Title: Reasonable criteria for functionalists; scarce criteria from phenomenological perspective

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Abstract:

In their article (Doerig et al., 2020), Doerig et al suggest a set of criteria for evaluating theories of consciousness. Naturally, their criteria are situated in their own particular perspective on consciousness science (Doerig et al., 2019), which we have critiqued in the past (Tsuchiya et al., 2020). Their first criterion is likely to be the one that is most productive and least contentious: if the field can agree to a family of paradigm cases for consciousness, this would be an important endeavor for the field.

Main Text:

Right away, we perceive two ways in which the paradigm case criterion should be expanded or reconsidered. First, the authors define paradigm cases as binarized phenomena where consciousness is present or not (e.g. wakefulness versus coma), or where some perceptual object is experienced or not (e.g. trial-to-trial perception of a near-threshold object). Here we propose to amend this misleading contrast. To see the problem of the second type of contrast, consider when a target's contrast is set at the observer's detection threshold, sometimes *a blank field is seen* (instead of the target), and sometimes *the target is seen* (instead of a blank field). A theory should explain what is seen and not-seen in *both* cases, rather than explaining only the consciousness or unconsciousness of the target. Otherwise, a theory might leave the impression that, without a target to be experienced, there is no experience at all!

Second, the 'conscious/unconscious' divide should be considered not only with regard to sensory stimulus conditions like near-threshold targets or masking displays: paradigm cases should cover empirical facts about the known physical substrate of conscious experience. When we stimulate the brain, what happens to conscious experience, and when/where does stimulation have or not have effects on consciousness (Schalk et al., 2017)? When do lesions affect consciousness, and when do they not seem to matter (Boly et al., 2017)? Why do experiences associated with some brain areas feel different from those associated with different areas (Tsuchiya, 2017)?

The other criteria are problematic, being more about intuition or consistency with prevailing ideas in cognitive science, than they are about empirical phenomena. We take particular issue with the 'unfolding argument' as a criterion for consciousness theories. In general, we propose that such metaphysical criteria not be included on the list.

As the idea of paradigm cases suggests, consciousness science, and theorizing about consciousness, needs to focus on phenomena where the consciousness variable is *known* or at least fairly certain. Cases of human consciousness or unconsciousness are of course central; the presumption that animals like monkeys are similar in important ways to humans also allows us to study them in connection with questions about consciousness (Leopold et al., 2003). But when it comes to systems where the consciousness variable is *completely unknown* – like a hypothetical feedforward equivalent to the human brain – we have left the domain of consciousness science and entered a different field of questions entirely. The unfolding problem is more a problem of metaphysics, which the authors claim they wish to avoid. A theory of consciousness must be evaluated on the basis of how it explains empirical problems, how it handles known facts about consciousness – i.e. the phenomena identified in the first criterion. If a theory can then extend beyond paradigm cases to make claims about other parts of nature where the consciousness variable is unknown, that is certainly interesting. However, such extrapolation should not be a criterion for evaluating theories of consciousness.

The ‘small and large systems’ criteria are specific instances of the notion that theories of consciousness should attribute consciousness only in ways that fit with certain pre-theoretic intuitions. But as with the unfolding argument, this criterion is not based in any known facts about consciousness: we only know that consciousness should be attributed (sometimes) to human brains and, perhaps, other similar brains (primates etc). We know nothing about whether or not consciousness exists in atoms or galaxies, so why should they show up as “empirical” criteria for theories of consciousness? Here, the authors are applying their own pre-theoretic *intuitions* about the consciousness to such systems. Gut feelings are indeed often valuable in science, and it’s a good idea to formalize such intuitions so that they can be openly debated. Ultimately, however, science must proceed on evidence, and we should be wary of introducing such unknowns into the core of consciousness science.

The authors admit that there is another, less-formal but no-less-concrete criterion for theories of consciousness. They note that it matters that a theory fits within prevailing attitudes or frameworks. We believe this is related to the choice of the unfolding and systems criteria. Does a theory conform to what we already believe about brain function, does it resonate with the metaphors and models we already use to understand brain and mind? The authors take this as a plus for ‘computational’ theories like the GWT or HOT, and we have pointed out elsewhere that the unfolding argument is powerful only from a certain “i/o” functionalist perspective (Tsuchiya et al., 2020). Theories that are orthogonal to, or that seem to run against prevailing frameworks

certainly have more work to do in convincing consciousness scientists of their meaningfulness, or that they are scientific at all, since “science” is often taken to be synonymous with “the way science is done in this time and place”. But we would resist this kind of social-cultural criterion. If a theory of consciousness explains what it is supposed to explain, if it conforms to empirical data, if it advances our understanding beyond questions we had even thought to ask, then it is worth the time of consciousness scientists. And if it violates our intuitions or preconceptions about consciousness – this might just mean that there are interesting times ahead.

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