Communities of Practice in the business and organization studies literature

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Abstract

Introduction. As it approaches the two decade milestone, the concept of Community of Practice (CoP) faces what can be described as a midlife crisis. It has achieved wide diffusion, but users have adapted it to suit their needs, leading to a proliferation of diverging interpretations. Recent critiques lament that the concept is losing its coherence and analytical power.

Method. This review uses Benders and van Veen's (2001) model of a management fashion to account for the popularity of CoPs in the business and organisation studies literature, and for the current crisis.

Results. The literature displays considerable confusion between CoPs and other social structures concerned with knowledge and learning, although recent typologies are helping to clarify concepts. Researchers have accepted CoPs as a enduring element in the knowledge-based view of the firm, but practitioners have mostly used CoPs as fashionable management discourse, specifically as a Knowledge Management tool, resulting in numerous publications based on pragmatic interpretations of the concept. By now, the CoP fashion is fading in the practitioner literature, but the researcher community displays renewed interest in the form of several in-depth critiques and a resurgence of theory-grounded studies.

Conclusion. The review therefore predicts the CoP concept will successfully mature out of its current crisis through a new period, already started, of theory development grounded in rigourous studies conducted within organisations.

Keywords: communities of practice, virtual communities of practice, knowledge management, management fashions, literature review

The Community of Practice (CoP) originally introduced by Lave and Wenger (1991), and further developed by Wenger (1998), has been described as "one of the most influential concepts to have emerged within the social sciences during recent years" (Hughes *et al* 2007: 1). However, as it approaches the two-decade milestone, it faces a 'midlife crisis' in the form of mounting conceptual critiques, and a recent downturn in hitherto robust publication trends. A mid-2010 search for the terms "community of practice" OR "communities of practice"[1] in the *EBSCO Business Source Complete* database revealed, from 2005 onwards, a descent of publications in the practitioner literature (which in *EBSCO* includes magazines, newspapers, trade publications and book reviews, also when published by academic journals), and a more recent decline in academic journals, although it is too early to know if it constitutes a trend (see Figure 1).
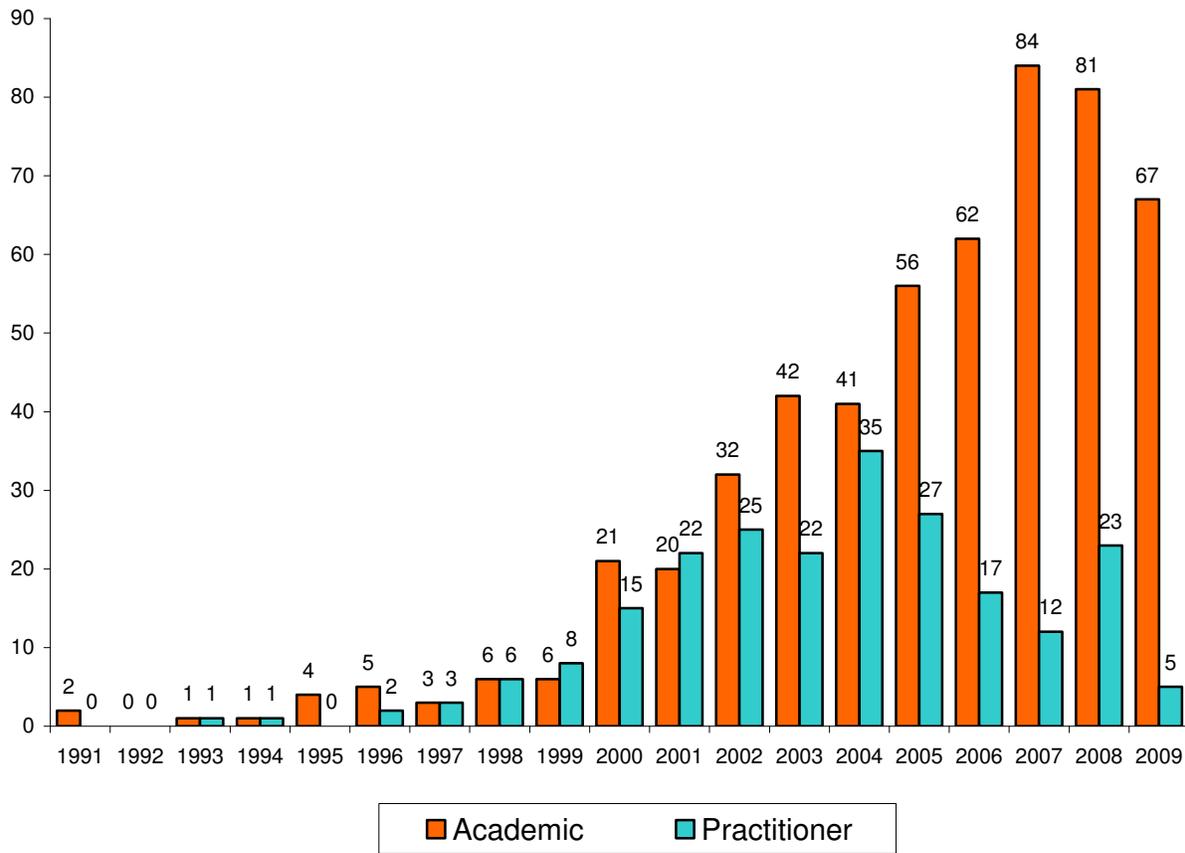
Figure 1 – Academic and Practitioner CoP publications in EBSCO Business Source Complete

CoPs have been described as *"groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis"* (Wenger *et al* 2002: 4). Examples might include a group of nurses who discuss patient cases over their daily lunch meeting (Wenger 1996), petrophysicists involved in deep-sea petroleum exploration at Shell who meet weekly to explore issues and real problems they face in their formal teams (McDermott and Kendrick 2000), Chief Information Officers from various companies in the San Francisco area who meet monthly for a technical presentation

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[1] References to the unrelated topics of "community pharmacy practice" and "community practice" were removed. The printout from the search, distinguishing academic versus practitioner articles, is available from the author.

and discussion followed by dinner (Moran and Weimer 2004); or public defense attorneys sharing a county office who learn from each other how to improve their court performance, and thereby develop their professional identities (Hara and Schwen 2006).

The concept has led to far-reaching insights about workplace learning. Researchers found that employees are constantly learning as they go about their daily work, and much of this learning bears little relation –and is often at odds– with formal training and canonical work procedures (Brown and Duguid 1991; Wenger 1998). Rather, learning is a matter of becoming competent practitioners of informal communities, which through their shared practices provide a living repository for knowledge (Orr 1990; Brown and Grey 1995). Thus CoPs are not confined to formal apprenticeships, but are natural social structures existing wherever people work and accomplish things together (Wenger 1998).

Theorists now see CoPs as an essential component of the knowledge-based view of the firm (Kogut and Zander 1996; Brown and Duguid 1998; Cook and Brown 1999; Tsoukas and Vladimirou 2001; Grover and Davenport 2001). For their part, managers increasingly view CoPs as privileged sites of knowledge-sharing and innovation (Prokesch 1997; Swan *et al* 1999; Lesser and Everest 2001). Moreover, after disappointing results from first-generation Knowledge Management (KM) projects, with their heavy emphasis on IT solutions for knowledge-sharing (Scarbrough 2003; Thompson and Walsham 2004; McDermott 1999), CoPs have been recognised as an indispensible element of organisational KM programmes. In a KM field that is criticised for its increasing fragmentation (Alvesson and Kärreman 2001; Wilson 2002; Grey and Meister 2003); CoPs have emerged as one of the few common denominators in existing KM typologies (Hansen *et al* 1999; Despres and Chauvel 2000; Binney 2001; Earl 2001; Alvesson and Kärreman 2001; Kakabadse *et al* 2003; Lloria 2008)

Even as the concept reaches the two decade milestone, it still lacks a widely accepted definition. The literature displays considerable confusion, failing to distinguish CoPs from other social structures concerned with knowledge and learning, such as occupational communities, organisational subcultures, Networks of Practice (NoPs) and epistemic cultures. Moreover, both academics and practitioners have interpreted and adapted the concept in many different ways, for which the ambiguity of the seminal studies is mostly responsible.

Widespread diffusion, non-agreement on a definition, and diversity of adaptations are all symptoms identified by Benders and van Veen (2001) in their conceptualisation of a *management fashion*, which they define as *the patterns of production and consumption of temporarily intensive management discourse, and the organisational changes induced by and associated with this discourse* (2001: 40).

These authors critique Abrahamson's (1996) seminal conceptualisation of a fashion for failing to include what they consider a key characteristic, namely, *interpretative viability*. This refers to a certain degree of ambiguity in a concept, which endows it with greater appeal to a broader set of potential users. A concept that is loosely specified leaves room for a manager to "see" it as *the* solution for a vexing problem, or to selectively adopt from the concept those elements which s/he finds most appealing. Such concepts can be operationalised in a number of different ways, can be deployed to achieve different purposes, and can simultaneously appeal to different constituencies since each can interpret the concept in their own way.

Benders and van Veen (2001) also view Abrahamson's conceptualisation as simplistic in classifying fashion users as either setters (academics and consultants) or followers ('docile' managers). Instead they argue that, to a certain extent, all actors develop their own interpretation of the concept, adapt it to create fashionable discourse, and use this to promote organisational change.

This review found that Benders and van Veen's model provides a plausible explanation for the rapid diffusion of the CoP concept and the proliferation of diverging interpretations, which has led to the current crisis. In the historical evolution of the literature, three events are singled out as deserving special attention:

a) Seminal works on the CoP concept (Lave and Wenger 1991; Brown and Duguid 1991) failed to establish a clear definition, leaving it "largely as an intuitive notion" in need of further development (Lave and Wenger 1991: 42). This development was provided much later by Wenger (1998), but even then a "closed" definition was not put forward. From its origins, then, the CoP concept was endowed with a large degree of interpretative viability.

b) This ambiguity of an undeniably appealing concept enabled academics and practitioners alike to interpret and operationalise CoPs in many different ways. As a result, there was a rapid growth of publications, but also a proliferation of different interpretations.

c) The concept satisfied an urgent theoretical need by providing a rationale for the early failures of a previous fashion, specifically KM. Despite widespread agreement that knowledge has become a key source of competitive advantage and superior performance (Spender and Grant, 1996; Davenport and Prusak, 1998; Hansen *et al* 1999; Von Krogh *et al* 2001), first generation IT-intensive KM projects ended mostly with disappointing results. The cause, CoP theorists convincingly argued, lay in the failure of these projects to consider intra-organisational CoPs (Brown and Duguid 1998; McDermott 1999; Swan *et al* 1999; Wenger 2000a; Tsoukas and Vladimirou 2001). The CoP concept thus afforded a timely boost to KM, which quickly embraced it as part of its toolkit (e.g. Hansen *et al* 1999; Binney 2001; Earl 2001).

Since Benders and van Veen's fashion model addresses management discourses and their effects on organisations, this review will limit its purview to business and organisational studies. Nevertheless, the CoP concept has also been very influential in the fields of Education, Sociology and Anthropology. For extensive reviews of those literatures, the reader is referred to Davenport and Hall (2002) and Koliba and Gajda (2009).

Beyond this introduction, the review is organised into seven sections. The first presents early CoP studies and the evolution of the concept through the seminal works of Lave, Wenger, Orr, and Brown and Duguid. Section Two describes Wenger's (1998) theoretical framework of CoPs, starting with his broader social theory of learning, where CoPs are an embedded element, followed by a focus on CoPs and their defining dimensions. The Third Section reviews related social groups, and their differences with respect to CoPs. Section Four examines alternative or competing designations that have been proposed for CoPs. Section Five discusses direct challenges and critiques to Wenger's 1998 framework. The major part of the review is contained in Section Six, which examines theoretically grounded contributions to CoP research published in the last decade. The final section presents detected trends and conclusions.

1 – Seminal studies and rapid diffusion

The concept of CoP was originally proposed by Jean Lave and Etienne Wenger (Lave and Wenger 1991). The focus of their research was social learning as a critique of the then dominant cognitive approach. They grounded their theory on five ethnographic studies of traditional apprenticeship institutions: Yucatec midwives in Mexico, Vai and Gola tailors in Liberia, U.S. Navy quartermasters, U.S. supermarket meat cutters and U.S. nondrinking alcoholics. They proposed a theory of learning whereby people learn by becoming acknowledged but peripheral members of social communities where knowledge resides, not as abstract ideas, but as embodied and shared practices. They view learning as the process of joining a community, and actually taking part in its practices, beginning with the most basic and gradually mastering the most complex, while working alongside established members. In this way, newcomers gradually change their identity to that of an insider. The progression from peripheral membership to full insider status they named *legitimate peripheral participation* (LPP)*,* and it is their main intended contribution and the title of their book. They coined the term *communities of practice,* without providing a formal definition, in order to designate the communities apprentices joined. Thus, by design, their monograph focuses on the apprentices and the process of LPP, while paying less attention to the inchoate CoP.

The CoPs described by Lave and Wenger were all characterised by LPP, learning (equated to the construction of a practitioner identity), and a practice. Though sketchy, this model of CoP is still currently in use, especially in studies focusing on the inbound trajectories of newcomers into established CoPs (e.g. Harris *et al* 2004; Handley *et al* 2007; Campbell 2009).

Another seminal study is Orr's (1990) ethnography of Xerox photocopier field technicians, which famously revealed the extent to which conventional job descriptions failed to capture the intricacies of practice. The company assumed the "tech reps" had an individual job which could be accomplished by simply following the repair procedures specified in the official service manual. In practice, though, Orr discovered the reps had developed a strong informal community that met daily for breakfast to exchange problem-solving tips. Specifically, they crafted and told each other stories about the machines they fixed. This narration served the dual purpose of holding contextualised actionable knowledge about individual machines, and enacting their professional identities as (heroic) reps. Because they already shared a great deal of common ground (Bechky 2003), this narration was an effective way of communicating complex tacit knowledge about the machines. In fact, becoming a member of the community was as much about learning to tell good stories as it was about learning mechanical repair skills.

At the time he wrote his ethnography, Orr was not unaware of the CoP concept (Duguid, 2006); nevertheless he used van Maanen and Barley's (1984) construct of *occupational community* to describe the community of technicians, and reaffirmed this choice in his later book (Orr 1996). Contu and Willmott (2003: 289) further note Orr's debt is "principally to the work of Suchman rather than Lave and Wenger". Other CoP researchers nevertheless acknowledge Orr's ground-breaking study as the earliest ethnography of a CoP (Raelin 1997; Brown and Duguid 2001; Teigland 2003).

The third, and by far most cited seminal study, is Brown and Duguid (1991), who were the first to articulate the relevance for business organisations of a concept developed by anthropologists. Their article was the first to argue that, despite their near-invisibility, CoPs were the key to effective workplace learning and innovation, and therefore constituted an important issue for management, especially in knowledge-based organisations.

They base their theorising on Orr's (1990) account and were thus the first to propose a reinterpretation of Orr's thick description in terms of a CoP that can make a positive contribution to the organisation. Other researchers would later propose more conflictual reinterpretations (Fox 2000; Contu and Willmott 2003, 2006). Specifically, Brown and Duguid (1991) propose three overlapping categories as an explanatory model that fits the reps' practice: narration, collaboration and social construction. In so doing, they develop an initial model of CoP that goes well beyond Lave and Wenger's "intuitive notion", and probably explains why their article is cited by many as *the* seminal CoP reference.

Narration is the crafting and exchanging of "war stories" about the repair of specific machines. Telling a story about a faulty machine was the reps' heuristic for building a causal map that gave a coherent account of the problem. Because the story included and took into account the social and material context in which the machine operated, it provided a much more actionable account than the decision decision tree prescribed by the official service manual.

Collaboration refers to the fact that the reps spontaneously organised themselves as an informal team in order to collaborate with each other, trading stories and helping each other to make sense of the idiosyncrasies of different machines. This despite the fact that the corporation viewed the job as individual and asocial.

Finally, the category of social construction manifests itself in two dimensions. First, that the reps build through their interactions a shared understanding, in effect a rep's model of the machines. Second, that by becoming proficient in the telling of stories, the rep simultaneously builds his own identity as a rep and contributes to the collectively-held knowledge base of the CoP.

Brown and Duguid next adapt Lave and Wenger's (1991) concept of CoP in order to characterise the reps' actions as learning to function, or developing insider identities, in an organisational CoP. "Workplace learning is best understood, then, in terms of communities being formed or joined and personal identities being changed (1991: 48)". This organisational CoP is slightly different from the communities described by Lave and Wenger, and not just by the fact that it is embedded in a large corporation, whereas the former communities were largely autonomous. Brown and Duguid also prefer the egalitarian community described by Orr (1990: 33), "the only real status is that of member"; whereas Lave and Wenger's CoP, displays wide status differentials between masters and apprentices.

A final adaptation is their call for organisations to reconceive themselves as communities of CoPs, and thereby release the innovative potential of these continuously learning groups. They thus grasp the potential of multiple CoPs acting in a loosely coordinated fashion, whereas Lave and Wenger's CoPs were isolated and self-sufficient.

Thus, in developing their conceptualisation of an organisational CoP, Brown and Duguid have used the concept's interpretative viability to perform the necessary adaptations to transplant it into organisations (and organisational studies), and thereby present the business community with a new organisational group that would provide the key to continuous learning, knowledge sharing and innovation. Over the following years, various articles and interviews, mostly by Brown, marketed the CoP concept to various audiences (Brown and Grey 1995; LaPlante 1996; Brown and Duguid 1996; Stucky and Brown 1996; Brown 1998; Brown and Duguid 2000a), and fairly soon the business media picked up on the trend.

A final point worth stressing is that at no point in Brown and Duguid's article are CoPs defined, just as they were not in Lave and Wenger (1991). The conclusion that can be drawn from this historical overview is that the seminal works on CoPs introduced an appealing concept with substantial interpretative viability, using Benders and van Veen's terminology. In the following years, the resulting ambiguity allowed the CoP concept to be used and interpreted in many different ways.

The mid- and late nineties can be characterised as a period of increasing excitement about CoPs, with enthusiastic accounts appearing in business magazines (e.g. Brown and Gray 1995; Manville and Foote 1996; Roth 1996; Stucky and Brown 1996; Stewart 1996; Prokesch 1997; Stamps 1997; Graham *et al* 1998; Wright 1999; Stewart 2000, Ward 2000; Brown and Duguid 2000a). This growing interest was partly due to the fact that the concept gives a name to the familiar human need to belong and take part in a group of like-minded peers. Indeed, Wenger (1999) argues CoPs are natural social structures, citing prehistoric tribes and medieval guilds as historical examples. In addition, the same years witnessed an explosion of interest in KM. Ponzi and Koenig (2002) report that KM publications had very rapid growth after 1996, and hit a peak of almost 600 articles in 1999. Clearly, some of these KM articles were written using the new angle afforded by organisational CoPs.

In 1998, Wenger published his now famous ethnography of insurance claims processors. After his research with Lave, Wenger shifted his attention from the process of induction of new members to the CoP itself. He based his new theorising on ethnographic fieldwork conducted in 1989-90 in a medical claims processing centre operated by a large US insurance company (Wenger 1998). The book remains, to this day, the most detailed and comprehensive treatise on CoPs (Schwen and Hara 2003; Plaskoff 2003; Zhang and Watts 2008), arguably making Wenger's theory the *de facto* benchmark. This is also suggested by its becoming the focus of an increasing number of critiques (e.g. Fox 2000; Contu and Willmot 2003; Marshall and Rollinson 2004; Cox 2005; Roberts 2006).

However, as already mentioned, the book fails to provide an explicit definition of CoP, and the detailed theoretical framework it proposes is fairly complex and difficult to operationalise. Hence, over the next years, very few studies applied this model, choosing instead to interpret and adapt the 'intuitive notion' of Lave and Wenger (1991) or Brown and Duguid (1991). Moreover, this was not limited to practitioner magazines, but extended as well to top academic journals (e.g. Lee and Cole 2003; Pan and Leidner 2003; Holmqvist 2003).

By the time Wenger's ethnography appeared, a trend was already visible in the literature which would continue after the turn of the century. CoP studies were roughly aligned along two distinct camps which might be labelled the "Organisational studies" interpretation and the "Knowledge Management" interpretation. The first group emphasises CoP theory development by describing emergent, informal organisational CoPs. The second group emphasises the business value of CoPs, and aims to identify, support, and/or launch "strategic" CoPs in order to manage organisational knowledge. The two perspectives are displayed in Table 1 which highlights their contrasting interpretations of various CoP characteristics and capabilities as reflected in representative studies. Thus, as the concept approached its tenth birthday, signs of a management fashion were in evidence, with rising publication trends and interpretative viability leading to more and more diverging interpretations.

Table 1 – Contrasting "Organisational" and "KM" interpretations of CoPs

"Organisational studies" interpretation	"Knowledge Management" interpretation
These studies interpret CoPs as emergent, self-organising, informal groups who set their own learning agenda, and operate beyond management control. Therefore, the positions they emphasise are:	These studies interpret CoPs as hidden resources that should be identified, supported by management, and charged with pursuing knowledge initiatives that have strategic value for the organisation. Therefore, the positions they emphasise are:
"CoPs are informal emergent structures" Orr (1990); Brown and Duguid (1991); Hendry (1996); Wenger (1998); Gherardi and Nicolini (2000)	**"CoPs are organisational knowledge assets"** Prokesch (1997); Wenger and Snyder (2000); Lesser and Everest (2001); Lesser and Storck (2001); Kimble and Bourdon (2008)
"Because CoPs are informal, they are not under management's control" Brown and Duguid (1991); Wenger (1998); Gongla and Rizzuto (2004); Thompson (2005); Duguid (2006); Pastoors (2007); Raz (2007)	**"Because CoPs are knowledge assets, they should be managed"** Prokesch (1997); Hanley (1998); Lesser and Everest (2001); Cross *et al* (2006); Probst and Borzillo (2008)
"All competencies of the organisation reside in CoPs" Brown and Duguid (1991); Wenger (1998); Tsoukas and Vladimirou (2001)	**"Core competencies of the organisation reside in CoPs"** Brown and Gray (1995); Manville and Foote (1996); Roth (1996); Wenger (1999); McDermott and Kendrick (2000); Barrow (2001); Saint-Onge and Wallace (2003)
"CoPs emerge to solve routine problems" Orr (1990); Wenger (1998); Gherardi and Nicolini (2000); Tsoukas and Vladimirou (2001); Hara and Schwen (2006)	**"CoPs should focus on strategically important problems"** Brown and Gray (1995); Wenger (1999; 2004); McDermott and Kendrick (2000); Barrow (2001); Saint-Onge and Wallace (2003); Anand *et al* (2007)
"The CoP's knowledge is situated and held communally, hence it cannot be extracted" McDermott (1999); Newell *et al* (2002); Duguid (2006); Cox (2007b)	**"KM systems should build on and leverage a CoP's natural knowledge-sharing practices"** Brown (1998), Wright (1999), Brown and Duguid (2000a); Bobrow and Whalen (2002)
"CoPs emerge of their own accord" Orr (1990); Wenger (1998); Gherardi and Nicolini (2000; 2002); Hara and Schwen (2006)	**"CoPs can be designed and launched"** McDermott and Kendrick (2000); Barrow (2001); Wenger *et al* (2002); Plaskoff (2003); Saint-Onge and Wallace (2003); Thompson (2005); Anand *et al* (2007); McDermott (2000; 2007); Meeuwesen and Berends (2007)
"CoPs subvert management authority" Orr (1990); Korczynski (2003); Cox (2005); Duguid (2006); Raz (2007)	**"CoPs are the heroes of the organisation"** Brown and Grey (1995); Prokesch (1997); Brown (1998); Stewart (2000); Brown and Duguid (2000a); Barrow (2001)
"CoPs are (just) an analytical category" Contu and Willmott (2003; 2006); Gherardi (2006)	**"CoPs are a new organisational group, the key to managing knowledge and innovation"** Brown and Duguid (1991, 2000a); Brown and Grey (1995); Wenger and Snyder (2000); Kimble and Bourdon (2008)
"CoPs benefit mostly their own members" Orr (1990); Ibarra (2003); Moran and Weimer (2004)	**"Organisations can harvest the knowledge of CoPs"** Manville and Foote (1996); Prokesch (1997); McDermott and Kendrick (2000); Bobrow and Whalen (2002); Probst and Borzillo (2008); Kimble and Bourdon (2008)

Wenger (1998) is arguably the key reference in the organisational studies camp, although in later publications he shifted to the KM camp. However, Wenger himself stresses that he uses the concept of CoP mainly as an "entry point" into a broader social theory of learning, or as a way to bring together social theory and learning theory (Wenger 1998: 5). The concept of CoP is embedded within this framework which is described in some detail in the following section.

2 – Wenger's social theory of learning and the role played by the CoP concept

Most learning theories are cognitive, i.e. focused on the mechanics of learning –brain research, genetics, evolutionary psychology, cognitive science, information-processing models. Wenger's theory addresses a different level by focusing on *meaningfulness,* which it sees as the ultimate aim of learning (Wenger 1998). This focus, taken with the premise that meanings are negotiated in social communities, implies that the social nature of human beings is an essential enabler of learning. This is not to deny the possibility or the value of individual learning, but to make the important assertion that meanings cannot be determined in isolation.

Wenger defines the negotiation of meaning as "the process by which we experience the world and our engagement in it as meaningful" (Wenger 1998: 53). This process is embedded in the practices of CoPs. Moreover, it is constituted by the interaction of two further processes termed *participation* and *reification*. Participation is "the process of being active participants in the *practices* of social communities and constructing *identities* in relation to these communities" (Wenger 1998: 4, emphasis in the original). Reification is "the process of giving form to our experience by producing objects that congeal this experience into 'thingness' [in order to] create points of focus around which the negotiation of meaning becomes organised" (1998: 58).

Human learning is chiefly about the negotiation of new meanings rather than the acquisition of new skills or information. The negotiation of meaning takes place in CoPs, social groups that organise themselves to pursue enterprises deemed valuable to their members. In so doing, these communities define what it means to be a competent practitioner with respect to their enterprise, be it fixing photocopiers (Orr 1990), building flutes (Cook and Yanow 1993), or processing insurance claims (Wenger 1998). Learning is therefore a social becoming, the ongoing negotiation of an identity that is developed in the context of participation in selected communities and their practices (ibid).

Thus, althoug CoPs have taken center stage, they play a subordinate and instrumental role in Wenger's theory of learning. They enable the theory to focus on meaningfulness by locating Learning within a social structure where the meaning of Learning is negotiated. To achieve this, the framework builds on four interconnected and mutually defining elements, specifically (1998: 5):

- *Meaning: a way of talking about our (changing) ability –individually and collectively– to experience our life and the world as meaningful.*
- *Practice: a way of talking about the shared historical and social resources, frameworks, and perspectives that can sustain mutual engagement in action[2].*
- *Community* [of practice]*: a way of talking about the social configurations in which our enterprises are defined as worth pursuing and our participation is recognisable as competence.*

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[2] Wenger's use of the term *practice* is very specific to his theoretical characterization of a CoP. He views practice as an emergent social structure that members of a community collectively develop through their negotiation of meaning (involving both participation and reification) in order to address the challenges of their enterprise. The claims processors, for instance, developed an indigenous practice to accomplish the job in a manner satisfying for themselves (Wenger 1998). This practice imported elements of broader professional practices, such as law and medicine. Yet it also developed original elements in response to local challenges. Ultimately the practice was a complex, adaptable and yet resilient solution, wholly owned by the community.

- *Identity: a way of talking about how learning changes who we are and creates personal histories of becoming in the context of our communities.*

To illustrate the connections between Learning and these four elements, and to highlight the distinct processes that result in Learning, Wenger (1998: 5) proposed a diagram, reproduced with slight changes in Figure 2.
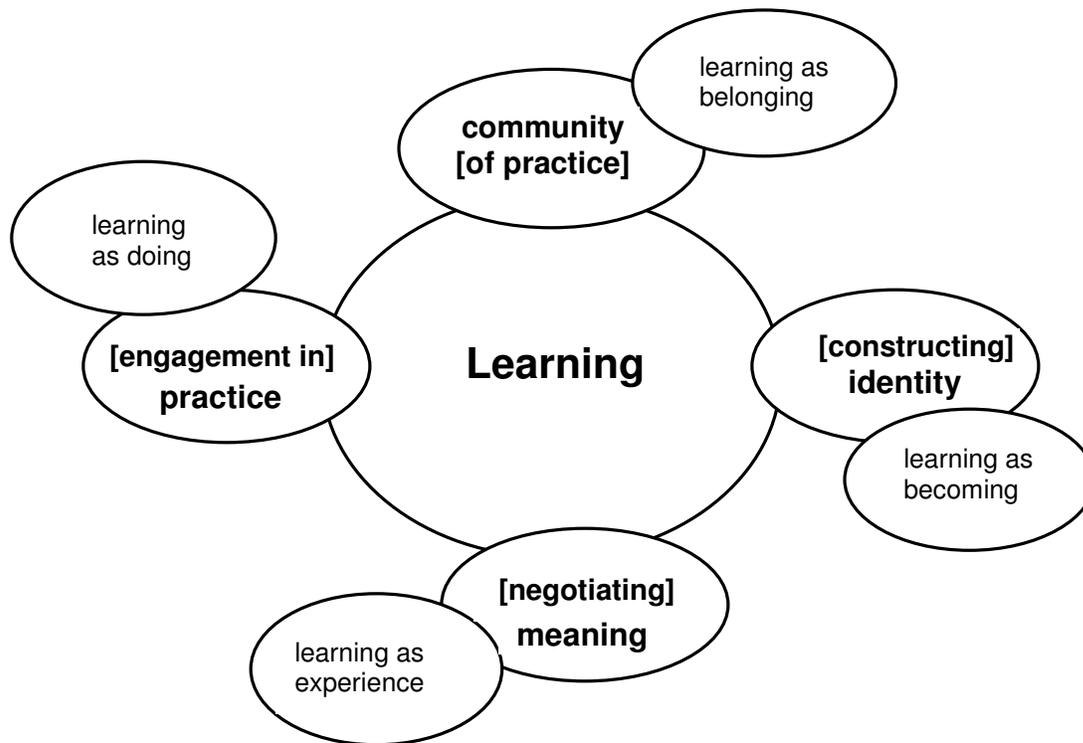
FIGURE 2 – Components of Wenger's social theory of learning
(adapted from Wenger, 1998: 5)

In the diagram, CoPs are but one conceptual element of the full theory. It is a necessary concept because it ties together analytically all the elements in the figure. Moreover, it is a concept that resonates, because it evokes the human experience of participating in a group of like-minded peers, as hinted in the paragraph where Wenger's (1998: 45) formally introduces the CoP concept:

> *Being alive as human beings means that we are constantly engaged in the pursuit of enterprises of all kinds, from ensuring our physical survival to seeking the most lofty pleasures. As we define these enterprises and engage in their pursuit together, we interact with each other and with the world, and we tune our relations with each other*

and with the world accordingly. In other words, we learn. Over time, this collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of a kind of community created over time by the pursuit of a shared enterprise. It makes sense, therefore, to call these kinds of communities communities of practice (Wenger 1998: 45).

Within this lengthy description, which is not a strictly a definition, the three elements of engagement, enterprise and practices deserve a particular emphasis because Wenger uses them to join the concepts community and practice into a unitary construct. He does this by describing three dimensions of practice as the source of coherence of a community (of practice), i.e. as what makes that particular kind of community cohere. These dimensions thus become the constitutive or defining dimensions of CoPs (Wenger 1998):

- *Mutual engagement*: members build the community and the practice by conducting practice-related interactions with each other on a regular basis.
- a *Joint enterprise*: members collectively negotiate what their CoP is all about, and hold each other accountable to this understanding.
- a *Shared repertoire*: over time, members develop a set of shared resources that allow them to engage more effectively.

The presence of these three dimensions in a group is a necessary and sufficient condition for the existence of a CoP. They also provide a more straightforward way of operationalising Wenger's model of CoP than the earlier description. This is further aided by a list Wenger provides of empirical indicators of the existence of a CoP. These indicators can be further classified as specific manifestations of the defining dimensions as shown in Table 2.

Table 2 – Indicators that a CoP has formed

Dimension	Indicators of a CoP
Mutual engagement	1) Sustained mutual relationships – harmonious or conflictual 2) Shared ways of engaging in doing things together 3) The rapid flow of information and propagation of innovation 4) Absence of introductory preambles, as if conversations and interactions were merely the continuation of an ongoing process 5) Very quick setup of a problem to be discussed
Joint enterprise	6) Substantial overlap in participants' descriptions of who belongs 7) Knowing what others know, what they can do, and how they can contribute to an enterprise 8) Mutually defining identities 9) The ability to assess the appropriateness of actions and products
Shared repertoire	10) Specific tools, representations, and other artefacts 11) Local lore, shared stories, inside jokes, knowing laughter 12) Jargon and shortcuts to communication as well as the ease of producing new ones 13) Certain styles recognised as displaying membership 14) A shared discourse reflecting a certain perspective on the world

Source: Adapted from Wenger (1998: 125-126).

It should be noted that the operationalisation of Wenger's model (for instance to empirically detect CoPs) requires just the three defining dimensions mentioned above, and not the more fundamental processes of negotiation of meaning, participation and reification. These concepts, although central to Wenger's social theory of learning, are not especially helpful to define CoPs or to describe their empirical attributes.

Wenger defines *participation* as the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises. Moreover, he explicitly qualifies participation as broader than mutual engagement (1998: 55). Hence, not all participation involves CoPs, it may involve various types of social structures, and do so without engagement in practice.

Similarly, Wenger (1998: 58) defines *reification* as the process of giving form to our experience by producing objects that congeal this experience into 'thingness' in order to create points of focus around which the negotiation of meaning becomes organised. So defined, the process of reification becomes a basic building block of practically *any human discussion*, and certainly not limited to interactions taking place within an established CoP. Even something as transient as a conversation on an airplane would very likely make use of reification. Reification is a constitutive process in the development and use of a Shared repertoire, but again, it is broader and more basic than this Wenger concept.

In sum, CoPs display processes of participation and reification, but so do other types of groups and social structures, which is why these processes are not useful for the purpose of empirically identifying CoPs.

Wenger's (1998) framework is a substantial theoretical development of Lave and Wenger's (1991) 'intuitive notion', grounded on an organisational ethnography of a single CoP. Even though a 'closed' definition of CoP is not proposed, the detailed framework could have set bounds to the interpretative viability of the concept if it had been promptly adopted in CoP studies. Still, it is not an easy model to operationalise, which probably explains the paucity of studies that use this model instead of the more adaptable notion of Lave and Wenger (1991) or Brown and Duguid (1991). Wenger (2000b) is a theoretical essay which argues organisations should design themselves as social learning systems, constituted by CoPs, boundary processes between them, and the identities participants develop as they participate in these systems. The article constitutes a fairly compact summary of the 1998 book, and is, in fact, the most often cited article in the journal *Organization*. But once again, Wenger fails to provide a more explicit definition of CoP.

Other writings by Wenger are aimed at practitioners (1999; 2000a; 2004). Most particularly, his book co-authored with McDermott and Snyder (Wenger *et al* 2002) is a practical guide for organisations wishing to launch and nurture CoPs. Several authors have critiqued Wenger for this popularisation of a highly complex concept, and for his shift from what is interpreted as an emancipatory discourse in Lave and Wenger (1991), to a managerialist discourse in his practitioner writings (Fox 2000; Contu and Willmott 2003; Cox 2005; Hughes 2007).

This review considers Wenger's (1998) framework as a critical and lasting contribution to the CoP literature, and can only deplore the lack of subsequent empirical studies by the author, which would have contributed to a clearer and nuanced understanding of this complex notion. As things turned out, the review feels compelled to trace some of the conceptual confusions in the

literature to Wenger *et al*'s (2002) introduction of a simplified CoP model, now consisting of Community, Domain and Practice, as well as some liberties taken in the practitioner book with respect to the 1998 framework, such as the possibility of distributed CoPs counting thousands of members (in effect abandoning the 1998 criterion of direct Mutual engagement). This relaxation of the carefully balanced 1998 framework reinforced interpretative viability, contributed to the proliferation of studies built on shallow theoretical foundations, and blurred the differences between CoPs and other social phenomena concerned with knowledge or learning. The resulting confusions are reviewed in the following section.

3. Conceptual confusion from similar phenomena

Some of the conceptual confusions in the CoP literature can be traced to the similarity of the concept to other social structures that are related to knowledge and learning; the most prominent are listed in Table 3. The first is Constant's (1980) concept of communities of technological practitioners, which Brown and Duguid (2001: 210) consider an earlier and independent derivation of the CoP concept. However, Constant's communities are actually closer to Brown and Duguid's own concept of NoP (defined simply by a shared practice), than to Wenger's concept of CoP (which is defined by direct engagement between participants). Constant's aim is to build a Kuhnian model to explain a technological revolution, specifically the advent of turbojets. Yet his communities are defined as people sharing a narrow technical specialty, rather than people sustaining direct engagement.

Table 3 – Social structures that bear some resemblance to CoPs

Community of technological practitioners	"Utilisation of a community of practitioners as a primary unit of historical analysis nevertheless does promise to generate basic insights for the history of technology. A community of technological practitioners, moreover, may be analysed in turn as an aggregation of individuals or of firms, just as a scientific specialty may be analysed as an aggregation of individuals or of labs and departments" (Constant, 1980: 9).
Occupational community	"[A] group of people who consider themselves to be engaged in the same sort of work; who identify (more or less positively) with their work; who share a set of values, norms, and perspectives that apply to, but extend beyond work related matters; and whose social relationships meld the realms of work and leisure" (Van Maanen and Barley, 1984: 295).
Occupational subculture	Occupational subcultures comprise unique clusters of ideologies, beliefs, cultural forms, and practices that arise from shared educational, personal and work experiences of individuals who pursue the same profession within the overarching organisational culture of a single workplace (Trice, 1993).
Epistemic culture	"[T]hose amalgams of arrangements and mechanisms— bonded through affinity, necessity and historical coincidence—which, in a given field, make up *how we know what we know*" (Knorr Cetina, 1999: 1, italics in original).
Network of practice (NoP)	"Networks of practice are made up of people that engage in the same or very similar practice, but unlike in a community of practice, these people don't necessarily work together [yet] such a network shares a great deal of common practice. Consequently, its members share a great deal of insight and implicit understanding. And in these conditions, new ideas can circulate. These do not circulate as in a community of practice, through collaborative, coordinated practice and direct communication. Instead, they circulate on the back of similar practice (people doing similar things but independently) and indirect communications (professional newsletters, listservs, journals, and conferences, for example)" (Brown and Duguid, 2000b: 28).

Next is Van Maanen and Barley's (1984) notion of *occupational community*, whose definition is shown in Table 3. Crucially absent from this definition is any mention of Mutual engagement, which for Wenger (1998) is the only necessary condition for the existence of a CoP, irrespective of members' occupations. Moreover, since CoPs can have interdisciplinary membership (e.g. Goodwin *et al* 2005), they cannot be considered local portions of a broader occupational community.

As mentioned earlier, the concept of occupational community is famously used in Orr's (1990) ethnography of tech reps, even though they formed a local group who regularly engaged in sharing stories, i.e. a CoP, while simultaneously belonging, as Brown and Duguid (2001: 206) point out, to a much larger occupational community.

Trice's (1993) concept of *occupational subculture* is another that superficially bears some resemblance to the concept of CoP. However, Trice's concept, like Constant's and Van Maanen and Barley's, does not require or guarantee that members of these groups actually engage with each other. Therefore, though they may share a profession, they cannot cohere into a CoP without regular engagement.

Brown and Duguid's (2000b; 2000c) concept of NoP has attracted much attention, possibly because it provides a theoretically legitimate way of talking about Internet-based structures that could be easily taken for virtual CoPs (Wasko and Faraj 2000; Wasko and Teigland 2004; Wasko *et al* 2009). However, this is not the original intent of the concept, as the authors themselves explain. They acknowledge their concept is close to van Maanen and Barley's (1984) occupational community, using at one time the metaphor of a "virtual guild" (Brown and Duguid 2000b: 29), but they wish to re-direct attention from the "community" aspect of such groups to the shared practice. They see NoPs as extended epistemic networks where practice provides a common substrate which makes them capable of effectively sharing a great deal of knowledge, even if most of their members "will never know, know of, or come across one another" (Brown and Duguid 2001: 205). Thus, a key strength of the concept is spatial extension. Two hematologists who have never met would be part of the same NoP because of the highly specialised practice they both belong to (Brown and Duguid 2000b). Indeed, Duguid (2005: 113) defines a NoP as "the collective of all practitioners of a particular practice". This is distinctly different from a CoP, where the membership criterion is direct and sustained engagement.

However, by definition, NoPs contain embedded CoPs: high density sections of the network formed by practitioners who actually engage with each other regularly and thus develop much stronger ties than those prevalent over the NoP (Brown and Duguid 2000c). This suggests that a viable search strategy for CoPs, is to examine the social network structure of a known NoP for areas of high-density. Fleming and Marx (2006) have studied the social networks of co-authored patent-holders in the US for the 25 year period starting in 1975. This has allowed them to actually sketch existing NoPs and their embedded CoPs, and to link them to increasing innovation, particularly in Silicon Valley and Boston.

Finally there is Knorr Cetina's (1999) concept of *epistemic culture,* which Brown and Duguid (2001: 205) assess as equivalent to a NoP by pointing out it makes no distinction between groups of scientists working closely together on a regular basis, and same-discipline scientists who rarely meet or know each other. Hence, a local portion of an epistemic culture might qualify as a CoP, but not the complete culture. As before, the crucial distinction is that a CoP is defined by direct engagement, while both NoP and epistemic culture require only a common practice, however specialised.

The concepts reviewed in this section have caused some confusion in the CoP literature, but in the end they designate different realities. Greater confusion has been caused by alternative or competing designations for CoPs, which are reviewed next.

4. Conceptual confusion from competing designations

Another manifestation of interpretative viability can be discerned in the appearance of a number of alternative designations for CoPs. Some authors have introduced new names for various learning groups in organisations, which upon close examination appear to differ very little from the earlier concept of CoP, thereby contributing to the conceptual confusion in the literature.

Boland and Tenkasi (1995) acknowledge borrowing Lave and Wenger's (1991) concept of CoP, to which they added their own nuances. They propose the term *community of knowing* to describe communities of specialised or expert knowledge workers in knowledge-intensive firms. Arguably, they could have referred to a 'CoP of experts' to avoid the introduction of a new designation.

Other authors have differentiated themselves from the Wenger framework by making absence of management direction or support a necessary condition for a true CoP, and proposing new designations for groups that display all the properties of CoPs, yet develop with management's blessing and support.

For instance, Büchel and Raub (2002) introduced the concept of *knowledge networks* which they argue extends beyond the traditional concept of CoP. The authors propose four variants of this concept: "hobby" networks, "professional learning" network, "business opportunity" network and "best practices" network. They contend only the first two conform to the traditional concept of CoP (2002: 589), but it is the last two that can bring about organisational benefits. Their position is that once a CoP receives management support it ceases to be "informal" and "voluntary", and therefore ceases to be a CoP.

Similarly, Barret *et al* (2004: 1) establish a distinction between communities "which are […] voluntary in terms of participation, and those with a more managed membership", with only the former being considered CoPs. They use the umbrella term "knowledge communities" to cover voluntary and managed communities, and they also include constellations of CoPs (Wenger 1998).

Stork and Hill (2000) also present informality as a necessary condition of a CoP. They describe a community of Information Technology (IT) managers at Xerox, which began with an initial roundtable 2-day meeting, decided to meet again in two-months, and thereafter met every six weeks. They took the name Transition Alliance, and agreed their domain was to orchestate a major transition from Xerox's proprietary IT to more open industry standards. Senior management fostered the launch of the Alliance, and was supportive of it, but did not try to control it or request deliverables. For instance, attendance to meetings was not mandatory. Still, Stork and Hill argue that because the group was deliberately established by senior management, it did not qualify as a CoP (2000: 65), but as a new organisational group they labelled a "strategic community". However, the large amount of freedom this group enjoyed from the start, the fact that members all shared the same practice and were all stakeholders in the IT transition, and the crucial fact that they interacted regularly both in and between meetings would suggest

that, from Wenger's perspective, the group did evolve into a true CoP. (In fact, both Wenger and Thomas Davenport wrote letters to the Editor to suggest this.)

These various authors' insistence on informality as a *defining* condition of a true CoP is contradicted by Wenger's (1998) study of claims processors, which showed mutual engagement, and not informality, to be the essential condition. Any workgroup engaged in a specific domain of knowledge will over time evolve into a CoP; that is, it will develop an indigenous practice that allows it to get the job done, even if the workgroup is formally established by management, as was the claims processors unit, which boasted a supervisor and an assistant supervisor (1998: 75). Still, because a CoP defines itself through engagement, its boundaries will not necessarily match institutional boundaries, because membership is not defined by institutional categories. It is in *this* sense, that Wenger describes CoPs as essentially informal, but he explicitly rejects the view that CoPs can never have a formal status.

Further evidence against informality as a defining condition of a CoP is provided by several recent studies of strategically-important CoPs supported, or even intentionally launched by management (Swan *et al* 2002; Thompson 2005; Anand *et al* 2007). These studies, which are reviewed in Section 6, support Wenger's position that CoPs can assume "knowledge stewarding" responsibilities in organisations if management is socially sensitive, and is careful not to stiffle their self-organising drive (Wenger 1999; 2000a). Intra-organisational CoPs are ubiquitous, a consequence of engagement being their root cause (Wenger 1998). The problem is that not all CoPs are equally relevant to managers; most are only important to members, helping them to cope with a particular class of problems at work. Much more exceptional are CoPs with the potential to have a strategic impact on the business, whose main interest is aligned with managers' priorities, and who are actually recognised and supported. The KM agenda of detecting or "launching" such CoPs has resulted in a large number of publications displaying minimal theoretical support.

A final example to close this section is Korczynski's (2003) concept of *communities of coping*. These are informal groups that emerge among service workers to support each other in dealing with the stress and discomfort caused by having to deal with irate customers, for instance in call centers. In choosing this label, the author acknowledges adopting Brown and Duguid's (1991) language, but still considers these groups as a different structural form without clearly articulating said difference. In a recent study, Raz (2007) uses participant observation and interviews to examine work in three Israeli call centers where employees not only support each other but teach new members how to 'work the system'. This study indistinctly uses both labels, CoPs and communities of coping. It finds that the key driver for the emergence of the community is to help its members deal with the contradictions of their work, such as the tension between time spent on each call and quality of customer service. However, Wenger's (1998) ethnography of claims processors gives ample space to describing how that co-located CoP helped employees to cope with management demands, including dealing with irate customer calls (1998: 24). There thus seems to be little reason for creating a new label to highlight this previously identified aspect of a CoP's enterprise.

5. Challenges to Wenger's (1998) framework

Some authors argue that when Lave and Wenger (1991) refer to a community of practice they use this designation just as an analytic viewpoint or a conceptual lens for examining social learning processes, but it was not their intention to name a stable group (Contu and Willmott 2003; Cox 2005). However, taking at face value Lave and Wenger's ethnographic studies, as well as the minutely detailed ethnography by Orr (1990), it seems implausible to argue the CoP concept does not identify a particular type of social structure. The potential difficulties to clearly establish their membership, the relations between them, or the exact contents of their practice should not be exacerbated into denying their reality as stable social structures with identifiable characteristics that members are aware of belonging to.

Gherardi, Nicolini and Odella (1998) similarly argue from a constructivist perspective that there is a danger of reifying CoPs. They reject the view of CoPs as a community with defined boundaries, established behavioural rules and canons. They argue CoPs are just one of the forms of organising, specifically, organising for the execution and perpetuation of a practice.

> *In other words, referring to a community of practice is not a way to postulate the existence of a new informal grouping or social system within the organisation, but is a way to emphasise that every practice is dependent on social processes through which it is sustained and perpetuated, and that learning takes place through the engagement in that practice* (1998: 279).

By declining to reify the community, Gherardi *et al* seem to reify the practice instead, as if the practice had a life of its own independent from this or that specific group of practitioners. Cook and Yanow (1993: 378) provide a good counterargument by noting how the Concergebouw Orchestra and the New York Philharmonic perform the same Mahler symphony differently (as any Mahler fan knows, this is the case even in the same hall and under the same conductor).

Wenger's (2002: 2340) position is that a CoP is an analytical category but also a real social structure:

> *Yet, you can go into the world and actually see communities of practice at work. Moreover, these communities are not beyond the awareness of those who belong to them, even though participants may not use this language to describe their experience. Members can usually discuss what their communities of practice are about, who else belongs, and what competence is required to qualify as a member.*

Another frequent critique concerns Wenger's (1998) treatment of power issues within CoPs and what is regarded as a shift from an "emancipatory" discourse in his seminal work with Lave, to a managerialist discourse of "performance" in his later publications.

Specifically, Fox (2000) critiques Wenger (1998) for insufficiently addressing unequal relations of power, and for explaining power only as an aspect of identity formation and not as an aspect of practice per se. Marshall and Rollins (2004) also underscore the importance of power and politics in the process of negotiating meaning. They critique Wenger (1998) for mentioning without further elaboration the potential struggles for the appropriation and fixing of meaning within CoPs. Cox (2005) argues mundane workplaces, such as those chronicled by Wenger (1998), trigger alienation, and suggests CoPs are informal groups of employees with an agenda

of active opposition to management's control. However, this is a somewhat strained extrapolation of Wenger's observation that by inventing a practice, the claims processors CoP aimed to get the job done in a manner satisfying to themselves.

For their part, Contu and Willmott (2000: 271) critique the later Wenger for his support for a managerialist agenda:

> *The account of learning presented in 'Communities of Practice and Social Learning Systems'* [Wenger 2000b] *can be interpreted as a shift from earlier participation in an analytic community engaged in practices that aspire to enhance mutual understanding for purposes of emancipation (Lave and Wenger, 1991) to participation in a community that is primarily preoccupied with improving prediction and control for purposes of improving performance.*

In point of fact, Wenger argues CoPs cannot be "managed" in the usual sense of the word; they can be manipulated or coerced into submission, but "managing" the practice of a CoP, in the narrow sense of exercising control over it, is not possible:

> *[T]he power –benevolent or malevolent– that institutions, prescriptions or individuals have over the practice of a community is always mediated by the community's production of its practice. External forces have no direct power over this production, because in the last analysis (i.e., in the doing through mutual engagement in practice), it is the community that negotiates its enterprise* (Wenger 1998: 80).

Indeed, because a CoP is essentially an informal group, it always has the option of removing itself from management's control if it feels its enterprise is threatened. Studies by Gongla and Rizzuto (2004) and Pastoors (2007), reviewed in the next section, give evidence of employees joining bootlegged or underground CoPs to escape management control and freely pursue their own interests. Nevertheless, Wenger also qualifies that asserting CoPs produce their own practices is not to assert that they are an emancipatory force (1998: 85).

Wenger's treatment of power issues is, in fact, consistent with his broader theoretical framework. He sees CoPs as wielding power because it is they that socially-define competence and identities (Wenger 2000b). Thus, a person decides whether he or she wants to belong to a particular community (i.e. learn its practice), but has a limited capacity as an outsider (or even as full member) to change the practice of the community. On the other hand, a CoP is powerless before an individual who does not recognise its authority and is not interested in joining.

It ought to be noted that this competence-defining role of CoPs is also the source of their greatest weakness: the danger of becoming insular (Wenger 2000b), and losing touch with the broader organisation and market environment (Thompson 2005).

Wenger's (1998) framework thus seems to give coherent replies to the principal critiques that have been levelled at it. Moreover, the framework seems to be enjoying a renaissance, as a growing number of studies are attempting to operationalise it. In the meanwhile, other researchers have gradually made specific contributions to CoP theory, either by confirming insights already mentioned in Wenger (1998), or by extending that framework in particular respects. These contributions are reviewed in the next section.

6 – Recent theoretical contributions to the CoP literature

This section reviews a selection of theoretically-grounded studies, published during the second decade of CoP literature, that have made significant contributions to our understanding of CoPs. They are broadly grouped into six areas of current interest: Launching CoPs, Managing and controlling CoPs, Boundaries and innovation, Identity construction, Virtual CoPs and The Concept of CoP. An overview of these contributions is provided in Table 4.

Launching CoPs

Several recent studies examine whether CoPs can be launched, or more precisely, whether a group initiated by management has a reasonable chance of developing into a true CoP. The answer appears to be a cautious yes, if the necessary structural elements are provided (McDermott 2000; Wenger *et al* 2002; Thompson 2005). However, management attempts to control CoPs, for instance by demanding certain deliverables, can simply transform them into organisational units (teams or task forces), make them go underground (Gongla and Rizzuto 2004) or make them conform to the official line with little real learning (McDermott 2007).

Swan, Scarbrough and Robertson (2002) provide an example of highly nuanced managerial intervention, a case study of a medical CoP convened or promoted by administrators of a health organisation as a vehicle for a radical innovation in the treatment of prostate cancer known as brachytherapy. These managers envisioned their role not quite as 'launching' but as 'facilitating' the construction of a new multidisciplinary community engaged around brachytherapy practice. They explicitly addressed constitutive dimensions of CoPs such as a well-defined domain of knowledge, identity enhancement, networking, and knowledge brokering. Thus, even though managers were relatively powerless before established medical professionals, they were able to deploy the theory and the discourse of 'communities of practice' to promote the adoption of an innovative procedure. The study also provides a textbook example of the use of fashionable management discourse to promote change (Benders and van Veen 2001).

Thompson (2005) makes a contribution to the CoP-launching debate by distinguishing between structural parameters and epistemic behaviors adopted from Wenger's (1998) indicators (see Table 2), and proposing management can manipulate them to launch a CoP. The study relies on participant observation and interviews to examine a co-located CoP at a large IT hardware and services firm. The 40-member group was formally established as a creative Web-design agency, exempt from the commercial and procedural restrictions of the parent organisation. It enjoyed heavy corporate sponsorship of IT infrastructure and culturally symbolic artifacts (pool tables, video games, bean bags, etc.) conducive to a relaxed, informal and creative work environment. The author reports strong group identification and epistemic interaction, relying on Wenger's (1998) framework to assess the emergent tight-knit group as a CoP. However, the organisation tried to capitalise on the group's success with the addition of 140 new in-training participants, which required formal documentation of procedures (hitherto unnecessary because of the group's small size), and other prescriptive measures such as controls on billable vs non-billable activities. This brought about the demise of the original CoP, as members quickly withdrew identification and commitment from the new, more formalised structure. These findings are in line with Wenger's (1998) position that CoPs can be supported or "nurtured" but not controlled. Furthermore, they refine Wenger's framework by distinguishing between two dimensions which

Table 4 – An overview of recent contributions to CoP theory

Launching CoPs	Swan *et al* (2002): CoPs used as a rhethoric device to promote change and innovation Thompson (2005): Distinguishes between CoP structural components, which organisations can furnish, and epistemic behaviors, which depend on CoP members alone. Anand *et al* (2007): Identifies success factors for launching new 'practice areas' in consulting firms
Managing or controlling CoPs	Gongla and Rizzuto (2004); Pastoors (2007): CoPs can and do evade management control Cross *et al*'s (2006): Use SNA to measure knowledge transactions and perform targeted interventions in CoP membership and structure. Meeuwesen and Berends (2007): Develop measures of performance of intentionally launched CoPs Schenkel and Teigland (2008): Use learning curves to measure performance of identified CoPs
Boundaries and Innovation	Hislop (2003): Study of seven companies where a technological innovation was promoted by management; found that some CoPs supported and others hindered the project. Bechky (2003): Ethnographic study of difficulties in transferring knowledge across CoP boundaries. Carlile (2004): Identifies three types of boundaries between CoPs, syntactic, semantic and pragmatic, and three processes for spanning each type of boundary: transfer, translation, transformation. Swan *et al* (2007): Use Carlile typology to examine the role of objects in spanning different boundaries in a study of innovation diffusion in the UK health system. Ferlie *et al* (2005): Found that epistemic boundaries between discipline-bound health care CoPs can retard the spread of innovations. Mork *et al* (2008): Study of cross-disciplinary R&D medical center, where new knowledge challenging an established CoPs was marginalised.
Identity construction	Ibarra (2003): Mid-career transitions require severing ties from former CoPs and joining new CoPs. Hara and Schwen (2006): Ethnographic study of a public defenders' office developed new CoP framework consisting of six dimensions. Handley *et al* (2007): Ethnographic study of identity construction by two junior consultants working at a leading firm. Campbell *et al* (2009): Case study of the learning trajectory into a CoP of a middle-aged nurse who made a career change to police officer. Goodwin *et al* (2005): Ethnographic study of *internal* boundaries in multi-disciplinary CoPs in anaesthesia Faraj and Xiao (2006): Emergency boundary suspension in multidisciplinary medical teams.
Virtual CoPs	Bryant, Forte and Bruckman (2005): Case study of increasing involvement in Wikipedia as an induction into an online CoP and development of 'Wikipedian' identity. Hara and Hew (2007): Case study of community of advanced practice nurses based on a listserv. Zhang and Watts (2008): Apply Wenger framework to online community focused on backpacking. Murillo (2008): Systematic Usenet search and detection of four VCoPs displaying Wenger dimensions. Silva *et al* (2008): Apply LPP model to a blog, operationalised as old-timers who enforce local norms. Fang and Neufeld (2009): Apply LPP model to an open-source software community, finding evidence of strong identity construction/enactment.
The concept of CoP	Cox (2005): Critical review and comparison of four seminal CoP studies. Roberts (2006): Literature review that highlights the limits of CoPs as a KM tool, and identifies issues that have been insufficiently addressed in CoP research. Hughes (2007): Critique of Lave and Wenger (1991) that questions whether their model extends beyond the cases they examined. Amin and Roberts (2008): Critique the status of CoPs as an umbrella concept, and propose a typology of four modes of 'knowing in action'. Gherardi (2006): Proposes new definition and theoretical framework for CoPs based on a full-length ethnography of three interacting CoPs in a construction site. Hara (2009): Proposes a new definition and theoretical framework of CoPs based on ethnographic study of a public defenders' county office.

managers must pay attention to when launching CoPs. The first, *seeding* structures, including shared symbols, artifacts, monuments, tools, boundary objects, that can be comprised under the Wenger concept of shared repertoire and which organisations can subsidize and make available to potential CoP members. Second, and more difficult, is encouraging CoP members to interact around these structures and among themselves, i.e. to engage in practice or perform the *epistemic behaviors* which over time will give rise to a CoP. The article also maps these dimensions onto Wenger's indicators, with epistemic behaviors corresponding to Indicators 1-9, and structural components to Indicators 10-14.

Anand *et al* (2007) investigate the success factors for launching new practice areas within management consultancies. They characterise these as innovative knowledge-based structures, and they expressly identify them with CoPs as portrayed in a vignette of a consulting company in the book by Wenger *et al* (2002). Their multiple case study was conducted at four consulting firms and included a total of 29 cases of practice areas, including both successful and unsuccessful efforts. This led them to identify four critical generative elements: socialised agency (a consultant's drive to create a new practice area as a key career-progression move), differentiated expertise (a new and distinctive body of professional knowledge), defensible turf (persuading others of the market relevance of the new practice area), and organisational support (resources, personnel and sponsorship to nourish the new practice area). All instances of successful practice area creation displayed socialised agency as the process catalyst. In what the authors called emergence step, agency combines with one of the other three critical elements, which gives the new practice area visibility within the firm. But the new structure only becomes viable if the other two elements are also added, in what is called the embedding step. The study identified three equally robust pathways whereby a practice area can be born depending on which of the three elements initially combines with socialised agency: the expertise-based pathway (when a consultant develops new expertise), the turf-based pathway (when a client opportunity provides a consultant with enough market power) and the support-based pathway (when firm leadership nominates a consultant to create a new practice top-down). The study found as many instances of successful management-launched CoPs, through the support-based pathway, as of bottom-up emergence through the other two pathways. Study findings thus complement Thompson's (2005) single firm case study, and contrasts with previous literature about the immunity of CoPs to management control (Gongla and Rizzuto 2004; Pastoors 2007).

In sum, there is empirical support to claims that CoPs can be intentionally designed and launched, and there is certainly no shortage of step-by-step guides (e.g. McDermott and Kendrick 2000; Wenger *et al* 2002; Plaskoff 2003; Saint-Onge and Wallace 2003; Moran and Weimer 2004).

Managing or controlling CoPs

On the other hand, several studies document the reluctance of CoP members to maintain their commitment when management attempts to control the learning agenda of the community or request specific deliverables. An example is the demise of Thompson's (2005) community, described before. In addition, there is a systematic study by Gongla and Rizzuto (2004) who tracked the "disappearance", over a six year period, of 25 organisational CoPs at IBM Global Services. In many cases, the demise of CoPs can be attributed to "natural" causes, as members' interests and commitments shift. However, they also found that management intervention can cause the transformation or demise of a CoP in two ways: first, management interventions can

transform a CoP into an oficial organisational unit, like a program, a project or a practice. Henceforth, decisions about (former) community objectives, agenda, deliverables and membership are made by management, not by members. Second, a community that faces increasing management control may decide to "remove itself completely from the organisational radar screen" (2004: 299), and continue to function off-site or outside work hours in order to preserve its independence and avoid management-imposed assignments.

In a similar vein, Pastoors (2007) provides a case study of a large IT consultancy that ran a strong internal program of institutionalised CoPs. Management assigns consultants to different CoPs without paying much attention to their preferences. CoPs are highly formalised and opperate according to strict guidelines with respect to roles, communication and performance evaluation. Moreover, consultants' career advancement is contingent on their performance in their assigned CoP. The study found consultants were not motivated to spend extra time or effort in their assigned CoPs. Instead, they joined and spent time on bootlegged, unofficial CoPs where they were free to pursue their passion.

An unusual angle, with respect to management control, is provided by Cross *et al*'s (2006) study of targeted interventions to improve performance of CoPs. They use Social Network Analysis (SNA) to map the existing relationships between community members and the volume of knowledge transactions flowing through these social ties. Coupled with background information of member expertise, SNA can reveal CoP members who are excessively connected, and thus bear a disproportionate burden of consultations, usually repetitive. SNA can also detect functional and geographical silos where good practices are not being effectively communicated due to lack of connections between some members. Similarly, SNA can locate peripheral individuals in the community who have high experience and expertise but are relatively isolated and hence unable to fulfill their potential. Specific interventions that companies can use include revising the formal roles of certain CoP members, using electronic profiling systems to communicate member expertise more broadly, and transferring or rotating specific experts to particular geographical areas. Post intervention member surveys, again interpreted through SNA, can then quantify the knowledge-transfer improvements and thus validate the interventions.

Another dimension of management control is the attempt to measure the performance of intentionally launched CoPs. Various indicators have been tried, including levels of CoP activity, development of new products and processes, knowledge sharing behaviors, messages posted in discussion boards, etc. A related concern has been to measure the benefits of CoP activity to the launching organisation (Lesser and Storck 2001; Fontaine and Millen 2004).

Meeuwesen and Berends (2007) provide a case study of four intentionally launched CoPs focused on advanced manufacturing technologies at Rolls Royce. The communities were formed by management-designated experts, about ten in each. All of them went through a day long workshop where they learned about the characteristics and benefits of a CoP and a dedicated facilitator was assigned to each. An important caveat is that the CoPs were not all launched simultaneously: at the time of the evaluation the youngest was a month old and the oldest (and most successful), over three months old. The company evaluated the performance of the CoPs using member surveys with scales for measuring CoP activities such as internal and external knowledge sharing, contributions to the online bulletin board, meeting frequency. Other scales measured outcomes, such as number of products, procedures and processes adopted, that were originally mentioned in the CoP. The study found that intentionally designed CoPs indeed began to function as such, and provided some benefits to its members. However, the results were

uneven across the four CoPs; in particular, no correlation was found between the level of CoP activity and the outcome variables. Moreover, the study found that the structural elements of CoPs (the Wenger dualities of participation/reification, identification/negotiability, local/global and designed/emergent) take time to develop and to become balanced. A limitation of the study is lack of information about ground rules, deliverables, or the time members were allowed to commit to the CoP. Hence, even though the study is grounded upon Wenger's (1998) framework, it is difficult to decide whether these communities are true CoPs, cross-disciplinary teams or committees, a failing displayed by similar other studies of CoP performance (e.g. Chua 2006; Verburg and Andriessen 2006; Probst and Borzillo 2008).

Schenkel and Teigland (2008) used learning curves to measure the performance of four co-located CoPs at a large construction site. To identify them, they relied on the Wenger dimensions of Mutual engagement, Joint enterprise and Shared repertoire. They developed a performance measure using the learning curves associated with the number of recorded deviations from defined standards. They found all learning curves had negative slopes, indicative of a decreasing number of deviations, which in turn spoke of improving CoP performance. One community broke the pattern, though, displaying positively sloped learning curves for a time, and then plateauing. The authors traced this anomaly to a disruption in that CoPs communicative processes caused by a physical move of the group to a new location that additionally split the group between two separate locations, making face-to-face exchanges a rare occurrence.

Reviewed studies thus seem to confirm the ability of CoPs to evade management control when they feel their jointly negotiated enterprise is threatened. Management can, of course, take over a CoP but Gongla and Rizzuto (2004) are correct in pointing out this will just turn it into a committee or task force, and is unlikely to draw the same level of enthusiasm from members.

Boundaries and Innovation

Recent studies have also examined the role CoP sometimes play in retarding or inhibiting innovation. This is a relatively new angle given the many studies that present innovation as a defining feature of CoPs (Orr 1990; Brown and Duguid 1991, 2000a; Brown and Grey 1995; Prokesch 1997; Swan *et al* 1999; Wenger 2000b; Lesser and Everest 2001; Fontaine and Millen 2004). Indeed, the studies by Anand *et al* (2007), Meeuwesen and Berends (2007) and Schenkel and Teigland (2008) all provide evidence of innovation taking place *inside* CoPs, and specific measures of innovation are often used in studies of CoPs performance. Yet there are also studies showing more mixed results.

For instance Hislop (2003) reports longitudinal case study evidence from seven companies implementing technological innovation projects, specifically multi-site, cross-functional management information systems. He uses Brown and Duguid's (2001) definition of CoPs as groups possessing common knowledge/practices, shared identity and common work-related values, which results in his identifying CoPs with local business units and/or business functions. The study found CoPs that strongly supported the innovation project, specifically those that had a strong IT identity which valued information systems. Other CoPs hindered the innovation because they valued their local autonomy, were resistant to management's centralising agenda, and were reluctant to share knowledge with other units. These results are congruent with Wenger's (2000b) views on boundaries and identities, but are limited by the condensed

definition of CoP and the study's generalised characterisation of each of the company's business units and functions as CoPs.

Wenger (2000b) argues CoP boundaries deserve special attention because they connect different CoPs and because they offer distinct learning opportunities. Radical insights often arise at the intersection of multiple practices. Yet the process is not without tension and conflict. Researchers have chronicled instances of successful innovation at the boundaries of different CoPs, but also instances where such boundaries have retarded the spread of innovations. In talking about moving knowledge across CoPs or NoPs, Duguid (2005) introduces a useful distinction by talking about the *epistemic* and *ethical* entailments of practice: the former refers to the challenge of translating knowledge held within one practice into a different one; the latter refers to the political barriers that may make exporting such knowledge (or even importing it) unacceptable to one of the communities.

In fact, boundaries (specifically boundary spanning) have recently become an important topic in their own right, to the point that the CoPs that generate them are scarcely examined (e.g. Carlile 2004; Swan *et al* 2007). Moreover, some danger of conceptual confusion arises from the fact that since boundaries are created by different practices, they are not privative of CoPs, but also of larger networks, such as professions, occupational communities and Networks of Practice (Brown and Duguid 2001).

The study by Bechky (2003) illuminates boundary processes by providing a detailed ethnographic analysis of the interactions between different CoPs at a semiconductor equipment manufacturing company. The manufacturing process included three phases assigned to three highly distinct CoPs. In the design phase, teams of design engineers developed the engineering drawings of new products. These would be turned over to the technicians of the prototyping phase, whose job was to verify and correct the drawings by building a physical prototype of the machine. After several prototypes had been built, and technicians and engineers agree on a final set of drawings, the assemblers of the assembly phase are brought in to learn from the technicians and the prototypes how to build a finished product. These three CoPs have different practices, languages, repertoires and perspectives, but needed to coordinate and work together, especially during product "handoffs". The study uses the term *decontextualisation* to describe the misunderstandings and communication difficulties between the three CoPs. It occurred when people from different CoPs met to discuss a problem bringing different understandings of the same problem. The misunderstandings were resolved through a process named *transformation* (borrowed from Carlile 2004) which occurred when a member of one CoP came to understand how knowledge from another CoP fit within the context of his own work, thus enriching and altering what he knew (Wenger 2000b). It was not just the introduction of new knowledge, but the placing of it within his own locus of practice, that allowed the practitioner to see the world in a new light.

Carlile (2004) undertakes a similar ethnographic study of exchanges between different functional groups involved in new product development at a car manufacturer. The contribution of this study is a classification of boundaries between CoPs into three progressively more complex types: syntactic or information-processing boundaries, semantic or interpretive boundaries and pragmatic or political boundaries. Furthermore, the study describes three processes for moving knowledge across each type of boundary: transfer, translation and transformation.

Swan *et al* (2007) apply this framework to explain the role played by objects in exchanging knowledge across boundaries in a longitudinal study of ten innovations in the UK's National Health System. Each of Carlile's boundaries was spanned by an object with different epistemic attributes. The syntactic boundary was spanned by developing a common project database to serve the different professional groups involved. The semantic boundary required not just a physical object but the collaborative development by participating groups of data collection instruments, such as a patient questionnaire, in order that they might align their different interpretations in a concrete instrument. The pragmatic boundary is the most complex because the involved actors have different vested interest and incentives which makes them unwilling to change their practice and must be reconciled in order to successfully span the boundary. This was accomplished by two members of the project who prepared and delivered a presentation on the benefits of the research, along with an information pack, to each of the recruiting centers and clinician groups whose commitment was essential to the project.

In a study more directly overtly concerned with CoPs, Ferlie *et al* (2005) provide an interview-based longitudinal analysis of the spread of eight innovations in the UK health system. Half of the innovations had strong scientific evidence supporting their medical value, while the other half had more contestable evidence. Moreover, half of the innovations involved just one focal stakeholder, being relatively easy to implement, while the other half involved multiple stakeholders and greater difficulty to achieve consensus. Results showed unexpectedly slow spread of innovations with strong scientific support, one of them spread widely, two had some spread and one stayed at the pilot stage. Innovations involving one stakeholder spread more widely –but not overwhelmingly– so than those involving multiple stakeholders. In interpreting their results, the authors theorise that the spread of innovations was retarded by social and epistemic boundaries between uniprofessional communities of practice of the various health care professionals involved in the system. They report three characteristics of these groups which differenced them from Wenger's (1998) claims processors CoP: they are unidisciplinary, they seal themselves off from neighboring communities defending jurisdiction and group identity, and they are highly institutionalised. These features erected barriers to learning and knowledge sharing between CoPs, for instance between the communities of orthopedic and vascular surgeons, whose lack of consensus led to the slow spread of one of the strongly supported innovations. However, a closer examination of the communities involved is warranted, to discard the alternative explanation that these were territorial disputes between members of competing professional associations (Swan, Newell and Robertson 1999; Cox 2007a).

Finally, Mork *et al* (2008) develop an ethnographic account of a medical R&D center whose mission is to develop new practices for patient diagnostic and treatment using advanced technologies contributed by a number of different professional groups, such as surgeons, anaesthetics, engineers, nurses, radiologists and radiographers (imaging technicians). At the time of the study, the center had operated for 12 years, developed over 20 new procedures, filed 12 patent applications and published over 200 scientific papers. Thus it has been highly successful in developing new cross-disciplinary practices. However, the study found that collaboration between different CoPs was a source of constant tensions. New practices had to build upon the knowledge of different co-located CoPs, each one with its own epistemological foundations. Informants reported that less collaboration took place than was desireable, and that many opportunities went unrealised. In particular, new knowledge that challenged current practice belonging to any of the involved CoPs was more likely to be marginalised.

Identity construction

Both Lave and Wenger (1991) and Wenger (1998; 2000b) underscore the importance of identity construction in the individual decision to join a CoP, since learning the practice implies acquiring the identity of a competent practitioner. They argue people have an intrinsic and powerful motivation to join some CoPs, and keep their distance from others:

> *In the landscape of communities and boundaries in which we live, we identify with some communities strongly and not at all with others. We define who we are by what is familiar and what is foreign, by what we need to know and what we can safely ignore* (Wenger 2000b: 239).

For example, people undergoing career change, even as they withdraw personal and psychological commitment from outdated professional identities and related CoPs, try to connect to new CoPs in order to perform low-risk practice/identity experiments to bring into sharper focus the new professional identity they are trying on (Ibarra 2003).

Studies of people joining CoPs to develop practitioner identities are often grounded on Lave and Wenger's (1991) theoretical framework of LPP (e.g. Harris *et al* 2004; Taber *et al* 2008; Campbell 2009). This framework has recently benefited from insights regarding apprenticeships at modern workplaces which are very different from the ethnographies grounding Lave and Wenger's model of LPP. Specifically, Fuller and Unwin (2004) studied the relationships between apprentices and experienced workers at four private companies from the steel industry in the UK, where the government has funded a program called Modern Apprenticeship. Using interviews, structured learning-logs, surveys and observations, they found that learning was not a one-way relationship from experienced workers to apprentices as predicted by the LPP model. In all companies, 'novices' reported helping others, both novices and experienced workers, to learn new skills in spontaneous problem-solving sessions at work. For instance, many young apprentices were more familiar with information technology than their older more experienced colleagues. Thus the study warns that neither novices nor experts are stable or uniform concepts, and that modern novices bring a wealth of previous learning experiences to the workplace.

Hara and Schwen (2006) provide an ethnographic study of a public defenders' office, where attorneys formed a strong co-located CoP to share knowledge and information and support each other in the difficult task of representing clients who did not have means to pay for private counsel. Because the job was not high status, even in the eyes of the clients, attorneys banded together to provide emotional support. The CoP had several members with considerable experience and willingness to share knowledge and mentor others. Moreover, the CoP closely monitored the performance of new attorneys, since their failure or successes in court reflected on the prestige of the public defender's office. The authors introduce a new theoretical framework for CoPs; with more detail provided in a later monograph of the full ethnography (Hara 2009).

Handley *et al* (2007) provide an ethnographic study of identity construction by two junior consultants working at a leading firm of strategy consultants. Their opportunities for participation and identity-construction were closely regulated by senior managers who assigned them to less visible data crunching activities and allowed them only limited contact with clients. Junior consultants attended internal review meetings where they would hear senior consultants speak about project progress, client responses and ways of 'handling' the client. They also accompanied senior consultants to work meetings with clients where they could silently observe

interactions of their older colleagues with clients. At one point, the two junior consultants were assigned to play a much more active role at the site of a different and relatively minor client, where their existential confidence in being 'good consultants' increased sharply. Apprentices thus learned what it meant to 'think like' and to 'behave like' a consultant from carefully orchestrated opportunities for legitimate participation and thereby developed their professional identities as consultants, and through different project assignments and interaction with senior colleagues, became conscious of possible career paths, i.e. "the proposal of an identity" (Wenger 1998: 156).

Campbell (2009) uses Lave and Wenger's (1991) model of LPP to examine the learning trajectory into a CoP of a nurse unit manager who at the age of 50 made a career change to police officer. Her previous managing experience gave her people skills, respect for hierarchical authority, and medical expertise which were all valued by the policing community, where she was accorded respect much sooner than younger trainees. While her training progressed, she continued to work part time as a nurse, but over time she shifted her identity from a nurse becoming a police officer to a police officer who used to be a nurse. After gaining her constable stripes, she quit nursing altogether and started seeing herself first and foremost as a police officer. The study contributes the insight that learners do not shed their former identity when striving to acquire a new one, rather, the new identity is a composition of previous histories enriched with new experiences.

One of the manifestations of identity enactment is a strong awareness of the occupational and institutional boundaries that separate members of the CoP from non-members. These boundaries are less about the epistemic barriers between CoPs, discussed before, as about establishing who has legitimate access to practice in the CoP.

Goodwin *et al*'s (2005) ethnography of anaesthetic teams uses Wenger's (1998) framework to examine multidisciplinary CoPs that stand in contrast to the unidisciplinary communities analysed in seminal studies (Lave and Wenger 1991; Brown and Duguid 1991; Wenger 1998). An anaesthetic team is composed of an anaesthetist, an operating department practitioner (ODP) and a recovery nurse. The ethnography brings out how boundaries *inside* the CoP are drawn and regularly enforced by the enactment of the different professional practices and identities of each practitioner. The study also shows how in this community legitimacy is *stratified*, i.e. access and participation is contingent upon each member's professional identity, and learning trajectories do not lead to all-encompassing mastery, as they did in Lave and Wenger's (1991) examples, but are constrained by the explicit rules and responsibilities governing each position in the anaesthetic team.

In a related vein, Faraj and Xiao's (2006) study of emergency medical coordination procedures identifies a unique instance of boundary suspension. The authors examine coordination between different CoPs in a medical trauma center, a fast-paced setting where diverse communities must collaboratively build an accurate diagnosis and treatment for patients. Disciplinary and epistemic boundaries between CoPs are regularly enforced; the study describes how CoPs assume coordinating responsibilities across disciplines, as well as scheduling and legitimate participation (learning) responsibilities within each discipline. Furthermore, the authors identified a practice labelled *expertise coordination* process, which relies heavily on established protocols, and facilitates the management of the diverse and interdependent skills and knowledges required to diagnose and treat patients. This is normal practice, accounting for 90% of patients. The remaining 10% are patients whose condition unexpectedly deteriorates, demanding immediate

improvisational intervention. The authors labelled these *dialogic coordination practices*; they involve a suspension of disciplinary boundaries, a process of joint sensemaking between participants, drawing in additional experts, judicious breaking of protocols, and deliberate boundary-crossing interventions in the name of patient safety.

Virtual CoPs

No review of CoP literature can fail to mention the current popularity of the topic of "virtual" or Internet-based CoPs. The increase in the number of such studies is partly explained by the relentless pace of technological innovation (e.g. blogs, wikis, and social networking sites are all recent developments), and strong interest among KM practitioners who view CoP development as a key offering in their portfolios. Workshops on launching and supporting "virtual" CoPs are a staple of professional KM conferences.

Two important clarifications should be made with respect to the virtual CoP literature. First is the fact that many studies label as virtual CoPs what are really virtual teams or workgroups convened on a *temporary* basis to accomplish specific projects (e.g. Jarvenpaa and Leidner 1999; Rogers 2000; Chalk 2001; Smeds and Alvesalo 2003; Davenport 2004). The compulsory character, professional or academic, of such projects leads to impressive online collaboration, but for a limited time. The disbandment of the team at the end of the project clearly distinguishes them from CoPs which are usually characterised as emergent persistent communities (Barab *et al* 2003).

The second and more serious problem, just as in the co-located CoP literature, is that a large majority of published studies have relied on a condensed definition of CoP, that either lacks a formal model, or sidesteps Wenger's (1998) theoretical framework without providing a developed alternative, thus casting doubt on the characterisation as a CoP of examined communities (e.g. Baym 2000; Robey *et al* 2000; Johnson 2001; Schlager *et al* 2002; Pan and Leidner 2003; Ardichvili *et al* 2003; Dubé *et al* 2005; Ardichvili *et al* 2006; Fahey *et al* 2007; Usoro *et al* 2007).

Given these two caveats, the virtual CoP studies which follow all involve a persistent online community and are based on a theoretically grounded model.

Bryant, Forte and Bruckman (2005) provide a case study of participation in Wikipedia as an induction into an online CoP, 'becoming Wikipedian', as it were. They apply Lave and Wenger's (1991) concept of LPP to describe the induction of novices into the Wikipedia community. Furthermore, they report the presence of Wenger's (1998) traits of Mutual Engagement, Shared Repertoire and Joint Enterprise. Although the question remains of whether this is truly a single community or rather a constellation (Wenger 1998), the study makes a theory-grounded case for a virtual CoP.

Hara and Hew (2007) use content analysis of messages and 27 member interviews to build an in-depth case study of an online community of advanced practice professional nurses based on a listserv. In their depiction of the group as an online CoP the authors apply Wenger's (1998) theory, but take as defining CoP characteristics Practice, Community, Meaning, and Identity. However, these are the elements of Wenger's social theory of learning, in which CoPs constitute a single element (Wenger 1998: 5). Notwithstanding this difference of interpretation, reported evidence of

the Essential Traits is sufficient to support the authors' characterisation of the community as a successful virtual CoP.

Zhang and Watts (2008) provide a study of a very active Chinese online community focused on backpacking. They relied on Wenger's (1998) framework, specifically the dimensions of Mutual engagement, Joint enterprise, Shared repertoire, Practice, and Identity construction. The study performed qualitative data analysis of messages downloaded from the bulletin board, and complemented this with interviews of the group's moderators. From the presence of all Wenger dimensions, the authors conclude the group is indeed a virtual CoP.

Murillo (2008) conducted a systematic search of the mainstream hierarchies in the Usenet discussion network, using quantitative and qualitative filtering criteria developed from Wenger's dimensions of Mutual engagement, Joint enterprise, Shared repertoire, Community and Learning/Identity acquisition. This resulted in a selection of eleven high-potential newsgroups, which were further examined using Social Network Analysis, an online survey of participants and content analysis of discussions. Results identified four professionally oriented newsgroups that displayed the complete set of Wenger dimensions, and were thus rigorously assessed as Usenet-based CoPs.

Silva *et al* (2008) provide a theory-grounded study of an Internet CoP based on the relatively new medium of blogs. They conducted an interpretive study of MetaFilter, an online community blog which they describe as a CoP. They performed hermeneutic interpretation of 38 threads containing about 1300 comments, plus the posting guidelines and policies for new users. The data was coded using four constructs derived from Lave and Wenger (1991) and Wenger (1998): identity, knowledge sharing, warrants (community procedures for evaluating the relevance of posts) and LPP. However, LPP was operationalised as old-timers enforcing community rules for good posts, either through praise or ridicule, which does not consider things from the viewpoint of novices, and, more fundamentally, does not document inbound trajectories into the VCoP.

Finally, Fang and Neufeld (2009) used qualitative analysis of online documents and e-mail messages to predict sustained participation in an open-source software (OSS) development online community. The study is grounded on Lave and Wenger's LPP framework; specifically focused on two dimensions: situated learning (operationalised as conceptual and practical contributions to code development) and identity construction (operationalised as identity regulation and identity work). The study found both of these dimensions were related to sustained participation, but initial motivation and initial access to the community were not. The authors note the OSS CoP was different from traditional CoPs that were apprenticeship oriented (Lave and Wenger 1991) or collegial oriented (Brown and Duguid 1991; Wenger 1998). In the OSS CoP, conceptual or practical contributions were required for sustained core membership. Thus, although initial access was easily granted, it was not a CoP for novices to learn how to code, but rather a serious project for experts willing to commit time and work. An example of this is how the project leader grants different levels of code-modifying privileges to participants, according to their expertise and previous contributions, thus echoing Goodwin *et al*'s (2005) concept of stratified legitimacy. Where Lave and Wenger (1991) pay little attention to the learning of established members, Fang and Neufeld (2009) put the greatest emphasis on the situated learning achieved by expert and involved core members. In this they reveal a slightly different interpretation of LPP than Lave and Wenger (1991), and a feeling that Wenger's (1998) construct of Mutual engagement could provide a better conceptual fit.

Nevertheless, the article makes strong contributions to the study of identity construction/enactment in virtual CoPs, and clearly illustrates the social definition of competence that takes place within CoP, even when they are Internet-based.

The concept of CoP

In recent years the confusion in the literature and the perceived dilution of the concept to little more than a fashionable label has resulted in the publication of several conceptual critiques and/or proposed typologies.

Cox (2005) provides a comparative review of the three seminal CoP studies (Lave and Wenger 1991; Brown and Duguid 1991; Wenger 1998) and the Wenger *et al* (2002) practitioner book. Across these works the author finds substantial differences in the treatment of key issues: community, learning, power, change, formality and diversity. The article provides a useful comparative table of these concepts across the four studies (2005: 537). The author traces the popularity of the CoP concept to the ambiguity of both terms, 'community' and 'practice', which has enabled academic and practitioner audiences to appropriate the notion in different ways, which fits Benders and van Veen's notion of interpretive viability. The same author provides a remarkable account of the appropriation and adaptation of Orr's (1996) ethnographic findings about the Xerox tech reps, to develop an MBA case study for a top business school on the topic of Knowledge Management (Cox 2007b).

Lindkvist (2005) proposes a two-part typology of knowledge work performed in groups. On one side he locates CoPs, characterised as tightly knit, with a high degree of shared understandings and repertoire, operating with a significant amount of face-to-face encounters and requiring an extended time period of local interaction to develop fully. On the other side he locates a frequent work unit in today's economy, which he terms a *collectivity of practice*. This is a temporary group or team, assembled to carry out a specified task involving knowledge creation and exchange, and to do so within cost and time limits. Moreover, members of the collectivity have typically not met or worked together before, and posess highly specialised competences, not conducive to shared understandings or a common knowledge base.

Roberts (2006) performs a literature review and raises several conceptual challenges that have been insufficiently addressed in the literature. First, since trust is a precondition for knowledge-sharing within a CoP (Wenger 2000b: 230), the approach will be less effective in organisational environments characterised by adversarial relations between workers and management. Second, societies with strongly individualistic cultures (such as the UK or the USA), which have experienced a decline of community in the social context, will experience greater difficulty in deploying a community structure in business organisations. Third, the author rejects using the CoP concept for the large (over 1500 members) distributed communities described in Wenger *et al* (2002), arguing size and spatial reach impose limits to member participation. Fourth, the current acceleration of change in business organisations –e.g. restructurings, downsizings and outsourcing– threatens to disrupt the sustained engagement CoPs need to develop and endure.

Hughes (2007) points out that Lave and Wenger (1991) are somewhat equivocal on whether their theory of learning *emerges* from their empirical research, or is *projected onto* concrete cases of apprenticeship. In effect, the critique questions "whether the theory can be said to speak beyond the cases examined" (2007: 39). This also translates into an ambiguity with respect to the status

and purpose of Lave and Wenger's model; whether it is a descriptive theory of learning or a prescriptive model of learning. The author suggests that it is the second version, the 'ideal model' of how learning should be that has been eagerly adopted by consultants and human resource development practitioners, in turn leading to numerous 'translations' of the concept, and an increasing divergence from the original theory.

Amin and Roberts (2008) argue that the CoP concept has become an umbrella term that does not contemplate all the social varieties of 'knowing in action'. They conducted an extensive review of the literature describing situated social practice, learning and knowing. From this they developed a four-part typology of specific modes of knowing in action: task/craft-based, professional, epistemic/creative and virtual. Each group is then examined along four proposed dimensions of the character and dynamic of knowledge production: the type of knowledge used and produced, the nature of the within-group social interaction, the kind of innovation achieved and the within-group organisational dynamic. In turn, three further traits characterise the within-group social interaction: proximity, longevity and strength of the social ties. The authors acknowledge their typology is not exhaustive, nor are the four groups mutually exclusive, but their intent is to highlight that differences in their proposed dimensions result in significant differences between the groups. With respect to CoPs, each of the four proposed groups contains literature examples of CoPs and non-CoPs. The key dimension in separating the ones from the others appears to be the proximity, longevity and (resulting) strength of social ties; which is coherent with Wenger's (1998) admonition regarding sustained mutual engagement.

Lastly, two authors deserve special mention for conducting and publishing full-length ethnographic accounts of CoPs in organisational settings, and for proposing comprehensive theoretical frameworks for CoPs that for the first time offer a developed alternative to Wenger (1998).

Gherardi (2006) conducted ethnographic fieldwork of three distinct CoPs in a construction site, in order to study the situated learning of safety. The book goes beyond Wenger's (1998) single CoP ethnography by closely examining how different CoPs interact discursively. The author proposes a theoretical-methodological framework to account for the phenomenon of 'knowing-in-practice', and includes a radically new conceptualization of CoPs, deliberately relabelled as 'communities of practitioners' in order to shift the emphasis to the pre-existing practice. Gherardi does not view CoPs as a social object or as a collective subject, but more as a fluid social process whose 'existence' is a construction of the researcher's gaze. Lave and Wenger's (1991) realist ontology is rejected in favour of postmodern constructivist assumptions, thereby proposing a novel way of looking at CoPs (2006: 108):

> *I argue that it is practice, with its materiality, its technological knowledge and its transorganisational character, that organises a community. I maintain that practice 'performs' the community (Gherardi and Nicolini 2002) in order to emphasise that the terms of the causal relation have been reversed: it is not the community as the acting subject that somehow precedes the action and has ontological primacy over it; rather, it is the process of doing, the course of action, which aggregates an incipient community in a process of reciprocal definition.*

Gherardi's theoretical-methodological framework on 'knowing-in-practice' is proposed as a 'third way' between a mentalistic vision of knowledge in organisations, identified with the discourse of organisational learning, and a commodification and reification of knowledge, identified with the discourse of knowledge management. The aspiration to avoid these two discourses through a

reliance on the concept of practice has resulted in a new and growing field called Practice-Based Studies, where the author has emerged as a leading figure (e.g. Gherardi 2009a, 2009b).

Hara's (2009) monograph is a full-length ethnography of a public defenders' county office where attorneys have developed a strong CoP to share information, provide emotional support, and learn from each other. The book proposes a specific definition of CoPs as "collaborative, informal networks that support professional practitioners in their efforts to develop shared understandings and engage in work-relevant knowledge building" (2009: 3). In addition, the author proposes a novel theoretical framework for CoPs comprised of six distinct attributes:

1) A group of professional practitioners
2) Development of a shared meaning
3) Informal social networks
4) A supportive culture – trust
5) Engagement in knowledge building
6) Members' negotiation and development of professional identities

Thus, although not as fully developed as Gherardi's (2006) theory, Hara makes a welcome contribution to the field by proposing an alternative to Wenger's framework that is grounded on a full-length organisational ethnography. More such studies are urgently needed.

7. Detected trends and conclusions

This review of the first two decades of CoP literature has found both cause for concern and hopeful developments. This section summarises detected trends, and concludes with an optimistic forecast.

Misuse of the CoP concept

As described in Sections 3 and 4, the literature reveals a large number of studies that rely on condensed or abridged definitions, lack a theory-grounded model, or mistake CoPs with other social structures that somehow feature knowledge sharing, such as occupational communities, professional associations, epistemic cultures, or networks of practice. Although less often, the confusion has gone both ways, as some exemplary studies using the later concepts are clearly about CoPs rigorously defined (notably Orr 1990 and Bechky 2003).

Further confusion has been introduced into the literature by a number of competing designations for essentially the same social phenomenon or some aspect of it, including communities of knowing (Boland and Tenkasi 1995), strategic communities (Stork and Hill 2000), knowledge networks (Büchel and Raub 2002), communities of coping (Korczynski 2003), and knowledge communities (Barret *et al* 2004).

Interpretations and adaptations of the CoP concept

The review encountered numerous studies that casually applied the CoP label to a learning group without a formal assessment of the traits defined by existing theoretical frameworks (Lave and Wenger 1991; Brown and Duguid 1991; Wenger 1998), and without proposing an alternative framework. A clear example are the many studies that apply the CoP label to short-lived organisational workgroups or task forces, and to semester-long academic team projects, virtual or co-located. The review sees this as evidence of CoPs becoming fashionable, and of the concept being loosely interpreted without being theoretically ammended or challenged. This is cause for concern to the extent that good research should be grounded on theory.

On the other hand, extant theory (Brown and Duguid 1991; Wenger 1998) describes CoPs as sufficiently versatile to accommodate a wide range of successful organisational deployments. The studies in Section 6, which are all theoretically grounded, provide examples of CoPs used as fashionable managerial discourse to support organisational change (Swan *et al* 2002); as a support group to succesfully navigate a midlife career change (Ibarra 2003); or as an innovative task force (Thompson 2005). They have been deployed as a formal organisational structure for discipline-based personnel management (Faraj and Xiao 2006); as 'practice areas', a formal knowledge-based organisational unit in consultancy firms (Anand *et al* 2007); and as an online support group for advanced practice nurses (Hara and Hew 2007). Success in this variety of endeavours clearly adds to the concept's appeal, and supports those who defend the organisational contribution of CoPs (Wenger *et al* 2002; McDermott 2007).

On balance, the most serious consequence of the interpretative viability that has marked the evolution of CoP literature is the fact that researchers currently defend divergent conceptualizations of CoPs, to the point where academic gatherings focused on the topic may

end up speaking past each other (Duguid 2008). It is this state of affairs that the review has characterised as a 'midlife crisis' of the concept.

Assessing Wenger's 1998 framework

The review considers Wenger's (1998) theoretical framework to be the most developed CoP model, even as it welcomes the recent appearance of competing models (Gherardi 2006; Hara 2009). As mentioned in Section 4, several CoP scholars have critiqued various aspects of the framework, such as the cursory treatment of power issues (Fox 2000; Contu and Willmott 2003), the reification of CoPs (Gherardi *et al* 1998; Contu and Willmott 2003; Cox 2005), and Wenger's shift to a managerialist discourse between his 1991 work with Lave and his 2002 work with McDermott and Snyder (Contu and Willmott 2003; Cox 2005; Hughes 2007). Still, the review would argue that Wenger's framework does give coherent replies to most critiques, and that the way forward lies in extending this framework through fresh empirical studies, especially organisational ethnographies. In this respect, Gherardi's (2006) extensive ethnography of a construction site is seen as exemplary for revealing the interaction and discursive practices between three organisational CoPs, thus extending Wenger's (1998) single-CoP study.

While Wenger's framework provides substantial detail, it is not easily operationalised, even with the CoP indicators the author proposed (see Table 2). Each of the constitutive dimensions of Mutual engagement, Joint enterprise and Shared repertoire comprises four or five indicators, and these betray their ethnographic origin, making some of them hard to measure (e.g. Indicators 2, 8 or 13). Moreover, while providing useful guidelines for empirical research, the framework is not exempt from interpretative viability. Indeed, different operationalisations have been proposed (e.g. Thompson 2005; Hara and Hew 2007; Murillo 2008). Still, the 1998 framework does provide coherent criteria for evaluating CoPs studies and detecting lack of rigour or overenthusiastic claims about showcased organisational CoPs. In fact, this review used the framework to critique Wenger *et al's* (2002) characterisation as true CoPs of very large distributed networks of specialists which violate the direct engagement criterion. These should have been coherently described as constellations of practices, with due acknowledgement of the tradeoffs that size and lack of face-to-face interaction inflict on engagement (Wenger 1998: 131).

Recent theory-grounded studies striving for conceptual clarity

The review detected a welcome trend in the development of new concepts to describe what authors are presenting as extensions of the CoP model, as regards size, spatial distribution or temporal limits. Brown and Duguid's (2000b) concept of NoP is an important and useful addition to the literature with the specific theoretical justification of explaining knowledge "leakiness" and with a clear rationale as to how these large networks are different from CoPs. Several empirical studies have relied on the NoP concept to examine knowledge sharing in networks which, unlike CoPs, are characterised by weak links (e.g. Vaast 2004; Fleming and Marx 2006; Tagliaventi and Mattarelli 2006; Cox 2007a; Teigland and Wasko 2009; Wasko *et al* 2009).

Another useful clarification is provided by Lindkvist's (2005) model of collectivities of practice. Specifically, extant 'CoP' studies that describe temporary teams and task forces, virtual or not, that display impressive short-term collaboration, without becoming a permanent community, can

now be reclassified under the new concept, thereby extracting from the literature one major source of confusion.

More broadly, there is a nascent clarifying trend comprised by authors who have used the CoP concept as a point of departure to build broader typologies of situated learning or situated practice theories. Three recent examples include Lindkvist's (2005) typology of knowledge work in groups, Amin and Roberts' (2008) typology of modes of 'knowing in action', and Gherardi's (2006) theoretical framework of 'knowing in practice'.

Finally, a growing number of studies are returning to the Wenger framework by explicitly considering the constitutive dimensions of Mutual engagement, Joint enterprise and Shared repertoire (e.g. Thompson 2005; Goodwin *et al* 2005; Bryant *et al* 2005; Iverson and McPhee 2008; Murillo 2008; Wan *et al* 2008; Schenkel and Teigland 2008; Zhang and Watts 2008). Other studies have proposed operationalising different constructs from the 1998 framework, such as Practice, Meaning, Community and Identity (e.g. Hara and Hew 2007), or Participation, Identity and Practice (Handley *et al* 2007). These authors display a new willingness to engage with what many perceive as the most detailed and coherent CoP framework, and use it to study both co-located and virtual CoPs. These studies mark a new period of theoretically grounded studies, and provide some justification for an optimistic outlook regarding future empirical CoP research.

Conclusion: undiminished academic interest

This review began with the suggestion that the CoP concept faces a midlife crisis, based on three telltale signs. First, the increasing ambiguity of the concept, which has resulted in wide diffusion but emptied it of meaning. Second, recent critiques and reviews have highlighted the erosion in the concept's coherence and analytical power (Cox 2005; Roberts 2006; Hughes 2007; Amin and Roberts 2008). Third, a possible decline in publication trends, which is fairly established in the practitioner literature, still incipient in academic journals. A more anecdotal sign of this crisis are recent calls to look 'beyond CoPs' (Handley *et al* 2006; Amin and Roberts 2008).

This review does not join those calls, but it does argue that the time is overdue for developing what could be called 'CoP version 2.0'. Notwithstanding the critiques levelled at Lave and Wenger (1991), Orr (1990), Brown and Duguid (1991) and Wenger (1998), there are few who seriously doubt the existence of organisational CoPs. Yet few have embarked on the time-intensive project of conducting rigorous ethnographies within, and increasingly across, organisations in order to develop a refined theoretical framework for CoPs. For a topic that has demonstrated such a strong appeal, the dearth of theory-developing empirical studies is remarkable. Hence this review joins others (Roberts 2006; Hughes 2007; Hara 2009) in making a call for theory-grounded research focused on organisational CoPs that contributes to rigorously test, update and extend Wenger's (1998) framework, or to propose entirely new frameworks as others have done already.

The review argued that the growth of CoP literature during two decades, and the appearance of multiple interpretations of the concept, is consistent with Benders and van Veen's (2001) model of a management fashion. It is in the nature of fashions to fade away, either by becoming outmoded or by becoming mainstream. In the arena of practitioner publications, it is the latter course that CoPs appear to be taking.

Specifically, the observed decline is a symptom of the CoP concept becoming mainstream, an accepted addition to the Management vernacular. Some evidence of this comes from the fact that CoPs are currently given a cursory mention in the Training chapter of mainstream HRM textbooks (e.g. Noe *et al* 2007; Jackson *et al* 2008; Bohlander and Snell 2009). By this account, CoPs are no longer newsworthy for practitioner journals whose attention, in the key issue of knowledge-sharing, is currently focused on Web 2.0 technologies (e.g. Lynch 2008; Pace 2009; Lamont 2009; Rosenheck 2010). Though no longer novel, the CoP concept is an important contribution to managerial knowledge. It gives a name to the familiar human need to participate in a group of like-minded peers; many professionals are consciously seeking connection with competence and identity-defining CoPs (Ibarra 2003), for which the new social media are a promising avenue. Moreover, even as the KM fashion fades, CoPs have achieved lasting recognition of their role in managing knowledge work (Newell *et al* 2002).

By contrast, in the more rigorous arena of academic journals, the CoP fashion has turned into a heated theoretical debate, with many researchers, including some of the original proponents (Duguid 2008; Lave 2008), lamenting the proliferation of instrumentalist managerial interpretations of a concept that in its origin "was specifically *not* intended as a normative or prescriptive model for what to do differently or how to create better classrooms or businesses (Lave 2008: 283)".

This review assesses the current crisis as a healthy one, and predicts publications in academic journals will resume the rising trend of previous years, as a result of strong researcher interest in the topic. This assessment is based on several hopeful signs in the recent literature. First, the appearance of several typologies and in-depth critiques of extant CoP theory signals increased researcher interest, coupled with concern about the current state of confusion in the literature. These critiques converge on a few shortcomings of extant theory (e.g. the power differentials between CoP members, and their implications for participation, learning and identity formation), thus setting the stage for developing improved theory which, as previously mentioned, should be grounded in well-designed organisational studies.

Second, the appearance, for the first time, of developed alternatives to Wenger's (1998) framework is also regarded as a hopeful sign. Studies based on these new frameworks are just starting (e.g. Kaiser *et al* 2007), but in due time will contribute to academic publication numbers and to further theoretical development.

A third positive sign is the growing number of studies that are recovering Wenger's (1998) framework by attempting various operationalisations of the constitutive dimensions of Mutual engagement, Joint enterprise and Shared repertoire. Furthermore, these authors display an increased awareness of the demands of methodological rigour in empirical CoP studies, which is a welcome step forward.

In sum, the review draws an optimistic conclusion about the future of CoP research. This is not to mean the current crisis will soon be left behind, only that researchers' interest and indeed passion about this remarkable concept will remain unabated in the coming years.

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