

Where is Spacetime Constituted?

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> Upshot • In an attempt to understand its presuppositions, the commentary takes a closer look at the model proposed by the target article. By analysing the interactions between conscious agents, the model tries to derive the enaction of a spacetime framework. A critical examination of the ontological status of the involved entities indicates inconsistencies, especially at the adoption of viewpoints. It seems that despite the model's being supposedly grounded on the primacy of consciousness, this characteristic is not immediately apparent. The commentary proposes an even more radical adoption of the first-person point of view.

Ontological status of entities in the conscious agents model

« 1 » I am inclined to support the model presented by Chris Fields et al., especially the way it, in one big stroke, connects biological constructivism (Maturana & Varela 1980; Foerster 1984; Riegler 2012) with quantum physics. Yet, extraordinary claims (such as the proposed model) require extraordinary evidence. When the model's results confirm the authors' goals, i.e., that from the interactions of conscious agents almost miraculously springs a 3+1D physical framework of our everyday world, one should always beware of the possibility of motivated reasoning.

« 2 » As the remainder of this section will show, an explication of the proposed model's presuppositions exposes considerable issues. It remains to be seen whether those problems stem from the commentator's misunderstanding, from small inconsistencies in the proposed model (which can be easily patched), or from flaws with serious consequences for the model's fitness. I hope it will turn out to be one of the former options, for the idea of deriving characteristics of the physical world from the dynamic of consciousness is an exceptional one.

« 3 » The aim of the target article is to create a mathematical model of how con-

sciousness constitutes the world. The authors avoid the presupposition of "objects as spatially bounded, temporally persistent, internally cohesive, causally independent entities" (§14), and instead attempt to create a mathematical model of the constitution of those objects, presuming the primacy of consciousness. Discarding the natural attitude (the tendency to believe our construction of the world to be an accurate representation of objective reality), the authors seem to assume the phenomenological attitude (Husserl 1982), the attitude that phenomenology shares with constructivism (as argued in Kordeš 2016a).

« 4 » According to phenomenology, phenomenal consciousness is the epistemologically safest foundation on which to build science. According to Dan Zahavi (2004), for Edmund Husserl, studying how the world is constituted in consciousness became the cornerstone for transcendental phenomenology, which in turn was supposed to become the foundation of science. Despite the fact that Husserl created a philosophical system with this particular purpose, phenomenology has never completely succeeded in this endeavour. The problem being that phenomenologists never made it exactly clear how to actually build natural science (starting with physics) on phenomenological foundations. The target article offers a solution.

« 5 » The proposed mathematical model is based on the concept of conscious agents (CAs) (§2). In the following paragraphs I will try to summarise and more clearly explicate the presuppositions that come with this concept.

« 6 » The authors suggest that a defining feature of a CA is its "principled unpredictability [...] considered by some to indicate autonomy or 'free will' and hence agency from the perspective of external observers" (§6). Furthermore:

“While autonomy in the non-trivial machine sense inferred above is somewhat abstract, a requirement for autonomous decision-making at least suggests an awareness of potential consequences and hence consciousness.” (§8)

« 7 » From this definition of a CA, it is clear that consciousness is inferred from the CA's behaviour. Since this behaviour takes

place in an abstract mathematical space rather than in the space of our everyday world, the question arises: What is the ontological status of entities or phenomena those spaces represent?

The gap between functional and phenomenal aspects of consciousness

« 8 » Susan Blackmore (2013) divides discussions concerning consciousness into two distinct realms represented by the following two questions: "What is it like to be...?" and "What does consciousness do?" (for the purposes of this commentary, they will be referred to as the phenomenal and the functional aspect respectively). There are many answers to the latter. One of them is proposed by the target article, i.e., consciousness behaves in principle unpredictably. Between the functional aspect of consciousness and the aspect that answers the question "What is it like to be...?" (describing so-called phenomenal consciousness), there is an unsurmountable chasm – usually referred to as the explanatory gap.

« 9 » In order to assess which aspect is assumed by the authors of the target article, the basic mathematical elements of the proposed model need to be examined. What are the categories that define agents CA_1 and CA_2 , the interaction between whom enacts physical entities? Figure 1 of the target article provides the answer: "Here X_1 and G_1 and X_2 and G_2 are measurable spaces representing the experiences and available actions, respectively." The space X is especially important as on it rests the weight of the entire model. It is precisely X that is supposed to contain encoded objects.

« 10 » But what kind of entities does X represent? What is the meaning of "experiences" (§9) within the model? It would seem that X also introduces phenomenal consciousness into the model based on the strong presupposition that phenomenal consciousness can be mathematically described. With this, the model adopts the first-person perspective of lived experience (a perspective that is unreachable for most of natural science). By simultaneously including the functional and the phenomenal aspect of consciousness it seems that the model of Fields et al. unwittingly mixes first- and third-person perspectives.

« 11 » Another indication for the mix-up of perspectives is the model's separation of G and X . Separating experiences (X) and available actions (G) indicates a distinction between the two. If the model took the autonomy of CAs and the primacy of experience seriously, G would be a subset of X – available actions are only those noticed or autonomously constructed and as such experienced as available by the CA. Because that is not the case, the only possible interpretation is that the authors presuppose the possibility of a space of available actions as perceived from outside the CA. This takes autonomy away from the agent. Being autonomous means that the agent chooses from the options the agent itself constructs rather than from pre-given options (cf. Winograd & Flores 1986). Genuine autonomy is in the very construction of the elements of the world, which are, in this case, options to choose from.

Consciousness as the foundation

« 12 » With the exception of phenomenology, most other approaches see consciousness as a product of an observer-independent, “natural” world (i.e., they naturalise consciousness). If consciousness is to be taken as the foundation of a theory, then naturalising approaches are inappropriate, as they presuppose the primacy of something other than consciousness. The only aspect of consciousness that can be used as the foundation for a theory is phenomenal consciousness, i.e., lived experience. This is only possible if the theory's point of view is a first-person one. However, in the case of the proposed model it is the point of view of the CA.

« 13 » Constructivists always stress that every view is a view from somewhere. I fear that Fields et al. are not very clear from where they are observing. Are they looking at the world from the eyes of an agent (who, of course, does not have access to anything other than its own horizon – i.e., the surface that connects it to the world) or through the “eyes of God,” who sees all agents, their actions and interactions?

« 14 » The “God's eye” view or the view “from nowhere” (Nagel 1989) is characteristic of fields that have uncritically accepted the natural attitude (that is, for most of science with a few exceptions, such as phenomenologically inspired research). This view

enables intersubjectively valid methods and exceptionally successful research, characteristic of physics, neuroscience, biology, etc. What this view filters out, though, is consciousness. It perceives the researched structures as “real” and forgets that they came about only due to the act of consciousness. If naturalising research approaches are at all interested in consciousness, they look for it as a product of those natural structures. By filtering out the observer's consciousness, the naturalistic view can only resort to inference from behavior when trying to detect consciousness “out there.” As a consequence, they can only answer the functional question, i.e., “What does consciousness do?” while the question of phenomenal consciousness – “What is it like to be...?” – is inaccessible to the behaviour-oriented third-person view of natural science.

« 15 » By renouncing the view from nowhere, consciousness appears everywhere. Phenomenal consciousness imbues everything there is, everything one notices, thinks or perceives (Kordeš 2016b). Consciousness from the first-person perspective is a medium in which all features of the world are constituted.

« 16 » The history of cognitive science has shown that the growing understanding of brain dynamics and human behaviour does not bring us closer to understanding experience. The failure to bridge the explanatory gap points towards the conclusion that phenomenal consciousness is not only primary but also irreducible. If we want to get conscious experiences as a result, we have to start with conscious experiences. Only in that case can we say that we take consciousness as the foundation of our theory.

« 17 » The model proposed in the target article puts agents and their life dramas in an abstract space. The authors attempt to “develop the dynamics of interacting conscious agents, and study how the perception of objects and spacetime can emerge from such dynamics” (Hoffman & Prakash 2014: 557). Whatever this space is supposed to represent does not seem to represent the space of phenomenal consciousness. As argued above, only if the theory performs the (very radical) step of grounding itself in phenomenal consciousness, is it sensible to start looking for appropriate mathematics that might enable the modelling of the constitution of the

world. (One of such notable attempts being “primary algebra” proposed by George Spencer Brown 1969 in his *Laws of Form*).

« 18 » It would seem that the authors are not modelling the construction of a world from consciousness, but the construction of a world by entities that are behaving as if conscious.

Agency and the sense of agency

« 19 » The confusion of perspectives is also apparent from the use of the term “agent” and the consequential notion of agency. It seems that the authors conflate the sense of agency with agency as the actual ability of a CA to consciously influence courses of action. Agency and the sense of agency should not be carelessly equated. Many third-person studies such as those of Benjamin Libet et al. (1983) and Daniel Wegner (2003) have shown that our conscious decisions are not (always) causally linked with our actions, despite what the sense of agency might suggest. The phenomenal sense of agency functions mostly as a way of smoothing the narrative (i.e., sense-making).

« 20 » Agency and the sense of agency could only be equated if the model were to be intrinsically rooted in the experiential world, that is, if the whole process were to be seen as metamorphoses of phenomenal consciousness. Such a model would describe a consciousness that changes itself. That way, sense-making, the constitution of objects, etc. would all be part of the same substance, and the dualism that spoils the image of the presented model would be avoided.

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