

Book Review
Embodied Cognition

Laurence Shapiro
Routledge, London, 2010

Andrea Danielli *
andrea.danielli@collegiodimilano.it

1. THE BOOK AND ITS MERITS

Shapiro has the extraordinary merit of analyzing a highly debated subject, as embodied cognition, with honesty and cold blood. He is able to disentangle fascinating views comparing all the supportive arguments and experimental evidences without prejudices.

The structure of the book is very clear and effective in organizing the large literature with all its trends; embodiment is decomposed over three themes: conceptualization, replacement, and constitution. *Conceptualization* gives accordance to the idea that «the properties of an organism's body limit or constrain the concepts an organism can acquire» (p. 4). The concept of *replacement* bases on this claim: «an organism's body in interaction with its environment replaces the need for representational processes thought to have been at the core of cognition» (p. 4), finally *constitution* assert that «the body or world plays a constitutive rather than merely causal role in cognitive processing».

Of course it is a choice with some arbitrariness, as in the case of including system dynamics in the replacement theme. Certainly dynamicists discard representations and insist on the coupling between brain, body and the environment, but we see several exception as Van Gelder and Port's moderate claim «a wide variety of aspects of dynamical models can be regarded as having a representational status: these include states, *attractors*, trajectories, bifurcations, and parameter settings» (Van Gelder and Port 1995, *my emphasis*), as well as Edelman and Izhikevich (2008) that analyze in their

* University of Paris 1 Panthéon-Sorbonne

model only brain dynamics, with no regard to environment. Another reason to be cautious resides in the great novelty of system dynamics: their conceptual and mathematical tools. These tools are not extendable to all the embodiment paradigm: in terms of set theory, between embodiment and system dynamics we have an intersection, not an inclusion.

2. SOME (LITTLE) CRITICISM

I found disputable most part of the chapter devoted to cognitive sciences: it is too brief, only twenty pages, it holds on old case histories, with no historical treatment at all. Some remarks about cognitive sciences' origins: without a brief account of behaviorism it is difficult to understand the novelty, and I would had like just a few words about functionalism. For what it concerns case histories, why is Shapiro talking only about Newell and Simon 1961's research, when we progressed through fuzzy logic, heuristics, intelligent agents, data mining? In this strange arbitrariness, Shapiro did not talk of object recognition (Marr, Tarr, Biederman), nor language acquisition (generative grammar is the best didactical example to explain cognitive sciences).

Finally, Shapiro should had invested more time to talk about representations, moving from classical treatment and penetrating the neuroscientific approach as did Bechtel (2008).

3. SIMULATION

When talking about *conceptualization*, Shapiro admits that bodily characteristics may well be simulated by an algorithm, and this induces him to conclude: «embodiment is not inconsistent with computationalism» (p. 93). Unluckily, when examining the *envatment argument*, which opens the possibility to generalize this statement, Shapiro reduces its range to a lesser extent.

That is a pity: simulation is a clear concern for embodied cognition, because it shifts attention from the body to the brain, where information is really processed. As in phantom limb syndrome, what counts is not the origin of information (that may not exist), but its elaboration. I believe that simulating the brain itself discloses the opportunity of a computationalism without representations, indeed dynamicists use software to model brain at neural level. These are the early steps to make neural mechanisms' simulation a means

to shed light on information processing.

4. COMPETING PARADIGMS

Is embodied cognition a unified body of knowledge, a new promising paradigm? I do not think so, and I agree with Shapiro conclusions, as he finds conceptualization and replacement loosing the challenge with cognitive sciences. In fact, the real changes will arrive from neurosciences, especially when we will be able to correctly read brain coding, using fluorescent optical imaging, in vivo single cell recording, or new nanotechnological techniques still at conceptual development. New data will oblige us to change definitely our old assumptions. I am not proposing to quite our theoretical attitude, waiting for brute powerful solutions, but I do not share this author's optimistic claim «work on Conceptualization is ongoing, and neuroscientific findings promise to energize some of its basic assumptions» (p. 210). The use of neuroscientific knowledge seems an improper attempt to revitalize a gloomy paradigm. Instead of this risky strategy, philosophers shall focus on epistemology of the cognitive sciences, dissecting methods and conceptual tools.

A simple comparison between different paradigms, both diachronic and synchronic, allows us to see at the same time the inadequacy and fragmentation of the cognitive domains of research. Indeed, every cognitive paradigm works well over few cognitive capacities: computationalism started with problem solving, connectionism is good at describing learning mechanism from complex patterns, embodiment is perfect at explaining action and motion control. When we try to extend those paradigms beyond the border they fail completely their explicatory mission. I would have liked if Shapiro had developed this statement further to account for this fiasco: «I think that an effort to cover all the evidence under a single umbrella is not likely to succeed» (p. 2).

REFERENCES

Bechtel, W. (2008). *Mental Mechanisms: Philosophical Perspectives on Cognitive Neuroscience*. New York: Lawrence Erlbaum Associates.

Izhikevich, B. E., & Edelman, G. M. (2008). *Large-scale model of mammalian thalamocortical systems*. *PNAS*, *105*(9), 3593-3598.

Van Gelder, T., & Port, R. F. (1995). *Mind as Motion*. Cambridge, MA: MIT Press.