Clearing Up "Implicit Knowledge": Implications for Knowledge Management, Information Science, Psychology, and Social Epistemology

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"Implicit knowledge" and "tacit knowledge" in Knowledge Management (KM) are important, often synonymous, terms. In KM they often refer to private or personal knowledge that needs to be made public. The original reference of "tacit knowledge" is to the work of the late scientist and philosopher, Michael Polanyi (Polanyi, 1969), but there is substantial evidence that the KM discourse has poorly understood Polanyi's term. Two theoretical problems in Knowledge Management's notion of "implicit knowledge," which undermine empirical work in this area, are examined. The first problem involves understanding the term "knowledge" according to a folk-psychology of mental representation to model expression. The second is epistemological and social: understanding Polanyi's term, *tacit knowing* as a psychological concept instead of as an epistemological problem, in general, and one of social epistemology and of the epistemology of the sciences, in particular. Further, exploring Polanyi's notion of tacit knowing in more detail yields important insights into the role of knowledge in science, including empirical work in information science. This article has two parts: first, there is a discussion of the folk-psychology model of representation and the need to replace this with a more expressionist model. In the second part, Polanyi's concept of tacit knowledge in relation to the role of analogical thought in expertise is examined. The works of philosophers, particularly Harré and Wittgenstein, are brought to bear on these problems. Conceptual methods play several roles in information science that cannot satisfactorily be performed empirically at all or alone. Among these roles, such methods may examine historical issues, they may critically engage foundational assumptions, and they may deploy new concepts. In this article the last two roles are examined.

Introduction

The idea of a dichotomy between "implicit" or "tacit" and "explicit" knowledge has been one of the guiding concepts in Knowledge Management (KM). This dichotomy has provided a theoretical base, but it has, arguably, acted as a limit to Knowledge Management's further theoretical and practical development. In the KM literature the term, *implicit knowledge* is often treated as synonymous with Michael Polanyi's term, *tacit knowledge* (Polanyi, 1969), but then both are further dealt with as a form of private knowledge that is treated as "informal," and even, in a sense, "unconscious" knowledge. This is a problem of psychological modeling.[1] At the same time, human agency is discussed in terms of organizational expertise. This latter is an epistemological problem, in general, and particularly, a problem of social epistemology.

The Psychological Sense of "Implicit Knowledge"

The folk-psychology notion of individuals as "repositories" for knowledge,[2] information, and for other forms of mental "content" or their "states," and as agents for "sharing" these contents along lines of simple representational expression and the conduit model of communication, is quite problematic and has been heavily criticized by

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[1]Tsoukas (2002) gives an excellent explication of KM's misunderstanding of Polanyi's terms, "tacit knowing" and "tacit knowledge," particularly in regard to Polanyi's texts and in regard to Nonaka and Takeuchi's understanding of these terms. The purpose of this paper is not to replicate Tsoukas's work, but rather, to discuss some implications of KM's misunderstanding and to suggest alternative psychological and epistemological models to those misunderstandings.

[2]"Tacit knowledge is now the KM term typically used to describe the knowledge that is in people's heads or in their own files, as distinguished from explicit knowledge that exists in documents or databases" (Koenig, 2003, p. 355). This type of epistemology and language, particularly taking the human "head" as the location for tacit knowledge, is very common in KM discourse and suggests not only the conceptual metaphors in use but the fuzziness of the discourse and empirical work that follows from such. Koenig's equation of what is in one's "head" (i.e., mental content) and one's "own files" fits the reification of mental events as objects that we shall discuss in this article. The concept of mental content, thus, allows two horizons for representation in KM and Information Science: that of the representative expression of private mental content within a public form, and, that of knowledge "sharing" in the way of the conduit metaphor.

writers in information science such as Touminen (1997), Frohmann (1990), and Blair (1990, 2002). A common genesis for these authors' arguments can be found in Wittgenstein's (1958) critique of the grammar of the verb, "to have." Wittgenstein (1958), proposed that arguments which suggest that psychological events arise from mental contents, faculties, and states often use a false grammatical analogy between the "having" of empirical entities and the "having" of reified psychological events. The belief that we "have" mental contents, faculties, and states as empirical causes for psychological events makes up folk-psychology in Western thought, analogically following subject–verb–object syntax and other common grammatical forms in Western European languages. It is given philosophical substance in the idealist and rationalist traditions of philosophy, especially since Descartes and Locke, leading to, among other things, the Cartesian "dualism" of mind and body and the notion of simple and complex mental substances in modern British Empiricism. Against these traditions, Wittgenstein argued that the search for nominal correspondences ("knowledge," "belief," "hope," etc.) to verbal grammars and corresponding performative actions ("knowing," "believing," "hoping," etc.) has mistakenly redirected psychological research from the social embeddedness and construction of personal actions in categories formed by language and culture toward personal bodies themselves and their supposed mental faculties, states, and contents, analogous to physiological organs.

Wittgenstein's (1958) solution to this tendency of "mentalism," was that of an analogical comparison of grammatical cases in regard to their conceptual similarities or distinctions. For example, can we trade the knowledge we say that we *have*, or the self that we say that we *have*, with one another like we can trade a car that we *have*? If not, then the grammatical form of "to have" may be conceptually misleading between the cases, suggesting an empirical entity where only a conceptual one is possible.

If we reject mentalistic understanding of causes for psychological events, however, we are at risk of falling into functionalist or behaviorist modes of thought to account for personal causality. We may, in this case, then attempt to see causality simply in terms of biological or social events acting upon one another, rather than in terms of personal agency. The problem here is that of failing to acknowledge intentionality. Without intentionality, as Harré has argued (1989), there is the difficulty of not only valuing individuals as possessors and agents of unique powers, but also of assigning responsibility to persons. As Harré (1989) argues, no human culture exists without persons being seen as intentional, though the degree to which such intentionality is assigned to individual agents alone, rather than to social or metaphysical agencies together with individuals, greatly varies between cultures and languages.

The horns of the dilemma—mentalism or behaviorism/functionalism—both have to be discarded. We must account for intentionality without, on the one hand, introducing non-existent empirical mental entities within a problematic conception of "mind" and, on the other hand, we must do so without reducing agency to simply being an effect of physical or social events. With mentalism we are faced with an idealism of private mental content represented in a public form. In behaviorism and functionalism, human agency is solely viewed as a biological or social event within a causal chain of biological or social events. Neither mentalism nor behaviorism or functionalism is adequate for modeling human agency and expression. Mentalism fails because it misconceives of psychological events as mental content ("ideas"), positing this content as an empirical substance that is seen as subsequently "shaped" by public forms, including language, along lines of Descartes' famous metaphor of the shaping of wax. Behaviorism or functionalism fails because it confuses the developmental and contextual social *construction* of personal psychology with theories of personal psychology's physical or social *determination*. Instead, what is needed is a psychological model that accounts for *both* personal expression and social context without splitting these two terms into a classical Cartesian dualism or collapsing personal expression into a pure effect of biological or social events. Knowing is one psychological category of intentionality for which we value people. To be knowledgeable, to *have* knowledge, as we say, makes someone valuable in communities where *demonstrations* of knowing are highly valued. But this is to say that *expressing* knowledge is important.

Both Wilson (2002) and Blair (2002), working from very different epistemologies of mind, stress an understanding of knowledge as an act of expression. How can we preserve the notion of expression without resorting to a reified notion of an empirical self or mind and its mental faculties and content, such as what is traditionally understood as "knowledge"? One suggestion can be found in Rom Harré's (1989) conception of the self as a hypothetical conceptual unity of potential expression. "Knowledge," I would propose—at least in terms of personal knowledge expression—can be seen as a culturally recognized set of performances called "knowing" that suggest that a person "has" the potential for further performances like these kinds and, thus, is said to have "knowledge" of a certain form. The importance of seeing such "having" in terms of hypothetical potentials for expression is important for it avoids the Cartesian tendency to reify nominal correspondences of verbal signifiers and their performative actions while still preserving the qualities of uniqueness or "singularity," intentionality, and responsibility of individuals.

Reconceptualizing the "Self" and "Knowledge"

An expressionist critique of personal psychology and, subsequently of expression itself, attempts to reorient a philosophy and psychology of mind and language away from that of ideational, mental content and their representations in language and other public forms toward potential, historically and socially informed, "singular" powers or dispositions and their actualization in historically, culturally, and socially specific contexts. Deleuze (1994) has viewed expression

according to two parts or moments: that of potential ("virtual") powers and that of their "actualization" in social forms. Both the "virtual" and "actual" moments of expression, if we wish to put it this way, however, are based on the embeddedness of human beings in various life-worlds and mediums of communication. Therefore, given the social construction of being and expression, traditional private–public models of expression are not useful explanatory categories. For example, the "realm" of an actualized expression may be private self-expressions (for example, diary entries, reflective mumblings, and other forms of "private" action, whether linguistically based or not) or expressions made in the company of other persons.

Harré (1989) has offered a model of personal and social psychology that can be grafted onto an expressionist theory of knowledge. An expressionistic theory of knowledge sees knowledge as both potential and as actualized. The horizon for actualization is not that of a public/private dichotomy or that of a Cartesian division between mental content and public form, but of recognized performances. Social "context" doesn't so much give form to the manifestation of individual potential powers, including those that will later be seen as "knowledge" potentials, but rather, "context" allows the expression of powers and their recognition in various manners. "Context" signifies not a causal determinant of actualizations, but rather, a condition of allowances for potential powers (Harré & Madden, 1975).

Conceptually, how are we to conceive of "knowledge" as potential without either reifying it as an empirical content that is then represented in public form or understanding it only in terms of behaviors? This problem is analogous to that of the problem of intention, which is Harré's main focus in many of his works on psychological being.

For Harré (1989), the self, analogous to hypothetical nominal essences in the physical sciences (such as gravity), is a conceptual unity that explains real events. In a Kantian manner (Kant, 1998, particularly Kant's discussions of apperception), the concept of "the self" acts as a causal explanation for events even though its own existence is not empirical. Because of selves, we assume a unity of action for individuals including our own being (Harré, 1989). If we did not assume such a unity, then causal understandings of our own and others' agency (i.e., intentionality) would be meaningless. As we have suggested earlier in reference to Wittgenstein's (1958) critique of the grammar of "having," the grammar of having a "self" as well as having "knowledge" or any other hypothetical entity along the lines of having a car or other empirical objects is misleading. We cannot give away selves or knowledge as we could cars and other empirical objects. The self is a conceptual notion that allows us to explain personal causal agency in the presence of a restricted range of effects. Knowledge is a conceptual notion that allows us to explain acts of what people call "knowing" within whatever culture. Premising either self or knowledge as an empirical object is impossible. "Self" and "knowledge" are hypothetical conceptual unities of potentials, not empirical entities.

Tacit Knowing

So far, we have been discussing the notion of expressed knowledge. This forms one part of what KM often discusses in terms of implicit and explicit knowledge. We have critiqued a representational epistemology rooted in a tradition of mind that sees the mind as filled with mental contents that are then represented in public form, for example, within language. This is an idealist notion of mind and of language. We have argued, instead, that mental events are better thought of in terms of potentials toward expression within given situational and historical contexts or "releasers" (Harré, 2001).

Implicit knowledge in Knowledge Management, however, is also often written about in terms of Polanyi's notion of *tacit knowledge*. An exact formulation of Polanyi's term is not easy to pin down over his various writings—the writing is not rigorous enough at times and the examples blur different processes—but it is given a focused discussion in the beginning of his essay, "The Logic of Tacit Inference" (Polanyi, 1969). Although Polanyi uses the term *tacit knowledge*, his more common usage is *tacit knowing*. Tacit knowing is the process of creating general understandings from particular entities. What constitutes these "understandings" and these "entities" in Polanyi's writings varies greatly. His examples range from punishment enforced behavioral associations to his favorite examples of gestalt events of perception (the parts of the face unified into a whole face, for example) and of theoretical assertions or "discoveries" in the sciences from particular observations. In this last, Polanyi is sort of describing what has been popularly called the "Eureka!" moment in scientific discovery. Polanyi does not hesitate to describe such moments as being personally inscribed, but as such only by disciplinary training within a given field. It is here, with the notion of disciplinary training—as a type of *education*, rather than simply skills learning—that we will find the clues as to what constitutes "expertise," a term which Blair (2002) importantly underlines in KM's understanding of tacit knowledge. And it is within this concept that KM can be seen to add an important element to information science understood as technical training and technical research alone or dominantly. For, quantitative elements and processes of calculating, which are so important to information processing as they are for the claims of empirical method in information science, are found to come up short in accounting for the power of knowledge in everyday life, organizations, and in "scientific" activities.

Blair (2002) is on the right track when he states that expertise is not rule based, in the sense of the bringing of particulars into classes based on identifiable rules. The expertise of the manager, worker, scientist, or scholar is similar to the expertise of, particularly, native speakers of a language. Developmentally, children—as well as adults—pass through various stages of language acquisition. The child learns tacit or "implicit" rules about using a language by using it, applying generalized past cases to new cases, and then trimming back on the over-application of such rules, to a final, more or

less "correct" or passable use of the language in various social contexts. Explicit rules, on the other hand, are created for cases of ambiguity and are often embodied in rhymes (e.g., in the case of written English, the rhyme: "It's 'i' after 'e,' except after 'c'. . ."), just as moral rules and ambiguities of action are explained in fairy tales, fables, and direct moral prescriptions (e.g., "honesty is the best policy").

Explicit rules and ambiguous cases aside, the process by which one learns a language is by the practice and by the analogical application of learned, now "tacit," rules. Blair (2002) identifies the application of such learned processes through the concept of "heuristics," but the notion of heuristics somewhat hides the fact that these rule short-cuts are actually not based in any notion of subjective intuition nor upon explicit rules now made simpler, but rather, that they are analogical applications of previous cases. This is why, as Blair (2002) points out, experts learn from case studies, and not from prescriptive applications of explicit rules. Such cases constitute the "training wheels" for further application. Within new areas of studies, or in areas of studies that need to be reinvented, analogical cases are brought in from other fields. From an established field, analogical cases are developed from traditional precedents.

The manner by which analogical cases are used in disciplines varies depending on the task, the authority of the expert, and the "maturity" and stability of the field or context in which it is applied. A field, as Harré (1984) has suggested, is defined by certain "moral orders," which, among other things, dictate the leeway that authority has in applying analogical cases and how wide the field may be that these cases are drawn from.

Here, Polanyi's insight that tacit knowledge exceeds explicit knowledge may be mapped onto Blair's (2002) and Wilson's (2002) claims that the term, *information*, refers to quantitative and calculable elements and that the term, *knowledge*, refers to something else. Understood as analogical thought, Polanyi's notion of *tacit knowledge* may be rephrased as simply "knowledge" and his notion of *explicit knowledge* rephrased as a sense of "information." Polanyi's claim that "tacit knowledge" (i.e., "knowledge") appears in analogical application and so grounds any *explicit knowledge* (i.e., "information") in what he calls "meaning" is reasonable. "Science," in fact, is not just or even predominantly "about numbers"[3] or even about the particular disciplinary techniques and methods regarding the use of quantitative elements in general. Science, in a more narrow sense and quantitative sense, involves the judgment and application of numbers, techniques, and other elements to wide-ranging problems. This judgment and application involves social horizons and the horizons of particular disciplinary "moral orders," as well as personal judgment. Technical possibilities

and limitations are, of course, part of such consideration, but what Polanyi is pointing to is something more. This something more is intrinsic to expert knowledge, in so far as expert knowledge is not just knowledge of a domain, but it includes a sort of meta-domain knowledge—that is, an awareness of foundational horizons and boundary cases of application, as well. As Bowker and Star (1999) and others have suggested, boundary trading and boundary objects are quite common between scientific disciplines and experts are expected to play a chief role in these acts of application or translation.

It may be somewhat startling to think that analogy, which played such a central role in medieval thought and is so explicit of a technique in humanities scholarship today, should play such an important role in science or in any disciplinary activity that has quantitative techniques and technologies so central to its method. But Polanyi's basic argument, despite its sometimes-confused statements and examples, is quite persuasive: technique is meaningless without application, and application at a level of learning—or as Polanyi terms it, *discovery*—involves analogical thought. For Polanyi, analogical thought lies as the *meaningful* basis for new experiments, for the development of new techniques and technologies, and for the importance of quantitative methods in the sciences. That some activities—conceptual analysis ("philosophy"), for example—cannot take place outside of analogical thought should be of no surprise. But that analogy is central to *knowledge* in the sciences, and that analogical "trading" is common across the boundaries of what might be considered as scientific disciplines, may still be news to some who think that science is "about numbers" and who argue for a solely technical and skills based view of information science research and education. Analogical thought constitutes, as well, the process of "trading" across boundaries of disciplines and its particular tropes can constitute the boundary objects used in this trading.

Conclusion

We have proposed a model of personal knowledge based on hypothetical unities of personal powers and a type of public expression based on expertise of analogical application. Indeed, in Rom Harré's work, which we have been using throughout this article to explore these issues, the psychological constitution of the self is composed of unities of social and cultural possibilities for expression, including the analogical ranges granted by disciplines, professions, institutions, and social identities for "expert" knowledge.

Psychological being and social being are, of course, not strictly separable and the "moral" boundaries of expert activity in social spaces vary widely and are sometimes in flux. Commonly, we say that people bring to their jobs their lives and, increasingly in a "knowledge economy," that they take their public personas home with them. The management problem, then, is, how to account for both personal powers and social fluxes. Prescriptive training and skills are important so as to not only share knowledge, but also to maintain successful forms of knowledge and culture. On the other

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[3]It was asserted at a well-attended session of the annual meeting (2003) of the American Society for Information Science and Technology, by one of the leaders of the field, that Information Science was a *science* because it was "about numbers." The remarks in this section of this article attempt to address that perception.

hand, innovation requires more of an expanded range of expertise than is afforded by simple skills training.

Indeed, KM arose out of such very concerns during global expansion in late modern industrialism or "post-fordism" (see, for example, Reich, 1991). Knowledge Management's attempt to discuss a "knowledge economy" as distinct from an "information economy" was confused by its uncritical appropriation of folk-psychology and its very incomplete and problematic appropriation of source texts such as Polanyi's, but the general instincts of early KM proponents as to the importance of knowledge still deserve our attention.

An approach that is concerned with personal potential and with technical prescription and with the ability to negotiate between these in times of social flux has traditionally been termed *education*. "Education," here, stands in sharp contrast to purely technical skills training, in so far as its concern is with the *meaning* of techniques, technologies, and both qualitative styles and quantitative elements and method. Its concern with the meaning of these things is in terms of both theoretical discourse and speculation and as more practical matters, rather than the simple learning of skills, the simple application of skills within traditionally defined areas, and most importantly, the reverse of what we have just proposed, the view that education involves the simple summation of techniques, technologies, and data within theories. Higher-level academic institutions have traditionally been organized so as to foster education through a liberal arts program even in professional and technical fields because they are training not just "doers" but managers and professionals. Such "education" has been the basis for ruling class education since the Ancient Greeks. In modernity, it has been the basis for liberal theories of child rearing, beginning with the assumption that education should involve broad ranges of experiences—that is, broad ranges of cases. Further, the introduction of such surplus in experience and application in regard to previous production and "productive mechanisms" was the basis for Humboldt's design of the modern university and has been the basis for many recent industrial "think tanks" as well. It isn't enough that liberal arts form the basis for later technical or skills training (see Buckland, 1996). Seeing the liberal arts as a basis that is then made more precise or "applied" by technical training is precisely the idealist model that suggests that theory is some sort of general or transcendental knowledge or rule that categorically binds particular cases together. The education of executive managers and the education of the ruling class, however, has always begun and ended with cases toward their analogical application. It is no accident that the Harvard Business School was founded on case study pedagogy. Nor should it be surprising that Wittgenstein's success in philosophy was due to his examining particular cases of philosophical grammar and explanation and then comparing them to one another and to analogous, nonphilosophical cases. With this philosophical technique Wittgenstein was simply doing what his education in engineering told him to do: compare cases and the uses of tools (i.e., words) within them so as to see what works and what doesn't. Such an approach doesn't lead to a simple formalism (as some "ordinary language" readings of Wittgenstein seem to claim), but instead, it points to not only functional and nonfunctional cases, but also to culturally based, analogical, metaphorical, and inter-logical spaces between language games.

Despite the sometimes unevenness of Knowledge Management discourse, there are lessons to be learned by critically and historically examining it—not simply, or most importantly, for studying "management," but for critically viewing today's technocratic model of education, as a whole, and specifically, in regard to technical, professional, and scientific education. In part, these lessons have to do with critically thinking about mental events, language, and culture, and about the role of different types of intellectual practice to theory and to practice inside, outside, and between scientific disciplines and practices. Whether such lessons can be reduced to "best practices" within the current KM discourse, however, is quite dubious, for such a focus misses the issue of *knowledge* that KM pointed to, though in sometimes erroneous and equally technocratic and reductionist ways.

Acknowledgments

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