Editorial

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Pathological Complexity and the Function of Consciousness in Nature: Part 1

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Abstract

This essay functions as the introduction to a two-part special issue on Walter Veit's recent monograph *A Philosophy for the Science of Animal Consciousness* published with Routledge in 2023. Veit introduces the purpose of this special issue and offers a summary of the first batch of commentaries.

Keywords

Consciousness, adaptive behaviour, evolution, subjective experience, animal consciousness

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1. Introduction

The subject of animal consciousness has recently received a lot of attention by the public as well as academics, which is undoubtedly due to both the ethical importance of figuring out which animals have the capacity to suffer and more generally because animal consciousness may help us to understand human consciousness better (Veit, forthcoming). These motivations were also what drove me to pursue a PhD on the evolution of consciousness, with the goal to understand what adaptive benefit consciousness provides animals with in their natural environments.

My research resulted in a series of papers, an invitation to meet the Dalai Lama at an animal consciousness conference in 2023, and my first monograph *A Philosophy for the Science of Animal Consciousness* with Routledge (Veit, 2023a). I could hardly be happier about the interest my work has raised, but as scholars we deliberately seek out criticism of our work in order to get closer to the truth. This special issue on my book was the outcome of this goal, bringing together philosophers and scientists to find potential flaws and applications of my work.

In the remainder of this essay, I will offer an editorial introduction that introduces the purpose of this two-part special issue and offers a summary of the main arguments by the commentators in the first issue.

2. Pathological complexity and the adaptive function of phenomenological complexity

The most ambitious goal of this book was to enable something of a paradigm shift in how consciousness is studied. Instead of merely investigating human consciousness and applying tests and theories developed there onto the animal case, my hope was to move to a bottom-up approach that starts by asking the adaptationist question of what consciousness does for organisms. This functionalist approach was largely inspired by the work of Donald Griffin, Peter Godfrey-Smith, and Daniel Dennett, who all focused on consciousness through an evolutionary perspective. Griffin, as one of the discoverers of bat echolocation and founder of the field of cognitive ethology, has a special role here because of his emphasis of trying to investigate what role the mind plays for animals in the natural environments they evolved in, rather than the lab, where most cognitive studies are conducted (Veit, 2025). Simona Ginsburg and Eva Jablonka also offered an insightful evolutionary study of consciousness (see Ginsburg & Jablonka, 2019), though they ultimately argue that consciousness has no function, which I think is a mistake, though my reply to one of the commentaries will go into more depth into why.[1] Ultimately, we want to answer one adaptationist question. What is the benefit animals derive from being conscious instead of relying on mere unconscious cognitive processes? This is a question that is surprisingly rarely asked within consciousness science. Unlike for all other biological traits, the questions of what

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consciousness is for and how it evolved are rarely central to debates. For the Darwinian revolution to extend and swallow consciousness whole, these questions must become central.

But, of course, science can often be resistant to change. Consciousness science lacks empirical tests (at least so far) that could fundamentally cause a seismic shift. So the more humble and realistic goal for my book was to inspire others to think more deeply about the plausible ways in which consciousness may have evolved. Consciousness is an incredibly complex multidimensional phenomenon. Yet, consciousness researchers often assume it is an all-or-nothing trait. Even proponents of the Integrated Information Theory of Consciousness or short IIT, with all their emphasis on the complexity of consciousness, present consciousness on a unidimensional scale while treating consciousness as a mere byproduct of cognitive complexity (Veit, 2022). But this is not how we'll solve the mysteries of consciousness. To understand consciousness as a natural, rather than human, phenomenon requires us to study what I have called *phenomenological complexity.* The subjective experience of humans and animals has many dimensions, variations, and gradations, which phenomenological complexity is meant to capture.

In the précis article in this issue, I summarize the core arguments of my book with a focus on its central thesis: the pathological complexity thesis (Veit, 2023b, 2024). As I set out in the book, the central idea of the book is that the complexity of dealing with the trade-offs of alternative actions underwent a combinatorial explosion during the Cambrian explosion where most of the modern basic animal body plans appeared, that required a way of dealing with these trade-offs in an efficient manner. The solution, I argued, is the provision of a hedonic common currency in which the values of competing actions can be compared against each other and triumph through an imperative signal of to-be-done-ness. At the very origins of consciousness, this capacity would have been a faint hedonic impulse, but evolution could have relatively quickly (in evolutionary time-scales) led to this capacity becoming representationally enriched, thus allowing for more complex comparisons and the evolution of much more complex bodies. Consciousness allowed evolution to explore a much more vast range of the Darwinian adaptive design space for animals.

This work was also inspired by work in AI and robotics, which has long highlighted the difficulty of efficient action selection and control, which researchers involved in offering evolutionary explanations for the dawn of consciousness have unfortunately neglected. Competing evolutionary explanations often take rich sensory and action capacities as a starting point, with much interaction between organisms, but at that point evolution already succeeded in designing complex adaptive systems at a multicellular level that can engage in efficient action prioritization to deal with the trade-offs of having a complex body with many alternative actions. Consciousness, I argue, was a precondition for the diversification of multicellular body plans during the Cambrian.

But my thesis is not just intended to help us understand the evolutionary origins of consciousness. More importantly perhaps, it is a framework for the study of animal consciousness. We have an incredibly diverse range of alternative ecological lives animals live, even if many are unfortunately lost due to climate change and human interference with nature. Different species are adapted to unique environments and strategies. They are pursuing alternative life-history strategies and it is the complexity of these strategies that is captured by pathological complexity.

Pathological complexity can ultimately be measured through a generalized behavioral and state-based life history theory that attempts to map out all the design trade-offs animals face (Veit, 2023b; Veit, Gascoigne, & Salguero-Gómez, 2025). If we understand the pathological complexity challenges animals face in their ordinary lives, this gives us the means to make better predictions about their phenomenological complexity. We ask the adaptationist questions of what types of experience it would be useful to invest in and which would be too costly? Consciousness is too often treated as a magical property that comes for free with cognitive complexity, but it is a capacity, a trait, that was fine-tuned by evolution. If it was biologically "cheaper" to reduce and diminish experiential capacities, evolution would have done so. So when we look at the unique lives of different species, we will be in a better position to make progress in answering what it is like to be an elephant (see this special issue) or a crow (see a recent review paper motivated by the pathological complexity thesis: Veit et al., 2025).

Unsurprisingly, most of the commentators in this special issue have focused on this thesis. Does the function of consciousness actually reduce to dealing with pathological complexity? Does my thesis make progress on the hard problem of consciousness? Can it naturalize qualia? Where do plants fit into the story I have told? And can my framework be used to make plausible and testable predictions about the experiences of different species of animals?

The Special Issue on my book will be published across two issues of Adaptive Behavior. In the first issue, you will find my target article, alongside the first batch of commentaries. My response to the commentaries will be published in the second issue. Below, you will find my summary of the first three commentaries to be published in part I of this special issue.

3. The first batch of commentaries

The first essay on my book comes from the neurobiologist **Daichi G. Suzuki**, which offers a detailed discussion of

various aspects of my book (Suzuki, 2024). First, Suzuki argues that my emphasis on hedonic evaluation as the origin of consciousness, may be better replaced by prediction, which combines perception and evaluation. Second, Suzuki argues that my discussion of the synchronic unity of consciousness could be improved by distinguishing between creature and state consciousness, which may help us to better understand what goes on in octopus arms and binocular rivalry. Lastly, Suzuki offers an interesting discussion of the adaptivity of consciousness. He argues that similar to the basic bodyplans of metazoans, the basic brain architecture of consciousness may not have a specific function.

The second commentary is by **Özlem Yilmaz** (Yilmaz, 2024), which I solicited due to her rare dual background in plant biology and philosophy with two PhDs. While my book only concerns animal consciousness and I argue against plant consciousness in the book, I wanted to see what an expert in plants had to say about my framework. Yilmaz finds much value in the pathological complexity thesis, but suggests that the concept of "stress" may play a similarly important role due to its close connection to the life-history trade-offs central to my work. While paying attention to the unique life challenges of plants may not reveal them to be conscious, we nevertheless have much to learn about and from their cognitive capacities.

The first part of this special issue concludes with a commentary with an essay by the philosopher **Carl B. Sachs** (Sachs, 2024). His primary target is my discussion of autopoiesis as a competing approach to the pathological complexity thesis. He distinguishes between "autopoiesis 1.0" due to Maturana and earlier work by Varela (Maturana & Varela, 1980) that neglected external forces and saw itself as a competitor to a Darwinian approach to life, and "autopoiesis 2.0" influenced by the Hans Jonas that led the later Varela and other scholars to amend the original project for the purpose of naturalizing teleology/goal-directedness. To this end, Sachs also offers a discussion of the usage of the terms Naturphilosophie and philosophy of nature by me and other authors interested in bridging philosophy and biology, with the former giving a priority to science and the latter to phenomenology. Finally, Sachs urges phenomenologists and enactivists to examine the pathological complexity thesis for the purpose of offering a more nuanced discussion of the differences between cognition and consciousness.

Finally, part 2 of this special issue will offer a shorter introduction to the essays and my critical response to all foregoing commentaries.

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Note

1. Elsewhere, I have reviewed their book and responded to their criticisms of the pathological complexity thesis, see Browning & Veit (2021); Veit (2023c).

References

Browning, H., & Veit, W. (2021). Evolutionary biology meets consciousness: Essay review of Simona Ginsburg and Eva Jablonka's The Evolution of the Sensitive Soul. *Biology and Philosophy*, *36*(1), 5. https://doi.org/10.1007/s10539-021-09781-7

Ginsburg, S., & Jablonka, E. (2019). *The evolution of the sensitive soul: Learning and the origins of consciousness*. The MIT Press.

Maturana, H. R., & Varela, F. J. (1980). Autopoiesis and cognition: The realization of the living.

Sachs, C. B. (2024). The Gordian knot of consciousness meets the sword of Darwinism. *Adaptive Behavior*, Article 10597123241300371. https://doi.org/10.1177/10597123241300371

Suzuki, D. G. (2024). Toward a solid philosophical foundation of animal consciousness research: Bridging some conceptual gaps. *Adaptive Behavior*, Article 10597123241270884. https://doi.org/10.1177/10597123241270884

Veit, W. (2022). Consciousness, complexity, and evolution. *Behavioral and Brain Sciences*, *45*(1), Article e61. https://doi.org/10.1017/S0140525X21001825

Veit, W. (2023a). *A philosophy for the science of animal consciousness* (1st ed.). Routledge.

Veit, W. (2023b). Complexity and the evolution of consciousness. *Biological Theory*, *18*(3), 175–190. https://doi.org/10.1007/s13752-022-00407-z

Veit, W. (2023c). Defending the pathological complexity thesis. *Biological Theory*, *18*(3), 200–209. https://doi.org/10.1007/s13752-023-00430-8

Veit, W. (2024). The role of consciousness in adaptive behaviour: A philosophy for the science of animal consciousness. *Adaptive Behavior*, Article 10597123241293184. https://doi.org/10.1177/10597123241293184

Veit, W. (2025). Donald Griffin, cognitive ethology, and animal life histories. *Animal Sentience*, *35*(19), https://doi.org/10.52685/10.51291/2377-7478.1884

Veit, W., Browning, H., Garcia-Pelegrin, E., Davies, J. R., DuBois, J. G., & Clayton, N. S. (2025). Dimensions of corvid consciousness. *Animal Cognition*, *28*(1), 35. https://doi.org/10.1007/s10071-025-01949-y

Veit, W. (forthcoming). Animal consciousness: Why it matters. *Mètode Science Studies Journal*.

Veit, W., Gascoigne, S. J. L., & Salguero-Gómez, R. (2025). Evolution, complexity, and life history theory. *Biological Theory*. https://doi.org/10.1007/s13752-024-00487-z

Yilmaz, Ö. (2024). Environmental complexity, cognition, and plant stress physiology. *Adaptive Behavior*, Article 105971232 41278799. https://doi.org/10.1177/10597123241278799

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