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

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This submission concentrates on those areas of consciousness research about which, as the author puts it, 'there is a growing body of agreement in principle, if not in detail' (p.1.). He begins straight away with the problem of defining consciousness and acknowledging the very great number of definitions in the literature, opts for current purposes for a broad definition proposed by Irwin et al. (2022), whereby comparative animal consciousness is described as 'the process by which an animal has perceptual and affective experience or feelings, arising from the material substrate of a nervous system. This could be taken as confining the discussion to biologically based explanations of psychological phenomena, an approach I would certainly endorse. It is also a 'generous' definition in that it facilitates parallels between humans and other animals. This is not a bad thing in itself, although it might arguably leave research findings open to overinterpretation, at the very least in the public domain, whereby the conclusion will be promoted that nothing substantial distinguishes human consciousness from consciousness in other animals well before any definitive findings substantiate such a claim. The implied equation between the two potentially distinct concepts, 'conscious' and 'aware,' certainly has support in the literature, and the direction in which research seems to be going does militate against black and white distinctions between us and other species and suggests that many more nuanced, spectrum-like accounts will be forthcoming. Also, the later discussion concerning the hierarchy of processing and the discussion of levels of processing introduces some measure by which distinctions can be made in the neural substrate between different species in the area of consciousness. It should help establish empirically which species have consciousness - according to the current definition - in some form or other and perhaps what level of consciousness might be available to them. These possibilities emerge from the discussion of neural hierarchies. Reference is made in this submission to Feinberg and Mallatt's (2020) endorsement of the commonly held view based on sensory hierarchies such that consciousness will exist in animals that have reached a stage of evolution whereby they have come to possess at least four levels of neurons projecting into the highest processing area (or maybe three levels is enough). The underlying idea is that these multilevel structural architectures allow a high level of complexity at each individual level and also in the interactions *between* levels.

Looking bottom-up at brain complexity is clearly a good starting point in the search for solving the mapping problem

between brain and mind phenomena, something which is mentioned in the Remaining Uncertainties section. What we get so far from this association of structural complexity observable in brain tissue as a minimal requirement for whatever we choose to call consciousness or different types of consciousness amounts to what you might call an implied promise of some plausible explanation eventually being derived from it. That is progress, at least. The main challenge would seem to be to explain more than just primary sensory consciousness, which most researchers seem to accept already is not confined to humans alone. The key challenge when discussing animal consciousness is to develop accounts of higher order thought (HOT). Part of such accounts will probably include a further narrowing down of what the sense of self involves. Although not mentioned, human language capacity also needs to be explained in those specific aspects of language as a whole which cannot be accounted for by general cognitive processing principles but would seem to have strong implications for many accounts of HOT, where human consciousness diverges from that of other species, even fellow primates. The complexity of thought which syntax enables must have a bearing on what facilitates HOT, however that may be defined (Chomsky, 1995, Jackendoff, 2007; Jackendoff & Wittenberg, 2014; Sharwood-Smith, 2024). Along with this aspect of HOT should be a comparative study of conceptual ('semantic') systems in humans and other animals, since there is a growing body of thought that acknowledges such a system as existing independently and amodally in the human brain (Rodgers & Lambon-Ralph, 2022).

I would also like to question the (perhaps) implied irrelevance of dreaming to explanations about consciousness. When the mind is deprived of its normal levels of sensory stimulation, it enters a state in which a kind of alternative consciousness is created, one that in humans, at least, does appear to include HOT operating without reality checks. We may assume that (other) animals also enter into dream states if we give credence to all the observable signatures of dreaming that they show. We might also speculate that their alternative version of dream consciousness might be based on primary sensory consciousness alone in many species (perhaps with something like HOT in some species). The sensory input in this case will not come directly from the environment but from internally stored representations of those signals. The fact that people who are sleeping are described as 'unconscious' (in many languages, but certainly English) should not prevent a serious consideration of what dream consciousness might be and how it fits into a more general account of consciousness as a whole.

Finally, in this literature and in all these detailed descriptions of neural anatomy and neural physiology, there does not seem to be a full engagement with the idea of a comprehensive and coherently framed architecture of the human mind. This is relevant for exploiting complementary top-down accounts of consciousness to aid the mapping problem (Poeppel, 2012). There are numerous maps of the human brain, including the developing connectome account undertaken by the Human Connectome Project, but what about the contribution from the 'mind' side of the equation? (see Toga et al., 2012). At the moment, comparisons are frequently made on a case-by-case or piecemeal basis by looking at selected aspects of the mind. How is fear expressed neurally and psychologically, for example (see, for example), and what about emotions in general (see, for example, Damasio 2003, LeDoux 1996, 2000), and, indeed, what about consciousness (Damasio 2010, 2021)? Are there more comprehensive and elaborated frameworks that can be used to map mind onto brain-related research within a psycho-biological framework? Peter Carruthers, for example, might provide just such a framework where the basic characteristics are shared with other species (Carruthers, 2006, 2013). Also relevant in this regard are

publications related to the Modular Cognition Framework, such as Truscott and Sharwood Smith 2011, 2019, Sharwood Smith and Truscott 2011, Sharwood Smith 2019, 2024, Truscott 2015, 2022).

To conclude, we are clearly a long way from accounting for consciousness/awareness in cephalopods, cetaceans, corvids, and not forgetting our fellow primates. However, along with the qualifications just raised above, I think this submission does serve its purpose of stimulating and setting the scene for further debate.

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