

Sensimotorists

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Andy Clark
SUPERSIZING THE MIND
Embodiment, action, and cognitive extension
286pp. Oxford University Press.
£18.99 (US \$35).
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Alva Noë
OUT OF OUR HEADS
Why you are not your brain and other lessons from the biology of consciousness
214pp. Hill and Wang. \$25.
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get a good sense of the current state of play in so-called embodied, embedded, and extended cognitive science.

Noë’s concern is consciousness in the broad sense of subjective experience of the world from the perspective of being a cognitive and intentional agent. He targets the view that consciosness so understood happens inside us, in the brain. Starting from this assumption, he argues, we will never be able to understand how the brain enables the animal or person to experience its environment. Consciousness is a way of being actively related to the environment; it depends on inner states but is not itself an inner state. Its locus is therefore not the brain, but the body in active engagement with the world.

If the central negative claim of *Out of Our Heads* is that consciousness is not Brainbound (not supervenient only on brain states, in philosophers’ jargon), its main positive claim is that the brain contributes to consciousness by facilitating certain dynamic patterns of sensorimotor relatedness to the environment. For example, what instantiates or realizes visual consciousness is not activity in visual cortical areas, but rather a certain dynamic pattern of sensorimotor relatedness to the environment in which that cortical activity normally participates. In this way, Noë argues, the substrates of consciousness are not exclusively neural, but extend physically and functionally beyond neural systems to include the non-neural body geared into its environment. Noë expounds this idea of wide or extended perceptual experience through discussions of “neural plasticity” (how neural structure and function can change as a result of experience), prosthetic sensory substitution systems (tactile systems that function visually for blind perceivers), and phantom limbs. These discussions summarize ideas presented in his first book, *Action in Perception* (2004), as well as collaborations with the late Susan Hurley, a philosopher, and the perceptual psychologist J. Kevin O’Regan. *Out of Our Heads* also includes material on the role of perceptual and motor habits in our cognitive lives, a rebuttal of the idea that our visual experience of the world is a kind of “grand illusion”, and a critical chapter on David Hubel and Torsten Wiesel’s pioneering work on the neurophysiology of vision.

Clark’s primary concern is cognition. He

When you can’t remember how to make a Béarnaise sauce and you quickly and reliably consult the internet, moving back and forth from the information at your favourite recipe website to the double boiler on your stove, where exactly does your action take place? In the kitchen, of course, spread out among the stovetop, computer and cooking utensils. But what about your cognitive processes as you follow each step of the recipe? Where are they located? In the kitchen too – unless, like Descartes, you believe that the mind does not occupy space. But if you style yourself a non-Cartesian chef, then you might also insist that, strictly speaking, cognition happens inside the head, in the brain, and so occupies a more compact and delimited space.

If Andy Clark and Alva Noë are right, however, cognition is not skull-bound. Like cooking, it is a spatially and temporally extended activity involving the body and elements from the environment. Confining the mind to the head, they rightly tell us, is hardly non-Cartesian; it is the modern, materialist way to be Cartesian without one of Descartes’s key ingredients. No non-physical mind; all that’s needed for thinking is the brain. Clark names this view “Brainbound”. Both he and Noë reject Brainbound, offering instead views of the mind as “Extended” (Clark) or “Wide” (Noë). According to these views, cognition can and often does depend directly or constitutively on the non-brain body and structures outside the body.

But the common purpose stops there. Noë’s focus is human experience; Clark’s is cognition. Noë avoids the distinction between cognition and consciousness that is traditional in cognitive science (a state or process does not need to be actually or potentially conscious to be cognitive); Clark relies on it. Noë targets Brainbound as a working neuroscience assumption about consciousness; Clark rejects it for cognition but apparently has no problem with it for consciousness. Noë distances himself from computationalist and functionalist views of the mind; Clark holds fast to their core commitments while arguing that they do not entail Brainbound, and that Extended offers a better explanatory framework for cognitive science. Noë thinks that biological life is already mind, and that cognitive processes can be brought into focus for science only against the background of the active life of the animal; Clark treats cognition as intelligent problem-solving to be analysed in broadly computational or information-processing terms. Noë maintains that only a creature who possesses our kind of living body could have our kind of mind and experience; Clark views the body as a functional element admitting of multiple concrete implementations in an extended information-processing system.

These differences indicate much of what is at stake in the contemporary philosophical and scientific debates about the role of the body for experience and cognition. Although Noë’s book is engagingly written for the non-specialist reader and Clark’s for philosophers and scientists, anyone who reads both will

defends the extended mind theory, first proposed in his influential 1998 paper written with David Chalmers and reprinted in *Supersizing the Mind* as an appendix. (Chalmers also supplies a foreword to the book.) According to this theory, cognitive processes can include structures outside the body as proper parts of the information-processing routines undertaken to solve a problem or carry out a cognitive task. “Ada”, an arithmetically adept accountant, can solve problems quickly and reliably by copying numbers to a scratchpad as she works rather than holding those numbers in her biological short-term memory. Clark argues that the scratchpad functions not as a mere prop or support for Ada’s calculations, but as a proper part of her cognitive activity, no less so than her biological memory. As Chalmers states in his foreword, “when parts of the environment are coupled with the brain in the right way, they become parts of the mind”.

Supersizing the Mind is an important book for cognitive-science theorists of all stripes. Clark discusses a range of recent significant work that he thinks provides evidence for Extended. His position is not that cognition must be extended, but rather that it can be and sometimes is as a matter of fact. In making the case for Extended, Clark responds to influential critics who have argued for Brainbound from within the traditional heartland of cognitive science. He also defends his Extended version of functionalism and computationalism against more radical embodiment theorists (such as Noë) who call into question traditional ideas of mental representation and who reject functionalism because of the way it plays down the importance of the biological body for understanding the mind. Although traditional and radical theorists are likely to remain unconvinced, there can be no doubt that *Supersizing the Mind* will set the terms for many of the coming debates.

What about consciousness? Should Extended be applied to consciousness? Or is consciousness Brainbound? Neither position strikes me as satisfactory. Noë says that consciousness is more like dance than it is like digestion: it is something we do or achieve, not something that happens inside us. But there are ways in which consciousness is more like digestion than dance: we choose to dance but we do not choose to be conscious. More importantly, if consciousness is fundamentally a life-regulation process, then it is like digestion in being a systemic activity of the whole organism. In this way, it is not something we do, but something we live.

According to this view, consciousness need not be Brainbound, for it might depend constitutively on the integrated functioning of the body beyond the brain. Certainly, in the absence of a satisfactory biological understanding of consciousness, we cannot rule out this possibility. Yet even if we allow (as we should) for the body’s capacity to incorporate (take into itself) resources that go beyond what it can metabolically generate, consciousness would still be organismbound, and so in an important sense not Extended.