



Management knowledge and knowledge management: realism and forms of truth

John Mingers¹

¹Kent Business School, University of Kent, Canterbury, U.K.

Correspondence: John Mingers, Kent Business School, University of Kent, Canterbury, Kent, CT2 7PE, U.K.
Tel: +44 1227 824008;
E-mail: j.mingers@kent.ac.uk

Abstract

This paper addresses the issue of truth and knowledge in management generally and knowledge management in particular. Based on ideas from critical realism and critical theory, it argues against the monovalent conceptualization of knowledge implicitly or explicitly held by many authors and aims instead to develop a characterization that recognizes the rich and varied ways in which human beings may be said 'to know'. It points out and conceptualizes a fundamental dimension of knowledge that is generally ignored or cursorily treated within the literature, that is, 'truth'. It identifies four forms of knowledge – propositional, experiential, performative and epistemological – and explores their characteristics, especially in terms of truth and validity. It points out some implications for knowledge management.

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Introduction

Although knowledge management (KM) has established itself as a *bona fide* subject both in practice (Grover & Davenport, 2001) and in the academic world (Schultze & Leidner, 2002), there has been, and remains, considerable debate about the fundamental concepts of 'knowledge', 'information' and even of 'data'. In some ways this should not surprise us as the same thing may be said at the level of management research as a whole. Management as a discipline has the aim of generating valid knowledge but has been schizophrenic as to how this should be achieved at least since the time of Burrell & Morgan's (1979) *Sociological Paradigms and Organizational Analysis*. Different paradigms or, as Deetz (1996) terms them, discourses make radically different assumptions in terms of ontology, epistemology and methodology, thus generating competing views as to what might be taken as knowledge. It has become commonplace to identify at least four such discourses – positivism (empiricism), interpretivism (constructionism), critical and postmodern (Jackson, 2000, 2005).

It can be argued that the stand-off between positivism and interpretivism has been ameliorated (Mingers, 2004a) in favour of some form of pluralism, either one that simply accepts the validity of different paradigms (e.g., Robey, 1996; Jackson, 2000) or one that seeks actively to combine research approaches (e.g., Tashakkori & Teddlie, 1998; Goles & Hirschheim, 2000; Mingers, 2001a). However, where does this leave the question of knowledge? Are there different forms of knowledge depending on the paradigm in use? And how does this relate to truth, which is supposedly an essential characteristic of knowledge as opposed to mere belief?

This paper will address these issues from a particular perspective, that of *critical realism* (CR) as developed primarily by Bhaskar (Bhaskar, 1978, 1979; Archer *et al.*, 1998).¹ This philosophy accepts aspects of both positivism and interpretivism but maintains a strongly realist and critical core. We will contextualize the argument by considering a recent debate between Meckler & Baillie (M&B) (2003a,b) and Gioia (and others) (Gioia, 2003; Lounsbury, 2003; Ryan, 2005), and particularly a response by Hunt (2005). M&B proposed a 'middle way' between strong positivism and strong constructionism based, in part, on a form of correspondence theory and Searle's (1996) set of distinctions between epistemic and ontological objectivity and subjectivity. Gioia strongly attacked this as simply a way of assimilating interpretivism to positivism. Hunt essentially backed M&B by arguing the case for scientific realism (as distinct from CR mentioned above) and a particular conception of truth intimately related to trust.

The argument of this paper is in broad agreement with Hunt except that I would wish to maintain a more polyvalent view of truth, and therefore knowledge. Put simply, I accept the ontological claims of realism for the existence of a subject-independent and causally efficacious world. But, I argue, within this world there are substantively different kinds of things that can be the objects of knowledge to which we have different forms of epistemological access. Thus, there is neither one kind of knowledge nor one kind of truth.

The paper begins with a brief review of M&B's debate and particularly Hunt's response. It then reviews conceptions of knowledge within KM and points out their limitations, not least the lack of connection to truth. The next section describes various theories of truth, focusing on ideas from CR and the recent work of critical theorist Jürgen Habermas (2003). Following this, I show that there are many ways in which we validly talk of 'knowing' something and identify some dimensions that underlie all of them. One of these dimensions is that of truth or, more generally, warrantability or justification. This is essential in distinguishing knowledge from mere belief or assertion. I then bring these threads together to present a typology of four distinctively different forms of knowledge, each with different possibilities of truth or warrantability. Finally, I consider the implications of this theory for both KM and management knowledge.

The realism debate

M&B (2003a) project was to develop a position in between constructionism (or postmodernism as they sometimes, perhaps incorrectly, called it) and positivism. They wanted to maintain the notion of truth as a broad

correspondence between statement or beliefs about the world and the way the world 'actually is' without accepting some direct, positivistic, relation between sentences and facts. Their main aim, and most of their paper, was actually directed against what they took to be the constructionist view (Astley, 1985) that there could be no objective truth since the product of social research was only ever further concepts and theories, never statements that could be made true (or false) by some external reference. Truth was always socially constructed. M&B did accept that the world of social facts and events was humanly constructed, but drew on Searle's (1996) work to argue that the social world was ontologically subjective but still potentially epistemically objective.

Gioia (2003), in a vituperative response, sees it all as a plot to assimilate constructionism back into the positivist fold. The central disagreement can be described quite simply. For M&B there is a reality of facts and events (accepting the differences between physical and social) and a humanly constructed world of beliefs and theories that may be true or false in relation to that reality. Gioia accepts that things do exist and events do occur, there are indeed 'facts', but these in themselves are uninteresting or perhaps irrelevant until they become part of the social world through interpretation, discussion and debate. For Gioia it is this world of belief and interpretation that is real, not the facts in themselves. 'The actions, events, observations, and so forth might be common, but those are mere *data* from which the interpreted world is assembled. ... The world we deal with is the *interpreted world*, not the world rendered in objective facts' (Gioia, 2003, p. 287, original italics).

Reality, or at least *social* reality, is only that which results from peoples' interpretations, and therefore truth must be bound to that reality as well. It is either the relative truth of different interpretations and valuations, or, on occasions, 'an intersubjectively agreed truth arrived at by negotiated consensus' (Gioia, 2003, p. 288). I will discuss this later in terms of Habermas's consensus theory of truth.

Hunt (2005) is generally sympathetic to M&B's argument but feels that their Tarskian theory of truth is impoverished and so he presents a more sophisticated version based on scientific realism (SR). For Hunt, SR is based on four principles: (i) classical realism, which maintains that the world exists independently of its being perceived or represented; (ii) fallibilistic realism, which accepts that knowledge can *never* be known with certainty – it will always be fallible; (iii) Critical realism,² which maintains that because of (ii) we must always critically evaluate our theories; and (iv) inductive realism, which holds that the long-run success of a theory does provide evidence that something like that described in the theory must be the case.

¹Although we are mainly interested in Bhaskar's philosophy of science, CR is becoming influential in organization theory (Ackroyd & Fleetwood, 2000; Fleetwood & Ackroyd, 2004), sociology (Archer, 1995; Brown *et al.*, 2002; Danermark *et al.*, 2002) and economics (Lawson, 1997).

²'Critical realism' as mentioned here is not the same as Bhaskar's CR to be discussed later in the paper.

From this Hunt develops a 'model' (not really a definition) to explain what we might mean by saying 'Theory X is likely to be true' (because of (ii) above we cannot be certain that Theory X is true). The model presumes some theory (containing entities, attributes and structures) about the world. The theory has certain implications such as explanations or predictions that can be compared with the external world. These comparisons will result in successes or failures that reflect back on the theory. It is also recognized that the theory (or rather its implications) may have direct effects on the world through changing peoples' beliefs and behaviours. It is, then, the relative proportion of successes and failures that gives us cause to believe or not believe in the theory. The greater the proportion of successes, the more likely it is that something similar to the theory must actually exist.

Hunt then connects this idea to trust through the work of Harré (1986), who argued that, since we could never know for certain, in practice communities of scientists relied on trust. Rather than certain knowledge they trade in trustworthy knowledge that which they accepted is genuinely believed, for good reasons, by their colleagues. For Hunt, this means that it is imperative that valid knowledge should have some grounding in the external world rather than being wholly internal to a particular discourse.

The argument that I wish to put forward is that both M&B and Hunt have a singular or monovalent view of truth and knowledge. That is, that there is only one type of truth – some weak form of correspondence between theories or beliefs and an external world; that there is only one way of evaluating truth; and that there is, therefore, only one form of knowledge assuming that truth is an essential attribute of knowledge. In contrast, I suggest that there are several quite distinct forms of knowledge and correspondingly different ways in which truth claims may be redeemed and different ways in which knowledge may be generated (van der Walt, 2006).

Knowledge management

The discussion so far has been at the level of management knowledge in general, that is, the knowledge produced by management research, but to focus the debate I want to discuss one particular area of management, that of KM. This is an interesting domain to consider for two reasons. First, as its object is in fact knowledge itself we might expect that it would be particularly concerned about clarifying and defining the nature of knowledge and equally truth. Second, KM is interested not only in academically produced knowledge but also in the everyday, practical knowledge of managers and employees. This forces us to consider knowledge in a wider sense than just the output of academic research.

Within KM, it is conventional (Boisot, 1995; Davenport & Prusak, 1998; Bell, 1999; Freeman, 2001) to draw up a ladder from *data* to *information* to *knowledge* – what Tuomi (1999) calls the knowledge hierarchy. This is mirrored historically within information systems in the

move from *data* processing to *information* management to KM. To give some examples, for Davenport & Prusak (1998) *data* are discrete facts about the world, which in themselves are meaningless; *information* is data that has been processed or interpreted within a particular context to inform or reduce uncertainty; while *knowledge* is information that is even more valuable because of the addition of insight, experience, context or interpretation (Grover & Davenport, 2001). Others who use the same basic model define knowledge in different ways. For example, knowledge is that which enables us to assign meaning to data (van der Spek & Spijkervet, 1997); knowledge consists of truths, beliefs, concepts, judgements and expectations (Wiig, 1993); or knowledge is tested, validated and codified information (Earl, 1994). Müller-Merbach (2004b) points out that one can trace a similar distinction between knowledge and information as far back as Plato.

Tuomi (1999) actually argues the case for a reversed hierarchy, namely that knowledge precedes information, which in turn precedes data. On this view, knowledge becomes articulated within a verbal and textual context to form an information structure. This may be embodied as a document, a diagram, a data structure or information system. Once this has become totally defined the 'meaning' of the information is essentially fixed and this allows it to be populated or instantiated with items of data that would, by themselves, have no meaning at all. Put the other way round, data cannot exist without a pre-defined semantic and syntactic structure, which is information; and information is the articulation or explication of knowledge. Müller-Merbach (2006a) suggests information, knowledge and *opinion*, where information is stored knowledge, and opinion expresses subjective values.

Other authors have developed more complex categorizations of knowledge (Marshall & Sapsed, 2000). Miller *et al.* (1997) concentrate on what the knowledge is about and specify know-what, know-why, know-how, know-who and experiential knowledge that can involve any of the others. Blackler (1995), drawing on Collins (1993), focuses on where the knowledge is situated and distinguishes between knowledge that is embrained (cognitive), embodied (perceptual), encultured (social), embedded (systematized) and encoded (formal or symbolic). This has been applied empirically by Thompson & Walsham (2004). Other classifications have been suggested by, for example, Winter (1987), Fleck (1997) and Benson & Standing (2001). Many writers (e.g., Stenmark, 2001; Tsoukas & Vladimirou, 2001) refer to the distinction between tacit knowledge and focal knowledge originated by Polanyi (1958) and popularized by Nonaka & Takeuchi (1995).

However, as has been pointed out by many commentators (Swan & Scarbrough, 2001), the nature of knowledge itself is highly debatable and several authors are critical of the whole emphasis on knowledge as some objective, commodifiable entity. Alvesson & Kärreman (2001, p. 995) argue that knowledge 'is an ambiguous,

unspecific and dynamic phenomenon, intrinsically related to meaning, understanding and process and therefore difficult to manage'. Marshall and Sapsed (200, p.12) emphasize the 'importance of considering knowledge not simply as a stable and unproblematic object that can be effectively decontextualized and freely circulated, but as a complex, dynamic, and situated series of processes'. In addition, they go on to argue that knowing is essentially active – to be able to act effectively within a social situation. Jakubik (2007) identifies four emerging views of knowledge: the ontological view, which is concerned with the nature and location of knowledge; the epistemological view, which is particularly concerned with the production and justification of knowledge; the commodity view, which sees knowledge as a resource for the organization; and the community view, which focuses on knowledge as a social construction.

In practice, though, the overwhelming approach within KM is to take a resolutely functionalist reading of knowledge as Schultze & Leidner's (2002) research showed. They classified research articles on KM between 1990 and 2000 into one of Deetz's (1996) four discourses of management: normative (functionalist), interpretive, dialogic (postmodern) or critical. Of the 75 papers, 71% were classified as normative with a further 25% being interpretive. Schultze & Stabell (2004) look at the contradictions involved in trying to manage tacit knowledge through Burrell and Morgan's four paradigms.

There is no space in one paper to provide a detailed critique of all these approaches to the definition of knowledge and information, so I shall make some general points that will illustrate what I see as their weaknesses.

With respect to the various versions of the knowledge hierarchy, I would argue that they all suffer from inadequate and unclear conceptualizations of the nature of information and its possible relationships to knowledge. Mingers (1996) carried out a thorough survey of existing theories of information, many based in some way on Shannon & Weaver's (1949) information theory, including socially sophisticated models such as Mackay (1969) and Luhmann (1990). These theories were evaluated in terms of four criteria: the generality of the theory, the pragmatic usefulness for information systems, the degree of integration with other disciplines and lastly the correspondence with everyday usage. The approach that was judged most successful was that of Dretske (1981) and this formed the basis of a new theory of information and meaning (Mingers, 1995). This theory used Dretske's idea of knowledge and the flow of information but incorporated concepts from Habermas's (1978, 1984, 2003) theory of communicative action and Maturana *et al.*'s (1995) cognitive theories embedded within a critical realist philosophy (Mingers, 2004c).

With respect to Tuomi's reversed hierarchy, there are aspects of this that are valuable. Clearly, knowledge does structure that which can be information for us, and conditions the amount or extent of knowledge that is available from a particular source. For instance, as Polanyi

(1958) has shown, gaining information from an X-ray requires considerable knowledge. Equally, data does rely on a pre-existing and consensual semantic and syntactic structure for it to be effective as data. However, I will argue that we need both hierarchies – data can carry information and, in certain circumstances, this information can then generate knowledge. At the same time a subject's knowledge alters the information they can receive, and allows them to access the information in the first place. We thus need more of an interactive view.

With regard more specifically to theories of knowledge, there are three general problems. First, there are a large number of papers that take a simplistic and unquestioning view of knowledge as an objective commodity and often do not even bother to define what they mean by knowledge. Second, those authors who do recognize different forms of knowledge point out particular and partial sets of distinctions based on the object of knowledge, the form of knowledge or the location of knowledge and do not thereby do justice to the richness of ways in which we talk of 'knowing'. Third, and particularly important for this paper, almost none of the literature considers the relation of knowledge to truth.

Truth

One of the most traditional debates in philosophy has been that of epistemology – that is the study of knowledge (*episteme*) as opposed to mere belief or opinion (*doxa*). When are we entitled to say *I know* something rather than merely *I believe* it? We may all believe certain states of affairs to be the case, or that we know how to do certain things, but ultimately in order to be *knowledge*, these beliefs must be testable or able to be validated in some way; that is, there must be grounds for them to be considered to be *true*.

It is interesting and perhaps indicative of the field that there is almost no discussion at all, within the KM literature, of the problems of truth or warrantability. The assumption seems to be made that either knowledge is no different from any other cognitive category such as thought or belief, or that determining whether something is or is not knowledge is outside the scope of KM. Even one of the founders of KM, Machlup (1980), went in this direction. Having produced an informed discussion of varieties of truth and truth seeking, and discussed other aspects of the quality of knowledge such as beauty (aesthetics) and ethicality (axiology), he declared that such issues were largely irrelevant to his task of analysing the production and distribution of knowledge (p. 117).

Freeman (2001), whose paper titled 'IS Knowledge: Foundations, Definitions and Applications' seems to promise some answers, defines knowledge loosely as 'information that has been validated and is thought to be true' with no consideration of what being true might mean. Von Krogh & Grand (2000) are concerned with organizational knowledge, and in particular the way in which new knowledge comes to be accepted or rejected by an organization especially where it contradicts the

existing knowledge base. Baskerville & Dulipovici (2006), in another 'review of the theoretical foundations' type of paper, can only say that 'knowledge is a fluid mix of framed experiences, values, contextual information, and expert insight', and is distinguished from information (quoting from Wiig 1993) 'by the addition of "truths, beliefs, perspectives and concepts, judgements and expectations, methodologies and know-how"'. That certainly covers everything then!

Tell (2004) recognizes that knowledge requires some justification for it to be knowledge. He does not look to theories of truth for this, but instead he looks at the contexts within which particular knowledge claims may be justified. He recognizes two dimensions to this: external *vs* internal and procedural *vs* performative. External justification relies on reference to some causal reality external to the knowing subject while internal justification depends on the extent to which a belief is coherent with other beliefs and assumptions that already exist. With procedural justification, valid knowledge is generated by the extent to which a particular procedure or methodology is followed. Classically, scientific knowledge receives its justification from being the result of a scientific method. In contrast, knowledge justified by performance does not stem from following rules and procedures but from imagination, intuition, action and ultimately performative success. Tell than uses these distinctions to demarcate four forms of knowledge: objective, subjective, personal and organizational.

General theories of truth

I will now summarize the main theories of truth as found in philosophy before considering in more detail the theories of truth coming from CR and Habermas. Note that most theories concern the truth of propositions about states of affairs in the world.

The most common view, in Western philosophy anyway, is that knowledge is *justified, true belief (JTB)*. This stems from Plato's *Theaetetus* where Socrates argues that:

When, therefore, anyone forms the *true opinion* of anything without rational explanation, you may say that his mind is truly exercised, but has no knowledge; for he who cannot give and receive a reason for a thing, has no knowledge of that thing; but when he adds rational *explanation*, then, he is perfected in knowledge (my emphases).

Socrates was sharp enough to point out later the self-referential difficulty of 'knowing' what is a rational explanation. These three conditions have been taken to be both necessary and sufficient for a proposition to count as knowledge. In other words, to validly assert 'I know that p ...' implies:

- You must sincerely believe that p is the case.
- You must have justifiable grounds, evidence or explanation for p.
- p must, indeed, be true.

Although this sounds clear, there are in fact many problems with each condition as well as their conjunction. For instance, there is much debate about what would constitute proper justification for such a belief – empirical evidence, rational argument, personal experience, perception or what? How in any case can we determine if something is actually true? There are a whole range of theories of truth – correspondence, confirmation, coherence or consensus, not to mention sceptics (e.g. Rorty, 1989) who would deny the possibility of truth in the first place. Indeed we might say that the question of truth is actually the same question as that of knowledge, so defining knowledge in terms of truth makes little progress. There is also the Gettier problem that provides cases where each of the conditions holds but we would still not wish to call the result knowledge (Gettier, 1963).

I shall briefly summarize the main philosophical theories of truth:

- Correspondence theories (Russell, 1912; Tarski, 1944; Popper, 1959; Wittgenstein, 1974) are the main and most obvious view of truth. They hold that truth (and falsity) is applied to propositions, depending on whether the proposition corresponds to the way the world is. It thus applies to the relationship between a proposition and the states of affairs it describes. Problems with this view are: (i) In what sense can a linguistic statement be said to correspond to something quite different – an occurrence in the world? (ii) We cannot directly access the external world so we are only ever comparing experiences and statements with other experiences and statements, so that we can never actually determine if a proposition is, in fact, true. Most other theories stem from the problems in maintaining a correspondence theory.
- Coherence theories (Bradley, 1914; Putnam, 1981; Quine, 1992) stress the extent to which a proposition is consistent with other beliefs, theories and evidence that we have. The more that it fits in with other well-attested ideas, the more we should accept it as true. This approach avoids the need for a direct comparison with 'reality'. However, it is more concerned with the justification of beliefs rather than their absolute truth. From a Kuhnian (1970) perspective, fitting in with the current paradigm does not make the current paradigm correct. Quine held that coherent systems of beliefs were under-determined by empirical data and thus that no theory could ever ultimately be verified or falsified.
- Pragmatic theories (Peirce, 1878; James, 1976; Rorty, 1982) hold that truth is best seen in terms of how useful or practical a theory is – that which best solves a problem is the best theory. A version of this is instrumentalism, which holds that a theory is simply an instrument for making predictions, and has no necessary connection to truth at all. This also leads into consensus theories. An obvious argument against

this view is that a true theory is likely to be most useful and powerful³ and therefore should be an important component of a useful theory.

- Consensus or discursive theories (Habermas, 1978) accept that truth is that which results from a process of enquiry resulting in a consensus among those most fully informed – in the case of science, scientists. At one level, we can see that this must be the case if we accept with CR the impossibility of proving correspondence truth. But, often today's accepted truth is tomorrow's discarded theory and so this does not guarantee truth. See the discussion below about Habermas's more recent views.
- Redundancy and deflationary theories (Ramsey, 1927; Frege, 1952; Horwich, 1991) argue that the whole concept of truth is actually redundant. If we say 'it is true that snow is white' we are saying no more than that 'snow is white', the two propositions will always have the same truth-values and are therefore equivalent. This seems to me largely a linguistic move as it does not touch upon the question of how we might know or believe that a proposition is actually the case.
- Performative theories (Strawson, 1950) also deal with the linguistic use of the term. The suggestion here is that by saying 'p is true' we are not so much commenting on the truth of the proposition as such but on our willingness or intention of accepting it as true and commending it to someone else. Again, this just seems to ignore large areas of the question of truth.

Critical realism and truth

Turning now to CR, what view of truth does it espouse? First, how does CR relate to Hunt's scientific realism? It is simplest to describe it as a version of scientific realism. Certainly Bhaskar would accept Hunt's four propositions, and has in fact written a book called *Scientific Realism and Human Emancipation* (Bhaskar, 1986). More specific features of CR are (Mingers, 2004b):

- A *causal* criterion for existence as opposed to the *perceptibility* criterion of positivism. That is, we can argue for the existence of some structure or mechanism if it has causal effects whether or not it can be perceived.
- A distinction between the *intransitive* domain of science – objects and events that operate independently of our perceptions of them – and the *transitive* domain – the human process of generating theories, papers, books and experimental activity.
- Distinctions between the real (all objects, mechanisms and events), the actual (those events that do, or do not, occur dependent on the complex interplay of structures and mechanisms) and the empirical (that subset of events that are experienced by humans and can be the basis for science).

- Relating to the social world, the argument that no social theory can be purely descriptive, it must be evaluative, and thus there can be no split between facts and values. And, following from this, the view that social theory is inevitably transformative, providing an explanatory critique that logically entails action (Archer *et al.*, 1998, Part III).

The first thing to say about truth is that the whole approach is fallibilist as in Hunt's principle ii). That is, since it accepts epistemic relativity, the view that all knowledge is ultimately historically and locally situated, it has to accept that theories can never be proved or known certainly to be true. Thus, if provable truth were to be made a necessary criterion for knowledge there could be no knowledge within CR.

Bhaskar does discuss the notion of truth and comes up with a multivalent view involving four components or dimensions (Bhaskar, 1994, p. 62) that could apply to a judgment about the truth or falsity of something:

- a. *Normative-fiduciary*: Truth as being that which is believed from a trustworthy source – 'trust me, I believe it, act on it'. This sense would typically occur within a communication where the speaker states a proposition and the listener accepts their sincerity. This is clearly related to Hunt's argument about trust and also stems ultimately from Harré.⁴
- b. *Adequating*: Based on evidence and justification rather than mere belief – 'there's sound evidence for this'. This goes beyond just the speaker's belief to warranted assertability but can still, of course, be false.
- c. *Referential-expressive*: Corresponding to or at least being adequate to some intransitive object of knowledge. Whereas the first two dimensions are clearly in the transitive domain and strongly tied to language, this aspect moves beyond to posit some sort of relation between language and a referent. It moves towards a weak correspondence theory.
- d. *Ontological and alethic*: This final level is the most controversial (Groff, 2000) as it moves truth entirely into the intransitive domain. The truth of things in themselves, and their generative causes, rather than the truth of propositions. It is no longer tied to language, although it may be expressed in language.

Several comments need to be made here. First, the first three are relatively unproblematic and quite similar to the JTB formula, although set within a communicative context. 'This proposition is believable' (B); 'don't just listen to me there is some evidence for it' (J); and 'it fits the facts' (T); none of these in themselves or, indeed, together *guarantees* that it is true.

Second, Bhaskar sees them as ordered or progressive. Thus, the weakest form of truth is simply to have to believe someone with no further justification. Better is to

³Although postmodernists argue that it is the theory that is deemed most powerful that is accepted as true.

⁴Bhaskar was actually a student of Harré and there are still clear resonances of this.

have some sort of warranted assertability, some evidence justifying the claim, although what the evidence is and how strong it is are debatable points. Better still, there should be some theory, description or model that can be related to real-world structures. This obviously moves in the direction of some sort of correspondence theory of truth. CR does tend towards this view while accepting inevitable limitations on it (Sayer, 2000).

Third, the ontological/alethic aspect marks a major shift, as it no longer concerns propositions at all. It is not predicated of a proposition but is said to be a characteristic of the 'real' nature and causes of things in themselves: 'truth as *alethic*, that is, the truth of or reason for things, people and phenomena generally (including in science most importantly causal structures and generative mechanisms), not propositions' (Bhaskar, 1994, p. 64).

Habermas's theory of truth

We can now move to consider Habermas's theories of knowledge and truth. His early work is known as the theory of knowledge-constitutive interests (Habermas, 1978). This suggested that humans, as a species, had needs for, or interest in, three particular forms of knowledge. The *technical* interest in moulding nature led to the empirical and physical sciences. For Habermas these were underpinned by a pragmatist philosophy of science (inspired by Peirce) and a consensus theory of truth. The *practical* interest in communication and mutual understanding led to the historical and interpretive sciences underpinned by a hermeneutic criterion of understanding. And the *emancipatory* interest in self-development and authenticity led to critical science, which identified repressions and distortions in knowledge and in society. Its criterion of success was the development of insight and self-expression free from constraint. This triad drew inspiration from Kant's categorization of three forms of action (Müller-Merbach, 2006b).

This theory of transcendental interests was the subject of much criticism (see Mingers (1997) for a review), and Habermas later transmuted it into the theory of communicative action (Habermas, 1984, 1987). Utterances and, I would argue, actions as well raise certain validity claims that must, if challenged, be justified. These claims are *comprehensibility*, *truth*, *rightness* and *truthfulness* (*sincerity*). This is premised on the argument that utterances stand in relation to the three different 'worlds': the objective or material world that consists of all actual or possible states of affairs; the social or normative world that consists of accepted and legitimate norms of behaviour; and the subjective or personal world that consists of individuals' experiences and feelings.

When such a claim is challenged, the process of justification must always be discursive or dialogical. That is, there should ideally be a process of open debate unfettered by issues of power, resources, access and so on until agreement is reached by the 'unforced force of the

better argument' (Habermas, 1974, p. 240, 2003, p. 37), what Habermas calls the 'ideal speech situation'. Thus, Habermas held a consensus or discursive view of truth in the moral or normative domain of what we ought to do, as well as in the material domain of external reality. To say of a proposition 'it is true' is the same as saying of an action, 'it is right', namely *ideal, warranted assertability*. This links up to the realism debate discussed earlier since a constructionist such as Gioia would clearly be committed to a consensus theory of truth without recourse to an external world.

However, more recently Habermas (2003) has returned to the issue of truth and now rejects his discursive theory for propositions about the material world in favour of one with an irreducible ontological component. In essence, Habermas now maintains that there is a substantive difference between the moral domain of normative validity that can only ever be established through discussion and debate within an ideal speech situation, and the domain of propositional truth where properly arrived at and justified agreement may still be proven wrong by later events.

I have given up an epistemic {based only on reason and discussion – JM} conception of truth and have sought to distinguish more clearly between the truth of a proposition and its rational assertability (even under approximately ideal conditions) (Habermas, 2003, p. 8).

Habermas now accepts the basic realist view that there is a world independent of humans, that we all experience the same world, and that this places constraints upon us, while still accepting that our access to this world is inevitably conditioned or filtered through our concepts and language. This, of course, leads to the age-old dilemma of trying to discover some external standpoint, outside of language and cognition, from which to judge the truth of one's propositions. The idea of ideal rational discourse is not wholly wrong, but is insufficient for the task (p. 252). While it is necessary that we come to believe or accept the truth of propositions through a thorough process of rational discourse, that we do so is not sufficient to guarantee their truth. Even the most strongly held and well-justified views may turn out to be false.

These objections have prompted me to revise the discursive conception of rational acceptability by *relating* it to a pragmatically conceived, nonepistemic concept of truth, but without thereby assimilating 'truth' to 'ideal assertability' (Habermas, 2003, p. 38) (original emphasis).

The basic outline of this nonepistemic concept of truth has a very Popperian ring to it. If we begin with our everyday purposeful activities within the lifeworld, we can see that our perceptual and conceptual apparatus unavoidably shapes our access to reality – we never meet it naked – but at the same time our interactions, and particularly our failures, lead us to revise our conceptual structure. In the lifeworld, while engaged in action, we presume and do not question the truths of the

propositions we operate under. Only when these break down do we move from action to discourse and offer our beliefs up for debate and justification. Once we have become convinced of the truth of a proposition through the process of rational discourse we can then move back and adopt it within the sphere of engaged action. It is important in this process that the reasons we adduce for coming to believe a proposition are actually related to the experiences that have led us to question and debate. Within the true, justified belief definition of knowledge, the justification must stem from the actual experiential learning that has occurred rather than being *ad hoc* or coincidental as in the Gettier example above.

Habermas's move away from an epistemic (discursive) conception of truth is actually towards an ontological one. When we make what we take to be true assertions we are expressing beliefs that certain states of affairs do actually exist, and that these in turn refer to entities or relations that also exist. This establishes a relation between truth and reference: between the truth of statements and aspects of an objective world. This is so even between different linguistic communities (spatial or temporal) where the same referents, the same objects of discourse, may well go under different descriptions. "The experience of "coping" accounts for two determinations of "objectivity": the fact that the way the world is is not up to us; and the fact that it is the *same* for all of us" (Habermas, 2003, p. 254).

This does not of course guarantee that the 'knowledge' is true – Habermas is fallibilist in the same way that Bhaskar is:

Insofar as knowledge is justified based on a learning process that overcomes previous errors but does not protect from future ones, any current state of knowledge remains relative to the best possible epistemic situation at the time (Habermas, 2003, p. 41).

Habermas's move is certainly welcome from a realist position. One criticism was always that his view of natural science was overly pragmatic or even instrumental. He tended to call it 'empirical-analytic' and this, combined with the consensus theory of truth, lost touch with a realist view of ontology. It also meant that he was essentially anti-naturalist, seeing a radical disjunction between natural science and social science. This shift to some extent addresses both issues: accepting a causally constraining reality as discussed above, and accepting a 'weak naturalism' (Habermas, 2003, p. 22) that there is an underlying evolutionary continuity between the objective world and the lifeworld, between nature and culture.

However, I would argue that he does not go far enough in this direction, and more specifically remains too strongly wedded to the idea that validity claims, including those of (nonepistemic) truth, are validated linguistically. In the model described above, problems and failures in the world of action lead to a switch to the world of discourse wherein questions of truth are decided through debate. Now while I accept that humans do

always interact within language, that is not to say that all activity is linguistic. Within the realm of epistemological knowledge (i.e., science), experimental activity is clearly the cornerstone of progress. With performative knowledge, the measure is successful performance whether it is a motor skill such as riding or a social skill such as conducting a meeting. And with experiential knowledge, claims to have had a particular experience can be investigated forensically, that is, through some form of 'detective' work. Thus, the results of activity and action will inform the linguistic debates.⁵

Summary

As can be seen, truth is a highly complex and debatable concept. I would like to pull out the following general conclusions in leading on to consider the relations between knowledge and truth.

The underlying conception of truth, supported by Hunt, Bhaskar and Habermas, is a limited form of correspondence theory. As realists, we accept the existence of an independent or intransitive domain of objects of knowledge that have causal effect and thereby confirm or disconfirm our knowledge. We also have to accept, however, that we can never have pure unmediated access to this domain and thus that our knowledge is always provisional and subject to change.

This places the emphasis on the degree of warrantability or justification that there is for something claiming to be knowledge. Is it a matter of believing a trustworthy source? Seeking supporting evidence? Witnessing a demonstration? Or conducting extensive scientific research?

Here, some of the other theories of truth come into play. As Habermas emphasizes, all truth claims are ultimately validated discursively through discussion and debate. Even when the intransitive world appears to refute some theory, say through failed experiments, it is the community of scientists who decide why the experiment is failing and at what point it becomes conclusive (Collins, 1985). Thus, there is always an element of consensus about truth claims.

Another form of support is the extent to which a theory is consistent with other well-attested knowledge – that is, its coherence. But of course we have to recognize that innovations often contradict the perceived wisdom. Success in practice (i.e., pragmatism) also provides support for a theory although while a true theory should be successful it does not follow that a successful theory is true.

Forms of knowledge and truth

Much of the philosophical discussion of knowledge (an obvious exception being Ryle 1963) confines itself to propositional knowledge of a scientific nature. However, as we have seen, KM is concerned with knowledge in a wider, everyday sense. As one of the founders of KM said,

⁵These different varieties of knowledge will be discussed later.

Table 1 Senses of the term 'to know'

| No. | Dictionary definition | Example |
|-----|---|--|
| 1 | To perceive directly, to have cognition of | I know it is raining |
| 11 | To have full information of | I know everything there is to know about widgets |
| 12 | To know things from information | I know there is a train at 5.32 |
| 4 | To recognize as the same or as familiar | I know that voice |
| 5 | To be acquainted with (people) (organisation) | I know your mother I know your school |
| 8 | To have experience of | I have known the cares of office |
| 13 | To be acquainted with emotions and situations | I know the feeling; I know how you feel; I know how stressful an exam is |
| 7 | To have practical understanding of; to have a skill | I know how to use Excel; I know how to play the piano |
| 9 | To have fixed in the mind; to learn | I know my French verbs |
| 2 | To have understanding of | I know how a diesel engine works |
| 3 | To recognize the nature of | I know that lump is benign |
| 6 | To be aware of the truth of; to be certain of | I know she is lying |
| 10 | To be able to distinguish | I know right from wrong |

Most philosophers confine their discourses on knowledge to verbal propositions; ... In this book I use the word knowledge in a much wider sense, because a narrow (or 'strong') sense of knowing would restrict its meaning unnecessarily. If Tom, Dick and Harry say that they know somebody or something ... it is not reasonable to insist on so restrictive a definition of knowledge that 90 percent of all that Tom, Dick and Harry claim to know is 'really' not knowledge (Machlup 1980, p. 97).

So I am concerned with the ways in which the word 'knowledge' or, more actively, 'to know' are used in everyday speech: 'I know her well'; 'I know how to ride a bike'; 'I know there's a train at 3.00'; 'I know I left my key there'; 'I know the feeling'; 'I know what black holes are'; 'I know how to make a presentation'; 'I know how the system works'; 'I know linear algebra', 'I know how to speak Italian'. This leads us to consider whether there may be other important forms of knowledge with different characteristics and means of validation.

Generally, I will be talking about knowledge in the personal sense (Polanyi, 1958), that is, in terms of an individual and what they know, either consciously or unconsciously. Müller-Merbach (2004a) points out the importance of the subjective dimension of knowledge in terms of Berkeley's dictum that 'to be is to be perceived'. Knowledge also exists in an extra-personal sense as embodied in books, papers, films, organizational practices and procedures, the internet, etc. (World 3 in Popper's sense (Popper, 1972)), and indeed much of the literature in KM concerns precisely the interaction between the two (Tsoukas & Vladimirou, 2001). This can be viewed as the dualism between action and structure in Giddens's (1984) structuration theory terms (Nonaka & Toyama, 2003, 2005; Zhu, 2006). In this analysis I will concentrate on the 'action' side of the dualism, that is, the way in which individuals come to 'know' and then act in relation to this knowledge. In taking this view I am using Giddens's 'methodological epoché' (Giddens, 1979, p. 80) to bracket

one side of the duality, the way that structural (e.g., organizational) knowledge is generated and reproduced, in favour of the other side: '*the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both*' (Tsoukas & Vladimirou, 2001, p. 979).

To discover as many different senses of the term 'to know' in everyday use, I reviewed a wide range of dictionaries. This identified 13⁶ distinguishable uses as shown in Table 1. Clearly, there are certain families of resemblances here (Wittgenstein, 1958) and we will classify them in a later section, but to begin with we can identify certain dimensions that all usages of 'to know' have in common.

First, any form of knowledge must be knowledge of *something* (Bhaskar, 1978). There must always be an *object of knowledge*, although by no means necessarily a material or physical object. In the above examples, such objects include states of affairs, people, skills, values, feelings and emotions, social practices, organizations and complex physical entities. Nevertheless, there must be some object of knowledge and this connects immediately with CR. Knowledge itself, especially as it is an individual person's knowledge, is always in the transitive dimension but the objects of knowledge, even where they are concepts or ideas, are intransitive: objects available for investigation or debate. This transitive/intransitive distinction is not fixed as in the internal/external world, but is always relative to the event and context. Thus even an utterance, which is initially in the transitive domain, becomes intransitive after it has been uttered as it can then become an object of knowledge: 'Did you say that?' 'What did you mean?'

⁶It is coincidental that Machlup (1980, p. 47) also identifies 13 elements of knowing – I had not read his book at the time. As one might expect the two lists are similar but not identical.

Second, there must always be a source of knowledge – knowledge must come from somewhere, generally either as a matter of logic and deduction or as some aspect of a person’s experience. Kant (Müller-Merbach, 2007) distinguished these in terms of *a priori* knowledge, for example, that the angles of a triangle add to 180, and *a posteriori* knowledge, which is based on actual experience of the world. Some possible sources of knowledge are direct perception, a message or communication, reading a timetable or book, learning as in a language, practice as in playing the piano or plain experience over time. It is here that the most direct connections with information and meaning come – information can be a source of knowledge, and existing knowledge shapes the information that is available from a source as the example of reading an X-ray shows.

Related to this is the third dimension – the way in which the knowledge is stored or represented, particularly in terms of the degree of tacitness/explicitness. Some knowledge will be entirely conscious and explicit – we know we know it and can express it clearly. Some knowledge will have a degree of tacitness (Polanyi, 1958) – we have the knowledge but are not necessarily fully conscious of it or fully able to articulate it. For instance, we can speak a language without knowing the rules that govern it; or we can use a carpenter’s plane and know when the blade needs changing. Finally, much of our knowledge, especially at a perceptual/motor level but also at higher levels as well (Mingers, 2001b), is *embodied* at a pre-conscious level. It governs or shapes what we can be conscious of (Merleau-Ponty, 1962; Varela *et al.*, 1991).

Fourthly, as we have already discussed, one very important facet of knowledge is its *truth* or warrantability.

This is supposedly what distinguishes knowledge from simply belief or opinion. However, the nature of truth is a very complex question and differs between different forms of knowledge, so I shall discuss this in the next section.

This has led me to distinguish four generic forms of knowledge that differ in terms of the above four characteristics and yet account for the 13 usages identified in Table 1. These are summarized in Table 2.

Everyday propositional knowledge

This form of knowledge is our everyday, commonsense, relatively direct awareness of the world around us. To know in this sense is to know *that* – to be aware of or to be cognizant of states of affairs. It is to know that it is raining, that there is someone at the door, that there is a train at 12.15, that there are 35 widgets in stock or that the petrol tank is half-full. I call it propositional knowledge, in comparison with the other forms, because it is generally explicit and conscious, and can be represented in the form of propositional statements: ‘I know that x is or was the case’ (Klein, 1971).

We gain propositional knowledge from several sources. This first is our direct perception of the world, through any of the senses. In philosophy, this kind of direct knowledge of things is called *de re* as opposed to that which we are told about – *de dicto*. In fact, Dretske, whose work we drew on earlier, actually restricts his theory of knowledge to only this kind of direct perceptual knowledge generated by the receipt of signs carrying information. But I shall include more generally knowledge of states of affairs that we are told about through a linguistic (or indeed non-verbal) communication, and knowledge we get through books, papers, timetables and so on.

Table 2 Forms of knowledge and truth

| <i>Type of knowledge</i> | <i>Object of knowledge</i> | <i>Source of knowledge</i> | <i>Form of representation</i> | <i>Criteria for validity</i> |
|---|---|--|---|---|
| Propositional I know it is raining I know there is a train at 3.00 I know there is someone at the door | States of affairs in the physical and social world. <i>To know that x</i> | Direct perception, receipt of information, communications, the media | Generally explicit and propositional although some may be tacit | <i>(Ontological) truth</i> <u>Referential-expressive</u> |
| Experiential I know her well I know the feeling I know I left my key there I know how the system works | People, places, events we know through personal experience. <i>To know x</i> | Personal experiences | Memories, some aspects of which may be tacit and embodied | <i>Sincerity</i> <u>Normative-fiduciary</u> <u>Adequating</u> |
| Performative I know how to ride I know how to read an X-Ray I know how to present | Skills, abilities and competences <i>To know how to do x</i> | Personal experience, learning, training | Embodied | <i>Competence,</i> <i>(Epistemic) rightness</i> <u>Alethic</u> |
| Epistemological I know what black holes are I know linear algebra | Reasons for the (non-) occurrence of things and events. <i>To know why x</i> | Formal methods of discovery, for example, in science | Explicit, discursive, ‘objective’, open to debate. | <i>Truth, rightness,</i> <i>sincerity</i> <u>Ontological, alethic</u> |

Habermas’s validity claims.

Bhaskar’s four dimensions.

In terms of its warrantability, propositional knowledge is *referential-expressive* in Bhaskar's terms and concerns the validity claim of *truth* in Habermas's communication theory, or non-epistemic truth in his later work. Here we can go beyond belief and even justification towards confirming a relation between the proposition and the intransitive world to which it refers.

Indeed, if we follow Dretske (1981) and Mingers (1995) we can see a direct *causal* relation between information and the propositional knowledge that it creates. Dretske argues that the meaning that is generated from the information we receive leads us to have certain beliefs about the world. Now, beliefs as such are not identical to knowledge as is shown by the justified, true belief formula mentioned above. We may genuinely believe something but it may in fact be false even though there is justification for it, for example, the belief that the sun orbits the earth. Or, we may believe something that is in fact true but for the wrong reasons, for example, we may think it is 10.00 AM (and it is) because the clock says so although the clock has in fact stopped. In neither case would we be entitled to say 'we know that...'. However, beliefs caused by information must be true since for Dretske information must be true to be information. Thus, if the clock were working correctly we could say we know it is 10.00 because our belief is caused by (true) information.

Even so, we cannot finally prove our knowledge is true for we might be mistaken either in our interpretation of the sign (misreading the clock) or in believing it was (true) information when in fact it was not (the clock was stopped).

Experiential knowledge

We talk about knowing in this sense when we are referring to our own individual previous experience, particularly of people, places, events or feelings. To know in this sense is to be acquainted with or to be familiar with. Thus, I know Mary Scott, I know Birmingham, I know 'that feeling', I don't know your school, or I know how bad toothache can be.

Knowing in this sense is a statement about the experience that someone has had, or not had, in the past. The depth of knowledge concerned is very variable – in saying 'I know Mary Scott' I might just mean I know who she is, or I might mean that I know her very well. This form of knowledge is not primarily propositional. We can always make a propositional statement about it – 'It is true that I know Mary Scott' but this is a second-level statement the object of which is our first-level experiential knowledge. We do not say 'I know *that* Mary Scott.'

Knowledge in this sense can be much richer and deeper than simple propositional knowledge. To know someone is not simply to know that they exist; it is to have a complex set of understandings, experiences, feeling and beliefs about that person. Much of this may be tacit and difficult to express explicitly. It is also deeply personal or subjective since my experience of a person or place may be very different from someone else's.

The validity of this form of knowledge must ultimately come down to a matter of Habermas's *truthfulness* or *sincerity* (*normative-fiduciary* in Bhaskar's terms) since it concerns a particular person's experiences or feelings. Of course, one does not just have to accept a person's discursive justification, one might try to discover or provide some sort of evidence or justification as well which could include documentary evidence – letters, photos, transcripts, etc. or corroboration from other people.

Performative knowledge

Performative knowledge involves having some skill or competence in order to be able to do something – it is to know *how* rather than to know or to know *that* (Polanyi, 1958; Ryle, 1963). I include in this category much more than simple physical skills. So, we can talk of knowing how to ride a bike, knowing how to play the piano, knowing how to speak a language, knowing how to 'play the game' as in office politics or a sport, knowing how to parent, or knowing how to cook.

What distinguishes this type of knowledge is that it goes beyond simple experience of something to involve particular skills and abilities that have to be learnt over a period of time. It generally involves explicit training in order to develop the necessary skills. I call it performative because it usually involves some kind of physical motor skills, some kind of performance – it goes beyond knowledge in a purely conceptual sense. For example, one could know plenty of the theory of music without being able to play the piano, and in its turn playing the piano does not mean that you can play the violin. Each skill has to be learnt over time and through practice – it is inscriptive rather than intellectual (Hayles, 1992).

This in turn means that performative knowledge is inherently embodied (Varela *et al.*, 1991; Mingers, 2001b) – that is, it exists as dispositions or connective states of the body and nervous system itself and may well be pre-conscious. Even higher level skills such as language (Merleau-Ponty, 1962; Merleau-Ponty, 1969; Lakoff & Johnson, 1987) or cognitive/mathematical activities such as navigation (Hutchins, 1995) have significant bodily aspects. I once observed, at an airport, an English girl talking to her English friend. Their conversation was typically quiet and low-key. She then struck up a conversation with an Italian woman and it turned out she was herself half Italian and could speak Italian. Her whole manner and disposition changed instantly, becoming louder, more emotional and much more animated as she unconsciously switched from *being* English to *being* Italian.

Generally, experiential knowledge is evaluated in terms of practical success or failure rather than truth. Can one actually ride the bike, play the piano or converse in Italian? Although of course, there will be degrees of ability in many of these activities. Dreyfus (1992) presents a useful analysis from a phenomenological viewpoint of the development of skills from novice to expert. In some ways, this is actually quite close to

Bhaskar's concept of alethic truth that I critiqued above. To demonstrate that one is a pianist by actually performing validates itself without need of propositions or assertions. We can also bring in here Habermas's validity claim of comprehensibility. Before a speech act or indeed any other social action can be judged, it must be understood, that, it must be performed in a competent manner. Habermas draws on Chomsky's (1957) notion of a competent speaker of a language (Habermas, 1979, p. 29), but this can be enlarged to cover all the aspects of performative knowledge.

Epistemological knowledge

By epistemological knowledge, I am signalling a move away from the everyday *knowing that* things are the case towards deeper understandings of *why* things are as they are. It is to know *why*, to be knowledgeable about, to know the truth of, to be certain of, or to understand. It can be seen as related to or a development of everyday propositional knowledge and I would include within this category what we call scientific knowledge – very much the subject of CR. I have called it epistemological knowledge to indicate that it is the most self-conscious about its validity and, more than the other forms of knowledge, is centrally characterized by its concern for truth. It should not be confused with Habermas's epistemic (discursive) approach.

This form of knowledge goes beneath the surface of what appears to be the case, the domain of the empirical, to be able to account for the empirical in terms of underlying reasons or causes. I would not want this to be seen in terms of some simple-minded, linear model of cause and effect. Examples here are to know how a diesel engine works, to know why inflation is falling, to know the difference between right and wrong, or to know 'What Freud Really Said' to quote a well-known book.

This type of knowledge is in some ways the obverse of performative knowledge as it is almost entirely explicit and discursive and is judged in terms of its correctness rather than its success. It can be knowledge of an everyday kind – knowing how something works, but in the main it refers to scholarly knowledge that is generated according to well-defined procedures or methodologies. However, I do not only include knowledge of material things. Of equal importance (Habermas, 1984, 1990) is knowledge of the social world and the personal world. In the social world we are interested in explaining why certain norms or patterns of behaviour exist and are maintained, and perhaps why others are not. In the personal world we want to gain both valid interpretations of others and undistorted understanding of one's self (Sayer, 2000).

I should like to end with one final comment. The paper has been concerned with analysing several different forms or types of knowledge, but of course in real-world situations and activities these different types will typically be involved together and will interact with each other. To take just one example, suppose you are chairing a meeting.

This will draw on propositional knowledge about particular facts and states of affairs; experiential knowledge of people, events, and practices; performative knowledge, perhaps of body language and physical gestures; and epistemological knowledge, perhaps of economics or a particular industrial process.

Conclusions

The contributions of this paper have been primarily theoretical.

The first is to recognize the multidimensional nature of what we can know. Most KM literature implicitly assumes that knowledge is an integral, easily definable, commodity that can be extracted, stored and transmitted relatively easily. The literature that does not presume it to be some form of processed information, categorizes it on a single dimension such as tacit/explicit or argues that it is too complex to manage at all. In contrast, this paper has proposed a polyvalent view of knowledge that recognizes four distinctively different forms of knowledge – propositional, experiential, performative and epistemological – based on several different dimensions. It is argued that this typology does justice to the rich and varied ways in which people may be said 'to know' something.

The second is to point out the intimate connection between knowledge and truth, which is rarely discussed in the KM literature. Knowledge, to be knowledge rather than simply opinion, raises claims as to its truth or validity. Truth, too, turns out to be a complex concept and within the paper it has been explored from a critical realist perspective. This grounds its concept of truth in terms of correspondence to an external, independent reality but recognizes that epistemologically knowledge is always provisional and relative. If truth can never be known with certainty, then great emphasis must be paid to questions of justification and warrantability. What would lead us to accept a knowledge claim – accepting the trustworthiness of the source; witnessing an event; gathering evidence; or its consistency with our other beliefs?

This leads to the view that the different forms of knowledge imply different forms of truth or, rather, different ways of justifying their claim to truth. Propositional knowledge of day-to-day states of affairs can be directly justified in terms of the (true) information that generates it. Performative knowledge can be justified by a successful performance. Experiential knowledge can be justified through the sincerity of the claimant or the discovery of adequate evidence, while epistemological knowledge brings in the full force of science, whether it be natural or social.

Before moving on to some practical implications, I would like to make it clear that although this paper has concentrated on the subjective aspects of knowledge, the knowing subject, and has primarily developed somewhat static categorizations, I see this as only part of a much broader domain that is both processual and social. In terms of process, events in the world carry information

and lead to experiences that generate meaning, ideas and knowledge for individuals. At the same time, as Tuomi (1999) indicated, our knowledge, and more generally our cognitive structure, conditions both how we experience events and what information is available to us from them. This dynamic interactive process involves the material world, but even more significantly the social world. As individuals, we exist in multiple social networks or forms of life (Wittgenstein, 1958) and much of our everyday knowledge is actually intersubjectively shared knowledge about acting effectively within these social systems.

In terms of the practice of KM, I would draw two general conclusions. First, there is the sheer richness and variety of forms of knowledge and, significantly, the fact that in real situations they all interact together. This means that, except for fairly well-defined domains where knowledge can be easily codified and represented, managing knowledge is vastly different from managing information and requires sophisticated and people-intensive activities that can only be mediated or facilitated by information and communication technologies. It is interesting to realize that the major form of institutionalized KM is actually education. Here we have a massively complex and highly resourced system devoted entirely to generating knowledge, capturing and storing knowledge, instilling it into pupils and students over many years, and finally testing and certifying their capabilities and competencies. This gives some idea of the difficulty of the task, and should make us wary of those who peddle quick-fix KM systems to unwary organizations.

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About the author

John Mingers is Professor of Operational Research and Information Systems at Kent Business School and Director of Research. Prior to this, he was at Warwick University. His research interests include the development of theory concerning the nature of information, meaning and knowledge; the use of systems methodologies in problem situations – particularly the mixing of different methods within an intervention (multimethodology); the development of critical realism as an underpinning philosophy for information systems; and autopoiesis and its applications. He has published the only comprehensive study of autopoiesis – *Self-Producing Systems: Implications*

and Applications of Autopoiesis, and has also edited *Information Systems: an Emerging Discipline?* (with Professor Frank Stowell), *Social Theory and Philosophy for Information Systems* (with Professor Leslie Willcocks), *Multimethodology: The Theory and Practice of Combining Management Science Methodologies* (with Tony Gill), and *Rational Analysis for a Problematic World* (with Prof. Jonathan Rosenhead). His latest monograph is *Realizing Systems Thinking: Knowledge and Action in Management Science*. He has published widely in journals including *Information Systems Research*, *Information Systems Journal*, *Information and Organization* and *The Sociological Review*.