



## Discussion

## Bringing tacit knowledge back to contributory and interactional expertise: A reply to Goddixsen

Luis I. Reyes-Galindo <sup>a,\*</sup>, Tiago Ribeiro Duarte <sup>b</sup><sup>a</sup> Cardiff University, School of Social Sciences, Glamorgan Building, King Edward VII Avenue, Cardiff, CF10 3WT Wales, United Kingdom<sup>b</sup> University of Brasília, Campus Universitário Darcy Ribeiro/UnB, Instituto de Ciências Sociais – Departamento de Sociologia, Brasília/DF 70910-900, Brazil

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## ABSTRACT

We analyse a recent paper by Goddixsen (2014) where the author raises questions about the relationship between authorship, attribution and Collins & Evans' concept of contributory and interactional expertise. We then highlight recent empirical work in the sociology of climate change science that has made similar points in order to clarify how authorship, division of labour and contribution are handled in real scientific settings. Despite this, Goddixsen's critique of both contributory and interactional expertise is ultimately ineffective because it rests on a misguided attempt to de-socialise these concepts. We conclude by stressing the importance of collective tacit knowledge acquisition through immersion as a critical step in becoming a full-blown contributory or interactional expert.

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## 1. Introduction: some definitions

In a recent paper Goddixsen (2014) proposes that contributory and interactional expertise are not clearly defined and require clarification. This is a useful endeavour as Collins, Evans, and collaborators have been working on these concepts for more than a decade and, as with any developing concept, multiple definitions of both types of expertise have been put forward in different contexts. In the original 'Third Wave' paper (Collins & Evans, 2002: 254) interactional expertise is defined as "enough expertise to interact interestingly with participants [of a domain] and carry out a sociological analysis". Improving on that, Collins and Evans (2007: 28) define interactional expertise as "expertise in the language of a specialism in the absence of expertise in its practice". A recent paper (Collins, 2011) pointed out that all contributory experts have interactional expertise in their domain of practices, with a new category created for individuals who only have interactional expertise in a domain of practice but no contributory expertise: special interactional experts (e.g. sociologists of science who spend

a long time immersed in a scientific domain and become accomplished speakers of its language).

Goddixsen does not use the most recent 2011 elaboration to carry out his critique. This is unfortunate because the Studies in Expertise and Experience (SEE) programme now has a well-developed and empirically supported conceptual mapping of expertise-related concepts: expertise is the mastery of the tacit knowledge of a domain of practice, with interactional expertise being mastery of the domain's language and contributory expertise being the ability to competently engage in the practices of that domain. From the very start, however, Goddixsen's (2014: 112) definition of expertise is at odds with Collins and Evans' definition: "I take an expertise to be a set of skills that enable a person to perform certain tasks that are of importance to a wider community in a way that benefits this community". But, as pointed out above, Collins and Evans have defined expertise as mastery of the tacit knowledge shared by the members of a domain of practice. Whether the possession of expertise will lead to something beneficial to a domain or not is a whole different matter. Indeed, opposing members of core-sets tend to be quite vocal about how much harm their opponents are causing to the field in spite of their high levels of expertise (Collins, 1992, 1998).

\* Corresponding author.

E-mail addresses: [LuisReyes@ciencias.unam.mx](mailto:LuisReyes@ciencias.unam.mx) (L.I. Reyes-Galindo), [tiagoribeiroduarte@ig.com.br](mailto:tiagoribeiroduarte@ig.com.br) (T.R. Duarte).

## 2. Goddixsen on contributory expertise

Goddixsen's first step is to try to clarify the concept of contributory expertise by attempting to work out what type of contribution would make someone a contributory expert. For example, he asks whether a special interactional expert who engages in a conversation with the contributory experts of the relevant domain and makes useful suggestions that help solve a problem should be regarded as a contributory expert. He also points out that although a practicing chemist or a physics master student could be useful in a physics lab, they would not be able to fully perform as competent researchers, so that being able to engage with some of the practices of a domain is not enough to be a contributory expert. This flexing and tracing of the boundaries of contributory expertise in ambiguous cases like students or lab technicians could lead to a useful examination of the demarcation criteria for this category.

Goddixsen first posits epistemological criteria to identify contributory experts, arguing that contributory experts should be able to make contributions that lead to the progress of the field, even while acknowledging that there is a complex philosophical debate on what scientific progress means. Indeed, given the well-known debates in both the philosophy and sociology of science of the previous century it is difficult to see what concept of progress should be used here. Furthermore, as Collins and Evans' definition of expertise does not mention contributions that benefit or lead to the progress of a domain, reviving an intractable epistemological debate does not seem to be a very tempting move.

The second criterion on offer is much more promising. Goddixsen argues that a contributory expert has to be able to make contributions to a domain that would entitle him or her to authorship of scientific papers. This point strongly resonates with work recently carried out by Duarte (2013) examining collaborations in climate change science. The research shows that the notion of contribution can be split into two categories: standardised contributions and domain-language-based contributions. The former refers to practices that anyone who does not speak the language of a domain could make. For example, in paleoclimatology laboratories, technicians perform tasks such as washing sedimentary cores and preparing samples to be run in mass spectrometers for which no understanding of the theoretical side of paleoclimatology is needed. Domain-language-contributions refer to those that require mastery of the language of a domain. For example, to be able to interpret paleoclimatology data it is essential to have an in-depth knowledge of the principles behind the production of the data at hand, about the history of the Earth system, and about its main mechanisms of change. Interestingly, as work in progress (Duarte, 2014, 2015) points out, in actual scientific practice only domain-language contributions lead to authorship in paleoclimatology. It is worth noting, however, that the publication criterion could in some cases encompass some experts whose expertise was primarily interactional – such as the managers of large scientific projects (Collins & Sanders, 2007). Further empirical work is therefore necessary to clarify how to distinguish the special interactional experts from the contributory experts in published papers and these results would be important in further developing more solid demarcation criteria for contributory expertise within the larger SEE programme.

## 3. Interactional expertise

Further on, Goddixsen makes a distinction between Collins and Evans' concept of interactional expertise and what he refers to as 'imitational expertise'. For the former, the definition is nearly the same as Collins and Evans', centred on "the ability to speak the language of the community to a relatively high degree". The latter

consists of the ability to pass an Imitation Game (IG).<sup>1</sup> Goddixsen argues that for one to pass an IG one would 'only' have to answer the questions in a way that is indistinguishable from an expert in the relevant domain, different from an interactional expert, who, in his account, could attribute different meanings to objects, concepts, etc. and still interact with members of another community.

Nevertheless, Collins and Evans would not use the qualification "relatively", as they apply the notion of interactional expert only to individuals with *full* command of a domain language. This is because the concept of interactional experts was created to encompass individuals who share the same language and consequently the same frame of meaning when it comes to a given domain of practice. Goddixsen instead tries to place interactional expertise alongside other STS frameworks created to think about collaboration between different expert communities, such as interlanguages (Galison, 1997) or boundary objects (Star & Griesemer, 1989) that do not rely on shared meanings (Collins, Evans, & Gorman, 2007; Ribeiro, 2007). Goddixsen assumes that Collins and Evans argue that effective collaboration can only happen in contexts where interactional expertise is the mechanism to bridge the gaps between different communities. This is certainly not the case, as Collins, Evans & Gorman (2007) have clearly pointed out. While there may still be room to debate how interactional and imitational expertise overlap, the discussion would need to be centred on the understanding that an interactional expert has, by definition, access to the frames of meaning that delimit an esoteric culture.<sup>2</sup>

## 4. The tacit dimension(s)

So far, one could argue that these are only inconsistencies in terminology between the latest definitions of SEE and Goddixsen's usage. Nevertheless, we will argue that the second half of his paper suggests that the divergences between Goddixsen's and SEE's conceptualisation of interactional expertise run much deeper and are tied to a very different philosophical understanding of this concept. Furthermore, Goddixsen's definition of this term is at odds with the empirical background that underlies the whole expertise programme.

Goddixsen gives a brief description of how one becomes a scientist: a student starts out in a bachelor's course in which the basic technical knowledge and vocabulary within a large-scale discipline (viz. physics) is taught by practicing research scientists, but he makes the point that more often than not they interact more with TA's who are more likely to be "advanced interactional experts". Further specialisation means that they come into contact with experts from other areas of research, so that "they learn parts of the language of other specialisms" and that they therefore acquire "some degree of expertise in related domains." Finally, it is claimed that "the more tacit 'tricks of the trade' are learned through theoretical and practical exercises." Through this, he claims that interactional expertise is in fact sometimes gained without substantial contact with contributory experts but this means he has shifted into a framework that thinks of expertise as coming from organised education rather than socialisation into bodies of tacit knowledge. Goddixsen (2014: 115) correctly points out that "Collins and Evans

<sup>1</sup> See Collins, Evans, Ribeiro, and Hall (2006) for a description of the Imitation Game and its relevance to our understanding of tacit knowledge.

<sup>2</sup> See Collins and Kusch (1998) for an extensive discussion of why a conversation is a type of *polimorphic action* from which the collective and intentional *cannot* be subtracted in order to judge proficiency. Within that same framework, Goddixsen's conceptualisation of Imitation Game dialogues is closer to that of a *mimomorph action* in which intention and frames of collective meaning *can* be ignored when judging proficiency.

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