

Handout on “The search for invertebrate consciousness” by Jonathan Birch

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Thesis: Before we can even consider whether invertebrates are conscious, a robust approach for *how* to determine consciousness in invertebrates must first be agreed upon.

Birch examines three possible approaches and proposes what he believes to be the better option in an effort to gain consensus on a methodology to apply to the problem.

“What is needed? At this stage, not more theory, and not more undirected data gathering. What is needed is a systematic search for consciousness-linked cognitive abilities, their relationships to each other, and their sensitivity to masking.” (133)

Question: Why is it extra difficult to determine consciousness in invertebrates (meaning insects, e.g. bees, ants, decapod crustaceans e.g. crabs, cephalopod molluscs e.g. octopuses) than in mammalian animals?

Summary of Birch’s analysis

The paper focuses on evaluating the possible methodologies that could be applied to determining consciousness in invertebrates. These are based on existing research into both human determinants of consciousness and what has been applied to other types of animals. He places them into three main categories: Theory Heavy, Theory Neutral, and Theory Light, then examines each approach and any potential issues with each.

Ultimately, he argues for what he believes to be the best methodology to move forward: Theory Light. This option avoids the main drawbacks of the other two options by using a “cluster” of abilities (rather than an exhaustive list or definition) that would be observable only when an animal is conscious in order to determine when an invertebrate is demonstrating consciousness.

Three categories of approaches

Theory Heavy

Take a *definition* of “consciousness” and use it as the measure to compare animals against.

- Requires that first researchers “develop a well-confirmed, complete theory of consciousness in humans, and we take this theory ‘off the shelf’ and apply it to settle the question of whether animals, in disputed cases, are conscious or not” (134)

Question: Do we have a well-confirmed, complete theory to define consciousness in humans? Is there existing agreement on what determines “consciousness” in humans?

- Birch rejects Theory Heavy as viable on the basis that researchers have yet to agree on a definitive set of criteria for how to determine consciousness in humans, much less in animals.

Theory Neutral

Inference by analogy. Compare animal behaviours to a list of traits that we know to indicate consciousness in humans.

- Rather than start with a theory of human consciousness, we should “build up a list of the behavioural, functional anatomical similarities between humans and non-human animals, and use arguments from analogy and inferences to the best explanation to settle disputes about consciousness.” (134)
- Similar to the issue with Theory Heavy, Birch rejects this approach as viable because there is not yet an agreed up list of behaviours or anatomical similarities from which to propose analogies or inferences.

Theory Light

Birch’s own “middle path” between Theory High and Theory Neutral. Essentially proposes determining a *collection* of abilities that only occur during consciousness and using any number of those to determine if an animal meets criteria for consciousness.

- Birch’s *facilitation hypothesis*: “*Phenomenally conscious perception of a stimulus facilitates, relative to unconscious perception, a cluster of cognitive abilities in relation to that stimulus.*” (140)
- Using a “cluster” (or set of possible) cognitive abilities is key to his hypothesis because it both avoids having to have a complete, undisputed set of abilities but also allows for variations of what is observed in different animals. **It may not be the exact same abilities, but it will be a set of abilities that *only* display when consciousness is present.**

Question: What would be included in a cluster that would seen in conscious response to stimuli in a human? What might that cluster include for invertebrates?

- **What abilities go into the cluster?** Birch: focus on those abilities that we believe are “facilitated by conscious perception in humans.” (145) No role for neural correlation of those abilities either, since we know invertebrate biology to be quite different to humans – we’re looking for general cognitive abilities. (E.g. learning of these types: trace conditioning, interval timing, rapid reversal)
- **How many abilities will signal consciousness?** Birch: Avoid the pitfall of defining a number required. Measure as a percentage or fraction of the cluster. (145) The more abilities shown, the stronger the argument for existence of consciousness. One or two abilities would be a weak argument (which, Birch acknowledges, may turn out to be the case for invertebrates.)

Question: Do you agree with Birch that by loosening some of the theory requirements and using his methodology is satisfactory and sufficient to apply to whether animals, and specifically invertebrates, exhibit consciousness?