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Dynamics in Action: Intentional Behavior as a Complex System by Alicia Juarrero

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*The Philosophical Review*, Vol. 110, No. 3 (July 2001)

*DYNAMICS IN ACTION: INTENTIONAL BEHAVIOR AS A COMPLEX SYSTEM.*

By ALICIA JUARRERO. Cambridge, Mass: MIT Press, 1999. Pp. x, 288.

Action theory has given rise to some perplexing puzzles in the past half century. The most prominent one can be summarized as follows: What distinguishes intentional from unintentional acts (or, indeed, acts from non-acts)? Thanks to the ingenuity of philosophers and their (often macabre) thought experiments, we know better than to assume that the difference lies in the mere presence of an intention, or in its causal efficacy in generating the action. The intention might be present and may also cause the intended behavior, yet the behavior may not be an intentional action; it may not be an action at all. The classic example is that of the nervous nephew who intends to kill his uncle to inherit his estate, and whose intention makes him so nervous as to drive recklessly, thereby running over a pedestrian ... who happens to be his very uncle. The intention to kill is present and it causes the killing, yet the killing is not an intentional action. Rather, what appears to distinguish intentional from non-intentional action is *voluntary control of the proper sort*, and what distinguishes action from non-action is behavior *caused in a particular manner*. But spelling out the sort and specifying the manner have proven vexing tasks.

On the basis of this and other philosophical puzzles, Alicia Juarrero concludes that "a theory claiming that action is behavior caused in a particular manner requires a concept of cause that not only triggers but also structures and sustains behavior in an ongoing fashion" (34–35). Moreover, she holds that no such concept is forthcoming in contemporary philosophy. To remedy the situation, she seeks insight in the "theory of complex adaptive systems," or "nonlinear dynamical systems theory." After introducing her readers to the main ideas of these and related scientific theories, Juarrero applies them back to the familiar puzzles of action theory, so as to solve or dissolve these puzzles. The first part of this wide-ranging and insightful book sets up and diagnoses the problem with action theory, the second part introduces dynamical systems theory and shows how its associated notions of causation can be applied to human action, and the third part introduces a new model of explanation to go along with the new model of causation.

There is much to recommend Juarrero's view that the puzzles generated by action theory point to a deeper problem with the concepts of causation and intention prevalent in the philosophical literature, and that they cannot be resolved merely by coming up with increasingly sophisticated analyses. Indeed, some of these puzzles may arise from actual inconsistencies in our

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commonsense conceptions of cause, action, intention, volition, and associated notions. It is therefore wise to seek a solution to these puzzles by overhauling some of our most cherished notions. But it is not clear from Juarrero's book how the tools acquired from the scientific theories she advocates are to be folded back into action theory, nor how exactly they can be used to handle the problems she emphasizes in the first part of her book.

The first weakness of this book is that Juarrero often paints with an excessively broad brush, relating the history of modern philosophy and science in such a way as to vindicate her own views. Juarrero writes: "Galileo's ability to set aside the interference of friction from the equations governing the motion of bodies also suggested that context contributes nothing to reality" (22). She goes on to say that "context and environment were thus left without a role to play in either science or philosophy" (22). This state of affairs persisted until the nineteenth century, when 'Darwin's writings returned context to science for the first time in centuries" (106). Sweeping statements of this kind do not strengthen Juarrero's case, since without further elaboration they can be easily refuted by a more nuanced reading of the history of science and the history of philosophy. Exegetical errors crop up even in relating the recent history of philosophy: "The picture theory of meaning came under fire as a result of articles by Quine (1953) and Putnam (1975), who revolutionized epistemology by arguing that 'meanings just ain't in the head'" (197). Given that Quine's theory of meaning is so different from Putnam's and that the picture theory of meaning is not the main target of either, this statement is misleading at best.

The book's second weakness is that it does not do a good enough job of introducing philosophers of mind and action to the central concepts of the recent scientific theories that she champions. For example, Juarrero puts the fundamental claim of "general systems theory" as follows: "when living things are embedded in an orderly context, properties emerge that are not present when the things exist as isolated individuals" (108). But she does not justify the claim that these properties are truly emergent in the standard sense of the term: higher-level properties that do not supervene on lower-level ones. Indeed, she gives the following example of an emergent phenomenon: "The coherent laser beam can cauterize flesh; the waves of the individual laser atoms, separately, however, cannot. The emergent level is thus qualitatively different from the earlier one" (143). According to the same criterion, a heap of sand would be deemed emergent relative to a grain of sand if the former can tip the balance of a kilogram scale while the latter cannot. At times, Juarrero appears to contradict herself on this point: "Even if nothing other than parts organized in a certain way, complex dynamical systems are *for that very reason* more than the sum of those parts, and therefore different from and irreducible to their aggregation" (150, emphasis added). Surely, if they are indeed more than the sum of their parts it is not for the reason that they are

nothing but parts organized in a certain way, but for some other reason.

The third shortcoming is perhaps more serious. In trying to rehabilitate such notions as Aristotelian formal and final causes, or introducing such unorthodox ideas as self-causation, whole-part causation, and emergent properties, the author does not convince the reader either that these ideas can be made respectable and consistent with the modern scientific worldview, nor does she fully demonstrate how they can be used to settle some central problems in the theory of action. For example, in explaining how formal causes cause, Juarrero holds that they do so not in the way that efficient causes do, "by injecting an external force into a causal chain" (20). Rather, "formal causes cause by modulating, for example, gene expression, that is, by limiting when each component can do what" (20). But she does not show that Aristotelian formal causes *must* be appealed to in order to explain such phenomena, which are described by contemporary biologists using plain old efficient causation. Similarly, after noting that two animals with the same genotype can be phenotypically different depending on the environment in which they develop, Juarrero poses a rhetorical question: "Is this not a form of self-cause whereby the distributed whole influences its components?" (107). However, she never fully justifies this conjecture but proceeds as though it has been established. The alternative view that the phenotypic traits arise as a result of a complex interaction between genes and environment, purely through efficient causation, is never addressed. Indeed, it is not even clear why Juarrero thinks this biological fact necessitates positing self-causation and in what respect the whole has a causal influence on its parts.

Coupled with this last flaw is a tendency on the author's part to finesse the mind-body problem, at times apparently assuming a type-type identity theory. She states that "prior intentions are the felt counterpart to dynamical neural reorganizations that take place in response to cognitive, affective, or similar disequilibrium" (187). The same attitude emerges in throwaway remarks such as, "If among my other mental dynamics there is a self-organized region that embodies 'frugality,' I might drive a few blocks further to a discount store" (211). In this and other passages, she seems to hold that parallel distributed processing has resolved the problem of meaning and intentionality (as well as the frame problem) even though these remain hotly contested issues in the philosophy of mind (212).

Despite these flaws, Juarrero is to be commended for undertaking an ambitious and timely project, which should be of interest to philosophers who work on the problems of action theory. Her effort is instructive in two respects. First, it should spur philosophers of action to go beyond toy examples and a priori theorizing. Second, it should alert them to pay more attention to scientific explanations of complex hierarchical systems characterized by feedback loops, intricate whole-part relations, and dynamic evolution. The disciplines that study phenomena as diverse as ecological units

and weather systems may have much to teach those of us interested in the human mind and human action.

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*PICTURE, IMAGE AND EXPERIENCE*. By ROBERT HOPKINS. Cambridge: Cambridge University Press, 1998. Pp. 205

Robert Hopkins's *Picture, Image and Experience* aims to provide an account of pictorial representation that vindicates the intuitions of the many, namely that pictorial representation is a deeply *visual* phenomenon, that an explanation of pictorial representation needs to be based on an explanation of our *experience* of pictures, and that there must be some sense in the idea that pictures *resemble* their objects. Hopkins proposes that we can show what is correct in these intuitions by explaining pictures as representations that depend on a distinctive sort of perceptual experience: experienced resemblance in outline shape between a picture and its object(s). Experienced resemblance in outline shape is the experience of sameness of the solid angle subtended by the contours on the pictorial surface and the solid angle subtended by the actual depicted objects. Pictures don't resemble their objects but they are experienced as such and it is sameness of outline shape or sameness of subtended solid angles that secures this experience.<sup>1</sup>

Though this approach is on the right track, the perceptualist as opposed to the semiotic or conventionalist track, it takes several instructively wrong turns. These show, first, that we cannot give coherent shape to the resemblance intuition and its comparative or relational nature. Construing the experience on which picturing depends as one of resemblance imposes a comparative structure on the experience that would require that the perceiver have experiences of both the depiction and what it represents. But this is not the case for a vast number of the pictures we enjoy: pictures of particulars— persons, landscapes, flowers—that we enjoy as such but that we have not experienced ourselves.

Second, as this review will argue, we cannot vindicate our intuitions about the perceptual nature of pictures by trying to separate out something like the purely visual contribution to perceptual experience in order to explain picturing in terms of this fragment rather than in terms of the unified resources of conceptually informed perception. Perceptualist approaches to

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<sup>1</sup>Hopkins also aims to use this account of pictorial representation to illuminate the human capacity of visualizing; however, owing to space constraints, the final chapter of the book, which uses his theory of pictorial representation to provide "some modest conclusions" for an explanation of the visual imagination, lies beyond the scope of this review.