Descartes, Embodiment and the Post-human Horizon of Neurosciences

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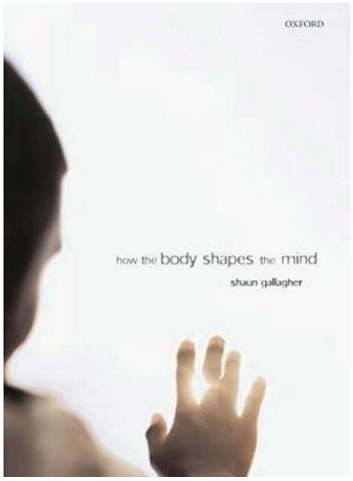
> Upshot • Neuroscience is at the crossroads between past beliefs that are still accepted by contemporary common sense and new, emergent findings, which are often counterintuitive for non-specialists. Gallagher's work provides a brilliant overview of this emerging knowledge that is re-drawing the map of the body–mind relationship.



Review of "How Body Shapes The Mind" by Shaun Gallagher. Clarendon Press, Oxford, 2005.
ISBN 978-019927194-8. 284 Pages.

Since Francisco Varela et al.'s superb book, *The Embodied Mind*, appeared in 1991, multidisciplinary research has emphasized the paradigm shift from a dualistic mind-body relationship to a monistic one. In the 1990s, Antonio Damasio's books such as *Descartes' Error* and *Looking for Spinoza* focused on providing increasingly stronger empirical evidence for monism. For several decades, Ervin Laszlo's brilliant works argued that if something survives death, it is not a spiritual mind that philosophers and theologians can theorize about. Rather, what survives has much more to do with energy, information, and the evolution of subatomic units, thus with scientific research in theoretical, experimental and applied physics (Wilczek 2008).

The rigid border between the two "cultures," i.e., the sciences and the humanities, as described by C. P. Snow in the 1950s, is no longer taken seriously by prominent scholars. Coping with the question of how the body shapes the mind requires a complex, up-to-date, multidisciplinary theoretical framework in which science is the general platform that provides the methodological standards and in which the humanities provide some key concepts and symbols. For example, the functional equivalence between genetics and memetics that Richard Dawkins has been developing since his 1976 book, *The Selfish Gene*, shows that the two cultures are allies rather than enemies. The works of the Edge Foundation (http://www.edge.org) are further pieces of evidence of the unity between body and mind, and of the unity between humanities and science. Only in an intellectual milieu in which the unity of science and humanities is solid and powerful can the unity of body and mind easily become a key pillar of multidisciplinary research. Gallagher's book is framed within and belongs to this milieu. Sometimes I wonder if "Descartes' error" (as Damasio called it) was not a scientific mistake or a philosophical error but rather a political operation that Descartes made to survive in his times. Descartes was a good scholar but not a very brave man, as his many biographies tell us (e.g., Cottingham 1986) His inclination for working slowly and carefully prevented his theory from becoming very powerful, as he died in his 50s before he could concretely evolve his theory of science further. His philosophy spread throughout the centuries; nevertheless, in my opinion, he did not develop it to its most powerful conclusions because he was scared to be unpopular, to be jailed, etc. He lived in the age of the trial of Galileo and he was not as resolute as the Italian scholar. In fact, in a letter Descartes wrote to his friend, Marsenne, on 23 December 1630, he states that he wants his ideas to spread, but without hurting or upsetting common sense and the beliefs of public opinion (cf. the introduction to Cartesio 2002). As, in those times, the Catholic Church wanted to rule on science, too, the only way to avoid the Church's influence on scientific research on the body was to split the human being into two parts resulting in the well-known dualism of mind and body. Therefore Descartes did so as a political move more than as a philosophical or scientific error.

The research on a non-dualistic understanding of cognition, which included prominent scholars like Varela and Damasio, showed that body and mind are connected by a monistic relationship. By "monistic" I do not mean "unidirectional" but rather a two-way relationship in which body and mind are a single unit. For example, a quite popular handbook for personal health care entitled "YOU" in its original, American, edition (Oz & Roizen 2004) was, in its Italian translation, entitled "Il corpo è tuo" ("The body is yours," Roizen & Oz 2007).

Even in a simple case of the title of a health-care book, there is a difference between the monism of the most advanced scientific research and the dualism of cultural censorship/filtering of ideological, unverifiable statements. Descartes wanted to free science (body) by separating it from the mind/spirit (as "spirit" was the most common term for metaphysical entities at that time) but in practice his very popular

dualistic model delayed scientific research as it did not allow the double bind, the mutual relationship between body and mind, to be considered. Gallagher's book brilliantly avoids the trap of dualism. From the very beginning of his book, the author clearly states that his book contributes

> "to the idea that to have an understanding of the mind, consciousness, or cognition, a detailed scientific and phenomenological understanding of the body is essential. […] the book proposes to remap the conceptual landscape by revitalizing the concepts of body image and body schema, proprioception, ecological experience, intermodal perception, and enactive concepts of ownership and agency for action. Informed by both philosophical theory and scientific evidence, it addresses two basic sets of questions that concern the structure of embodied experience. First, questions about the phenomenal aspects of that structure, specifically the relatively regular and constant phenomenal features found in the content of experience. Second, questions about aspects of the structure of consciousness that are more hidden, those that may be more difficult to get at because they happen before one knows it, and do not normally enter into the phenomenal content of experience in an explicit way." (p. 1)

As pointed out above, Gallagher's book belongs to this scenario of a double unity (science and humanities, body and mind). It is an excellent tool for redrawing the conceptual and epistemological map of the knowledge-based society, in which the unity of body and mind is a key presupposition of health policies based on knowledge-intensive toolkits such as those connected to the mapping of DNA: since June 2000, when the mapping was completed, we have entered the so-called Knowledge-Based Economy and Society (KBES), in which we are aware that if something survives death it has to do with physics and not metaphysics information and not faith, as witnessed by Ervin Laszlo's superb books. Sometimes, however, Gallagher's work seems to consider the role of imitation in the body-mind relationship too carefully. Imitation can be considered an operative tool of the evolution of and lifelong learning of psychic and biological systems, but not a strategic criterion. This important statement was splendidly evidenced by Maturana and Varela's research on autopoiesis, Dawkins' functional equivalence between genetics and memetics and Luhmann's essays on self-reference.

In particular, the German Systemic scholar Niklas Luhmann made an important contribution to strengthening this statement by introducing the concept of "reproducing by differentiating." As he wrote: "For a theory of autopoietic systems, only communication is a serious candidate for the position of the elementary unit of the basic self-referential process of social systems" (Luhmann 1990: 6). Applying Luhmann's concepts, we might be inspired to consider the body–mind relationship as an autopoietic, complex system in which body and mind activate both communication flows of energy and information, and selective coding of the negatively-selected potential links between body, mind and social behavior. Selection is *inevitable* ("zwangsläufig") in complex systems. In fact: "The term "complexity" is meant to indicate that there are always more possibilities of further experience and action than can be actualized" (Luhmann 1990: 26). The shaping of life looks more and more like the evolution of difference.

From this perspective, Gallagher's book reframes behavioral studies in terms of neurophysiology and biological mapping, downsizing philosophy and psychology as keys to understanding the body-mind unity.

This reframing operation is very important for focusing on the social reconstruction of science as the toolkit for facing the key bifurcations of our times, for example the bifurcation between the so-called human and post-human evolutionary step.

In the KBES, for example, the debate about stem cells as the crossroads between human and post-human evolutionary levels seems to be a revival of the dualistic mentality. When did Mankind became human? Maybe when Mankind started making fires in the caves? And when did it become post-human? Maybe when it began to use clothing, or glasses to correct sight problems, or when it began to use pacemakers to help sick hearts or… when? Monism means that body and mind also co-evolve by transforming themselves and the "outer" social life. Gallagher's book most negative and weakest aspect, in my opinion, is that its goal to redraw the map is based on the link between cognitive neurosciences and phenomenology – thus, in operational terms, on the development of a new vocabulary. In my opinion, his choice reduces the potential of his own work for abstraction and generalization.

After Lakoff & Núñez's (2000) contribution to embodied mathematics a more mathematical description of embodiment and of the body and mind dynamic would probably have been more effective. For example, when Gallagher writes,

> "The body image cannot be relegated to the mentalistic side. It is, as we first defined it, a system of perceptions, beliefs, and emotional attitudes pertaining to one's own body.
> Such intentional states concerning one's body, however, are not reducible to a set of explicit and discrete propositions. The visual perception of my own body is not reducible to the statement: 'I see my body,' since what I see is already operating in my seeing and in the constitution of the 'I' who sees" (pp. 211–212),

his discursive phenomenology implicitly describes the abstraction level of the work itself and shows how Gallagher's inputs are on the one hand stimulating and on the other hand cannot be generalized very easily.

Gallagher's book is fundamental because it focuses not only on the fact that the body shapes the mind but also copes with the key question of how this happens, thereby providing probably the best overview of the current state of the fast-growing field of neuroscience.

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