. As soon as a processual perspective on resources or activities is enacted, the idea of communication becomes problematic. Henri Bergson says:

> it is clear that fixed concepts may be extracted by our thought from mobile reality; but there are no means of reconstructing the mobility of the real with fixed concepts … all knowledge must necessarily start from concepts with fixed out-lines, in order to clasp with them the reality which flows. (Bergson, 1999: 51; original in italics)

To Bergson, the idea of a fully representative logical system, linguistic or numerical, is inherent in the transcendental tradition: “In truth, the dream of a universal mathematics is itself but a survival of Platonism” (Bergson, 1999: 58). The processual view of reality raises a number of ontological, epistemological, and methodological questions. For instance, how can complex realities be broken down into meaningful representative categories? The communication models are therefore problematic, as they assume the possibility of iconic representation (X represents Y) and that the transfer and dissemination of the representation are removed from subjective, context-based interpretations. The problem of representation is also, albeit in a somewhat limited extent, addressed in the knowledge management literature. For instance, Blackler, Crump, & McDonald (1999: 68) say that “language does not passively mirror the world, rather speech is a practical act that shapes and negotiates meanings.” As a substantial part of the knowledge in action is communicated through the use of language, the problem of representation entails a set of problems that the knowledge management literature needs to dismantle.

KNOWLEDGE AS THE TOTALITY OF SINGULAR BODIES

Newtonian physics has shaped the modern view of the world and modern science (Whitehead, 1925; 1978). Newton’s scientific program, the ideal-type model for scientific programs, was in turn based on the Cartesian doctrine of singular extended bodies. As opposed to Greek metaphysics, assuming a totality of being, Descartes separated being into three individual substances: God, the extended substance, and the thinking substance. The Cartesian-Newtonian framework is analytic and reductionistic, as are most scientific programs, and therefore operates through reducing systems to its components. In knowledge management literature, knowledge is conceived of as a stock, which is the totality of singular, univocal, and distinguished bodies of knowhow and experiences. However, there is a growing awareness that knowledge is distributed in organizations (Seufert, von Krogh, & Bach, 1999). Blackler, Crump, & McDonald (1999: 80) write:

> Organizations that compete through knowledge tend to be made up of multiple communities of experts. In the jargon of the new approach of understanding knowledge, knowledge is distributed within them. Traditional ways of integrating different domains of expertise do not function well in the fast-moving environments of the present day. Organizations that depend on knowledge work and organizational learning need to move away from coordination through rules and hierarchies and to create “self-managing” systems of collaboration where different specialists interact directly and jointly regulate their shared efforts.
Nevertheless, the knowledge-as-stock view is pervasive as knowledge is depicted as being “shared” rather than jointly “produced.” The dispersal of knowledge is primarily focused as being disseminated in processes and systems. Knowledge dispersal is technically and architecturally orchestrated at the expense of more close elaborations between communities of practice: “Knowledge resides not only in within individuals, but in the routines of the organization” (Von Krogh, Roos, & Kleine, 1999: 244). The awakened interest in distributed knowledge (see, e.g., Simonin, 1999; Augier & Vendelo, 1999), knowledge that evolves and disperses throughout organizational fields and organizational formations, is still based on the assumption that knowledge is already there, subject to distribution.

In summary, the Cartesian-Newtonian idea of singular bodies promotes a view of abstract resources as being conceived of as physical bodies. This mode of thinking has been discussed in terms of the spatiality of the intellect by Bergson (1998) and underlines the proclivity to use spatial metaphors when thinking of abstract notions and concepts. In the knowledge management literature, the immense complexity of the notion of knowledge is commonly examined and theorized as being consisting of a number of adjacent, separated bodies. This cognitive model of knowledge has some obvious advantages, at the same time as it is problematic in other respects.

COGNITION AS AN ISOLATED MENTAL FACULTY

Knowledge is fundamentally seen as being an outcome of rational and goal-oriented intellectual activities. It arises from two basic activities: (1) thinking and reasoning (cognition), and (2) experiences (e.g., actions). In a positivist theory of knowledge, thinking is widely seen as being removed from interests, objectives, and worldviews (Silverman, 1993; Alvesson, 1995: 8). Nevertheless, there are writers who suggest that science can never be removed from individual or group-based objectives and favored outcomes (cf. Lakatos, 1970; McClosey, 1986). The faculty of thinking is therefore not separated or isolated from other domains of human behavior such as emotions, beliefs, and attitudes. Experience (or experiencing), i.e., personal, activity-based modifications on the subject’s habitus, does also lead to knowledge creation. All experiences include the total set of human skills and dispositions and cannot therefore be isolated from noncognitive faculties such as emotions.

The exclusion of certain human qualities such as emotions is representative of organization theory in general. Martin, Knopoff, and Beckman (1998: 429) point out that emotions have been a “largely deemphasized, marginalized, or ignored” quality of organization members. To Mumby and Putnam (1992), Herbert Simon’s (1957) notion of bounded rationality does not primarily represent a critical view of rationality, but rather serves as “a way of isolating and suppressing the emotional/physical self from the process of organizing” (Mumby & Putnam, 1992: 471). The belief in human reason, the faculty of thinking, and cognitive abilities remain a dominant heritage from the Enlightenment (Foucault, 1997). The belief in all-encompassing human reason risks excluding other human properties (Gezart, Thatchener, & Boje, 1996: 364). Knowledge is based on shared cognitive, emotional, and attitudinal capabilities; that is, a Weltanschauung, a worldview. Embedded views on knowledge are not fully developed.

In knowledge management literature, there is an assumption that single individuals and groups of individuals have both the ability and the will to separate their attitudes and beliefs, their emotions, and their affects from the process of thinking. As opposed to this ideal-typical situation, studies suggest that human beings are very much emotionally engaged in cognitive activities. In addition, various writers suggest that there is no knowledge as such, in itself, removed from beliefs and ambitions. The ability to make rational (i.e., rule-governed, standardized) use of knowledge rests on the possibility of making the consequences of knowledge appealing to the users. Otherwise, knowledge is in a void; it has no end-users, no spokespersons, and no cases to be applied to (Latour, 1987).

THE THREE METAPHORS OF KNOWLEDGE IN ACTION

The notion of metaphor has been extensively used in organization theory since at least a seminal article by Gareth Morgan (Morgan, 1980). Under the label “the linguistic turn,” various semiotic, lexical, and narrative approaches to organization analyses have been put forth (Czarniawska, 1999; Hassard & Parker, 1993; Burrell, 1996). The metaphor concept is adopted from literature theory, and is one of numerous concepts (e.g., metonyms, synonysms, synodoches, etc.) that serve as conceptual tools for analyzing a literary text (Culler, 1975; Newton, 1990). Metaphors enable an understanding of one phenomenon through providing an analogy with another phenomenon, artefact, or event (Ricoeur, 1986; Arndt, 1985; Morgan, 1986; Hill & Levenhagen, 1995). In terms of knowledge and knowledge creation, there are three dominating metaphors in use: knowledge is depicted as (1) a point, (2) a line or trajectory, or (3) a texture.

The point metaphor emphasizes knowledge as being univocal, singular, and detached from other forms of knowledge. Seeing knowledge as a point is the most widespread and is an outcome of the reductionist view. The second metaphor, the line, acknowledges that knowledge is processual and is subject to changes, operations, and modifications. Knowledge as a line or trajectory includes temporal aspects of knowledge use and knowledge creation, and underlines that knowledge is always dependent on its history and previous applications. The line metaphor, moreover, recognizes ruptures and breaks, fluxes and leaps in the knowledge trajectory.
The third metaphor, the texture view of knowledge, does not only include a temporal and processual perspective on a trajectory of knowledge, but also points out the importance of the relationship between different bodies of knowledge and knowledge trajectories. The texture perspective of knowledge represents a nonreductionist view, inasmuch as it recognizes that various forms of human skills, capabilities, and knowhow, cognitive, perceptual, and emotions interact, integrate, and reinforce and mediate one another. Knowledge does not only reside in routines, processes, and communication, but is also mediated through emotional, cognitive, and perceptual processes and interactions. Knowledge does not evolve from parallel skills and capabilities, but from the totality—the texture—of human relations. The texture metaphor is fruitful as it opens up a pluralist, polyphonic, and polysemic view of organizations where activities do not always proceed along rulegoverned, predefined, rationalistic-mechanistic paths, but become embedded in complex social networks of meaning, action, and values (cf. Granovetter, 1985; Geertz, 1973). Knowledge in practice can never serve as singular qualities removed from other human properties and qualities. A nonreductionist view of knowledge that acknowledges all human, interpersonal, and organizational qualities and capabilities aims at capturing the full potential of knowledge creation and knowledge use.

KNOWLEDGE IN ACTION: THE CASE OF THE PHARMACEUTICAL INDUSTRY

The study was undertaken in one company, PharmaInc., over a period of six months. The methodology combined semistructured interviews, observations during meetings and seminars, and the study of documents and reports. Interviews were conducted with all sorts of clinical research and development staff, such as clinical research leaders, clinical research assistants, medical advisers, data coordinators, and study administrators.

PharmaInc. is one of the leading competitors in the areas of cancer, cardiovascular, and gastrointestinal medicine and is a multinational company consisting of two recently merged major pharmaceutical companies. The product development process includes at least four stages: (1) the discovery or identification of a molecule or substance that promises to produce desirable health effects, (2) pre-clinical testing of the substance on laboratory animals, (3) clinical testing of the substance on volunteers such as students or inmates, (4) clinical testing on patients subject to treatment and healthcare in hospitals. Especially the later stages of clinical testing are very costly and imply substantial investment in time and resources. Koretz and Lee (1998: 53) write:

The logistics and costs of these late stage trails can be daunting: one trail for a recently-approved drug involved 11,000 patients in 27 countries and 700 treatment centers … This process is conducted under careful regulatory guidelines, covering everything from scientific and ethical standards to record keeping. The end product of this phase is an application for approval from regulatory agencies, such as Food and Drug Administration (FDA) in the USA.

However, if it is able to provide the regulatory agencies with credible information that will lead to the registration of a new drug, substantial financial benefits can be expected for the company. Koretz and Lee (1998) remark that "a modestly successful drug can easily have annual revenues of $200 millions and the 'blockbusters' will go even higher—Prozac sold $2.56 billion in 1997."

As a consequence, the ability to undertake quick, rule-governed, reasonably low-cost, and credible clinical studies is a major organizational capability and source of sustainable competitive advantage in the pharmaceutical industry (Yeah & Roth, 1999; Roberts, 1999). Since the entire industry is, as Koretz and Lee (1998) point out, under detailed scrutiny and subject to audits, the clinical testing process includes a number of different knowledges, knowhow, skills, and experiences.

The clinical testing division at PharmaInc. can be characterized as what Blackler, Crump, and McDonald (1999) have called a "communicative-intensive" organization. The clinical testing activities were organized into so-called study working teams (SWTs), consisting of different experts with various backgrounds in formal training, education, and experiences. The bodies of knowledge mobilized in clinical testing cover medical expertise in the areas of cancer, cardiovascular, and gastrointestinal medicine, information technology and data processing technology, administrative and organizational development skills, and management and leadership capabilities. In the SWTs, these various bodies of knowledge had to be communicated, exchanged, and interrelated by team members.

As communication produces its own responses and deviances from the initial information, it departs from the linear sender-receiver model and therefore implies that different experts cannot be expected to fully understand or adapt the knowledge-laden information shared by other experts. In short, information is locally interpreted. The communication of expert knowledge therefore runs the danger of being disseminated as parallel tracks, detached from one another. To mediate the deficiencies of communication, other knowledges and skills had to be employed. Rather than viewing the clinical testing activities as being based on a mechanistic-rationalistic system for the distribution of components of enclosed knowledge, emotional, perceptual, and narrative skills served to integrate, make sense of, and reinforce the communication of knowledge.

For instance, to illustrate with a specific case, the data coordinators at PharmaInc. developed a new information system in which the clinical testers (i.e., doctors at local hospitals spread across up to 30 countries) could fax their forms containing patient information to PharmaInc., instead of using a more complicated, costly, and insecure web-based application. The technical specifications and the changes in day-to-day operations produced a need for training among the data processing operators. It was not self-evident that these changes in data processing benefited the data processing operators while the overall efficiency of the clinical testing was enhanced, neither was the implementation of the new system possible without the efforts of the data
processing operators. Therefore, the data coordinators needed to combine their technical, computer science, and systems management skills (the core knowledge of their formal training and education) with a set of emotional, didactic, and narrative skills. The (potential) rejection by data processing staff of the new system had to be anticipated and dealt with through a set of cognitive and emotional skills (cf. Sutton, 1991); the education and training challenges called for didactic and narrative skills, e.g., the ability to tell stories and make analogies that informed and helped the data processing staff to realize and recognize the benefits of the new system (cf. Deuten & Rip, 2000); individual learning problems and cognitive shortcomings could be dealt with through empathy.

The ability to implement changes, social, organizational, and technical, always rests on the ability to make the individuals subject to the changes realize the positive outcomes. In a nonauthoritarian, nonpatrimonial, empowered organization, changes do not only consist of force, but of agility, shared worldviews, and communication. As has been pointed out, communication is not as linear and univocal as the widespread sender-receiver model suggests, but it nevertheless remains the main model for social integration and change. In tightly integrated, time pressured, and professional organizations, expertise knowledge is perhaps the single most important organizational resource, but expertise knowledge has to be grounded and supported by what could be referred to as extra-expert skills such as empathy, humor, the ability to reflect, and so forth. Expert knowledge is never isolated, separate, and removed from the rest of the organizational activities, but comes into use in the middle of the multiplicity of organizational resources. What Pfeffer and Sutton (1999) call the “knowledge-doing gap,” i.e., the distance between formal knowledge and knowledge in use, consists largely of the inability to communicate expert knowledge outside of the expert group (Reed, 1996; Mueller & Dyerson, 1999). The ability to make the “non-experts” realize the implications and possibilities of expert knowledge substantially bridges the knowledge-doing gap.

In general, the clinical testing activities at PharmaInc. rested on the ability to mobilize a multiplicity of interdisciplinary, emotionally laden, cognitive, and technical resources under tight time constraints and the burden of massive investments (cf. Korentz & Lee, 1998). The PharmaInc. case suggests that knowledge in action cannot be examined though a reductionist methodology without failing to recognize the processes that are the source of competitive advantages. Clinical testing activities in the pharmaceutical industry are not focused on the use of a number of highly advanced expert skills, but equally on the ability to integrate and communicate such skills within heterogeneous groups. The expert knowledge and skills are vital to pharmaceutical companies (Henderson & Cockburn, 1994), but expert skills removed from day-to-day activities do not produce the competitive advantages they promise: expert skills and extra-expert skills must be integrated and mutually dependent.

DISCUSSION AND CONCLUSION

This article began with the proposition that much of the knowledge management literature is taking a reductionist epistemology stance, which implies that knowledge is always separated into a number of singular components. The benefits of applying a reductionist epistemology are evident. Numerous scientific contributions and technological innovations are based on an analytical, realist epistemology. This analytic position has been highly valuable to the understanding of what knowledge is in its pure forms. However, when knowledge is used in complex networks and in interrelated processes, the reductionist model is not a very useful tool for analysis. The reductionist epistemology works best in controlled, laboratory-like settings where the parts of the system investigated are fully understood and controlled. This experimental or quasi-experimental setting was not a representative (i.e., useful) model of the new product development activities at PharmaInc. Here, knowledge was not easily examined as an unambiguous, discrete component of a controlled system. Thus, reductionist epistemologies and reductionist views of knowledge should not be abandoned or rejected, but we need to be a little more aware of their opportunities and shortcomings. A more pluralist view of knowledge may be beneficial for our understanding of how knowledge is used in practice.

The complexity theory view of organizations in the vein of Anderson (1999) and Tsoukas (1998) shares with postmodernism a skepticism toward firm grounds and fixed categories. Social and biological systems operate and disperse on a flat surface, a single plane wherein individuals, artefacts, events, and processes develop and evolve. Complexity theory has problematized various systems models in the same manner as poststructuralism has questioned the hermeneutic search for concealed meanings and underlying structures. The relationships between knowledge management and complexity theory are thus numerous; the notion of knowledge is not located in a single space but is entangled with nonlinear processes and complex, multifaceted activities. A wider and deeper problematization of the notion of knowledge would benefit greatly from using complexity theory.

Much knowledge management literature makes use of a notion of knowledge that draws from a stock metaphor, i.e., knowledge is seen as a tangible resource that can be stored, disseminated, applied, and shared as any tangible organizational resource. To complement this view, this article has aimed to discussing knowledge as being socially embedded, emotionally laden, and temporal. Knowledge-as-techné, i.e., knowledge in its use in everyday life organization activities, can never be fully separated into discrete categories and processes. It is, rather, a distributed, widely shared, and enabling capacity that includes all sorts of organizational actors. The notion of knowledge includes a number of cognitive, perceptual, emotional, experienced-based skills and capabilities whose inter-relationships are neither necessarily linear, nor removed from preferences and beliefs. To examine and make an analysis of such an intellectually rich body without reflecting on the shortcomings of a reductionist method is myopic (cf. Levinthal & March, 1993); knowledge cannot, at least as long as we are interested in turning theoretical knowledge into action, be thought of as a set of singularities, removed from so-called “soft” variables and sociopolitical frameworks.
Knowledge can thus be seen as a texture or, better still, as one texture within the broad organizational texture consisting of the totality of organizational activities. This view promotes a more “embedded” theory of knowledge in action and bridges the knowledge-asepisteme and knowledge-as-techne positions.

References


