Selinger, Evan, Hubert Dreyfus, and Harry Collins, Interactional expertise and embodiment, *Studies in History and Philosophy of Science*, 2007, 1-19

Keywords

Interactional expertise, tacit knowledge.

Domain

Cognitive sciences, physics, science in general.

Abstract

The article consists in an exchange among Selinger, Dreyfus and Collins about the relation between embodiment and interactional expertise. Selinger criticizes Collins' tenet that interactional expertise reduces the significance of embodiment for the acquisition of linguistic competence. Collins concedes this point, but maintains that this does not modify the significance of interactional expertise and its interest in the experimental investigations about embodiment and language. Dreyfus maintains that Collins fails to recognize that full expertise always requires the ability to master situated language, which in turn implies the use of demonstratives, and that the latter normally demand bodily engagement. Collins concludes by pointing out that interactional expertise cannot be understood in terms of Dreyfus' binary distinction between situated and desituated uses of language.

Development

Part 1. "Conversational computers and interactional experts: Collins' on human embodiment" by Evan Selinger

In the first part of the article, Selinger develops a detailed critique of Collins' claim that the notion of interactional expertise has wide consequences for the relation between embodiment and language acquisition in general, and for artificial intelligence in particular. Selinger begins by reconstructing Collins' view about the extent to which knowledge can be conveyed by language alone. Central to this view is the notion of "interaction expertise", which amounts to the acquisition of all the linguistic understanding of a domain solely through immersion in the language of the "contributory experts" of that domain. According to Collins, given that only contributory experts are physically (i.e. bodily) engaged in their domain, the notion of interactional expertise shows that the role of embodiment for linguistic competence and socialization is overestimated. In particular, Dreyfus' phenomenological critique of artificial intelligence, according to which, computers will never be able to pass a Turing Test (and hence qualify as truly intelligent beings) unless they are embodied like humans is invalid. What is necessary in principle to pass a Turing Test is, for Collins, just a minimal embodiment enabling linguistic exchange (the equivalent of human ears, larynx, and the part of the brain decoding linguistic outputs and inputs). In short, if computers can't think is not because they are not embodied as humans' are, but because we haven't still found a way to make them socialize. Collins believes that three examples empirically support his claim 1) the case of Madeleine a congenitally blind woman with a severely disabled body who, only from books that were read to her, managed to develop a high-level conversational competence on a variety of subjects she could have

no direct experience of; 2) the case of colorblind people who learn to use competently all distinctions concerning colors, again, only thanks to immersion in the talk about color made by normal perceivers; 3) the case of Harry Collins himself, who became able to talk about gravitational wave physics so competently that no expert of the field was able to distinguish between him and their practicing colleagues. Selinger grants that these examples can be used to criticize an approach à la Dreyfus according to which the full linguistic competence can be acquired only through direct involvement in physical activities, but denies that they have any bearing on the role of embodiment in the development of linguistic skills. As to the first to cases, Selinger argues, that by neglecting how the subjects in question acquired linguistic ability in the first place, i.e. the ability to converse, Collins has failed to recognize that a non-minimal embodiment is necessary for humans to develop linguistic skills at all. Further, the competence acquired at this level through embodied learning can be used to extrapolate to cases not directly experienced, thus making interactional expertise possible. In short, given the way human subjects *de facto* acquire linguistic competence, interactional expertise, far from indicating the irrelevance of a non-minimal embodiment, presupposes it. According to Selinger, the case of the sociology of gravitational wave physics is, in this respect, even less convincing and it is wrong to compare it to the previous ones. By acquiring conversational competence about gravitational wave physics, Collins did not need to overcome any bodily deficiency, but only the boundary of his professional training. In short, this is a case of normally embodied person who managed to acquire interactional expertise. And it is difficult to imagine that the acquisition of the latter could take place through an entirely discursive training. Certainly, Collins had to understand communicative gestures, pictures of scientific equipments, and perhaps, he had direct experiences of the relevant laboratories and experimental apparatuses. All these activities require a non-minimal body. Selinger concludes: "It is as if he reasons that if someone can talk about a topic that they have never experienced, the only way that the person could compensate for their experiential deficiency it to utilize the fullest potential of discourse alone" (p.12), while "in the cases considered, conversation functioned as an important part of the compensatory process, but it depended upon the reception of a non-minimally embodied agent." (Ibid.).

Part 2. "Investigating extrapolation instead of treating the body as a unit" by Harry Collins.
In his response Collins concedes to Selinger that the body is necessary for language acquisition and that his previous notion of minimal embodiment must be enriched as to include an extra-component accounting for the ability to perceive and build up extrapolations to the domains that are not directly accessed. He also acknowledges that his treatment of Collins' acquisition of interactional expertise about gravitational wave physics was oversimplified, for Collins has indeed spent time in the laboratories and has developed his expertise also by looking at the relevant equipment. Hence, the expression "immersion of linguistic exchange alone" should not be interpreted in a literal way. Yet the new notion of body is almost equivalent to that referred to by his minimal body thesis. Furthermore, the main consequence of this thesis remains correct, namely that "Contra Dreyfus, people can learn to speak fluently about practical skills without practicing the skills"(p. 15). For instance, sport commentators can speak about sport with the same degree of competence as sports players. The interest of this conclusion is not only philosophical. Interactional expertise can be of great social significance for management,

journalism and peer reviewers. All the relations between science and policy can be better understood when this concept is taken into account. Finally, at the empirical level, new experiments such as those discusses by Collins, should performed, not in order to find out whether the body is necessary for language (that much being already established), but in order to know how much is possible to extrapolate (in the way described by Selinger) from the directly accessible domains to what will be known only via interactional expertise.

Part 3. "The Turing Test, linguistic expertise, and intelligence" by Hubert Dreyfus.
Dreyfus begins by quoting Heidegger's distinction between authentic/situated uses of language on the one hand and inauthentic/desituated use of language on the other. The former implies a contextual use of language for which demonstratives are necessary. An expert in a domain, unlike the layman, must necessarily be able to use demonstratives to point at instances of concepts in situations in which other experts would be able to understand. This form of ability to perform contextual discriminations is absent when language is just passed along, that is used in a desituated way. Even interactional expertise does not suffice for this kind of expertise/intelligence. The mastery of the surgeon's talk will not enable to tell apart thousands of different cuts as a practicing surgeon can do. As intelligence requires being able to make the correct distinctions in a given context, the Turing Test, which tests only the desituated use of language, does not test intelligence and linguistic expertise at all. Dreyfus concludes by pointing out the interesting case of scientific language: "Science in general is desituated but even science normally requires skilled discriminations. A nuclear physicist who couldn't tell the path of an X particle from a Y particle in a cloud chamber just isn't an expert. String theory and Gravity quantum stuff may, however, be so theoretical that no situational discriminations are ever called for." (p. 16).

Part 4. "Interactional expertise: Between formal and informal" by Harry Collins.
Collins denounces the inadequacy of Dreyfus's Heideggerian polarization between situated and desituated use of language. There is a formal mode of knowledge, that is knowledge that can be expressed in systems of rules and in principle instantiated in a computer, and there is an informal mode of knowledge, which requires a direct involvement in the world. This polarization prevents Dreyfus from recognizing that interactional expertise is category standing between the formal and the informal. It is true that interactional expertise does not allow performing the competent contextual discriminations that require the use of demonstrative, but this shows only that it is must be distinguished from full-blown expertise. Yet Dreyfus is wrong in thinking that what is not full-blown expertise, like interactional expertise, amounts simply to "pass along talk". Interactional expertise requires a certain degree of experience and is tacit knowledge-laden. It cannot therefore be considered as a type of formal knowledge. The experience in question is the involvement in the language of a domain. This form of expertise is necessary for the very existence of science. Without it no collective scientific world would be possible, for even within a specific research field, several small groups of specialists of different domains must interact. Besides, also interactional expertise requires a contextual and situated use of language, the situation being the conversation. As regards scientific research, theorization and experimentation are not at all desituated. "Each interpretation of an experimental result, or even a theoretical result… is a matter of situated judgment, the

situation being the social setting of the science." (p. 18). Collins concludes by pointing out that once the simplified account of knowledge and intelligence that was proposed by AI theorists is set aside, "it is now time to explore the richness of the world of situated and informal knowledge and how different types of situated and informal knowledge interact with one another." (p. 18).

Methodology

Philosophical and empirical analyses developed as a debate among the three authors and based on examples and experiments taken from cognitive sciences, and sociology of physics.

Specific contributions

The article casts light on the nature of interactional expertise and constitutes an interesting link between the general reflections on embodiment, language and cognition on the one hand, and the empirical analyses about the status of expertise in scientific practices on the other.

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