

"THE ART OF KNOWING":
SOCIAL AND TACIT DIMENSIONS OF KNOWLEDGE AND THE LIMITS
OF THE COMMUNITY OF PRACTICE

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Abstract

Community of practice theory is inherently a social theory. As such it is distinct from more individualist accounts of human behavior, such as main-stream economics. It is, then, unsurprising that community of practice theory and economics tend to favor quite different accounts of knowledge. Taking a community of practice perspective, this paper challenges economists' attempts to reduce knowledge to information and to reject tacit knowledge as no more than uncoded explicit knowledge. The essay argues that Polanyi's notion of a tacit dimension had a profound affect on numerous disciplines (including economics) because it addressed aspects of learning and identity that the conventional social sciences had overlooked. The paper situates the core of knowledge, identity, and learning within communities and points to ethical and epistemic entailments of community practice. So doing it attempts to limit, rather than expand, the scope of community of practice analysis and to stress the difference, rather than the commonalities, between this kind of analysis and other apparently congenial forms of social analysis.

Keywords: community of practice; knowledge; codification; economics; practice theory; methodological individualism; social capital.

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In the fifteen years since its appearance, Lave & Wenger's (1990, 1991) notion of "community of practice"[hereafter, "CoP"] has developed a remarkably wide following. Its appeal owes a good deal to the seductive character of community, aptly described as a "warmly persuasive word" (Williams, 1976, p. 66). As Carlile & Østerlund (this issue) note, most citations of Lave and Wenger have focused on community and ignored practice. Yet it is practice that makes the CoP, the social locus in which a practice is sustained and reproduced overtime, a distinct type of community.¹ Practice is thus critical to CoP analysis. We should not, however, lose sight of the community. The CoP is inherently and irreducibly a social endeavor.

Inevitably, claims about its inherently social character put CoP theory at odds with individualist approaches to knowledge, found most noticeably in economics, where ideas of something irreducibly social are generally viewed with distaste. Hayek (1988) regards social a "weasel" word. Von Mises (1962) suggests that any dissent from economists' methodological individualism "implies that the behavior of men is directed by mysterious forces that defy analysis and description." Yet the force of von Mises's argument is itself a little mysterious. There is no logical reason why the rejection of methodological individualism entails mystical forces--though it may entail disagreements with economists. Other economists (Cowan, David, & Foray, 2000) have detected more mysticism in discussions of "tacit knowledge." In an attempt to locate much of the importance of the CoP in the tacit knowledge shared among its members, this paper thus advances its case primarily in contrast to economic claims for the theoretical sufficiency in accounts of human practice of explicit knowledge of individuals. The paper accepts that both notions--the CoP and the tacit--have been deployed with a fair amount of mysticism. But it argues that both, nonetheless, have residual analytical usefulness and raise important issues about learning that are overlooked by standard economic explanations. Thus the paper hopes to show how and where CoP theory can illuminate while economics perhaps cannot what Polanyi (1966) calls "the art of knowing."

It begins by exploring the tendency within economics to align

knowledge with information. It then examines the argument of Cowan et al. (2000) in some detail, questioning their confident substitution of the tacit with the explicit. Having argued that the tacit deserves a place in discussions of knowledge, the paper then explores this concept in the context of communities and networks of practice. Finally, it concludes that the features of CoP theory that make it insightful both limit the areas where it can be useful and restrict its compatibility with other theoretical viewpoints.

[/H1] Knowledge and Economists

Ideas of the "information" or "knowledge" economy have drawn many economists towards epistemological issues. Early pioneers such as Hayek (1937, 1945), Machlup (1962), and Arrow (1969) are no longer alone. One way knowledge has been made economically manageable has been to reduce it to information. This move burrows through awkward aspects of knowledge in search of some sort of fundamental particle that is economically tractable.² Cognitive and Computer Science have made parallel moves, concluding that human knowledge and machine information are ultimately one.³ Perhaps the most confident account of the economic demystification of knowledge comes from Simon, a computer scientist and economist:

All the aspects of knowledge--its creation, its storage, its retrieval, its treatment as property, its role in the functioning of societies and organization--can be (and have been) analyzed with the tools of economics. Knowledge has a price and a cost of production; there are markets for knowledge, with their supply and demand curves, and marginal rates of substitution between one form of knowledge and another (Simon, 1999, quoted in Ancori, Bureth, & Cohendet, 2000, p 256n).

If Simon is right, innovation, learning, and knowledge diffusion are no more problematic than the production and distribution of widgets. With the right incentives, knowledge will be produced, articulated, and shared without problem. All that remains is a little work for political economists.

Some economists remain less confident, finding awkward puzzles in the way people deploy knowledge and, to the exasperation of Cowan et al (2000), continuing to invoke the notion of tacit knowledge. Implicitly asking how can we exchange something that we can't articulate and may not even know we possess, tacit arguments fit uneasily within Simon's paradigm. Cowan et al attempt to mop up this recalcitrant rearguard and end, at least for economists, this flirtation with an economically problematic notion. They believe that the stakes are high: "The concept of the inextricable tacitness

of human knowledge forms the basis of arguments ...against ... every construction of rational decision processes as the foundation for modeling and explaining the actions of individual human agents" (p. 218).⁴ If the tacit survives as analytically defensible, not only Simon's models of knowledge, but also all economic models of human action might be at risk.⁵

[/H2] The Skeptical Economists

Cowan et al dub their critique "the skeptical economists [hereafter, "SE"] guide to 'tacit knowledge'" (p. 213). They motivate their discussion around a paradox in arguments for government-subsidized research. On the one hand, they say, subsidy seekers argue that because markets deal poorly with public goods like information, government intervention is necessary. Yet, when it is claimed that some nations will free ride on the research subvention of others, the same people (according to the SE) argue that tacitness makes innovative knowledge "sticky" and so prevents free riding. Knowledge, the SE argue, can't be both so "leaky" that markets fail, and yet so "sticky" that free riding fails. The source of this incoherence, they claim, lies in this quasi-mystical notion of tacitness. Champions of the tacit are guilty, the SE argue, of concluding that what they can't see must be inherently invisible. While a group of experienced colleagues may, in Polanyi's (1966) famous phrase, "know more than [they] can say," it does not follow what is left unsaid is fundamentally unsayable. Knowledge workers may lack incentives to overcome the "substantial marginal cost" of codification, but there is no ontological barrier between tacit and explicit.⁶

Scrutiny of this argument is difficult because the SE don't examine any economists who actually fall foul of this paradox. An earlier version of the essay (Cowan et al, 1999) pins blame on an odd Anglo-French group, Harry Collins, Michel Callon, and Bruno Latour and the three make a residual but barely explained appearance in the later paper. Not only do these three antagonists sit uneasily together, but none is an economist, and none is known for this argument. Another candidate might be the conservative scientist Kealey (p. 224 n 12), who does oppose government-subsidized R&D. He has already suffered a withering critique at the hands of one of the SE (David, 1997). Curiously, neither Kealey's spurious argument nor David's damning dismissal turn on the tacit. Furthermore, Kealey too --as David (1997) makes abundantly clear--is not an economist. In the absence of named protagonists, the SE's target has many of the

characteristics of a straw man.

There are reasons to doubt the force of the SE's argument. First, while inveighing against the idea of unarticulable knowledge, the SE dismiss it from their argument as "not very interesting" (p. 230) and instead discuss articulable knowledge and the conditions of its codification. Thus they beg the central question they purport to raise.

Second, while they report Polanyi talking of a tacit dimension to knowledge (p. 249, emphasis added), they fail to treat it as dimension putting tacit and explicit on a continuum ("Our focus has been maintained on ... the dimension along which codification appeared at one extremum and tacitness occupied the other," p. 249). Two dimensions and two ends of a continuum are, of course, distinct. Polanyi was arguing that the tacit is not reducible to the explicit. The SE are determined that it should be, hence their translation of dimension into continuum.⁷

Third, while lamenting that the tacit has come loose from "epistemological moorings" (p. 213), the SE themselves duck philosophical questions. For instance, they characterize Polanyi's epistemological argument as primarily a theory of perception. Equally, the SE allude to Ryle's (1949) famous distinction between knowing how and knowing that but don't bother to consult Ryle himself.⁸ Ryle, like Polanyi, argues that the two aspects of knowing are complementary, knowing how helping to make knowing that actionable. They are not, however, substitutable: accumulation of know that does not lead to knowing how. Know that we acquire in the form of explicit, codified information. By contrast, "we learn how," Ryle argues, "by practice" (1949, p. 41).

The idea that know that does not produce knowing how is important. Oakeshott (1967) talks of

The tacit or implicit component of knowledge, the ingredient which is not merely unspecified in propositions, but which is unspecifiable in propositions. It is the component of knowledge which does not appear in the form of rules and which, therefore, cannot be resolved into information or itemized in the manner characteristic of information (p. 167)

Such arguments highlight the philosophically problematic recursiveness implicit in the idea that knowledge can be transferred through codification. Codification cannot explain how we come to read new codes. If all we have is the explicit, then a new codebook must either explain itself or require another codebook to do the explaining. The argument is thus trapped between circularity (with codebooks explaining themselves) and an infinite regress (with codebooks explaining codebooks). Such explanations must, as

Wittgenstein (1958) argues, "come to an end somewhere" (p. 3e).⁹ Ryle points to another, irreducible kind of knowledge or activity that gets us started, that shows us how, and gives us, in Oakeshott's terms the necessary "judgment" to put rules into effect.¹⁰ Indeed, a chain of epistemological arguments stretching back to Socrates and the Meno suggests that codified knowledge, the explicit dimension, rests on an uncodifiable substrate that tells us how to use the code. In Aristotle words,

While it is easy to know that honey, wine, hellebore, cautery, and the use of the knife are so, to know how, to whom, and when these should be applied with a view to producing health, is no less an achievement than that of being a physician (Aristotle, 1908, Book V part 9)

Explicit knowledge, from this viewpoint, is not a self-sufficient base, but a dependent superstructure. "Into every act of knowing" Polanyi claims, "there enters a tacit ... contribution" (1958).

Thus while knowledge may include codified content, to be used it requires the disposition to apply it, which cannot itself, without risk of recursion, be propositional. As Fodor (1968) puts it, knowledge involves not simply [indeed not even necessarily] knowing how the thing is done, but knowing how to do it and the two are quite distinct. Explaining a joke is quite different from telling a joke. They may both play a part in the world of humor, but they are not equivalent or substitutable.

[/H2] Tacit appeal

In their eagerness to dismiss the tacit, the SE portray it as little more than a fad brought into economics by Nelson and Winter (1982) and rapidly blown out of proportion:

A notion that took its origins in the psychology of visual perception and human motor skills has been wonderfully transmuted, first from an efficient mode of mental storage of knowledge into a putative epistemological category (having to do with the nature of knowledge itself), from there into a phenomenon of inarticulable inter-organizational relationships and finally to the keys to corporate, and perhaps national, competitive advantage! (p. 223)

Rooting Polanyi in the "psychology of visual perception" ignores his struggle to understand scientific invention, though this is close to the SE's heart. (Polanyi was, of course, himself, a gifted chemist.) It also overlooks the immediate appeal of his idea in diverse fields, including linguistics (Chomsky, 1965), physics (Ziman, 1967), philosophy (Fodor, 1968), political science (Oakeshott, 1967), the sociology of economics (Coats, 1967), as well as economics (Richardson, 1972) a little later, but well before

Nelson and Winter.¹¹ All appear to have recognized that Polanyi addressed an absence not so much to do with the stock of knowledge within their field as with the acquisition and appropriate use of that knowledge. Indeed, this multidisciplinary eagerness reflects not so much the emergence of a new fad, but the dwindling of an old one--the time-honored faith, identified with the enlightenment but going back much further, in explicit, codified knowledge. This faith gave rise to a long pursuit of such things as the universal library and the complete instruction manual.¹² Championing the explicit to the exclusion of the tacit may threaten to take us back, not forward.

[/H1] A little learning

Learning throws light on the importance of the tacit for dealing with codified knowledge. It is impossible to specify and hence codify all the knowledge involved in even the most elementary practice (as Fodor (1968) points out, this would take us down to the level of firing neurons and beyond). Were it possible, it seems unlikely to be helpful. A brief list of all that is involved in tying a shoelace would overwhelm a learner. Despite the SE faith in explication, in instruction as in design there is great value in economy in the sense of leaving as much as possible unsaid (Kreiner, 2001; Brown & Duguid, 1996). But in considering codification, quantity is not the only issue. Quality matters as well, for it is not clear that codified knowledge is equivalent to the tacit knowledge it comes from. The codification of knowledge may be less a matter of translation (though translation itself is rarely innocent) than transformation, whereby the codified no longer serves the purpose of the tacit it replaces.¹³ Uncodified knowledge provides background context and warrants for assessing the codified. Background no longer works as background when it is foregrounded.

In learning situations, for example, it is not simply what mentors or teachers can say, but what he or she implicitly displays about the particular art, craft, or discipline. As a thought experiment, consider those enormously lucrative textbooks that in one "new" edition after another introduce economics students to the discipline. Curiously, their authors often continue teaching, many times prescribing the very textbook into which they have distilled their codified knowledge. If texts can contain the requisite knowledge, as the SE suggest, then this is surely an odd situation. It might be argued that these teachers deliberately keep some of their knowledge uncoded to give them a double stream of income, one from writing and another from teaching. That situation,

economics suggests, would surely act as an incentive for rivals to codify the missing knowledge in an alternative textbook that would find a ready market. Students armed with the complete knowledge in codified form would not have to pay the fees of the expensive universities where the star professors teach--or go to class at all. Yet economists continue to write and teach. One star economist (McCloskey, 1985) suggests why:

Economics is ... a matter of feeling the applicability of arguments, of seeing analogies ... of knowing when to reason verbally and when mathematically, and of what implicit characterization of the world is most useful for correct economics ... Problem-solving in economics is the tacit knowledge of the sort Polanyi described (p. 178).¹⁴

Indeed, the failings of many teachers can probably be attributed less to their lack of explicit knowledge of a discipline than to their inability to exhibit the underlying practice successfully. For all their disciplinary wisdom, teachers are usually unaware of quite what, from their students' perspective, is on display and of the "stolen knowledge" (Brown & Duguid, 1995) their students carry away.

The idea that knowledge people reveal in action complements what they reveal in precepts is again an old one. It penetrates the false dichotomy that opens the Meno: "Can you tell me, Socrates, whether virtue is acquired by teaching or by practice?" (Plato, 1953). It also helps explain the power of apprenticeship and why apprenticeship is not merely the preferred method of "manual" trades, but also of the higher reaches of academic disciplines. Polanyi noticed this about his own discipline:

The large amounts of time spent by students of chemistry, biology and medicine in their practical courses shows how greatly these sciences rely on the transmission of skills and connoisseurship from master to apprentice. It offers an impressive demonstration of the extent to which the art of knowing has remained unspecifiable at the very heart of science' (Polanyi, 1958, p. 55)

Hayek reports something very similar about his discipline:

We need to remember only how much we have to learn in any occupation after we have completed our theoretical training, how big a part of our working life we spend learning particular jobs. ...

Even economists who regard themselves as definitely above the crude materialist fallacies ... commit the same mistake ... toward the acquisition of such practical knowledge ... the reproach of irrationality ... (Hayek, 1945, p. 522]

But the political scientist Oakeshott perhaps best sums up the process:

And if you were to ask me the circumstances in which patience, accuracy, economy, elegance and style first

dawned upon me, [they came from] a Sergeant gymnastics instructor . . . not on account of anything he ever said, but because he was a man of patience, accuracy, economy, elegance, and style (Oakeshott, 1967, p. 176).

Oakeshott reflects Ryle's (1949) argument that to do something patiently, accurately, economically, elegantly or stylishly does not involve two processes--an act and a "mental" monitoring, each of which can be specified in a set of rules. (In organizational literature, Weick, Sutcliffe, & Obstfeld's (1990) notion of "mindfulness" echoes Ryle's insight.¹⁵) Further, Oakeshott emphasizes that transferring knowledge, particularly to newcomers, involves more than transferring codified knowledge. Declarative statements are always underconstrained--usefully so, if our argument that voluminous explicit information is more likely to increase uncertainty than reduce it. Suffering from problems of self-referentiality, no text is able to determine the principles of its own interpretation. Or, to put it another way, all are open to multiple interpretations. Approaching a text as sincere or ironic yields two diametrically opposed interpretations of its meaning (a problem which famously landed Daniel Defoe in the stocks). A tacit understanding of the ground rules for interpretation thus plays a role in grounding a particular interpretation of a text--a facet of interpretation that originates outside the text to be interpreted.

[/H1] Interpretive communities

Which interpretation is seen as appropriate depends not on the text, but on the nature of the community making the interpretation (Fish, 1994). As Arrow (1974) and Leonard and Sensiper (1998) point, the same knowledge is used in quite different ways in different occupational communities, much as the bible finds radically different interpretations among different sects. Consequently, as teachers induct students into their discipline, they spend a great deal of time showing students how to read, for this is not simply a matter of learning to decode a text in the abstract, but of learning to decode from the perspective of that discipline (which is why we should not be too hard on those economists who teach from their textbooks).¹⁶ The knowing how involved, CoP theory suggests, is the product of communities of practice.

[/H2] The Community of practice

Talk of learning, apprenticeship, and communities helps to bring discussion back to the CoP. This, as noted, was introduced as a theory of learning, drawing much of its evidence from studies of

apprenticeship (Lave & Wenger, 1991). Within a CoP, knowledge is instantiated dynamically in what Giddens (1984) calls knowledgeability, including "all the things which actors know tacitly about how to "go on" in the context of social life without being able to give them direct discursive expression" (p. xxiii). Membership of the CoP offers form and context as well as content to aspiring practitioners, who need not just to acquire the explicit knowledge of the community but also the identity of a community member.¹⁷

Thus learning in the sense of becoming a practitioner--which includes acquiring not only codebooks but the ability to decode them appropriately--can usefully be thought of as learning to be and contrasted to what Bruner (1996) calls "learning about."¹⁸ The former requires knowing how, the art of practice, much of which lies tacit in a CoP. Learning about only requires the accumulation of knowing that, which confers the ability to talk a good game, but not necessarily to play one. Transforming knowing how into knowing that, the tacit into its nearest explicit equivalent is likely to transform learning from learning to be into learning about. The CoP's knowledge, in tacit or explicit form, may be distributed across the collective and their shared artifacts rather than held by or divisible among individuals (Hutchins, 1995). Within the CoP the knowing how of the community, not merely of an individual is on display.

[/H2] Networks of practice

Because tacit knowledge is displayed or exemplified, not transmitted, in most circumstances, a CoP is likely to involve face-to-face interaction.¹⁹ Of course, not all practice is local. In many areas, the practice is shared widely among practitioners, most of whom will never come into contact with one another. The network of practice designates the collective of all practitioners of a particular practice. For example, Knorr-Cetina's (1999) "epistemic culture" of high-energy physicists constitutes a global NoP that has within it multiple local CoPs. Though practice is not coordinated within a NoP as it is in a CoP, common practices and common tools allow distant members to exchange global know that and to reembed it (Giddens, 1990) in effective, coherent ways through the mediation of their locally acquired knowing how.²⁰ Consequently, where practice precedes it, explicit knowledge may appear to have global reach (or to be "leaky"). Where it does not, the same knowledge may appear remarkably parochial (or to be "sticky").

The central distinction between the CoP and the NoP turns on

the control and coordination of the reproduction of a group and its practice. Newcomers enter the network through a local community. You become an economist by entering an economics department in Chicago, or Berkeley, or Columbia--a route that may mark you for life, in part because the tacit knowledge of the local community profoundly shapes your identity and its trajectory.

[/H1] Epistemic and ethical dimensions of practice

Economistic explanations of knowledge diffusion focus on the codification of knowledge (Cohendet & Steinmueller, 2000), access to information (Mokyr, 2002), reduction of transaction costs (Williamson, 1981), and the specification and protection of private interests (Coase, 1988; North, 1981). The practice perspective modifies these assumptions along two distinct dimensions. On the one hand, there are difficulties around what knowledge people can meaningfully share. Such involuntary barriers to sharing might be thought of as epistemic entailments of practice. On the other, there are also difficulties concerning what people will share--not everything has its price. Local communities and even disaggregated networks of practice may simply not want to share, or they may not want to hide what they know. These voluntary constraints on sharing can be thought of as the ethical entailments of practice. These entailments distinguish the "can/can't" of knowledge flow from the "will/won't." The tacit dimension of a practice's knowledge--knowing how's shaping of propriety, rather than know that's suitability as property--profoundly shapes these entailments. Knowledge, that is, may stick or flow for epistemic and ethical rather than just economic reasons.

[/H2] Epistemic entailments: can/can't

Divisions of labor lead to Hayek's (1945) divisions of knowledge, which create distinct epistemic cultures. Within such cultures, explicit knowledge can travel and remain actionable; between, it usually cannot without difficulty. Economists generally acknowledge epistemic barriers between large cultural groups, between, for example, Europe and Asia. They seem less willing to consider them on a smaller scale, yet barriers seem to occur at the level of the CoP. Within CoPs or NoPs the potential for flow is high. Shared knowing how, produced by shared practice, creates the possibility of productive sharing of knowing that. But when the practice and knowing how of two communities are different, epistemic barriers develop and productively sharing knowing that becomes much more challenging--even when the different practices lie together within an

organization (Bechky, 2003; Carlile, 2002).²¹ Explication or codification does not solve the problem.²²

[/H2] Ethical commitments: will/won't

Arguments like Simon's above or Teece's (1986) about "regimes of appropriation" assume that financial incentives will prevent those who have competitive knowledge from sharing it with those outside the regime. Yet people will sometimes share what self-interest predicts they hold secret, and conversely will not share, despite encouragements, when it expects them to reveal. Whether they will or won't share may be determined by the ethical considerations reflecting a community's standards of propriety.

The idea that practice develops community standards that rise above self-interest is an old one. Marx and Engels (1978) argued that those among whom labor is divided develop a "communal interest" (p. 53). Durkheim (1960) argues that "the division of labor becomes a predominant source of social solidarity at the same time it becomes the foundation of the moral order" (p. 333). More recently, MacIntyre (1981) has argued that "the self has to find its moral identity in and through its membership of communities" (p. 205).²³ Thompson (1971), following Marx, suggests that such social groups will resist, in the name of their moral interests, appeals to their economic interests.²⁴ In all, if we want to understand individual's capacities and motives for sharing knowledge, we need to look not just at the knowledge, but at the communities in which their knowing how was shaped.

[/H1] Conclusion: Paradox resolved?

Though the route has been a long one, we might now be in a position to resolve the paradox that motivated the SE critique without needing to reject the tacit all together. To understand the distribution of knowledge, we should not look at knowledge à la Simon, as if it were a widget whose production and consumption could be modeled without reference to producers or consumers. Know that, as explicit, codified propositions, probably can be modeled this way. But it cannot usefully be isolated from the knowing how that makes it actionable.

For the SE, economic arguments about knowledge appear incoherent when, on the one hand, protagonists claim that knowledge causes markets to fail because it is a public good; yet on the other, the same protagonists apparently maintain knowledge production merits subsidy and resists free riders because knowledge is not a public

good. In short, knowledge appears to be both "leaky" (Liebeskind, 1996) and "sticky" (von Hippel, 1994). The argument, however, focuses on knowledge independent of knowers and the situation in which knowledge is used. It is different knowers and their knowing how that turns the same knowledge from sticky to leaky.²⁵ The ability to read gives any competent users of a language access to knowledge codified in that language. But access to that explicit knowledge does not confer the ability to put it into appropriate use. Tacit knowledge, which confers that ability, is by contrast with the explicit and codified remarkably sticky.

Knowledge paradoxes arise, then, by confusing the dimensions of knowledge or by assuming that we can substitute one for the other without problems. Nowhere, perhaps, is this more evident than in the endless problems of "best practice" diffusion. On the one hand, theorists of "best practice" put their finger on the essential point: practice is critical. On the other, they regularly attempt to move a best practice from one community to another by codifying and circulating the explicit knowledge. What, of course, is truly critical is the knowing how embedded in the practice and wrapped around with ethical and epistemic commitments. Without these--and these are admittedly very hard to transfer--the explicit is worth relatively little. Many have tried to imitate the form of Toyota's production methods; few have managed to replicate the quality of its practice.

Codification is remarkably powerful, but its power is only released through the corresponding knowing how, which explains how we get to know and learn to do. Because it is not so economically tractable, the SE try to dismiss this knowing how as readily substitutable by the more compliant know that. The argument leads them, this essay argues, to attend to what people can say but to overlook what they can do; to be able to describe what people know, but not account for how they come to know; to be able in theory to quantify a person's knowledge, but not to assess its quality. In making their case, the SE have mapped a very important part of the terrain of knowledge (see Cowan et al., 2000, fig 2), but not all. In particular, they have failed to show how we get access to the terrain and what we can do when we get there.

This argument attempts to reveal limits in some economist's accounts of knowledge. At the same time, it exposes limits to CoP analysis, which has occasionally been stretched well beyond its capacity. By emphasizing how CoP theory differs from more individualist social sciences, the argument also intimates limits to the theory's compatibility. To recap, the argument proposes a theory of knowledge

acquisition rooted not in the epistemological stocks of individual heads, but in the flow of practice within communities. Communities, it holds, have emergent properties that, while they are no doubt the outcome of individual actions, amount to more than the sum of those actions and more than the amortization of transaction costs. If this is right, then CoP theories may not fit well with approaches to work and knowledge that, at least on the surface, appear congenial.

For example, Cohen and Prusak (2001) highlight similarities between CoP and social capital theories. Social capital [SC] theories draw attention to networks of individuals that help to embed economic interactions in social relations (Polanyi, 1957; Granovetter, 1973, 1985). Through social exchanges, people build webs of trust (Fukuyama, 1995; Putnam, 1993, 2000), obligation, reputation, expectations, and norms (Coleman, 1988). In these webs, SC theory suggests, people are willing and able to share knowledge and coordinate action. Most CoP theorists would go along with these claims, but some would pause at the word "able." That is, CoP analysis accepts the importance of social capital networks to understanding why people will and will not share. But it makes a distinction between people's willingness to share and their ability to share, suggesting that people have to engage in similar or shared practices to be able to share knowledge about those practices. Thus, where SC theory points to unseen links, CoP theory points to unseen boundaries--boundaries shaped by practice--that divide knowledge networks from one another. These boundaries may prevent communication despite all the obligations of good will and social capital that connect them or, indeed, all the incentives of financial capital that may entice them. Indeed, while advancing the social, a good deal of SC theory has nonetheless remained fairly close to its roots in economics (residual in that word capital).²⁶ This has a couple of implications. First, SC theorists' focus on "rational actors" (Coleman, 1988) portrays social groups as little more than "combinations" of individuals (Nahapiet and Ghoshal, 1996). So, while SC analysis encompasses a broad array of social groups, including such things as firms, bowling leagues, housing organizations, and families, the CoP perspective, by contrast, limits itself to communities and networks where practice is coordinated or at least shared. Second, while some SC theorists, again like economists, view the sharing of knowledge as little more than the exchange of "information that facilitates action" (Coleman, 1988, p. 104) between individuals, and is primarily determined by ties, strong or weak, and good will, CoP theory suggests the challenge of communication is more complex. SC focuses primarily on the circulation of knowledge promoted by what is here called the ethical

commitment of the people involved. But, from the point of view of CoP theory, it overlooks the corresponding epistemic commitment. If that, too, is not shared--as it is among CoPs and NoPs, but not necessarily among SC networks--then, in the end no amount of bowling together will bring about shared, actionable knowledge.

These distinctions are not made to vaunt the superiority or even hegemony of CoP theories over rivals. CoP theory, as has been suggested above, only addresses certain topics involving quite special types of community and networks. SC is much broader and economics, of course, broader still. Indeed, this essay deliberately seeks to restrict the application of CoP theory, pointing instead to other theories that are less limited and more adaptable. It is hoped, however, that the edges of CoP theory thus narrowed will provide a sharper analytical tool that can tell us more about the "art of knowing."

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- 1 It is this sustenance and reproduction of practice through the opposing demands of continuity and displacement that give COPs their interdependent tension and dynamism. Nonetheless, the notion has repeatedly been applied to transient, cross-functional teams and miscellaneous work groups. See, for example, Nonaka (1994).
- 2 Habbes-Grey (2002) portrays information as a fundamental particle. The commonplace notion that there is an ascendancy from data through information to knowledge appears regularly in the economics literature (Ancori & Cohendet, 2000). Tuomi (2000) exposes flaws in the argument.
- 3 Shannon and Weaver (1964) note that the technical sense of communication is indifferent to meaning. The technical notion suggests that information reduces uncertainty; many who have to deal with the "tsunami of information" in the current "flux" (Steinmueller, 2000, p. 373) understandably assume the opposite. Applying the technical notion to human practice assumes that humans are Turing machines, a complex claim which needs to be argued rather than assumed (Floridi, 1999).
- 4 Page numbers refer to Cowan et al. (2000) unless otherwise noted.
- 5 While this paper does attempt to defend the tacit from this attack, I am more sceptical than the SE and do not hold that such a defence threatens the foundations of economics.
- 6 The paradox--though not its political implications--is suggested in Winter (1987) and addressed directly in Brown & Duguid (2000, 2001). Intriguingly, Polanyi, the indirect target of the SE was very interested in the political issues. See Polanyi (1944).
- 7 The economic historian Mokyr (2002) clearly recognizes the dimensional, irreducible character of tacit knowledge ("Tacit knowledge and formal or verbal knowledge should not be thought of as substitutes but as complements" (p. 73)).
- 8 Ryle is often misread, perhaps most egregiously by Nonaka (1994) and Nonaka & Takeuchi (1995).
- 9 See also Wittgenstein (1958), pp. 19e, 29e and 40e.
- 10 The SE concede that "Successfully reading the code ... may involve prior acquisition of considerable specialized knowledge (quite possibly including knowledge not written down anywhere)" (p. 225). They give no explanation, however, of how such acquisition occurs. See also pp. 232 note 18 and 233.
- 11 Richardson (1972), who discussed the terrain between market and hierarchy early and with insight, notes, "Technology cannot always be transferred simply by selling the right to use a process. It is rarely reducible to mere information to be passed on but consists also of experience and skills. In terms of Professor Ryle's celebrated distinction, much of it is 'knowledge how' rather than 'knowledge that'" (p. 895).
- 12 Diderot and D'Alembert's encyclopaedia is the cynosure of enlightenment codification, but such things as Moxon's "exercises" (1693) offer earlier examples. See also Davis (1975). For early belief in a universal library and its rebirth in the digital age, see O'Donnell (1998). Philosophically, logical positivism perhaps marked the end of this confidence in the exclusive character of explicit knowledge, though clearly it lived on in economics.
- 13 The multiple terms Nonaka (1994) uses to try to encompass the process of translation hint at some of the problems inherent in the notion. As well as translating and transforming, these include externalizing, converting, interacting, interchanging, articulating, merging, shifting, entangling, resolving, transferring, harmonizing, crystallizing.
- 14 Endorsing Ryle's notion that these things come with practice, McCloskey ends by admonishing students with a very old joke situated insightfully for a new domain:
How do you get to the Council of Economic Advisors?' ... 'Practice, practice (McCloskey, 1985, p. 178).
- 15 Ryle's argument raises some questions about Argyris and Schön's (1978) notion of "second loop learning." See also Giddens's (1984) Rylean discussion of reflexive monitoring, which concludes
Understanding is not a mental process accompanying the solving of a puzzle.... It is simply being able to apply the formula in the right context" (p. 20).
- 16 David's (1997) critique of Kealey, for example, rightly scolds Kealey, a biochemist, for failing to read economics literature as an economist would.
- 17 While "identity" can seem unpleasantly "soft" and far distant from hard-headed economic analysis, it's importance is stressed in Kogut & Zander's (1996) influential essay.
- 18 Compare Aristotle's comment above that knowing when and how to apply treatment is "no less an achievement than that of being a physician" [emphasis added].
- 19 See Giddens (1984) and in particular his use of Garfinkel's theory of "facework." See also Orlikowski (1992, 2002). (Orlikowski has been centrally instrumental in introducing Giddens's work to organizational studies and this paper is particularly indebted to her.)
- 20 The looseness of coordination within a NoP allows for innovation through epistemic speculation.
- 21 Alternative means to bring two different communities into alignment though not necessarily understanding include routines (Nelson & Winter, 1982), boundary objects (Star & Griesemer, 1989), and the price mechanism (Hayek, 1945).
- 22 Whitehead's joke about Principia Mathematica--he claimed to understand every word but not one of the sentences--suggests the limits of codification.