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Are experts right or are they members of expert groups?

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Abstract:

I describe an approach to the meaning of expertise that grows out of sociological approaches to the analysis of science such as 'sociology of scientific knowledge'. This approach was introduced to counter certain political interpretations of the movement associated with that new perspective. Here 'Studies of Expertise and Experience' (SEE) is described and contrasted with standard philosophical and psychological approaches to expertise. It is suggested that it leads in new and interesting directions and suffers from fewer conceptual problems than these standard approaches.

Keywords. Expert knowledge, sociology of expertise, studies of expertise and experience

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Harry Collins

In this brief paper I want to describe a way of thinking about expertise that starts with different assumptions than those of the standard philosophical and psychological

approaches.¹ This approach is sociological and is known as ‘Studies of Expertise and Experience’ (SEE).²

SEE and SSK

The approach was triggered by the new style of analysing science that began in the early 1970s and is known as ‘sociology of scientific knowledge’ (SSK).³ Crucially, SSK, in trying to answer the same kinds of questions about scientific knowledge traditionally asked by philosophers of science, sets aside the truth of the science. This can be a philosophical stance or a methodological stance – that is not important; what is important is that when we try to answer the question ‘Why do scientists, and consequently us, come to think this is true rather than that is true?’ we do not take into account what is actually true. That is, we do not take into account what *we believe* is true (which is what we mean when we say something is ‘actually true’). If we did take that into account we would

¹ See for example the five-stage model developed by Stuart and Hubert Dreyfus (Dreyfus and Dreyfus 1986; S. E. Dreyfus 2004), the stage model of Micheline Chi, 2006, Alvin Goldman’s definition of expertise based on true and justified beliefs, eg 1979 or, for the 10,000-hour view, see Ericsson, Krampe, and Tesch-Römer 1993.

² Collins and Evans, 2002, Collins and Evans, 2007. There are a disproportionate number of citations to Collins and the Cardiff University group in this paper because that is where most of the work has been done.

³ Though it leads to different conclusions regarding the relationship of science and society; see Collins and Evans, 2002. Sociology of scientific knowledge began with Bloor’s discussion of the idea of symmetry in 1973 with the first empirical paper being Collins, 1975. Collins assembles a number of empirical and philosophical contributions to SSK in his 1985/92. Bloor’s work was inspired by Wittgenstein’s, 1953, and Collins’s by the same source having been introduced to it by Winch’s, 1958, discussion of forms of life; the point being that this sociological approach has its roots deep in philosophy though not the kind of philosophy that finds terms such as ‘rational’ central to their work.

wind up with a circularity: ‘scientists and us believe X, not Y, because X is true’ – that is, ‘scientists and us believe X rather than Y is true because we believe that X rather than Y is true’. To escape from this circularity one merely adopts, for the purpose of analysis, the attitude that the truth of the matter has no influence on scientists’ beliefs about the truth of the matter. That enables one to explore, to the limits, the causes of scientists’ belief in the truth of the matter without being able to cut the exploration short at any time by invoking the ‘actual truth of the matter’ (ie, what the analyst believes to be the truth of the matter). It is vital that this attitude be applied to truth in the making, whatever attitude one takes to truth after it has been made – that is another matter. The recommended approach has the great advantage that it does not force the analyst to divide the world of scientists, which is typified by deep disagreement (Planck is said to have said that ‘science advances funeral by funeral’), into two camps, those who are wrong and those who are right. That is good because analysts have better tools than those possessed by scientists themselves to establish this categorisation and, in the nature of things, scientists themselves continually disagree about who occupies the two camps; science *is* deciding who is in which camp.⁴

Expertise as socialiation

SEE is related to this kind of thinking because it too avoids any definition of expertise that turns on the rightness or efficacy of the expert. Under SEE one can be an expert but

⁴ This approach is in sharp contrast to that of, say, Laudan, 1983, who claims that the truth of true beliefs explain their acceptance and that the only kind of sociology of belief there can be is a sociology of error.

be wrong just as under SSK one can be doing science and be wrong. Most definitions of expert are tied up the notion that an expert is more right or more efficacious than a non-expert. Typically, experts might be said to have more true and justifiable beliefs than non-experts or it might be said that 10,000 hours learning and practising are needed in order to become an expert. Starting this way creates great problems for the analysis of expertise since experts are always disagreeing and, once more, before you can empirically investigate the nature of expertise in a satisfactory way, one must separate experts into two camps – the true experts and the pretenders. It is hard to see how to do this when the experts themselves are disagreeing about who are the true experts and who are the pretenders. SEE avoids all this by starting with a different concept of expertise.

SEE's concept of expertise begins with observation that most of what experts know they know tacitly and that tacit knowledge is acquired by apprenticeship or socialisation.⁵

SEE defines an expert as someone who has been socialised into an expert community or specialist group. Indeed, SEE makes no distinction between acquiring an expertise and becoming socialised into a group. Thus, those who are socialised members of a society are experts at living in that society and can pass easily as members of that society; those who are experts at gravitational wave physics are socialised members of the community of gravitational wave physicists. Two persons who have been socialised into a specialist group and are therefore experts in that speciality (say, gravitational wave physics), can

⁵ Michael Polanyi is usually credited with creating the term 'tacit knowledge' (Polanyi 1966). For more recent treatments that grow out of studies of scientific knowledge see Collins, 1974, 2010

disagree fiercely with each other without analysts having to conclude that one of them must be less of an expert than the other (though one might expect such accusation to be part of the rhetoric of arguments among experts themselves). SEE also allows that what was once thought to be an expertise may cease to be thought of as an expertise as history unfolds (say, alchemy) without there being any question of the experts in the discredited group no longer being counted by the analyst as having been experts in that specialism (though the claim that they were never experts might well be deployed by the surviving groups of experts). Specialties range from, say, astronomy, which, today, is generally believed to be right and efficacious, to astrology, which is not; expertises include prediction of unemployment and inflation rates based on econometric modelling, the efficaciousness of which is subject to fierce argument, without such arguments needing to cause the analyst any anxiety about the definition of expertise.⁶

The Imitation Game and Interactional Expertise

SEE's definition of expertise, since it cannot reach for rightness or efficaciousness as a criterion, invites the question of what counts as an expertise and what does not. For example, does wearing brown shoes count as an expertise? The answer is that, the ability to wear brown shoes (by which is meant just wearing them, not wearing them with a particular flair indicated by, say, the choice of accompanying garments), does not require any socialisation, so it is not an expertise; expertises can be distinguished from non-expertises by asking whether it would be possible for a non-expert to pretend to be an

⁶ Evans 1999, 2014 for econometric modelling.

expert in an Imitation Game, where a judge, who is an expert, ask questions and compares the answers from an expert and a non-expert – a Turing Test with humans.⁷

Approaching expertise in this way invites a number of other questions. For instance, ‘How intense does the socialisation have to be for the socialised person to be counted as an expert?’ SEE’s answer to this question is a little different to the answers that might be given under the standard definition (eg ‘10,000 hours of learning and practice is necessary’), in that, firstly, the way of measuring the degree of socialisation with Imitation Games is different and, secondly, SEE’s definition allows for ‘ubiquitous expertise’ – which means that in the case of certain specialities, such as speaking a natural language, nearly everyone is an expert. Thirdly, SEE’s definition opens up the crucial idea of ‘interactional expertise’.

Language has a central role in the socialisation of humans. It is said that there are rare kinds of apprenticeship – eg, Japanese painting – where, at least in the idealised account, the apprentice master never speaks to the apprentice.⁸ But SEE would claim that even if that was true, the apprenticeship would go much better and more efficiently if the vow of silence was broken. SEE notes that during the acquisition of most skills, even the most practical skills, there is lots of verbal interaction going on as novices are taught both how

⁷ The locus classicus for the Turing Test is Turing, 1950. For Imitation Games with the colour-blind, blind and those with perfect pitch see Collins and Evans 2014; Collins et al. 2006, for the extent to which males and females understand each other see Collins et al. 2017; Evans under submission XXX

⁸ Jordan and Weston, 2003

to see the world and how to manipulate it. Thus according to SEE, even humans' practical skills are based in language – language is fundamental. The question is to what extent an expertise that involves practice can be learned by immersion in spoken discourse alone without engaging in any of the practices – the opposite of the ideal Japanese painting case? Learning by immersion in spoken discourse alone is called 'acquiring interactional expertise'.⁹

Initially, the idea comes partly from debates around artificial intelligence (AI) and partly from experience of doing sociological fieldwork. The critic of artificial intelligence, Hubert Dreyfus, argued that machines could not be intelligent in the way that humans are intelligent unless they have human-like bodies.¹⁰ The AI enthusiast, Douglas Lenat, responded that this could not be true or the congenitally physically disabled would not have human-like intelligence whereas it is clear that in any Turing-Test-like test of intelligence they will be indistinguishable from any other intelligent human. Lenat seems to have the right of this argument unless you define the notion of the body in a very minimalist way. The disabled may not be able to practice in the way fully-abled humans practice but they are indistinguishable in tests involving verbal fluency even though they have learned to speak of practices solely through immersion in discourse without

⁹ Collins 2004, 2011; Collins and Evans 2015

¹⁰ For example, Dreyfus 1967. Dreyfus was following Heidegger and especially Todes, 2001 (the book is based on Todes's PhD thesis which was completed much earlier – Todes and Dreyfus were fellow PhD students at Harvard).

practising— they have acquired interactional expertise. The same applies to sociologists, anthropologists, or ethnographers who immerse themselves in the spoken discourse of groups of specialist respondents without immersing themselves in their practices: they learn to speak the ‘practice-language’ of the specialist domain while being, effectively, disembodied. I demonstrated what it means to have interactional expertise in gravitational wave (GW) physics – I field I have studied as a sociologist since 1972 – on two occasions. A GW physicist set technical question to me and another GW physicist (or small panel of GW physicists on the second occasion), who answered them rapidly without using technical sources. On the first occasion, a panel of other GW physicists tried to guess which set of answers came from me and which from the genuine physicist, and on the second occasion, others simply marked the answers so that the marks from all parties could be compared. On both occasions I did well, the first time better than the physicist, and the second time nearly as well as the panel of GW physicists who answered and clearly better than panels of non-GW physicists and non-physicists.¹¹

But the role of interactional expertise is far wider than this. Consider the role of technical managers in a field like GW physics – recent Nobel laureate Barry Barish is an example. They have to make decisions about how to move the project forward that will be technically convincing to the scientists but without doing any hands-on work on the apparatus. Gary Sanders, Barish’s deputy for a number of years and LIGO’s project

¹¹ Giles, 2006 is the report of the first experiment in the scientific journal *Nature*. The report of the second experiment can be found in Collins, 2017 Chapter 14

manager, agreed that interactional expertise was central to his role.¹² Still more general, the specialist division of labour in a project like LIGO has to be mediated through interactional expertise since specialists can practice only where they have narrow practical competence whereas the mutual understanding that enables the technical specialties to interact comes through their sharing a common-practice language – sharing interactional expertise. Practices cannot be common or there would be no specialists! Indeed, it seems inescapable that the interaction between roles in a society is mediated through language and it is interactional expertise that allows human societies to cohere! It is all too easy to fall into a glib dismissal of the role of language in practical domains: ‘talking the talk is not walking the walk’, but practice languages are the foundation of practices and we should think of interactional expertise as ‘walking the talk’.¹³

This new kind of expertise arising out of the SEE approach also explains why the Turing Test is so powerful a test of intelligence and is an adequate test of intelligence in the absence of robotic capabilities.¹⁴ Language works the way it does in practical domains because language is itself a practice which is acquired through socialization and itself contains practical understandings; the reason that I could pass as a gravitational wave

¹² LIGO stands for ‘Laser Interferometer Gravitational-Wave Observatory. Sanders’s explanation can be found in Collins and Sanders, 2007.

¹³ A disappointing number of those who encounter the concept of interactional expertise think it is something to do with hoaxing (eg, see Giles, 2006), or a thin pretence of expertise, often referring to it as mere ‘talking the talk’; it is very hard to overthrow a prejudice like this even in those who cite the primary sources.

¹⁴ Collins, 2018, deals with this feature of the Turing Test at some length.

physicist is because, as a result of spending so long among gravitational wave physicists, I am likely to make the same practical judgments as them and the ability to make these practical judgements can be tested in verbal interchanges. Note what it not being claimed: it is not being claimed that sufficient immersion in the spoken discourse associated with bike-riding will enable anyone to ride a bike (though it will help a bit); one must practice bike-riding to learn to ride. What is being claimed is that someone who cannot ride, but has been sufficiently well immersed in fluent talk about bike-riding, could say everything there is to be said about bike-riding in a way indistinguishable from someone who could ride and without that possibility we would not understand how the social world worked. Something else that is not being said is that this means that bike-riding and understanding bike-riding are formally describable: what has to be grasped is that immersion in social discourse leads to the acquisition of a practical ability – fluency in the spoken discourse – a practical ability which cannot be reduced to a set of formulae.¹⁵

The three dimensional model of expertise and other avenues

The relationship between SEE's conception of expertise and other conceptions can be summarised in the 'three dimensional model of expertise' (Figure 1). In this figure the 'Z-axis' (into the page), captures standard treatments of expertise where the crucial dimension is individual accomplishment. SEE recognises that even if expertise is defined in terms of socialisation, some people will be better at it than others (e.g., autistic persons

¹⁵ See Collins, 2004, 'Interactional Expertise as a third kind of knowledge'.

find it harder to become socialised than others), so there must be a dimension recognising individual ability. The horizontal, X-axis, represents the extent to which an individual has been exposed to the socialisation process. The vertical dimension represents the degree of ‘esotericity’ of the expertise, from something like natural language speaking and general understanding of the native society at the bottom to something like gravitational wave physics at the top.

[Figure 1 about here]

Figure 1: The three dimensional model of expertise¹⁶

This diagram can be used in many ways. For instance, it can be used to illustrate the intellectual trajectory of students under different learning regimes – always well to the left in distance learning regimes but leaning toward the back right at the top at PhD level with undergraduate level teaching moving steadily left over the decades as staff-student ratios deteriorate. It can be used to indicate the way certain abilities, such as car-driving, change from esoteric when cars were first invented to near ubiquitous as cars become commonplace – revealed as horizontal plane which steadily moves downwards. And it can be used to remind us of another of the problems for the standard treatment of expertise, namely that a ubiquitous expertise, such as fluency in a natural language like English, which is no expertise under the standard models, can be an esoteric expertise in

¹⁶ Adapted from Collins 2013

another country such as France – and thus transmuted into a valued expertise under the standard models even though the substance is remains unchanged.

Other ways in which the new approach seems useful is that it gives rise to an exhaustive categorisation of types of expertise, including ubiquitous expertise, interactional expertise, ‘contributory expertise’, which includes the ability to contribute to a specialist domain, referred expertise, meta-expertise, and so on. These have been assembled in a ‘Periodic Table of Expertises’.¹⁷ One learns more and more by being forced to work out exactly what all these mean and what their variants are.¹⁸ Because of the equivalence of socialisation and acquisition of expertise under SEE, it also opens up a description of society as a cascade of embedded expertises from large – natural language fluency and other ubiquitous expertises that define a culture – to small such as gravitational wave physics. It enables one to argue that democracy as we know it is formed, in part, by most citizens’ understanding the hierarchy of these elements: a ubiquitous meta-expertise which, most of the time, enables citizens to weight the contributions of various kinds of expert to various kinds of decision. We see this, when it is working, as a bulwark against the growth of populism.

¹⁷ Collins and Evans, 2008.

¹⁸ Eg Collins and Evans, 2015, Collins, Evans and Weinel, 2015, Collins and Weinel, 2011

Conclusion

I have introduced a new(ish) way of thinking about expertise. I have tried to reveal both the way it resolves certain problems for standard models and the way it opens up quite new avenues for thinking about these matters.

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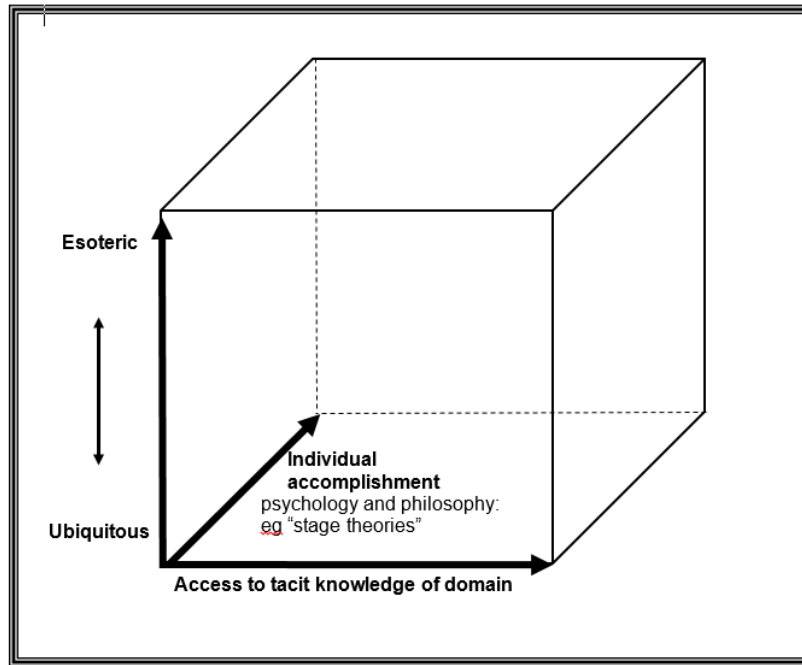
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This is Figure 1