

BOOK REVIEWS

Antti Revonsuo, *Inner Presence: Consciousness as a Biological Phenomenon*. Cambridge, MA: The MIT Press, 2006, xxv + 473 pages. ISBN 0-262-18249-1.

Reviewed by Liad Mudrik and Dominique Lamy (Tel Aviv University)

“Why is there something rather than nothing, for me?” asks Antti Revonsuo in the opening section of his book, a question he defines as the most fundamental mystery mankind is facing. Throughout the book, he aims at providing a comprehensive answer to this question, relying on both philosophical and scientific grounds. This remarkable endeavor sets him apart from other scientists who study consciousness empirically and treat philosophical discussions on the subject as mere setbacks for scientific progress (see, for example Crick 1994; Damasio 1994). Revonsuo tries to tie together empirical findings and philosophical arguments in order to prove the theory of Biological Realism, and show that consciousness can indeed be studied scientifically. The course he takes in combining philosophy and science is twofold. First, he clarifies the philosophical assumptions underlying his scientific work. Second, he tries to draw support from empirical findings for his metaphysical stance about consciousness and its place in nature.

The philosopher will find this book very interesting, because it presents a scientist’s direct confrontation with some of the most important questions in the philosophy of mind. But it is a highly interesting book for the student of cognitive psychology and neuroscience as well, because it presents a knowledgeable overview of the scientific findings, methods and theories relevant to the study of consciousness. Revunso provides the reader with vivid descriptions of the conditions under which the flabbergasting limitations of awareness in normal vision become exposed (e.g., change blindness or inattention blindness) and of the neuropsychological disorders in which the normal unity of consciousness breaks down.

However, the conclusions that he draws from the vast material he reviews in order to integrate the available findings into his own theory of consciousness cannot be embraced uncritically.

For instance, the evidence that he relies upon in defense of the existence of background consciousness is not always convincing. Background consciousness is an important feature of Revunso’s theory and refers to the subjective feeling that we have a very rich conscious representation, albeit fleeting and ephemeral, of the world around us, despite the fact that most of it lies in unattended parts of the visual field (see also Lamme 2003). On the one hand, Revunso insightfully

suggests that the proponents of the notion that we are blind outside the focus of attention and who deny therefore the existence of background awareness will have difficulty explaining why normal vision and simultanagnosia, a condition in which the patient is only aware of the one object that lies at the focus of her attention, differ so much. On the other hand, the idea that our ability to consciously retrieve initially unattended information from iconic memory supports the existence of background awareness is disputable. Retrieval from iconic memory might just as well be retrieval of unconsciously perceived material that makes its way to consciousness only *after* attention has been directed to it. In fact, it is not clear whether behavioral proof of the existence of background consciousness can at all be obtained, *in principle*. Information that lies in the background cannot be reported, by definition, because only attended information can be the object of overt report. But measures of performance that bypass overt report are not valid measures of consciousness because, as Revuonso extensively shows in his chapter on the “Zombies in the brain”, accurate performance can occur in the absence of awareness. Thus, finding the empirical strategy that will allow the investigation of background consciousness remains a challenge.

Revuonso rightly points out that “just about every distinct cortical lobe and area has been proposed by at least some researchers as the seat of the NCC [Neural Correlates of Consciousness]” (p. 308) and gives a useful classification of the different theories that are organized around the central role played by one or just a few regions in consciousness. Yet, he sees such anatomical descriptions only as a lower level of explanation that needs to be complemented by the discovery of the neurophysiological mechanisms involving these anatomical regions. He provides a very thorough and intelligible review of one such neurophysiological mechanism, neural synchronization, and clear justifications of why this is the mechanism in which he sees the most promising explanatory potential.

While Revuonso does not provide a radically new theory of consciousness, his integration of ideas and findings from different perspectives and scientific domains and his recasting of leading theories of perception into theories of consciousness provide the comforting feeling that consciousness as a field of study may not be so chaotic after all.

According to him, the above findings reflect science’s ongoing progress towards a theory of consciousness. Such a theory is possible, he asserts, since consciousness is a real, biological phenomenon that resides in the brain. In fact, these are the main assumptions of his *Biological realism*. This is a theory that, much like Searle’s position (1992, 1998), assigns consciousness to biological organisms (as opposed to Panpsychism. See Chalmers 1996, 2002), being a high-level property of the brain. In a nutshell, the theory claims that biological systems are characterized by a multilevel hierarchical organization (Bechtel 1994); they consist of

a multitude of distinct but interconnected levels...These levels are taken as ontological, that is, as real, causally potent natural phenomena that exist out there, independent of our scientific practices or conceptual systems (p. 15).

To explain the system one must first describe one of its levels, and then try to figure out what the other levels are, and how they interact with each other, so as to provide an idealized multilevel model of the system.

Applied to the study of consciousness, science should describe this high-level phenomenon in detail, including its relations with other cognitive mechanisms. In Revonsuo's terms, this would be the contextual level of explanation, which might correspond to Chalmers's definition of the 'easy problems' (Chalmers 1995: 144). Then, it should look for the constitutive mechanisms that underlie consciousness — its micro-level substrates. Finally, science should reach a multilevel explanation, one that fully describes every level of the phenomenon of consciousness, and explains their interrelations. The phenomenal, qualitative level of consciousness would then be undissociably linked to the neural level of the same phenomena.

And so, Revonsuo's theory of consciousness can be expressed in a series of basic assumptions:

- a. Consciousness is a biological phenomenon.
- b. It can be localized in space: it resides in the brain.
- c. Consciousness is real — it has causal powers.
- d. Science can fully explain it.

All the above claims can be considered as philosophical ones, ranging from metaphysics to epistemology. However, Revonsuo's way of justifying them is by turning to empirical findings. According to him, these findings provide a good enough stance to disclaim some of the very well known philosophical arguments, such as the Knowledge argument (Jackson 1982), the Zombie argument (Campbell 1970; Kripke 1980: 148–155), and others.

What evidence does Revonsuo offer, for instance, to prove that consciousness has causal powers? Philosophically, he relies mainly on Kim (1998). But while Kim offers philosophical arguments to justify his theory of supervenience, Revonsuo turns to data collected from various brain-damage patients, who, *despite deficiencies or even lack of conscious perception, are able to process information*. Among others, he describes Blindsight patients, Prosopagnostics and Unilateral Neglect patients. These forms of implicit processing indicate the existence of "zombie systems" in the brain: systems that don't have a phenomenal level, and yet function and process information. However, all the above pathologies lead to severe behavioral malfunctioning — *the unconscious systems alone are not enough to enable normal behavior*. Thus, Revonsuo claims that the zombie systems are "not very helpful to the organism" (p. 380), since they supposedly "cannot guide their [the

organisms] behavior along the adaptive trajectories in the physical environment” (ibid.). Thus, he concludes that

non conscious zombie systems do not provide the person with information that would match the causal powers of conscious information. The causal contribution of the phenomenal level of organization appears to be unique...once a piece of information does enter the level of consciousness, it seems to acquire causal powers...It is not possible to carve off phenomenal content while leaving the causal powers of the brain intact. Phenomenal content is not epiphenomenal but casually potent in the brain (pp. 380–382).

This might sound compelling, and profoundly promising for the defenders of consciousness’ causal role. Now it is no longer only a matter of philosophical arguments, relying on one intuition or another. Science itself has provided the proof that shows the epiphenomenalists their fundamental mistake.

But is that really so? Leaving aside the possible objections to the conclusion about the unconscious systems’ lack of causal influence (the brain damaged patients Revonsuo himself describes provide counter-evidence: their behavior *is* influenced by the unconscious information they process, hence the term *implicit processing*), one can quite easily provide a different epiphenomenal account for the above findings. Let us accept, for the sake of the argument, that consciousness is indeed an epiphenomenon, no more than a sheer byproduct of the brain’s mechanisms, which in itself has no causal powers. If we examine each of the above pathologies, we can simply claim that *the systems that control behavior and yield normal functioning are the ones that got damaged, while the deficit of consciousness is again only a byproduct*. In other words, it is not that the lack of conscious perception, as a result of brain damage, has led to problems in behavior. Quite differently, the brain damage caused the behavior-controlling systems in the brain to malfunction. Since consciousness is a byproduct of brain activity, when the latter gets damaged, the former also exhibits abnormalities. Consciousness is not the *cause* of abnormal behavior — it is nothing more than the *effect* of the brain damage that independently led to behavioral deficits. By itself, consciousness has no further influence or effects. And so, if we find this account even remotely plausible, it seems that Revonsuo’s reliance on empirical data in order to prove the epiphenomenal philosopher wrong does not hold here.

Similarly, one should closely examine Revonsuo’s evidence for consciousness’ location in nature. In Chapter 4, he addresses this question, relying mainly on empirical evidence from the dreaming brain. This evidence enables Revonsuo to show that the locus of control for consciousness is located *in the brain* — as opposed, for example, to its attribution to our ways of acting and sensing (O’Regan and Noe 2001). Since during dreams our phenomenal experience is independent of the external environment and our peripheral sensory organs, Revonsuo infers

that they are not the locus of control for consciousness. The same goes for our physical body: since its state is totally different from that of the subjective or phenomenal body image we have while dreaming, we know that the locus of control is located elsewhere. In Revonsuo's words:

The entire sphere of phenomenal consciousness resides within the confines of the brain. It is ontologically dependent neither on the sensory input mechanisms leading to the brain nor on the motor output mechanisms reaching out from the brain (p. 97).

However, one should note that as a starting point to his arguments, Revonsuo reformulates the question at stake: instead of looking for the location of consciousness, he aims at *isolating the locus of control for consciousness*, following Bechtel and Richardson (1993). Due to the limited extent of this review we will not question the logic behind this reformulation, but it should nonetheless be mentioned that some of the philosophical objections to consciousness having a location in nature adhere to it being a mental phenomenon or property that has *content*, and as such is not physically located in the brain (see, for example Tye 1995).¹

In fact, Revonsuo does not only claim that our consciousness resides in the brain; according to him our whole world lies exactly there:

We seldom realize that we are in actual fact inside our brains when we experience being-in-the-world... Even perception is just a "telepresence" experience created inside the brain, as the internal world simulation engages in real-time resonance with sensory information (p. 119).

In other words, Revonsuo holds an internalist conception of experience. Somewhat like Kant (1998: B204–316), he distinguishes between the external world that is inaccessible for us, and a world of simulations built by the brain.² If so, however, it seems somewhat surprising that he refers to his theory as "ontological", and turns to science to provide grounds for denying some of the metaphysical theories about consciousness.

Finally, one of the most interesting ideas in Revonsuo's book involves redefining the scientific quest towards a full explanation of consciousness. Much like Crick and Koch (1995, 1998), Revonsuo also sees consciousness as one of the most important challenges of neuroscience. However, as opposed to them and many others who focus on finding the *Neural Correlates of Consciousness* [NCC] (among others, see Dehaene and Naccache 2001; Kanwisher 2001; Zeki and Bartels 1999), Revonsuo claims that scientific explanation must not rest on correlations, but on discovering the *Constitutive Mechanisms of Consciousness* [CMC]. According to him, only CMC will enable scientists to attain two outstanding achievements: fully explain consciousness, and finally prove the falsehood of dualism:

The discovery of NCC does not necessarily lead to any explanation of consciousness. Nor does it rule out dualistic theories of consciousness. Therefore, the biological science of consciousness needs a stronger relationship with which to tie the phenomenal level to the brain... Unlike correlation, hierarchical constitution ties the two types of phenomena ontologically together. The higher level phenomena not merely correlate with the lower-level ones, but are ontologically dependent on them too (pp. 297–298).

But how can that be done? What methodology will provide the scientists with the desired tools for finding CMC and not only NCC? How can they transcend the limits of correlations and attain the world of constitutive mechanisms?

Revonsuo admits that the current scientific methods are not capable of such transcendence; a new method is needed, one that allows *reconstructing the phenomenal level solely from brain-data*. In his book, Revonsuo offers a hypothetical test — “The Dream Catcher test”. Two separate teams are studying the phenomenal world of the same subject while she is dreaming. The first — the brain team — is allowed to collect any biological information about the subject during REM sleep, but has no access whatsoever to her phenomenal content during the dream. They are also not allowed to use any information obtained from previously established correlations between neural activity and representational content. The second — the dream team — may use any means to collect as much data as possible about the subject’s phenomenal content during her dream — they can wake her up and ask her to report or draw what she dreamed about, and so on.

Both teams, completely ignorant of the existence of one another, are required to construct a full scale multimodality 3D computer animation of the dream events — one based on the phenomenal information gathered, the other, solely on brain activity. After repeating the procedure separately for 100 subjects, the two databases of dream animations are sent to independent judges, who know nothing about the experiment. They are instructed to pair each animation from the first group to an animation from the second. If they are able to pair the animations correctly, Revonsuo maintains, we may say that the CMC have been discovered. Moreover, according to him this will enable us to scientifically prove physicalism:

Once the methodology exists that is capable of passing the test, empirical consciousness science will have taken a quantum leap. Passing the test means that the pessimist philosophers who maintain that *no* amount of brain data can tell *anything* about consciousness have been decisively defeated (p. 302).³

Thus, Revonsuo sees the Dream Catcher test as a modern Turing test for consciousness studies. Since the brain team is not allowed to use previously found correlations between brain activity and phenomenal content, and so must infer phenomenal content from brain activity alone, one cannot apply the Chinese

room argument (Searle 1980) here, and claim that the dream animation is built solely on knowing the syntax of the appropriate correlations or correspondence rules between brain processes and mental ones. Passing the test means that physical information indeed suffices for complete phenomenal information. There is no mysterious quale that cannot be predicted from neural activity alone, luckily for Mary (Jackson 1982).

Will it ever be possible to pass the Dream Catcher test? Against the intuitions of many philosophers (most famously put forward by Nagel 1974), Revonsuo believes it will, and asserts that a negative answer will pose serious difficulties for his Biological realism. But let's suppose it is indeed possible: does that, as Revonsuo claims, serve as a good enough reason to rule out dualism?

Once again, it seems that Revonsuo is looking for scientific solutions to philosophical questions. Could any experiment prove dualism to be wrong? What prevents the defender of parallelism from claiming that passing the test only proves our astonishing ability to fully understand nature's perfect harmony between mind and matter, or the proto-panpsychist from asserting that passing the test could have only been achieved by the radical change physics underwent, understanding the way consciousness serves as an irreducible intrinsic property of things that causes their extrinsic properties? Far-fetched as it may seem to many of the readers given the dominant materialist presumption, such positions are nevertheless possible. It seems that passing the test will by all means be a tremendous achievement, leading indeed to a quantum leap in neuroscience. But it probably won't put an end to the ongoing, hundreds-of-year-long philosophical discussion about the relations between mind and body, or consciousness and brain.

Notes

1. We should note that Revonsuo addresses these theories in a separate chapter (8), claiming that their conception of consciousness is different than his; he is set to study phenomenal consciousness, which for the representationalists is part of the vehicle of consciousness, not its content. This distinction, however, is not entirely compatible with the writings of representationalists and other philosophers, who directly refer to "raw feels" and qualia (see again Tye 1995).
2. By this we do not take a stance about the two different interpretations of Kant's work: the "two world theory" and the "two aspects theory".
3. These pessimist philosophers would probably say that Revonsuo's choice of words does not accurately describe their position, since they maintain that no amount of brain data can tell us *everything* about consciousness. It can surely tell us *something* about its functions and relations with other cognitive faculties, but according to them, it will not be able to explain the subject's qualia. "Thus", those pessimists would say, probably nodding their heads with sympathetic sorrow, "the test simply can never be passed".

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Ruth Katz and Ruth HaCohen, *Tuning the Mind: Connecting Aesthetics to Cognitive Science*. New Brunswick (NJ) and London: Transaction Publishers, 2003, xvi + 317 pages. ISBN 0-7658-0081-0

Reviewed by Marcos Magalhães

Tuning the Mind is a book released in Cinemascope. In order to visualize the broad and encompassing mental connections the authors make from such distant historic moments as a Madrigal by Luca Marenzio and a quote from Jean-Jacques Rousseau one can rememorate the particular feel of Cinemascope and the way it makes the screen and the images we see in it so encircling and alive but always pointing to a larger than life outlook.

For a book such as this to appear, a certain cultural atmosphere and conceptual terrain must be implicit: a time of easy and unbound conceptual travels such as ours is mandatory. The weight of it all is unimaginable, but in our days we have the means to see such a long distance onto the past and to access enormous quantities of documents and remains from so many different historic periods and ethnic manifestations that the possibilities are endless. New opportunities arise for large synthetic overviews over the infinite combinations of reality, be it historically or culturally, and preconceived rigidities have lost their proeminence. New "simplifications" and "reductions" to more elemental substances are possible and necessary in order to "digest" and assimilate this overwhelming flow of information.