TACIT KNOWLEDGE

Making It Explicit

Background

Tacit knowledge is contrasted with explicit or propositional knowledge. Very loosely, tacit knowledge collects all those things that we know how to do but perhaps do not know how to explain (at least symbolically). The term "tacit knowledge" comes to us courtesy of Michael Polyani, a chemical engineer turned philosopher of science. This biographical detail is not incidental, for Polanyi emerged from his laboratory with the news that the philosophers had scientific practice all wrong: their account of how science proceeds was massively weighted toward the propositional, encoded, formulaic knowledge that is exchanged between laboratories, and almost totally ignorant of the set of skills that are required to actually work in one of those laboratories.

Polanyi's motivation is that we recognise the importance of this second, embodied (and hence "personal") sort of knowledge, and that we collapse the hierarchy that sees hands-on skills and unwritten rules neglected and devalued, whilst the propositional report is privileged. Tacit knowledge is messy, difficult to study, regarded as being of negligible epistemic worth. Proper knowledge exists in propositional form (which is, conveniently, much easier to study).

Is a fact the type of thing that could travel without being written down, or otherwise symbolically encoded? For those working with a narrow conception of "fact" that excludes all but propositional formulations, tacit knowledge is (necessarily) not the type of thing that could act as a conduit or vehicle for travelling "facts." But those who want to argue in this way will need a new word to describe what it is that travels when the technologies of early modernity spread across Europe. The growth of material culture effectively demonstrates that facts about how to make cement, mould and fire porcelain, cut stone, hew oak, and so on, travelled extensively among illiterate, innumerate populations. Some mechanism or other enabled this, and tacit knowledge seems like a good way to talk about it.

Nonetheless, resistance to the concept remains. Not everyone feels that talking about tacit knowledge is either useful or accurate, and some – like Jerry Fodor – doubt whether the term can support its claim to name a particular and distinct type of knowledge. Before we help ourselves to this new terminology, we ought to clarify (in propositional terms) what it is we intend to mean by it.

Polanyi's account of personal and tacit knowledge

What does Polanyi mean by "tacit knowledge"? He means that there is a type of knowledge that is not captured by language or mathematic

cannot be converted into "prescription" (written, spoken, signed, and so on), how, exactly, does Polanyi think it is going to get from mind to mind?

Polanyi explains this with reference to apprenticeship: "By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art" (2002 [1958]: 53). So the transfer of tacit knowledge consists in the imitation of physical gestures. But gestures, surely, could be described? Drawn, written about, mimed (like sign language). Polanyi will go further: for a suitably observant student will copy not only the types of conscious actions which could be described equally well in words ("hold the hammer by the handle, lower the metal head in an arc…"), but also "those which are not explicitly known to the master himself" (2002 [1958]: 53). Because these gestures are subliminal, it is important that the process of acquisition be unconscious: "These hidden rules can be assimilated only by a pers

quite quickly into delusion and charlatanry. As if aware of this latent capacity for the connoisseur to be a swindler, Polanyi reminds us of his position: "Wherever connoisseurship is found operating within science or technology we may assume that it persists only because it has not been possible to replace it with a measurable grading" (2002 [1958]: 55).

This might suggest that Polanyi feels that connoisseurship is an illusion arising as a consequence of our having clumsy tools – and that this, in turn, is a problem that can (and will) be remedied by the development of more accurate measuring equipment. He is disdainful of the efforts of scientists using their laboratory methods to try to divine the special quality of Stradivarius violins, but he would presumably concede (taking the homeopathy example into account) that aTJstopmwnd Heuldi2l0itke eTa2 Tc 0650.05 Tw(singthino(dr)Tj 1 BDC BT/T th)]TJ/

Polanyi on tool use

It's worth noting that the weak reading is consistent with the strong-sounding claim that the efficacy of these rules may in fact partially or wholly rely on their remaining unspecified to the agent who is involved in their performance. This seems to be the case with many physical skills – e.g., catching a ball is easier (which means: more effective) if you don't think about how the arm and hand physically execute their complex synchronous ball-catching motions. Physical aptitudes frequently possess this character. So it is that Polanyi mentions the "blind man's probe" to show how we extend our attention through tools (a knife and fork or even a pair of gloves would have been equally demonstrative – both enable a similar sort of prosthetic extension). The tool, when in the hands of someone who is competent, becomes invisible to them – or rather, becomes like an extension of their body (2002 [1958]: 60). (This is the same distinction Heidegger had made between "present at hand" and "ready to hand" – the latter being a functioning tool, the former the physical object made apparent by [e.g.] it's malfunction. In other words, the issue of tool use was something that philosophers had recently been thinking about quite a lot).

Another reason for Polanyi's use of the blind man's probe is a rhetorical advantage: it allows for a smooth transition into talk of our "feeling our way through" a problem (2002 [1958]: 62). Like the blind man who eventually finds what he is looking form by bumping and touching, so too is much (and maybe all) human discovery a product of the integration of conscious knowing and unconscious knowing. At all times, the point is that our knowledge is not composed only of declarative sentences and logical propositions, but rather that it is also (and substantially) composed of "personal knowledge" which evades explicit formulation but contributes to the production the final product of our endeavours, be they knowledge claims or technologies.

Fodor's argument against tacit knowledge

Polanyi's distinction seems so obvious, trivial even, that it would be surprising if no one else had made it. In *The Concept of Mind* (1949) Gilbert Ryle had spoken of the distinction between knowing that something was the case, and knowing how to do something. With an admirable directness, he called this distinction "knowing that" and "knowing how." Once this distinction has been made, it looks very obvious. If we ever confused the two before, it was only because the English language uses the same verb for task performance and sentence memorising (or some such formulation). It might have been the case that we used difference verbs – after which the distinction between knowing that and knowing how would already be present in the language and thus of little surprise to us. We might, under these conditions,

have found ourselves instead having a discussion about how the "two" types of knowledge we thought we had were in fact one and the same.

As it is, the distinction has become so embedded, that it actually requires some concentration to return to the previous state whereby we (apparently) had no awareness that such a distinction could be made. Interestingly, this is exactly what Jerry Fodor does in "The Appeal to Tacit Knowledge" (1981, originally 1968). Fodor puts is well when he says of Ryle's distinction between "knowing that" and "knowing how" that "there is not one, but a family of distinctions that goes by that name" (Fodor 1981: 70). Of these, Fodor mentions skills (which may be "best taught by example" [1981: 70]), and "cases where we know how to do X and can give an account of what we do when we do X, but where it seems clear that the ability to give the account is logically and psychologically independent of the abilities involved in X-ing" (1981: 70).

Fodor dismisses these categories as "too crude" and goes on to argue that to call it all "know how" (or "tacit knowledge" – Fodor makes no distinction) blurs the distinction between "doing" and "doing well," claiming that: "Traits give rise to adverbs, competences to verbs: we exhibit our competences in our activities and our traits in our style" (1981: 72). So there are (at least) two classes of know how: knowing how to do something and knowing how to do something well.

The second of these is the more slippery, and seems to correspond with "proficiency," or what Polanyi called "connoisseurship." This opens the "serious question" underneath the paper: "what, if anything, would make it reasonable to decide to talk this way, what kinds of evidence should we take to be relevant to asses

> Although an organism can know how to *X* without knowing the answer to the question "How does one *X*?," it cannot know how to *X* unless there *is* an answer to the question "How does one *X*?" Now, one kind of requirement it would be rational to place on a psychological theory is this: for every behaviour an organism knows how to perform, a psychological theory of that organism must supply an answer to the question "How does one produce behaviours of that kind? (1981: 74)

(The "psychological theory" in question, we can be sure, is Fodor's, or one very much like it.) He goes on to argue:

> In describing the propositions, maxims, or instructions that a machine employs in the computation of its output, we are *ipso facto* describing the etiology of its output. (1981: 76)

Fodor's is quite a contorted argument, but breaks down into quite clear steps. In effect, he says that *if* a machine can simulate the behaviour of an organism, and *if* a machine code can always be translated into English sentences, *then* an organism's behaviour (or an exact simulation of it) is expressible in English sentences.[1]

Not everyone, of course, will be happy to join Fodor in supposing "there is a machine that optimally simulates the behaviour of some organism" (1981: 77). There are problems with the computer-program/AI analogy. For example, Fodor claims that the isomorphism between machine behaviour and organism behaviour is "intended to be a formulation of the principle that permits us to infer like causes from like effects" (Fodor 1981: 77) – although it remains entirely unclear whether such an inference is valid for

performance of tacit knowledge is evidence that humans must be doing something similar. (He feels confident doing this because he is already convinced that the mind works in this way. If you don't think that the "language of thought" is persuasive, you may not be convinced by the argument.) The problem is that Fodor's premises ask rather a lot of us. Effectively: we are asked first to believe that a machine can optimally simulate an organism, and secondly, we are asked to agree that similar outputs must have similar causes. Even if the first is imaginable, the second just doesn't seem a fair inference.

The weak and the strong readings – some consequences

As Fodor's objection to tacit as a usefully distinct category points up, tacit knowledge (in the strong sense) prohibits the project of artificial intelligence (AI). AI cannot even get off the ground, cannot even begin to simulate organism behaviour, if organism behaviour categorically cannot be reduced to program statements. On the other hand, if AI is possible, and if the simulated organism is able to do something that in human terms would constitute a performance of tacit knowing, then there are at least grounds for saying that knowing how to do something only tacitly is not a *necessary* feature of certain task performances. In other words: successful AI would be a argument against the *necessity* of tacit knowledge, but it would not (as Fodor claims) be an argument against the necessity of tacit knowledge for successful task performance in humans.

As mentioned, the weak reading is the claim that tacit knowledge is precisely that type of competence which does not rely on explicit formulation in order to be effective (and may in fact be less effective or impossible when made explicit). The weak reading, then, is still quite strong. But it seems that Polanyi won't settle for this. See how Polanyi uses "completely specified" in the following sentence:

> Hence the practical discovery of a wide range of not consciously known rules of

elaborate and long lasting apprenticeships – then facts travel slowly, embodied, person to person. But do they travel poorly because of this?

Another consequence of the rules being unavailable to conscious examination (when even scrupulous introspection will not disclose them, as with the master and the apprentice) is that the extent to which performances of tacit knowledge are willed or chosen becomes problematic. It seems that an action over which you have limited awareness is voluntary in a weaker sense than an action you decide to do knowing more precisely how it is accomplished because less controlled (we would certainly say this regarding reflexes and tropisms: a sneeze, a yawn, the regulation of the circulation – sometimes these acts can be initiated, but it's a fire-and-forget species of voluntary behaviour, quite different from, say, writing a paper, where every word is chosen). Of course, this condition only applies to the strong reading. But in what sense one "works according to the rules" and in what sense the rules make you work in a particular way is an interesting adjunct to this problem: in other words, if you don't have conscious control over the action, it's unclear if you are "doing the action" of if the action is "doing" you.

Works cited

Boden, Margaret A., Ed. 1990. *The Philosophy of Artificial Intelligence*. Oxford: Oxford University Press.

Polanyi, Michael. 2002 [1958]. *Personal Knowledge: Towards a Post-Critical Philosophy*. London: Routledge.

Fodor, Jerry. 1981. "The Appeal to Tacit Knowledge in Psychological Explanation." *Representations*. Cambridge, MA: Bradford/MIT Press, 1981.

Ryle, Gilbert. 1949. *The Concept of Mind*. Oxford: Oxford University Press.

Turing, Alan M. 1950. "Computing Machinery and Intelligence." *Mind* 59.2236: 433-60. Reprinted in Boden 1990: 40-66.