

movie *The Searchers*. What this discussion vividly establishes is the importance of the 'could-mean' interpretations just mentioned. The movie raises a number of questions about the motivation of its central character that it ultimately leaves open rather than settles. Interpretations of *The Searchers* can suggest plausible ways of taking the movie so as suggest answers to these questions, but what they cannot do is truly assert that the movie actually implies that the character is so motivated. Another way of putting this is that they cannot assert that these interpretations identify the movie's utterance meaning.

Those who are familiar with Currie's work will enjoy *Arts and Minds* for what it adds to issues they have encountered before in his writing. Those who first encounter Currie's thought in this volume will receive a sampling of views on a wide range of issues explored more fully in his other books.

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How the Body Shapes the Mind, by Shaun Gallagher. Oxford: Clarendon Press, 2005. Pp. 284. H/b £35.00.

In recent years, a number of authors in cognitive neuroscience, psychology, phenomenology and the philosophy of mind have argued for the importance of embodiment in understanding cognition and experience. Shaun Gallagher shares this insight and his main aim is to develop a common terminology and a common conceptual framework capable of integrating contributions from these various fields. This book is therefore an exercise in 'impure' phenomenology, a philosophical investigation of the terms of embodiment extensively informed by empirical studies.

Gallagher's book addresses two basic sets of questions. The first set consists of questions about the phenomenal aspects of the structure of experience. The main issue Gallagher wants to explore is whether throughout conscious experience there is a constant reference to one's own body, even if this is a marginal or recessive awareness, and whether and to what degree reference to one's body is therefore a structural feature of the phenomenal field of consciousness likely to influence all other aspects of experience. The second set of questions concerns aspects of the structure of experience that are more hidden and that do not normally enter into the phenomenal content of experience in an explicit way and are often inaccessible to reflective consciousness. Gallagher calls these hidden aspects prenoetic. These prenoetic aspects have to do not with the apparent structure of consciousness but rather with the structuring of consciousness, that is the ways in which the body, through its motor abilities, its actual movements, and its posture, informs and shapes cognition and intentional experience.

The book divides into two parts. The chapters in the first part present phenomenological and empirical studies of the terms of embodiment. Gallagher starts by introducing a conceptual distinction between body image and body schema. This distinction parallels the distinction between the phenomenal and prenoetic structures of embodied consciousness and plays a pivotal role in organizing the conceptual framework Gallagher aims to develop. He then proceeds to provide empirical support for the conceptual distinction between body image and body schema and to demonstrate its usefulness in unravelling the complexities of embodied cognition. In the second part of the book, Gallagher extends the results of his scientific and phenomenological studies and explores their implications for several philosophical problem areas that border on cognitive sciences.

The first theoretical developments of the concepts of 'body image' and 'body schema' date back to the late nineteenth century. Despite their extensive use in both the scientific and philosophical literature ever since, their history, well-documented by Gallagher in his first chapter, has been one of both terminological and conceptual confusion. The first task Gallagher sets himself is therefore one of conceptual clarification. The distinction he proposes in chapter one relies on a phenomenological analysis. To a first approximation, a body image as he conceives of it consists of a complex set of intentional states and dispositions—perceptions, beliefs and attitudes—pertaining to one's own body. In contrast, a body schema is a system of sensory-motor capacities enabling movement and the maintenance of posture that function without awareness or the necessity of perceptual monitoring.

Gallagher's aim in putting forward this conceptual distinction is to integrate first-person phenomenology and third-person science of embodied cognition. He therefore brings to bear a wealth of empirical data from both psychology and cognitive neuroscience to show that this phenomenological distinction has empirical support, that various aspects of both the body schema and the body image are innately specified, and that they can be tied to both specific and global brain processes.

Some pathological conditions provide one line of empirical evidence in favour of the distinction between body image and body schema. In certain cases of neglect, for instance, one side of the body is excluded from the body image, and yet the body schema remains operational (pp. 40–1). Conversely, in deafferented patients, the body schema is missing but the body image appears to be intact. In chapter two, Gallagher discusses in great detail the case of the deafferented patient Ian Waterman and offers insightful analyses of the role of the normal functioning of the body schema in the integration between body and environment and of the changes in the structure of consciousness and self-consciousness its disruption creates. In particular, posture maintenance and motor control that are normally automatic processes are no longer so for Ian Waterman. His movements must be self-consciously monitored and require constant visual and mental concentration on his part. Yet, intriguingly,

his conversational gestures appear to be normal or close to normal. Chapter five retraces Gallagher's exploration of this puzzling fact. Gallagher argues that expressive gestures form a special category different in kind from locomotive or instrumental movements and are not primarily controlled by the body schema but rather by cognitive-semantic and communicative processes. The first part of the book also provides detailed discussion of neonate imitation (chapter three) and of aplasic phantom limbs (chapter four). Gallagher argues that in both cases existing empirical evidence supports the view that some aspects at least of the body schema and the body image are innately specified.

Although the rich body of empirical evidence Gallagher discusses clearly supports the need for a distinction between body schema and body image, one sometimes wishes that Gallagher be more careful and precise in his delineation of the distinction. For instance, on some occasions, Gallagher seems to think of this contrast as one between what is explicitly part of the phenomenal content of my experience and what shapes my experience but does 'not necessarily appear, in an explicit manner, as part of the phenomenal content that I experience' (p. 3). Yet, on other occasions, he also claims that the body image includes forms of bodily awareness, such as what he calls 'performative proprioceptive awareness', that are tacit, pre-reflective and do not involve making one's body an object of perception. As I see it, this claim can be interpreted in at least three ways, corresponding to three possible readings of the distinction between implicit and explicit awareness of the body. On a first reading, the distinction is akin to the distinction between states with nonconceptual content and states with conceptual content. This is a reading suggested by Gallagher's remark on p. 74 that an infant does not have to identify its mouth or tongue as a mouth or tongue to have proprioceptive awareness of it. On a second reading, this distinction amounts to the distinction between reflective and non- or pre-reflective awareness of one's body, where reflective awareness is not just a matter of identifying a particular body as a body or a particular body part as a leg or an arm, but of identifying a particular body or body part as one's own. Gallagher is quite clear that experiences pertaining to the body image need not be reflective. On a third possible reading, the distinction between implicit and explicit forms of awareness of the body would be akin to the distinction Perry draws between representations that *concern* an agent or body and representations that are *about* her (Perry, J., *The Problem of the Essential Indexical*, Oxford: Oxford University Press, 1993). When the representation merely concerns the agent, it is self-relative without being self-referential, that is, without having any component referring to the self. Perry claims that this is the case with perceptual representations:

What each of us gets from perception may be regarded as information concerning ourselves, to explain connections between perception and action. There is no need for a self-referring component of our belief, no need for an idea or representation of ourselves. When a ball comes at me, I duck; when a milk shake is put in front of me, I advance. The eyes that see and the torso or legs that move are parts of the same

more or less integrated body. And this fact, external to the belief, supplies the needed coordination. (Perry 1993, p 219)

One may balk at Perry's identification of perceptions with beliefs, but this does not make his distinction between self-referentiality and self-relativity less relevant. Gallagher's characterization of the kind of performative awareness one has of one's body in the normal performance of intentional action (pp. 74–5) suggests that this form of awareness may be better described as self-relative than as self-referential. It is not clear however whether Gallagher would accept this suggestion or would rather consider the distinction between self-referentiality and self-relativity as one way of drawing the line between what pertains to the body image and what does not. Similarly, it is not always completely clear how the distinctions between body image and body schema, noetic and prenoetic processes, structure and structuring of experience relate.

The chapters in part two of the book further explore the constraints—and specifically the prenoetic constraints—, embodiment places on cognitive processes and their implications for philosophical problems concerning perception, action, self-consciousness and the knowledge of others. Gallagher offers numerous original insights. For instance, re-examining the Molyneux question in the light of recent developmental data (chapter seven), he argues both that perception is intermodal from the start and that experience has effects on the neurological development of perceptual systems. He claims that these facts warrant a negative answer to the empirical version of the Molyneux question but a positive answer to the in-principle version of the question. In other words, the Molyneux patient will not be visually able to distinguish shapes because he suffered neuronal deterioration in the visual cortex due to lack of early visual experience, but if he could see the shapes he would know the sphere from the cube before he touched them.

Gallagher also proposes (chapter nine) an interactionist theory of our understanding of other minds. This theory is presented as an alternative to theory-theory and simulation theory which he both sees as overemphasizing certain cognitive processes that we sometimes use to make sense of the mental life of others but not accounting for a more primary embodied practise of relating to others. The final chapter criticizes arguments against free-will based on Libet's experiments.

In the remainder of this review, I will concentrate on what I take to be one of Gallagher's most original applications of his views on embodiment, namely the analysis of the sense of agency he pursues in chapter eight. The sense of agency—the sense of being the source or author of a movement, action or thought—is an important aspect of pre-reflective self-consciousness. It is also disrupted in schizophrenia where patients frequently suffer from delusions of control (they feel that their movements are made or caused by someone or something else) and experience phenomena such as thought-insertion (they feel that other agents are inserting thoughts in their minds). Gallagher offers a detailed critical examination of Christopher Frith's cognitive theory of schizo-

phrenia. Frith's main thesis is that the disruption of the sense of agency in schizophrenia is due to a breakdown of basic self-monitoring processes. His claim has its source in the theory of motor control. This theory involves the notion of hypothetical brain mechanisms termed comparators, among which a forward comparator mechanism that predicts the result of a motor command in advance of actual execution and compares this predicted state with the state the agent intends to produce. The view is that the match between intended and predicted states is what gives rise to the normal pre-reflective sense of agency. In schizophrenia, this comparator mechanism would be dysfunctional, leading to false mismatches between intended and predicted states and to a lack of sense of agency for the corresponding actions. Although Gallagher thinks this model provides a reasonably plausible explanation of delusions of control, he raises serious objections against Frith's attempt to extend it to cognition. For one thing, applying this model to thought-insertion would seem to require that thoughts be preceded by conscious intentions to think. Not only is this claim phenomenologically problematic, it also brings with it a threat of infinite regress, as it seems that if in order to think, I must intend to think, then in order to intend to think, I would also need to intend to so intend. Gallagher also points out that Frith's model does not account for the selectivity and specificity of thought-insertion: typically, patients experience only some of their thoughts as inserted and these thoughts tend to have specific kinds of content.

I fully concur with Gallagher's criticisms of Frith's model and find his alternative proposal well worth pursuing, although some aspects of it might require further elaboration and clarification. Gallagher suggests that a better way of understanding why in schizophrenia the sense of agency is often disrupted for both actions and thoughts is in terms of their common temporal dynamic structure. Here, he exploits Husserl's analysis of the phenomenology of time-consciousness and, specifically, the notions of retention and protention Husserl uses to explain how consciousness unifies itself across time. Gallagher argues that this temporal structure is normally shared by consciousness, cognition and action and that a disruption in the protentional function mechanisms in schizophrenia could explain why both thoughts and actions could be experienced by patients as not generated by themselves but rather already made or preformed for them. Gallagher's proposal is certainly intriguing. An appeal to temporal structure as the common ground between action and cognition appears more plausible than an appeal to intentions.

Gallagher claims that one benefit of the alternative he proposes to the Frithian account is that it does not require mechanisms over and above those that account for the temporal structure of consciousness itself. Yet, protention may be a ubiquitous feature of the temporal structure of experience without this implying that a single kind of all-purpose anticipatory mechanism is at work behind the scene of consciousness. Indeed, the mechanisms underlying protention for actions, directed thoughts, and unbidden thoughts may well be

quite different, in which case we would still need to explain why disruptions of protentional function for thought and protentional function for action often co-occur. Gallagher suggests that affect may be the ultimate causal factor. Unfortunately, Gallagher's discussion of the role of affect is, to this reader at least, pretty obscure. The notion of auto-affective protentional functions Gallagher appeals to remains quite unclear. Besides, Gallagher seems to waver between saying that the retentional–protentional structure of consciousness generates the basic sense of auto-affection and saying that a disturbance of this auto-affective sense is responsible for the disruption of protentional function, which leaves us with the impression that we are moving in a circle.

These are, however, fairly minor complaints. Although one could wish that some of the distinctions and arguments Gallagher presents be spelled out in a more careful and detailed way, there can be no doubt that this book is a massive interdisciplinary achievement and a major contribution to a better understanding of the role of embodiment in consciousness and cognition. Gallagher has a unique ability to convey the mutual import of philosophical and empirical investigations. His book combines an impressive knowledge of contemporary research in the cognitive and neurocognitive sciences with a keen sense of the deep and important philosophical issues this research raises. It deserves to be read by anyone interested in the contribution of embodiment to cognition.

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Plato's Natural Philosophy, by T. K. Johansen. Cambridge and New York: Cambridge University Press, 2004. Pp vi + 218. H/b £45.00.

'Goodness is represented in the universe. We can therefore learn something about goodness by studying the cosmos. Cosmology teaches us how to lead our lives. It is therefore a recommended course of studies if we are to become better people. This is Plato's claim in the *Timaeus-Critias*' (p. 1). Johansen's book aims to explicate how the *Timaeus* articulates the way in which the universe manifests goodness and beauty. He identifies this conception of cosmology as 'teleology' (p. 2). Few, if any, would dissent from the claim that for Plato goodness is represented in the universe or that the cosmology of the *Timaeus* is teleological. Plato does not think that cosmology teaches us what to do in our daily lives, and indeed nowhere in the book does Johansen discuss much in the way of moral philosophy. Johansen's book, rather, is an effort to show how the