Review of: "A Metaphoric Exploration of Objective Constructivism"

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Potential competing interests: No potential competing interests to declare.

The paper is well and clearly written and presents an interesting discussion on possible compatibilities of constructivist and objective accounts of epistemic processes. The main example in debate is instigating, though complex. On the other hand, the paper is clear (as far as I could understand). I could understand the general ideas, and for this reason, I start describing what I could get from the discussion before expressing my views on some issues and suggesting a few improvements on the presentation.

From my (subjective) reading of the paper, I am understanding that:

1. The focus:

This is a discussion paper focusing on the possible compatibility of constructivist and objective accounts of epistemic processes. It investigates the idea that “there may be no real clash between constructivist and realistic positions at all, rather it may be just a question of the relative completeness of information” (p.2).

1. Method:

The discussion is developed through argumentation by analogy and metaphor, drawing on the concept of parallel reasoning (Bartha, 2010). Here, the source domain is the algebraic theory of quantum field theory, and the target domain is epistemology.

Preliminary step (context of the study): Take the algebraic approach to quantum field theory.

First step: Describe the reconstruction of the field algebra in the algebraic approach to quantum field theory.

Second step: Use parallel reasoning to give the main argument (which is: there may be no real clash between constructivist and realistic positions and “objective knowledge of global reality may be achieved from local observations”)

1. Theoretical perspectives

It considers Finkelde and Livingston (2020) and their perspective that objectivity poses both conceptual and methodological problems, raising questions on “how to gain insights that are valid beyond the scope of the subjective view and interpretation of a specific individual subject”.

The author proposes, as in Wainberg (2001), that “an objectivist position may assume, within the limits of the physical

laws of relativity and objective mechanics, that objective knowledge can be gathered and different subjects will converge in their approximation of reality".

1. Main constructs

The author proposes an understanding of the **constructivist** perspective as "assuming a strictly local nature of epistemic processes", meaning "each single mind infers from its restricted information sources a theory of the world". Seeing it this way, for many other authors, the objectivist perspective is impossible to be reached this way.

Reality, for the author (as for Waimberg 2001), is taken as an advanced concept that could account for the quantum state in a Hilbert space as a "reality per se," a view which is also called "wave function reality." It is in dialogue with the approach by Giere (2006), in his program "scientific perspectivism," acknowledging that "while scientific theories aim to reflect the real world, they do so through the lens of human conceptual frameworks and practices, and hence their local subjective observations."

I will not comment on sections II and III because I could follow the flow of the development in physics and mathematics, but not in depth. Follows my interpretation.

I am interpreting that the very proposal of taking a "vector" as the "quantum theoretical replacement for reality" sets a specific context for developing related notions from a scientific perspective:

1. It (the context) could be thought to be immersed in an intersubjective space, shared by physicists and mathematicians.
2. The mathematical language, which deliberately tries to avoid polysemy, is adopted to mediate and to build "reality," in this case. It is also shared by individuals in this case.
3. Methods and practices to give accounts of reality in this case are mathematical – deductive and axiomatic reasoning. They are also shared by individual physicists.

Thus, there will be "affordances and constraints" determined by the selected "reality," seen from a scientific perspective: it is built on physical and mathematical shared knowledge - and the method to work out this reality is mathematical.

So, individuals share "reality" and the instruments to work out the reality. Thus, it is reasonable to accept the possibility that the results of subjective accounts could converge.

These ideas have the potential to lead to new discussions in the area. In fact, it seems that they break the dichotomy between formal and informal approaches (to mathematical knowledge, at least), if we consider the shared mathematical knowledge as setting the context and the shared mathematical reasoning as providing the instrument to develop mathematical practices. In this case, an intersubjective space is determining affordances and constraints to the subjective work out of questions. (See the second and third paragraphs of section IV.) But this seems only an aspect of the question.

So first, I would suggest a better clarification of the meaning for the notion of constructivism that is adopted: "assuming a strictly local nature of epistemic processes", meaning "each single mind infers from its restricted information sources a theory of the world". It gives the impression that the local nature of epistemic processes is to be identified with subjectivity.

Second, in the Conclusion, please consider issues of complementarity on the space of possible observations leading to global theories in place of “exhaustion” of possible observations.