

*How the Body Shapes the Mind*

By Shaun Gallagher

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The stated aim of Shaun Gallagher's book is to provide, "an account of embodiment that is sufficiently detailed, and that is articulated in a vocabulary that can integrate discussions across the cognitive sciences...to remap the terrain that lies between phenomenology and cognitive neuroscience" (10). With this in mind, the book must be considered a success. The book provides a unified account of embodiment, and its relations to a number of aspects of experience, that is genuinely accessible from the perspectives of the philosophy of mind, phenomenology, cognitive psychology, and neuroscience. The book is divided into two parts. The first presents an admirably lucid account of the different ways in which embodiment informs and structures experience. The second attempts to "extend the results of the scientific and phenomenological studies developed in the first part into various philosophical problem areas that border on the cognitive sciences." (12). A large amount of the material that appears here has appeared, in some form or other, before. This is perhaps partly responsible for the feel, especially in the second part of the book, that we are being given a collection of essays on a loosely connected theme. However, this does not detract from its philosophical and scientific significance, and there is genuine value in having this impressive body of work to hand in a single book. It must be said that some chapters are more successful (for example, chapters 5 and 7 on gesture and on Molyneux's Problem respectively) than others (for example, chapters 6 and 10 on perception and free will respectively), and some of them appear rather well distanced from the general picture of embodiment presented in the first part of the book (for example, chapter 9 on other minds). It also has to be admitted that the book's primary strength, the vast and interdisciplinary range of resources under its command, occasionally becomes a weakness. This happens in chapter 8 where we are promised an exploration of, "a variety of issues that pertain to the structure of self-awareness and the capacity for self-reference...[demonstrating] just how complex and fragile these phenomena are." (173). Yet what we get is an account of how thought insertion is explained by deficiencies in the temporal structure of experience. Whilst this is fascinating in its own right, and does speak, to a certain extent, to issues concerning self-awareness, the vexed issue of self-reference is not even mentioned again. Minor gripes aside, this book contains such an incredible wealth of information and argumentation that it must surely be considered required reading for anyone working on embodiment, embodied cognition and the philosophy of mind more generally.

The main conceptual distinction in the first part of the book is that between the body image

and the body schema. This will be familiar to the many people who have been helped through the confusing literature on embodiment by Gallagher's previous articles. Gallagher's general account of embodiment and its role in structuring our experience is, I think it fair to say, based upon this distinction. As a rough characterisation, the body image is, "a system of perceptions, attitudes, and beliefs pertaining to one's own body" (24). The body schema on the other hand is, "a system of sensory motor capacities that function without awareness or the necessity of perceptual monitoring" (24). That these two are distinct is shown, argues Gallagher, by cases of body schema without body image, and cases of body image without body schema. For the first type of case we can consider patients suffering from unilateral neglect. Although such patients have deficiencies in their perceptual, affective and cognitive relations to the left sides of their bodies, their motor behaviour, for example in walking, often employs that left side in a natural, unreflective way. For the second type of case we can consider patients suffering from deafferentiation. As is well known, IW has lost the capacity, taken for granted by the rest of us, to act in such a non-reflective fashion. When we reach to grasp an egg, our hand adjusts itself to just the right shape and grasps with just the right amount of pressure to perform the task. IW's body does not do this, he has lost body schematic control of behaviour, and has had to learn to control his movements via continuous visual attention. Whilst he has lost his body schema, he retains certain (visual, cognitive, affective) aspects of his body image.

This distinction between body image and body schema is complicated by its relation to proprioception. We need to distinguish between non-conscious 'proprioceptive information', which contributes to the body schema, and conscious 'proprioceptive awareness', which contributes to the body image. Since IW has lost both proprioceptive information and proprioceptive awareness (including the sense of touch), it is not strictly speaking true that he retains *all* of his body image. Indeed, it might be argued that he has lost that aspect of his body image that is most central – the pre-reflective awareness that each of us has of our bodies 'from the inside'.

Another chapter of the book that is of central importance is that concerning neonate imitation (chapter 3). Here it is argued that whilst the body schema is innate, the same cannot be said for the body image. The fact that neonates engage in the 'invisible imitation' of others' facial expressions is taken, quite plausibly in my view, as evidence for a number of things: that the newborn's experience is not a 'blooming, buzzing confusion' as the traditional empiricist view has it; that the body schema is evident from birth; and that there is an innate intermodal perceptual capacity allowing the infant to 'translate' what it sees into a proprioceptive awareness of the relevant body parts – imitation involving generating a match between proprioceptive awareness and what is seen in the behaviour of the other. This last point concerning intermodality is made with

reference to the increasingly popular ‘mirror neurons’. These, “respond *both* when a subject *performs* a particular (goal-directed) action involving arm, hand, or mouth *and* when the subject *observes* such actions being done by another subject. This class of neurons thus constitutes an intermodal link between the visual perception of action or dynamic expression, and the *intrasubjective*, proprioceptive sense of one’s own capabilities.” (77).

This account of intermodal perception is brought to bear on the perennial question set by Molyneux in 1688: if a congenitally blind person, who could distinguish by touch between spheres and cubes, had their sight restored, would sight alone now allow them to distinguish between the two? This is often taken to be a question concerning whether the information we receive via perception is modality specific or intermodal. Indeed, Gallagher’s account of the intermodal character of perception would naturally lead to a positive answer to Molyneux’s question. And so it does, in principle. But Gallagher distinguishes the *in principle* question that concerns intermodal perception, from the *empirical* question as to whether in actual fact, newly sighted subjects would be able to make the relevant distinction. Now the answer to the *empirical* question appears to have been answered in the negative by actual instances (going back at least to 1728) of restored sight. Gallagher offers an explanation of how, given his *in principle* positive answer, the answer to the *empirical* question is negative by citing evidence suggesting that, although infant perception is coherent in some respects, “there is a *critical period* of three to twelve weeks in early infancy in which visual experience is necessary for the proper formation of ocular dominance columns in the visual cortex...Thus, childhood cataracts, if not removed prior to or early in the critical period, lead to visual deficiencies that remain even after they are removed.” (165). Thus, using methods that rely on both phenomenology and neuroscience, we gain a well grounded answer to Molyneux’s question.

Chapter 9 offers an account of social cognition, or the intersubjective aspects of experience, that Gallagher refers to as ‘interaction theory’. Gallagher presents his account as an alternative to the two predominant approaches to social cognition, both treated as varieties of the Theory of Mind approach, namely simulationism and theory theory. Against the Theory of Mind approach, Gallagher maintains that explanation and prediction of others’ behaviour is only a marginal aspect of social interaction, that our access to others is primarily non-conceptual and pre-reflective, that it is perceptual rather than inferential, and that it pre-dates the child’s formation of a theory of mind (at around 4 years), existing from birth as ‘primary intersubjectivity’ and from around the first year as ‘secondary intersubjectivity’. He further maintains that Autism, far from being adequately explained by the Theory of Mind model, is actually more consistent with his own approach. Autists, on his account, lacking the kinds of intersubjective interaction that we most naturally enjoy, are

forced to adopt the kind of theoretical stance toward others that the proponents of Theory of Mind treat as the normal case.

Whilst I sympathise with Gallagher's perceptual rather than theoretical account of intersubjective interaction, there are points at which his argument may be challenged. For example, his case against both simulationists and theory theorists relies in part on his phenomenology of intersubjectivity which emphasises that 'prediction' and 'explanation' are not terms that we use to describe our dealings with others, and that intersubjectivity, "is poorly described as resulting from formulating a theoretical hypothesis or running a simulation routine" (211). Gallagher notes that the obvious response to be made by the proponent of Theory of Mind is that such things are tacit, or not conscious, and so phenomenology will not contradict the view. To which Gallagher responds that the terms 'predict' and 'explain' are personal not sub-personal terms. But this is an obvious conflation of the non-conscious with the sub-personal. As such, other arguments against Theory of Mind are required and, I should add, offered.

That I have not found space to discuss the account of phantom limbs, the intriguing material concerning gesture and language, the explanation of schizophrenia, or the remarks on free will, attests to the richness and diversity that characterise this book. Nobody will agree with everything written here. Much of the scientific work is still to be done and there is, consequently, a certain amount of speculation. However, not since Merleau-Ponty's, *Phenomenology of Perception* has there been such an eloquent case made for the absolute centrality of the body in shaping the way in which we experience the world.

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