

***The New Science of the Mind: From Extended Mind to Embodied Phenomenology.* Cambridge. BY Rowlands, Mark. (MA: The MIT Press, 2010). Pp. 249. Hardcover. ISBN-10: 0262014556.**

ABOUT FOUR DECADES ago Gibsonians, a significant minority among psychologists, advocated the idea that perception would be better explained by the dynamic, interactive, and synergistic relationship between the organism and its environment. At the same time the idea of viewing perceptual experience as embodied emerged in the study of western philosophy. These small streams have now become a strong current in the intellectual pursuit of truths about the mind, especially in the areas of developmental and perceptual psychology, situated robotics, and cognitive neuroscience. The initial ideas have developed into new models for the study of the mind. In fact, they have grown so strong in cognitive science that they seem to suggest a new science of the mind and there comes the title of Rowlands' book under review. In its current status in cognitive studies this new science is rather a set of new ways of thinking about the mind. These new conceptualizations include: the *embodied mind*—the idea that the mind may be partly constituted by extra-neural processes of the body; the *embedded mind*—the idea that the mind is evolved to function in a situated environment; the *enacted mind*—the idea that the mind is involved in the organism's interaction with the environment; and the *extended mind*—the idea that the mind may be partly constituted by the processes of the organism's environment.

*The New Science of the Mind*, however, is not a science book. It may not even be a book about the mind if you think of the mind as a substratum which is different from but underlies mental processes, properties, events and states. This book treats the mind in the Humean way, that is, it treats the mind as nothing more than an aggregate of mental processes. It is an attempt to articulate the conceptual foundation of a non-Cartesian cognitive science through a systematic treatment of the '4e model'—the mind being embodied, enacted, embedded, and extended. The non-Cartesian conception of the mind rejects the assumption underlying Cartesian cognitive science that mental processes—perceiving, remembering, thinking, reasoning, and so on—must exclusively occur inside the head of the organism. Instead it advances the hypothesis that those processes, structures, properties, events, and states of affairs which exist outside the brain may partly constitute mental processes. However, the non-Cartesian conception of the mind, which Rowlands calls the *amalgamated mind*, excludes the notions of the enacted mind and the embedded mind. The notion of the embedded mind is excluded because it makes no claim about the composition of mental processes; hence it does not entail the idea of extending mental processes beyond the boundary of the brain. The enactive account is excluded because at best it yields an embodied and/or embedded account of the mind. Thus, the amalgamated mind is the conjunction of the embodied mind and the extended mind.

How can extra-neural processes be cognitive? Rowlands' first strategy is to specify a set of *sufficient* conditions for a process to count as cognitive. A process is cognitive if (1) it manipulates and transforms information for its subject, (2) it has the

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proper function of making information available to its subject, (3) it produces a representational state in its subject, and (4) it belongs to its subject. Focusing on the notion of the extended mind, Rowlands explains how some environmental processes may satisfy these conditions. In the case of visual perception, the optic array is an environmental structure; by encountering and manipulating the structure the perceiving organism exploits, transforms, and makes available to itself invariant information contained in the structure, and typically, this process culminates in a visual experience in the organism. Thus, the process of visual perception does not start at the retina; but rather it begins with the much earlier environmental operations of transforming ambient information contained in the light array. In the case of cognition, for example, with the process of remembering, the subject may accomplish a memory task through the actions of manipulating such environmental objects as notebooks, pictures, and maps; in certain circumstances those actions are forms of information processing, making information available to the subject and producing beliefs in the subject; hence they count as cognitive processes.

The idea here is not that these environmental processes *per se*, which are commonly understood as the causal mechanisms or material bases responsible for perception and cognition, count as cognitive. The idea is rather that these information manipulating processes located in the organism's environment count as cognitive only if they function in tandem with information transforming processes—typically, representational ones—internal to the head of the organism. The essential component of the four sufficient conditions for cognitive process is that each of these conditions makes essential/direct reference to the subject. The information processing is for the subject; the information is made available to the subject, the representation of what the information is about is produced in the subject, and all of the above belong to the subject.

Why must cognitive processes be owned by a subject? How can these processes be extended beyond the brain and into the world? Rowlands' second strategy is to account for intentionality in terms of revelation or disclosure. Cognitive processes are owned by a subject, and many of them are extended beyond the brain and into the world because they are *intentional*, and they are intentional because they are *revealing* or *disclosing* processes. To say that my experience or my belief is directed at an environmental object is to say that the object is revealed as falling under some viewpoints of mine. The processes that produce the experience or belief are therefore revealing processes. Revealing is a dual-mode process. What my experience is like is that of which I am or I can be aware; and hence it is the *empirical* mode of revealing. On the other hand, the set of causal processes in virtue of which I am aware of the experience's object, the set of conditions that make the experience possible, is that of which I am not and cannot be aware; and hence, it is the *transcendental* mode of revealing. Intentionality, Rowlands says, is that in virtue of which one type of intentional object (an object *simpliciter*) is revealed as possessing another type of intentional object (an aspect or empirical mode of presentation).

The empirical-transcendental mode distinction can be understood as a content-vehicle distinction. The content of my experience of an object is logically sufficient for the object to be revealed to me under some aspects. The vehicle of that content

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reveals the object to me by providing a causally sufficient condition for me to have the experience with that content. The thesis of the amalgamated mind as the conjunction of an embodied mind and an extended mind is a thesis about the *vehicles*, not about the *content*. Obviously, those causal processes which constitute the vehicle of cognition are not necessarily located in the brain; in fact, most of them are not. Therefore, it seems natural to envision that the mind, which is traditionally conceived as internal, can be in principle extended beyond the brain and into the world. In fact, we can even extend the model of the amalgamated mind to a more dynamic one. We can conceive that the mind or the aggregate of perceptual and cognitive processes is so *elastic* that it is constantly expanding and contracting alternately. It may expand, as in the case of perceiving, beyond the brain and beyond the body; and it may shrink, as in the case of self-reflecting, into the brain.

It seems that the dual-mode account of intentionality gives a dualistic characterization of the mind. The vehicle is causal but the content is phenomenal. The empirical revelation of the world supervenes on the transcendental revelation of the world; and the latter culminates in the former by producing a phenomenal and representational property in the brain. These points taken together suggest a property-dualism. The theory of the amalgamated mind is consistent with and supportive of J.J. Gibson's direct realism of perception, Hilary Putnam's natural realism of cognition, and the reliability theory of knowledge. Since revelation runs through its causal processes from the intentional object of an experience to phenomenal representation of that object, hence the relevant intentional acts travels through the causal processes out to the world. Are we, then, in genuine cognitive contact with a world? The transcendental revelation may be well extended beyond the brain and into the world; but as long as it culminates in a phenomenal revelation, the explanatory gap between what the world seems to me (e.g., it seems to me a green bird) and what the world is (e.g., it is actually a white bird under green lighting) remains.

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