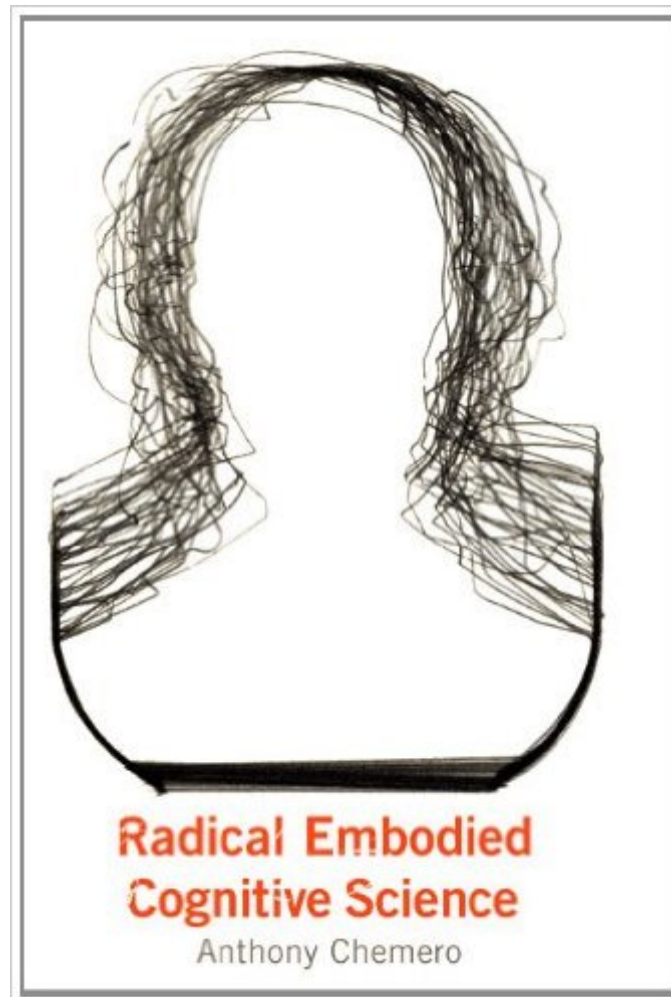


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# Radical Embodied Cognitive Science (MIT Press)



## Synopsis

While philosophers of mind have been arguing over the status of mental representations in cognitive science, cognitive scientists have been quietly engaged in studying perception, action, and cognition without explaining them in terms of mental representation. In this book, Anthony Chemero describes this nonrepresentational approach (which he terms radical embodied cognitive science), puts it in historical and conceptual context, and applies it to traditional problems in the philosophy of mind. Radical embodied cognitive science is a direct descendant of the American naturalist psychology of William James and John Dewey, and follows them in viewing perception and cognition to be understandable only in terms of action in the environment. Chemero argues that cognition should be described in terms of agent-environment dynamics rather than in terms of computation and representation. After outlining this orientation to cognition, Chemero proposes a methodology: dynamical systems theory, which would explain things dynamically and without reference to representation. He also advances a background theory: Gibsonian ecological psychology, "shored up" and clarified. Chemero then looks at some traditional philosophical problems (reductionism, epistemological skepticism, metaphysical realism, consciousness) through the lens of radical embodied cognitive science and concludes that the comparative ease with which it resolves these problems, combined with its empirical promise, makes this approach to cognitive science a rewarding one. "Jerry Fodor is my favorite philosopher," Chemero writes in his preface, adding, "I think that Jerry Fodor is wrong about nearly everything." With this book, Chemero explains nonrepresentational, dynamical, ecological cognitive science as clearly and as rigorously as Jerry Fodor explained computational cognitive science in his classic work *The Language of Thought*.

## Book Information

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## Customer Reviews

The striking turn of cognitive science to understand the mind as beyond the brain and out in the body and in the environment keeps gaining momentum. This is the best yet to advance the research and the arguments for the embodied dynamic systems view of cognition. It's 200 pages of concise, well-reasoned, and well-written excursions across the field. On the content side 1) it situates the embodied tradition among competitor theories; 2) it explains and justifies the "radical" label as not requiring representations in the brain; and 3) it makes a strong case that the affordances of ecological psychology (roughly features of the environment that organisms respond to) are a less problematic and richer source for cognitive research than are representations. On the writing side, who can not be drawn to a book that begins with a dedication to the "crowd at Sweet William's Pub" and then follows with these opening lines? - "Jerry Fodor is my favorite philosopher. I think that Jerry Fodor is wrong about nearly everything." The style of writing and thinking follows just as boldly. In doing such a good job of laying out the full arguments in favor of the radical embodied direction, there are definitely side arguments that he sews up to make his overall argument complete. At times these mental flanking maneuvers stretched my interest, but then his clarity and quickness of laying out what was worth disagreeing about or what should wait for what type of further research turned another messy corner of ideas into something satisfying. With the inclusion of other views, the frequent diagrams, the always never-wasting-time clear prose, and the relaxed fairness to other ideas, the quality of writing is at a level that matches the high level of the synthesis of ideas. It was unusually pleasant to read. The field is in exciting ferment. The author brings it together and pushes it forward in a very deft manner. It would not surprise me if this book turns out to be a benchmark for the next 5 to 15 years even in this fast-moving field.

There is great need, imo, for clear explications of embodied cognitive science, particularly the form that is faithful to Gibson and ecological psychology - the "radical embodied" form as Chemero dubs it. To me, this is not so much that the architects of AGI (Artificial General Intelligence) are seriously entertaining these considerations, but that the whole AGI movement with its touted imminent "singularity" needs to be brought into the reality of what it really faces in capturing or equaling human intelligence and its basis in perception. This latter "into reality" goal, however, was not quite

Chemero's purpose, rather it is an attempt to clarify the philosophical bases of the concept and address major philosophical issues that block understanding of where this concept fits for philosophy/psychology. What is there for the AGI types nevertheless has aspects that are easily mined, and some not. Chemero's writing is easy, unpretentious, clear and incisive. It can get heavy at times, but it must in order to plunge into and cut away at the thickets of philosophy, but so thankfully, he explicitly avoids the zombies, inverted qualia, swampmen and Martians of the philosophers. I have to immediately note a rare and neat phenomenon, for Chemero, the mere philosopher, via a literature review of animal object exploration studies and via his own experiments, shows that the research literature (100+ studies) has been nearly completely confounded by its failure to consider Gibson's affordance values in regard to the objects that are commonly strewn around the area the critters are to explore. Cool. This alone tells us we are reading an interesting mind. And yes, ecological psych indeed holds a discovery guide as Chemero rightly argues. I would just note that this theme could have gone much, much farther - I have argued for example that ecological psychology could dominate memory research, particularly our model of the fundamental operation of redintegration (see "On the possibility of direct memory," in Fallio, *New Developments in Consciousness Research*, 2006 [or see the ASSC site] ). Gibson's invariance laws structure the events being remembered, and parametric variation of these invariants and transformations will control/predict memory performance, making it an absolute requirement for any device/machine trying to equivalence human memory capabilities of concrete events to acknowledge/employ these laws (none do [or can for that matter] - connectionist networks or symbolic AI). Imo, this is indicative of a large mistake of focus in ecological psych, evident also in the book - a heavy, almost exclusive focus on the nature and illusive final meaning of Gibson's "affordance" concept (based on invariance) while neglecting and failing to emphasize the straightforward and powerful fact of the role of invariance laws in structuring events. (Simply emphasizing these is a far clearer message for the AI folks re what they must consider.) The major discussion in the book on the key issue of the role of representations in perception/cognition in the radical embodied framework, is deep, considered, obviously vastly informed. The examples of coupled oscillators (where analogously we have the organism coupled to the environment) help nicely to make principles concrete. Chemero warns us that these sections will be heavy in philosophy, and this unfortunately is also a flashing red light that he is going to struggle in his thesis. The thesis, in considering Gibson's "direct perception," effectively removes representations in perception, while via other arguments, some of which involve considerations of doing analogy without representations, he also argues for the removal of representations (or lack of explanatory need for them) in cognition. On the whole, this is a very

interesting set of chapters, spanning major theorists and philosophical precursors in the field. But the thesis has major problems, at least imo. On direct perception, Chemero slides over the fact that he has no actual theory of the origin of the image of the external world (though he thinks he does). Simply rejecting the claim that the mind is a computer and saying your science is about explaining experience (where the meaningfulness of experience - via affordances - is inseparable from, say, our seeing) does not actually explain how this experience is an image of the external world, i.e., of the matter-field which looks nothing like our experience. Your embodied science doesn't need an account of qualia (as Chemero argues), yes, but only if you can actually explain the origin of the qualitative image (and only, I would add, if you have significantly altered our model of space, time and matter as opposed to the current metaphysic). Like Gibson, who argued that invariants in the optic array to which the brain is resonating allow the brain to be "specific to" the external environment, there is no explication of how this "specific to" actually results in an image. An example makes this clear quickly. Embed Gibson in Bergson. Bergson (*Matter and Memory*, 1896) presciently saw the universal field as a holographic field and the brain effectively as being a modulated reconstructive wave passing through (or resonating within) this field, and thus "specific to" a subset of the field, now an "image" of a portion of the field. The selection principle for a subset out of the mass of holographic information is the relevance to the body's action, and to Bergson - deeply reflective of the affordance concept - perception is "virtual action." In this holographic reconstruction model, where within the brain there are indeed no representations of the external world, we now have an actual, concrete mechanism for explaining the origin of the image of the environment, something which I think is vanishingly vague in Chemero's attempt. On the cognition side, Chemero's elimination of representations struggles against a fundamental intuition, namely our obvious use of representations in thought - I can clearly imagine the construction of a new chicken coop. But when one has virtually a non-source of, or theory of, the perceptual image, one will tend to deny the memory image - in fact one has not much of a theory of memory. Some of this bleeds into contortions such as, "on the Turvey-Shaw-Mace view, either babies do not perceive their mothers (because information for direct perception is unavailable) or they do not perceive them directly," and rather strange somersaults to resolve this. But surely I can see my mother as my mother because of memory, in fact, this is just a very bad neglect of the problem of explicit memory (one can see for example, "The COST of explicit memory," *Phenomenology and the Cognitive Sciences*, 2009 [or ASSC site] ). This is not to take away from Chemero's excellent book which holds a set of fascinating considerations and explications. Some of these weaknesses, however, point to the need to place Gibson and ecological psychology into a more coherent framework (to

include a far more serious theory of memory) where the body/brain/mind is indeed explicitly described and seen as a much more radical "device." - Stephen E. Robbins, PhD

I am a philosophy graduate student reading this book as part of a reading group. The reading group is comprised of students from neuroscience, philosophy, psychology, and English. In total, we have only two or three students who are able to understand all of what the text is explicating. The book presupposes a background knowledge of philosophy and psychology with a dash of neuroscience. The small explanations to "fill in the gaps" for those lacking that background knowledge is insufficient, and you might find yourself confused.

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