

# Review of: "Holographic Quantum Theory of Consciousness"

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Potential competing interests: No potential competing interests to declare.

This is an ambitious, creative, and fun paper to read, but it is held back by presenting various highly contested positions as facts, sometimes with minimal motivation, and by failing to have an explicit epistemology for favouring one mathematical formalism over another.

On the first issue, a stronger philosophical presentation would be to enumerate these contested positions as clearly-stated, enumerated, and explicit assumptions for the rest of the argument. Each claim would likely need its own paper to be well motivated, so it may be better to take an assumption-driven approach, with a brief paragraph to motivate why the authors believe the assumption over common alternatives (but acknowledging the contested territory). By converting these long-debated assertions into explicit assumptions, the paper can progress into the value-added elements, which I read as the mathematical analysis (see comment at the end), although the authors' thinking in 2.1 would also merit a longer, separate discussion.

Three non-exhaustive examples are given below of the assertions that I suggest are better treated as assumptions to be enumerated as part of an argument format.

(a) "Since human consciousness is involved in all measurements, it is natural to presume that consciousness is critical in manifesting and determining the observed natural laws and phenomena." --> Is it? The measurement of an object can also be posterior to the existence of the object, being our everyday experience of measurement. While some interpretations of quantum theory invert this relationship, there are alternative interpretations which do not seem to be discussed in this paper or motivated for rejection. Citation 8 helps here, but does not address the metaphysical alternatives. If the paper is simply assuming this as an axiom in order to progress, then there would be less need for a detailed discussion of it, but asserting it as "natural" requires further effort.

(b) "Because emptiness has infinite possible trajectories, the vibrational field of emptiness contains infinite information, energy, and matter." --> Different notions of infinity are being invoked here, which is unhelpful. The application of QM mathematics often invokes tricks for handling, normalising, contrasting, or eliminating problematic infinities. The convenience of infinities in mathematical manipulations to model reality should not be taken to guarantee that such infinities have a straightforward ontological parallel, and certainly not that there is "infinite matter" in any defined and limited physical space. Indeed, in the philosophy of QM, the presence of such infinities in the mathematics is often considered problematic - a paradox to be resolved in a future theory, rather than pointing out a fundamental truth in reality.

(c) "If one examines human consciousness, one finds that an essential quality of human consciousness is duality, expressed in Chinese philosophy as Yin and Yang." Does one? Does everyone agree on this? Do any alternatives exist?

These are strong metaphysical and psychological claims which require equally strong support. The MPE notion of Metzinger, for instance, places weight on stripped-back conscious awareness which might be singular rather than dual. Duality might be something that emerges, rather than the underlying essence of all of our consciousness. There is a very interesting claim about human experience in this sentence, but it would take much more than its following couple of paragraphs to explain it properly and defend it. Perhaps this could be a separate paper? Glancing briefly at the references in those sections did not seem to do the idea proper justice.

On the second point, turning to the mathematical formalism, other questions come up where an answer is presented without explanation. Even accepting the idealist assumption that underlying reality is "two basic duality pairs", why would those four elements combine through a summation operation? Why not a product operation or some more sophisticated function? Physics is replete with examples where putting simple things together in large volumes produces a novel phenomenon beyond the incremental consistency implied by a summation function, such as increased adjacencies of mass-bearing particles leading to fusion and then to black holes. Whatever mathematical function best describes (or even governs) this physical behaviour, it is not a naked summation. If summation is simply meant as a stand-in for some combination function which we do not currently know, this ambiguity should be made explicit.

Importantly, matters of argument motivation and clarity aside, why would someone accept this holographic action mathematical formalism of idealism over the six-tuple of Hoffman, Prakash, & Prentner (see Fusions of Consciousness, Entropy, 2023) or any other mathematical formalism? See open source reviews and discussion of Hoffman et al here: <https://www.researchhub.com/paper/1526844/fusions-of-consciousness/reviews>

At this level of abstraction, at least until an empirical validation is proposed, the authors need to motivate an epistemological process by which one mathematical formalism would be preferred to another. Working with Turing complete mathematical objects or by simply importing the wave function, many mathematical formalisms can be identified that would have similar explanatory power and similar limitations to various modern particle physics models, but adding little to those models and providing little reason to change those models to adopt the proposed framing.

Of course, one high-profile epistemology is the explanation of all observed phenomena under a single set of mathematics, without arbitrary thresholds for switching between different and unrelated theories as we have at present. If holographic action modelling leads to a grand unification theory, as the authors claim in 3.2, I look forward to seeing their progress in future years and the Nobel Prizes they would be owed for such success. Such a theory cannot be motivated in principle alone; as it is so far, the authors need to put in the numbers corresponding to observed phenomena into specific formulae to show how everything from quantum entanglement and water molecules to black holes and the patterns of galaxies can be produced.

Short of such an achievement or the experimental observation of human levitation, the authors could still make significant progress by motivating a structured, more accessible epistemology and explicitly using it to compare their mathematical formalism against others that have been proposed. This is where I would encourage the authors to take their philosophical work first.

One hint of an ad hoc epistemology, that DNA also has four elements like their theory, is not currently convincing to me, but perhaps the authors could do more to explain why "four elements" is a universal underpinning of all phenomena, rather than the coincidence of a molecule produced by natural selection in the one instance we are aware of. Hoffman et al. propose six elements to model conscious agents, not four. I do not think that the CGAT elements in DNA constitute a good argument to favour the authors' approach over theirs. Perhaps the idea around the arrow of time in 3.4 could feed into a stronger argument, but as it is currently presented, I am unable to follow it. The argument reads as either tautological or as an entropy-style argument that as maximum potential information tends to increase, perhaps with an expanding universe, there would tend to be one-way expansion in both space and time dimensions. Rather than separate ad hoc elements, the authors could develop a structured epistemological framework for assessing different mathematical formalisms of consciousness; otherwise, I'm unsure how this avenue of study progresses beyond a proliferation of preferred alternatives.

Finally, let me share my interest in the authors' ideas that holographic action may prove a useful mathematical tool for tackling other topics, such as DNA vibrations. Although outside my scope to comment on, these ideas are particularly intriguing and follow a well-trodden path of mathematical concepts enriching our understanding of specific physical phenomena. I would welcome seeing further investigation of this and other applications of holographic mathematics. However, I would separate such empirical modelling and explanation efforts from claims about metaphysics, philosophy of mind, and spirituality/levitation, at least in its early days.