A few months ago I had the excellent opportunity to attend an international conference at the Center for Interdisciplinary Research, Bielefeld University, Germany (23–25 November 2009) that was entirely dedicated to the “Extended Mind Thesis” (EMT). The conference brought together one of the creators and major supporters of EMT, Andy Clark, and some of its most important detractors in the philosophy of mind. After three days of being a passive bystander to a passionate and heated discussion between champions and detractors of EMT, I came to the conclusion that, perhaps, EMT has truly been making an attempt to install a new paradigm in the sciences of the mind since the late nineties. In any case, it certainly stirred my interest in the old-new version of EMT developed in Andy Clark’s latest book *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*.

EMT, being a relatively new hypothesis about the extended nature of the mind, received quite some attention in 1998 as a result of Andy Clark and David Chalmers’ paper “The Extended Mind.” EMT claims that while some mental states and some experiences can be defined internally, there are many others in which the meaning attribution processes are highly influenced by external factors (Clark & Chalmers 1998). That is, some environmental elements can exert a crucial influence in guiding cognitive processes. According to the extended mind hypothesis, cognition depends on multiple connections between the brain, the body and the world – both the physical and the social world. The main point of EMT is that cognitive processes cannot be isolated from the physical constraints of the cognitive system, which basically means its situatedness and its dynamic interaction with the environment. That is, cognitive processes are no longer simply characterized at an abstract, brain-bounded, purely information-processing level, but as interacting networks, which integrate and synchronize in a functional and goal-oriented manner the brain, the body and the world. Thus, culture is a constitutive factor for the human mind. This leads Clark to claim that in some circumstances (which are explained in detail throughout the book) cultural artefacts (including language) and technological developments can have cognitive life by becoming a literal extension of the human’s cognitive system, and in so doing go beyond their basic functionality as tools that just extend a human’s capabilities. In a few words, the interaction between the brain, the body and the world facilitates the construction of new extended cognitive systems that guide problem-solving cognitive processes situated in the real world.

Having the above theoretical framework in mind, what is new in *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*? Two details strike the reader: firstly, the book starts with a foreword by David Chalmers; secondly, Chalmers and Clark’s joint 1998 paper “The Extended Mind” is reprinted in the appendix. Both texts may prove helpful for those readers who are not completely familiar with EMT, and it is highly recommended that those new to EMT look at them before diving into the rest of the book.

Clark’s book is organized into three major sections: (1) From Embodiment to Cognitive Extension – Chapters 1 to 4; (2) The Limits of Embodiment – Chapters 5 to 7; and (3) The Limits of Embodiment – Chapters 8 to 10. In the first major section of Supersizing the Mind, Chapter 1, presents an example, i.e., the Toddler robot, through which Clark shows that agents’ bodily actions may be “among the means by which computational and representational operations are implemented” (p. 14). That is, some agents have the capacity to use the world as its own best model, rather than having to go to the expense of constructing detailed internal representations. In doing so, the cognitive operations “are not realized in the neural system alone but in the whole embodied system located in the world” (p. 14). In the next chapter, Clark provides more arguments to support EMT. Clark employs the example of “stick-augmented perception” (p. 32) to demonstrate that human beings are able to shape and re-shape the boundaries of their bodies in relation to the outside world. Ac-
According to Clark, the stick is not just a tool for improving stability, but a truly cognitive and bodily incorporation that results in the creation of a “new agent-world circuit.” Neural plasticity alters and updates human beings’ body schema, playing a key role in the entire process of cognitive incorporation of the stick (p. 39). What is crucial to point out is that this continuous negotiation and re-negotiation of the boundaries between the brain, the body, the stick (considered as a cultural tool) and the world are guided by goal-oriented problem-solving behaviour. Chapter 3, then, deals with human language and its relation to EMT. Clark considers language as another cultural tool that enables human beings to “think about thinking” because of its distinctive capacity for labelling the world. This way, human language operates by constructing new objects not only for the language user but also for the larger community. Having language as a cultural tool allows human beings to improve their daily lives by providing them with instruments to better learn how to construct more beneficial brain-body-world couplings to solve real-world problems. This has a vital role in processes involved in human cognitive evolution (Donald 1991). The last chapter of section one introduces a key notion for better understanding and differentiating real cases of extended cognition, with common examples of expert tool users. The “Parity Principle” is a key notion originally proposed in the 1998 paper “The Extended Mind” and it basically claims that:

“as we are confronted with some task, if a part of the world functions as a process which, were it to go on in the head, we would have no hesitation in accepting as part of the cognitive process, then that part of the world is (for some time) part of the cognitive process.” (p. 77, see also Clark & Chalmers 1998: 8)

The Parity Principle is the basis for the creation of four crucial criteria that genuine cases of extended cognition must fulfil in order to be considered as such. These criteria can be summarized as the following: (a) the tool or resource that the agent possesses has to be reliably available and typically invoked; (b) the information retrieved must be automatically endorsed and not subject to question; (c) the information contained in the tool or resource should be easily accessible as and when required; and (d) the information in the tool or resource has been consciously endorsed at some point in the past and, indeed, there is a consequence to this endorsement (p. 79).

In short, section one, “From Embodiment to Cognitive Extension,” overtly challenges mainstream “brainbound” theories (this is how Clark defines internalist theories in cognitive science) to cognitive science and philosophy of mind, which are still strongly grounded in the mind/body Cartesian dualism. According to Clark, “brainbounders” argue for an architectural and modular approach to the human mind. A “brainbounder,” in Clark’s terms, such as Jerry Fodor (1983) claims that the mind has two parts: input systems and cognition or central systems. The input systems are a series of discrete modules with dedicated architecture that govern sight, hearing, touch, etc. Language is also regarded as an input system. However the cognitive or central processing system has no architecture at all – this is where thought, imagination and problem solving occur and intelligence lives. Each input system is based on independent brain processes and they are quite different from each other, reflecting their different purposes. These systems are localized in specific areas of the brain and they are mandatory. Fodor believes that the input systems are encapsulated, which means that they do not have direct access to the information being acquired by other input systems. In short, what one experiences at a given time in one sensory modality is not experienced in any of the others. This has the important consequence that for “brainbounders,” the external cognitive resources such as the tools or resources presented in Clark’s book would need a direct wiring to the neural systems in order to be considered as part of an individual’s cognitive system.

The second section of Supersizing the Mind, “Boundary Disputes,” is centered in a stronger defense of EMT than Clark presented in section one. The main point of Chapter 5 is to rule out the underlying observations based on apparently substantial differences between “brainbounded” cognitive processes (e.g., the role of biological memory) and extended ones (e.g., the role of external memory aids in the making of new extended cognitive processes). In so doing, he reminds us that what really matters is not where the cognitive processes unfold (and at the same time makes clear the key role played by the brain as “cognitive core”), but better explains the ways in which these processes are embedded in “larger systemic webs that help to give human cognition its distinctive power” (p. 108). Clark employs the next chapter to make a clear differentiation between what he believes are truly extended cognitive processes and cases in which external devices exert a profound impact that guides (but does not generate) cognitive processes. Clark argues that in examples of writing and thinking at the same time, the paper does not merely facilitate the cognitive processes or act as a medium by which the cognitive processes unfold but is a “medium in which, this time via some kind of coupled neural-scribing-reading unfolding, we are enabled to explore ways of thinking that might otherwise be unavailable” (p. 126). In Chapter 7, Clark makes clear that EMT is not on the side of antirepresentationalism. This is an important claim for those readers who might think that EMT could be considered as a new perspective within a (broad) radical constructivist framework. He tries to avoid getting into such a controversy by claiming that EMT is just committed to better explaining those aspects of real-world structure that brains represent and that are often closely linked to particular pragmatic needs and sensorimotor capacities. Thus, concepts such as computation and representation are maintained but reshaped according to the complexities of human life experience. So, if you believed that EMT was a completely revolutionary theory of the mind, now might be the time to begin reconsidering such thinking.

The third and last part of Clark’s book, “The Limits of Embodiment,” specifically focuses on the key role that the body plays in the extended problem-solving cognitive processes, by which human beings successfully behave in the world. Focusing on this, Clark employs Chapter 8 to differentiate EMT from a strong sensorimotor model of perceptual experience such as that of Kevin O’Regan & Alva Noë (2001). In a few words, their model supports the view that perceptual experience (e.g., seeing) is a mode of acting in the world in which the outside
world serves as its own, external representation. That is, there are no internal representations in the brain that are activated by the perceptual experience. According to Clark’s extended representationalism, that view attempts to undermine the grounds of human cognition by being “congenitally blind to the computationally potent insensitivity of key information-processing events to the full subtleties of embodied cycles of sensing and moving” (p. 195). In Chapter 9, then, Clark defines the human body as the interface through which “thinking beings” are capable of self-realization in the world. The body is the matrix enabling the situated emergence of extended cognitive processes. Clark provides some examples based on thought experiments quite common in philosophy of mind. For those readers (like the reviewer) who are eager to find more empirical evidence “from the real world” to back up the crucial role of the human body in EMT, the computational processes attributed to the fictional beings made up by Clark are, unfortunately, not illuminating at all. The last chapter of *Supersizing the Mind* briefly summarizes the major points made throughout the book, and opens the door to future interdisciplinary work to better understand the embodied, embedded and extended nature of the human mind.

In *Supersizing the Mind: Embodiment, Action and Cognitive Extension*, Andy Clark engages the reader in a cutting edge project, making a notable attempt to bridge the gaps (or “boundaries” in Clark’s terms) between the brain, body and the world. However, if we go a little bit further than the imagined worlds created by philosophers of mind (Clark does it several times in his book) when making up fictional entities, such as Ned Block’s *China Brain* (1978) and Donald Davidson’s *Swampman* (1987), the question would be: Is the extended mind a truly functional cognitive strategy in real life? So far, it just seems so. Undoubtedly, more empirical evidence from the “real world” is needed.

I recommend this book to everyone interested in the sciences of the mind: from graduate students to senior scholars working on philosophy, linguistics, cognitive science, neurosciences, robotics, etc. The Extended Mind Thesis will probably be one of the hottest topics in the emerging agendas of those fields.

References


