Qeios

Peer Review

Review of: "Growing Confidence and Remaining Uncertainty About Animal Consciousness"

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Dr. Louis Irwin, I would like to thank you for timely addressing such an important issue. Nowadays, multiple international organisations are fighting for animal rights with the aim to recognize that our main ability to consciously experience the world surrounding us, including the conscious perception of pain, might be actually shared with other species. Since the establishment of the scientific study of consciousness through the first Tucson meeting in 1994, great advancements have been made in the neuroscience of consciousness. You have greatly explained some of the main phenomenal features of access consciousness, what could be their neurobiological substrate and evolutionary roots, as well as some of the remaining critical questions to tackle in the following years. I completely agree with your view on animal consciousness being « the process by which an animal has perceptual and affective experience or feelings » because even if we describe and predict their level of consciousness, it will always require some sort of subjective access to percepts for the animal to be defined as conscious.

For the sake of improvement and constructive discussion, let me please raise some thoughts on several aspects. First of all, I strongly suggest you remain open to the possibility that consciousness might in fact not be as « complex » as we believe it to be. You see, each time we try to study conscious perception in a lab, we require the participant to be active and report when something is cognitively accessed. That hits us scientists with a strong methodological problem. Even if we ask the participant to remain passive and we register the neural activity, we can't be sure of cognition taking place at the same time as consciousness. This methodological limitation could potentially be solved one day and reveal consciousness to be some sort of dynamic core of informational exchange moving from here to there, but essentially distinguishable from other cognitive modules. In the end, I would recommend you to explicitly mention that the main uncertainty that we have today is that we do not know how to measure

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consciousness and that this same methodological limitation applies to other animals. In a way, that helps remain open about the possibility of other phylogenetically close species to be as conscious as we are.

A second important recommendation I would like to offer is to expand a bit more on the monitoring mechanism within the agency. I am particularly annoyed by the fact that even asking participants to report their perception of some stimuli is not as simple as it seems. Sometimes, some unconscious mechanisms can motivate a report. Thus, Type2 signal detection theory has been an interesting advancement (i.e., asking participants to report how strong their perception was or how confident they are in their response). However, this alternative makes consciousness virtually undistinguishable from metacognition and dependent on executive functions. As you can see, this uncertainty reveals, again, a structural methodological limitation of contemporary science. Even more so, and related to the agency, this reveals a rather sneaky assumption worth mentioning, that of a self. In order to be conscious of some stimuli, the subject must get this information into a consciousness network (perhaps around associative frontoparietal structures) that then would be perceived as possessed by the subject. This implies a prerequisite, that of having a self. However, are the self and consciousness the same thing, or are they different components of a neural system that collaborates? If different, what would happen if a neural system loses the self? Would consciousness continue to work? This is rather an important question to address with other animals because the science of the self nowadays understands its formation through learning, language, and social interaction, clearly something that perhaps other animals wouldn't integrate. Could it be possible that there is a qualitative step in evolution that prevented other species from having consciousness? If so, finding that step would help in knowing which species are conscious.

Finally, I would like to share some minor suggestions. On page 4, you talk about the 4Es (embodied, embedded, extended, and enacted). Could you define them one by one? Some people might not be familiar with these words, and I found the explanation not too clear. On page 6, in "The Evolutionary Imperative," paragraph 3, it is said that « consciousness became necessary especially once animals started moving about ». I would rephrase this statement because we don't actually know if consciousness has any evolutionary function at all. In paragraph 6, it is said that « plausible evidence for cognition complex enough to imply consciousness has been reported for insects ». I would also rephrase this and other similar sentences because they might create confusion in the public. Consciousness is not proved by intelligence or high-level cognition. On page 8, when discussing the global neuronal workspace theory, I would recommend citing Baars, since he laid out the theory for Dehaene to apply it to neuroscience. On page 9, paragraph 2, when mentioning that « evidence that stimulation of anterolateral

prefrontal sites seldom elicits any reportable alterations in consciousness », you could also mention, if considered relevant, one of my previous works in which I show that the inhibition of these sites leaves reports of consciousness also unaltered (https://doi.org/10.1016/j.cortex.2023.05.022).

As a final thought, I always like to remind myself that even though we would all love to understand and explain why and how consciousness is created in the brain, this is just a desideratum, a final stage which we might never achieve. What science does, though, is to describe the mechanisms observed to correlate with an event in order to predict it. Perhaps we should simply encourage and fund research to observe and describe animal behaviour and its potential similarities to human consciousness. In my opinion, the article you are presenting now is probably doing the best job to accomplish this.

Declarations

Potential competing interests: No potential competing interests to declare.