Functional theories can describe many features of conscious phenomenology but cannot account for its existence

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Abstract

This is a commentary on Merker, Williford & Rudrauf (2022), "The integrated information theory of consciousness: Unmasked and identified", a target article in Behavioral and Brain Sciences, Vol. 45, e65. Merker, Williford & Rudrauf argue persuasively that integrated information is not identical to or sufficient for consciousness, and that projective geometries more closely formalize the spatial features of conscious phenomenology. However, these too, are not identical to or sufficient for consciousness. While such third-person specifiable functional theories can describe the many forms of consciousness, they cannot account for its existence.

Main Text

Merker, Williford & Rudrauf have provided a thoughtful, and, in my view, decisive critique of the IIT claim that "consciousness is one and the same as integrated information" (Tononi, 2008, Oizumi, Albantakis and Tononi, 2014). Rather, Φ (the formal measure of integrated information within IIT) is one measure of network efficiency, that can be applied to network information processing in general. For this reason, information integration efficiency can be doubly dissociated from consciousness. For example, there can there be efficient information flows in complex economic, social and transportation systems that are far removed from those usually thought to have a unified, integrated consciousness, and there is extensive evidence for efficient *unconscious* integrated information processing in systems that do have consciousness, namely human minds (see e.g., Velmans, 1991, Kihlstrom, 1996). If so, integrated information processing is not a sufficient condition for consciousness.

Given the inability of IIT to clearly demarcate systems (or subsystems) that don't have consciousness from those that do, Merker, et al. suggest an alternative measure of what it is like to have a conscious "point of view" employing a form of projective geometry that specifies the "point-horizon" structure of human consciousness (Rudrauf et al., 2017). As with the other theories that focus on the projected, three-dimensional nature of conscious phenomenology (e.g., Lehar, 2003; Pereira, 2018; Revonsuo, 2006; Trehub, 2007; Velmans 1990, 2008, 2009), this specification of self-location within a three-dimensional phenomenal world captures a central, but often ignored feature of human conscious phenomenology that has many important consequences for understanding consciousness (c.f. Velmans, 2009). However, it does not follow that the ability to generate and implement such a geometry demarcates conscious entities from nonconscious ones. As with integrated information, double dissociations between systems that instantiate projective geometries and consciousness are

easy to envisage. For example, one can devise complex *nonconscious* guided missile systems that have sophisticated ways of computing and navigating their own location within a surrounding terrain. Conversely, although projective geometries can be used to formalize self-location and navigational aspects of human consciousness, there are many "qualia" of consciousness that cannot be formalized in this way, such as the taste of coffee or the smell of a rose.

Which leads to a deeper question: Is it possible, even in principle, to specify a third-person observable, functional principle that demarcates conscious entities from non-conscious ones? In Velmans (2009, 2012) I have surveyed many suggested criteria for distinguishing entities that are conscious from those that are not. Broadly speaking, theories about the distribution of consciousness divide into *continuity* and *discontinuity* theories. Discontinuity theories all claim that consciousness emerged at a particular point in the evolution of the universe. They merely disagree about which point. Most try to define the point of transition in functional terms, although they disagree about the nature of the critical function. Some think consciousness "switched on" only in humans, for example once they acquired language or a theory of mind. Some believe that consciousness emerged once brains reached a critical size or complexity. Others believe it co-emerged with the ability to learn, or to respond in an adaptive way to the environment. However, it is well recognized in modern philosophy of mind that all such theories face the problem of "brute emergence". If consciousness was entirely absent before the emergence of a critical function, what is it about that function that suddenly creates consciousness?

In Velmans (2009, 2012) I have argued that such theories confuse the conditions for the *existence* of consciousness with the added conditions that determine the many *forms* that it can take. Who can doubt that verbal thoughts require language, or that full human self-consciousness requires a theory of mind? Without internal representations of the world, how could consciousness be *of* anything? And without motility and the ability to approach or avoid, what point would there be to rudimentary pleasure or pain? However, none of these theories explains what it is about such biological functions that suddenly switch on consciousness.

Continuity theorists do not face this problem for the simple reason that they do not believe that consciousness suddenly emerged at *any* stage of evolution. Rather, as Sherrington (1942) suggested, consciousness is a "development of mind from unrecognisable into recognisable." According to such *panpsychist*, *panexperientialist,* and *cosmopsychist* views (Skrbina, 2009; Seager, 2020; Shani, 2015; Velmans, 2021) consciousness co-emerged with matter and co-evolves with it. As matter became more differentiated and developed in complexity, consciousness became correspondingly differentiated and complex. The emergence of carbon-based life forms developed into creatures with sensory systems that had associated sensory "qualia." The development of *representation* was accompanied by the development of consciousness that is *of* something. The development of *self-representation* was accompanied by the dawn of differentiated self-consciousness and so on. On this view, functional evolution can in principle account for the different *forms* that consciousness takes. But, consciousness, in some primordial form, did not emerge at any particular stage of evolution. Rather, it was there

from the beginning. Its emergence, with the birth of the universe is neither more nor less mysterious than the emergence of matter and energy.

Which view is correct? One must choose for oneself. However, in the absence of anything other than arbitrary criteria for when consciousness suddenly emerged, continuity theory is arguably more elegant. Continuity in the evolution of consciousness favours continuity in the distribution of consciousness, although there may be critical transition points in the *forms* of consciousness associated with the development of life, representation, self-representation, and so on.

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