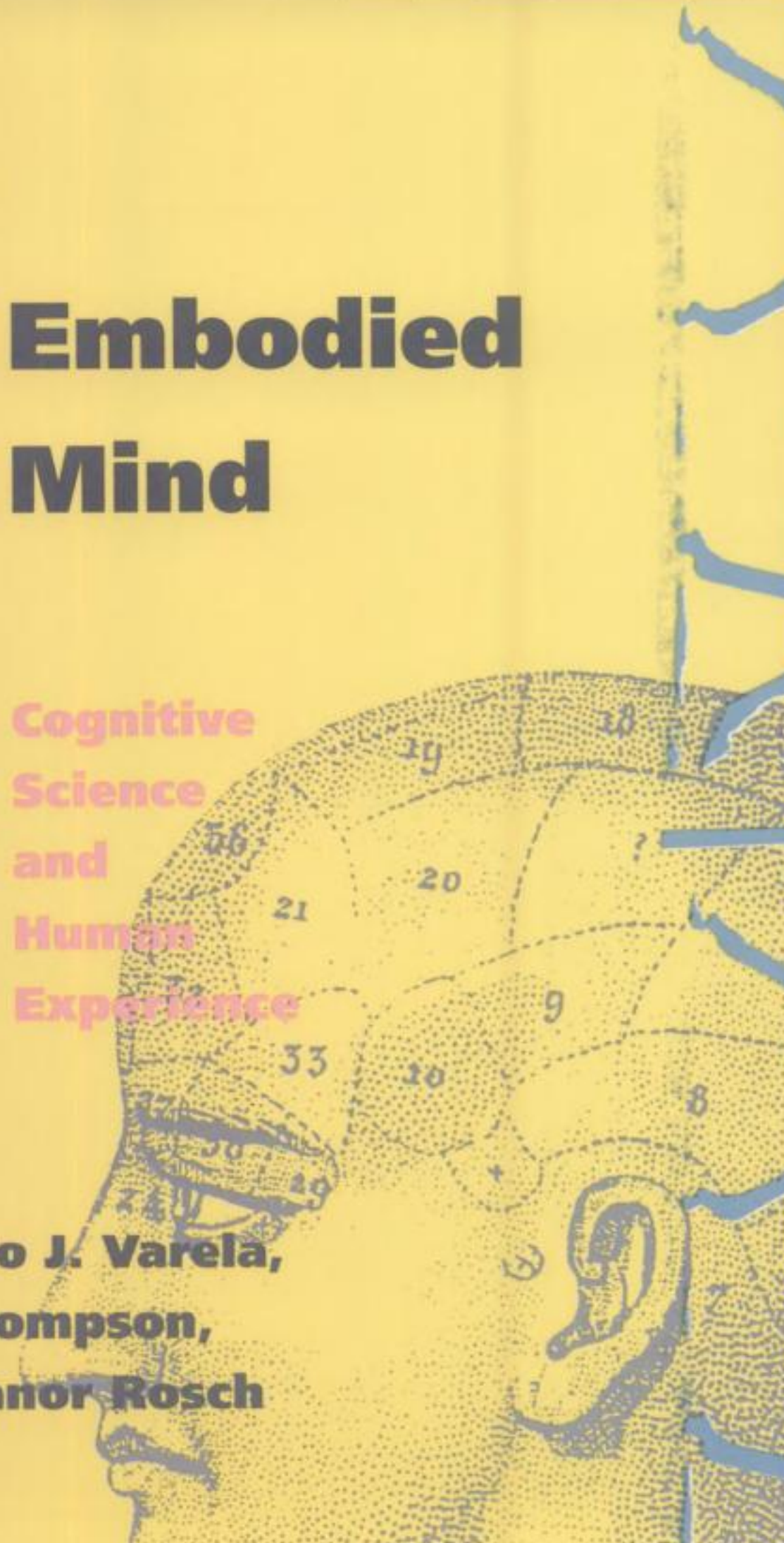


# The Embodied Mind

Cognitive  
Science  
and  
Human  
Experience

Francisco J. Varela,  
Evan Thompson,  
and Eleanor Rosch



The Embodied Mind: Cognitive Science and Human Experience, Francisco J. Varela, MIT Press, 1993, 0262261235, 9780262261234, 308 pages. "An important book with wide-ranging implications for the construction of subjectivity in the Western tradition. Moreover, it is engagingly written, presenting difficult ideas and complex research programs with grace, lucidity, and style." -- N. Katherine Hayles, "American Book Review" "The Embodied Mind" provides a unique, sophisticated treatment of the spontaneous and reflective dimension of human experience. The authors argue that only by having a sense of common ground between mind in science and mind in experience can our understanding of cognition be more complete. Toward that end, they develop a dialogue between cognitive science and Buddhist meditative psychology and situate it in relation to other traditions such as phenomenology and psychoanalysis..

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Voices of the Mind Sociocultural Approach to Mediated Action, James V. WERTSCH, 1991, Psychology, 169 pages. In Voices of the Mind, James Wertsch outlines an approach to mental functioning that stresses its inherent cultural, historical, and institutional context. A critical aspect of ....

Minds, Brains, and Computers An Historical Introduction to the Foundations of Cognitive Science, Robert Cummings, Denise D. Cummins, Feb 3, 2000, Philosophy, 552 pages. This work offers a selection of seminal papers on the foundations of cognitive science, from leading figures in artificial intelligence, linguistics, philosophy and cognitive ....

Organization of memory , Endel Tulving, Wayne Donaldson, Gordon H. Bower, United States. Office of Naval Research, 1972, Psychology, 423 pages. .

Philosophy in the Flesh The Embodied Mind and Its Challenge to Western Thought, George Lakoff, Mark Johnson, 1999, Philosophy, 624 pages. Reexamines the Western philosophical tradition, looking at the basic concepts of the mind, time, causation, morality, and the self..

Mind as Machine: A History of Cognitive Science, Volume 2 A History of Cognitive Science, Margaret A. Boden, Jan 1, 2006, Cognitive science, 1631 pages. V.1: 1. Setting the scene--2. Man as machine: origins of the idea--3. Anticipatory engines--4. Maybe minds are machines too--5. Movements beneath the mantle--6. Cognitive ....

On Becoming Aware A Pragmatics of Experiencing, Natalie Depraz, Francisco J. Varela, Pierre Vermersch, 2003, Psychology, 281 pages. This book searches for the sources and means for a disciplined practical approach to exploring human experience. The spirit of this book is pragmatic and relies on a Husserlian ....

An Invitation to Cognitive Science: Visual cognition, Volume 2 , Daniel N. Osherson, 1995, Psychology, 363 pages. Rather than surveying theories and data in the manner characteristic of many introductory textbooks in the field, An Invitation to Cognitive Science employs a unique case study ....

Embodied Cognition , Lawrence Shapiro, Aug 12, 2010, Philosophy, 242 pages. Embodied cognition often challenges standard cognitive science. In this outstanding introduction, Lawrence Shapiro sets out the central themes and debates surrounding embodied ....

Vision and Mind Selected Readings in the Philosophy of Perception, Alva Noë, Evan Thompson, 2002, Philosophy, 627 pages. A collection of works, many of them classics, on the orthodox view of visual perception..

The Resonance of Emptiness A Buddhist Inspiration for a Contemporary Psychotherapy, Gay Watson, Jan 1, 2001, Buddhism, 327 pages. This book presents an exploration of Buddhist philosophy and practice as a potential resource for an approach to psycho-therapy which is responsive to the needs of its time and ....

Functional Models of Cognition Self-Organizing Dynamics and Semantic Structures in Cognitive Systems, A. Carsetti, 2000, Computers, 307 pages. "Of crucial importance in the attempt to outline an adequate theory of human cognition, these remain amongst the most difficult of questions in the cognitive sciences. This ....

Behaviorism, Volumes 4-5 , , 1976, , . .

An Invitation to Cognitive Science, Volume 4 , Daniel N. Osherson, Don Scarborough, Saul Sternberg, 1998, Psychology, 950 pages. The chapters in this volume span many areas of cognitive science -- including artificial intelligence, neural network models, animal cognition, signal detection theory ....

The Foundations of Cognitive Science , Michael I. Posner, 1993, Psychology, 888 pages. the first broad treatment of cognitive science at an advanced level.

The Embodied Mind provides a unique, sophisticated treatment of the spontaneous and reflective dimension of human experience. The authors argue that only by having a sense of common ground between mind in Science and mind in experience can our understanding of cognition be more complete. Toward that end, they develop a dialogue between cognitive science and Buddhist meditative psychology and situate it in relation to other traditions such as phenomenology and psychoanalysis.

This is perhaps the most challenging and unusual book I ever read. At first it seems similar to the other books on mind and consciousness that started appearing in the late 1980s, in response to advances in neurobiology and artificial intelligence. But the final chapters confirm that the authors were shooting for something much grander.

The writers of this book, which was first published in 1991, were a "dream team" of philosopher, psychologist, and neuroscientist (the late, great Francisco Varela). They wrote for a professional audience. An interested layperson having some familiarity with philosophy of mind issues can keep up, but only with much effort; I had to stop several times to look up a term or research an important concept. But it's worth the effort. You will review a wide variety of interesting ideas and be shown how they relate to one other, including neural networks, societies of mind, object-relations psychoanalysis, adaptive resource theory, multi-chromatic vision, evolutionary drift, nihilism, the delusion of "self", and much more.

And you will also read about Buddhism. The authors introduce Buddhist concepts every second or third chapter, noting the parallels between ancient thought and modern science (and the failures of western philosophy). Yes, this does remind one of Capra's Tao of Physics, although the conceptual juxtapositions aren't as forced. The two biggest problems that cognitive science present for western thought involve the failure to integrate and account for subjective experience, and an increasing sense of social groundlessness as science and history reveal the world to be mostly "relative". Varela and his team believe that these problems lie at the root of a major social crisis that is now being felt in the developed world, i.e. a growing sense of nihilism. When despair and confusion become prevalent and our enemies are at the gates, can the new dark ages be far behind?

The response to this gathering storm, the authors argue, can be found in the wisdom of the Buddhist tradition. However, this isn't your father's Buddhism. Varela and company have cleaned it of any supernatural accretions such as hungry ghosts, cosmic nirvana and reincarnation. And although karma is discussed, its definition is narrowed so that it could appear in any graduate textbook on psychology without objection.

The Buddhism presented in this book appears to be fully compatible with our modern scientific viewpoint. Through awareness meditation techniques, subjective experience can be grasped and integrated in a way consistent with empiricism. And in that grasping, we can learn to stop grasping.

(Love those eastern paradoxes). Instead of fighting the relativity introduced over time by Einstein, quantum physics, psychoanalysis, evolution, complexity theory and cognitive research, we can learn to embrace the end of grounding. Our science can be enriched through "embodiment", expanding science's conceptual boundaries so as to embrace subjective experience without losing precision and explanatory power. And we ourselves can learn to give up the unsustainable concept of "self" and become more open-hearted and compassionate (those words are used more than once by the authors). We can work with our everyday experiences in ways that are "liberating and transformative".

I've read some professional reviews of this book, most notably by the famous neuro-philosopher Daniel Dennett. They focus on the many technical and research-oriented discussions, and generally ignore the chapters on liberation and compassion. There is so much here regarding the techniques and directions of cognitive research that one can easily ignore the hub and concentrate on the spokes.

The cognitive field appears to have responded to these spokes, i.e. to the need to take "embodiment" and subjective experience more seriously. Neuroscientists Antonio Damasio and Gerald Edelman have discussed the need to conceptualize consciousness in light of the overall human body and its "stay alive" dynamics. Even arch-representationalist Dennett became interested in "heterophenomenology", which seeks to document a person's subjective feelings and impressions, though not without a certain distance and skepticism.

But getting back to the axis of this book - i.e. saving the world - I will now attempt to go where better minds than my own have feared to tread. First off, one can sense a truly good intent on the part of these authors. They pictured a bridge between eastern and western ideas that could allegedly convey our half-civilized, half-atavistic species toward a more mature state of collective mind and individual being. They honestly felt that brain research had reached the point where it had something earthshaking to say to humankind, once catalyzed through the wisdom of the east. They wrote this book with a sincere sense of hope and purpose. Books like this are rare, especially in the cognitive science field.

Unfortunately, science and critical thought are not compatible with the Buddhist notions presented in this book, however denuded of supernaturalism. The authors call Buddhism a "case study" regarding the positive social effects of embracing groundlessness. Unfortunately, they don't provide a citation to that case study. I'm sure that awareness meditation, the annihilation of self, and the cessation of grasping desire have helped many people to live better lives. But as to whether it works on the scale of a particular culture, or nation, or for humankind as a whole - can we answer that question? And even if we can, what would the side-effects be? Less innovation and economic wealth? Or extreme exploitation by a cabal of charlatans, as happened with Communism? We won't be fooled again? Although Buddhism is not a religion in the same sense as Christianity and Islam, Varela and company still urge a leap of faith upon the reader.

I would recommend this book to anyone even vaguely interested in the issues of the mind - but be ready for a long, tough slog. Despite all the cold technical jargon and talk of emptiness, a sincere human warmth and idealism eventually comes forth. It's kind of like listening to John Lennon's Imagine - except that these authors couldn't expect nearly the payday (and possessions) that Lennon got for his Utopian formula. Read more &rsquo;

Reading this book contributed helpfully to my studies of the phenomenology of the embodied experience. The authors argue that we cannot understand ourselves to be isolated bodies controlled by a mind that stands apart from and judges an independent environment. I would recommend this book to anyone who is interested in cognitive science, phenomenological philosophy, philosophies of embodiment, and the relationship of Buddhism to these areas of thought.

This book is well worth the price if you are interested in theories of mind and Buddhism. Bert Dreyfus took some of the philosophical references to task in a review that appeared in "Mind" indicating a couple of questions concerning references to Kant's philosophy. He also points out that

there is no case made in the book to support the inference that experiences derived from zazen are experiences of "reality." So there are some holes here and there...or maybe assumptions a philosopher would jump on. But I would still recommend this book. It is very interesting and lays out its facet of the Buddhist perspective quite well.

This ranks up there with Chogyam Trungpa's books for clearly presented insights. Trunpa's genius is making Buddhist ideas come alive for Western readers by clearly presenting Buddhist ideas in everyday terms. This book is a wonderful addition to the same delicious feast, building a bridge from Eastern mindfulness/awareness traditions to Western scientific thought. The effect is to improve our understanding of both. Very powerful and thought-provoking. Each page is like a meal. Hungry? Chew this one slowly and enjoy every bite!

Abhidharma action activity actually aggregates analysis arises awareness basic become behavior biological Bittorio body brain Buddhist Buddhist tradition Cartesian anxiety chapter codependent cognitive science cognitive scientists cognitive system cognitivism cognitivist color categories color vision computational mind conception connectionism connectionist consciousness context cortex cultural discussion distinction domain ego-self embodied emergent properties environment everyday evolution evolutionary example existence experiential feeling fundamental genes grasping ground groundlessness human experience Husserl idea independent Jackendoff language life-world logic Madhyamika Mahayana means mental factors Merleau-Ponty mindfulness/awareness meditation Minsky Minsky's models Nagarjuna networks neuronal nihilism notion object relations theory objectivism one's open-ended optimal organism patterns perceived perception perceptually guided phenomenology philosophical possible pragmatic pregiven world problem processes psychology reflection representation result Rosch scientific self-organizing sense simply situation Society of Mind specific structural coupling sunyata symbolic task Tetrachromatic theory things thought tion Varela visual visual cortex Western

For the past year or so I've been steeped in literature in cognitive science focused on addressing issues surrounding representation. Human beings can represent all sorts of things; chairs and cups, dogs and cats, the smell of a glass of wine, hunger and thirst, the meanings of words, and on and on. At any point in your moment to moment experience, your mental states are in some sense "about" something that the brain is capable of representing. But brains are just a vast web of interconnected cells...more For the past year or so I've been steeped in literature in cognitive science focused on addressing issues surrounding representation. Human beings can represent all sorts of things; chairs and cups, dogs and cats, the smell of a glass of wine, hunger and thirst, the meanings of words, and on and on. At any point in your moment to moment experience, your mental states are in some sense "about" something that the brain is capable of representing. But brains are just a vast web of interconnected cells, passing chemicals back and forth. Where is it that thoughts and concepts arise? How is it that representation can arise out of the electrochemical functioning of the brain?

Various theories have been proposed over the years to account for this, but the foremost theories in cognitive science, computationalism and connectionism, each are riddled with a myriad of problems that preclude the emergence of representation. Don't get me wrong, each of this research paradigms has allowed for really great breakthroughs in the functioning of computer and robotic systems. But while there has been some success in mimicking certain cognitive functions (to some degree), neither theory has been able to account for representation, for intelligence, for consciousness (there's also problems to do with learning, as well as what's known as the frame problem).

So I've been recently reading some of the embodied cognition and dynamic systems literature. These theories are radical departures from standard cognitive science, rejecting the fundamental assumption in cognitive science that the brain is basically an information processing device, and instead focusing on the embodied sensorimotor coupling of a dynamic system (whether biological or not). Research in these fields has produced robotic agents capable of engaging in many varied behaviors, including self organization, thus far outside the reach of classical theories. Each of these platforms separately provide strong predictive and explanatory power when dealing with issues of

cognition or intelligent behavior, and combining them, which has so far only been discussed theoretically as far as I know, is an extremely promising research strategy. The only problem is...these theories eschew the concept of representation all together. And my main question coming into this book was...how? I really like many of the ideas in these fields, but how exactly do they account for consciousness, for subjective experience, for qualia?

I picked up this book hoping for an answer to that question, and I didn't get it. But I still found the book to be excellent on the whole. Their criticisms of standard cognitive science were in my opinion, spot on. Those sections alone would be worth it for anyone interested in these issues to pick up and read. And the real kicker is that for the most part I agree strongly with their own theories of cognition, or embodied action as they call it. Below are two quotes I pulled out of the book that I think do the best job of summarizing their basic points:

Embodied action: by using the term embodied we mean to highlight two points: first, that cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological, and cultural context. By using the term action we mean to emphasize once again that sensory and motor processes, perception and action, are fundamentally inseparable in lived cognition. Indeed, the two are not merely contingently linked in individuals; they have also evolved together.

I think I'm with them 100% here, and if you're not quite ready to buy into what they say from those quotes, I can only say, pick up the book. They provide plenty of justification for these ideas, but even more so, much of the reading I've been doing over the last year bolsters their argument strongly.

Where I disagree with them is the conclusion they draw given this theory they've constructed. Which is that there is no such thing as representation. Worse, there is actually no objective pregiven world (a necessary conclusion give many of their arguments, but a regrettable one). Their basic criticisms of representation are actually completely valid given certain naive conceptions of representation, which is representation defined as the "act of re-presenting pregiven features of the world through a process of recovery of information from sensory signals". Their criticism hinges on the notion that there is an optimal fit correspondence between a pregiven world and our representation of it. i.e. - there is an object world, sensory signals hit us, our brain processes the information, and re-presents it accurately.

Sure, acknowledged. We don't experience a pregiven world. We experience a construction of that world. But some sort of object reality does exist. We interact with it with our sensory systems, and our construction as a result of this interaction can be in error. So what? What is it about about the possibility of representational error that is so hard to stomach? They don't address this idea. In fact, they seem to assume that all the theories of representation out there don't account for the possibility of error, don't even think they need to. Now, if they had argued that no popular theories actually do account for the normativity of representation, I would agree. But all theories agree that representation is a normative phenomena, it could be true or false. What justification we have for taking our representations to be accurate is certainly tricky (we can't compare our representation of the world with the actual world, since all we have access to is our own internal representation. No matter how much "external" justification you have, it must always be filtered through an internal cognitive process. this is a serious problem in epistemology).

So what is one of their main justifications for this argument against representation? It's an argument against a certain brand of evolutionary theory. What they argue against is the notion of evolution as resulting in organisms that have an optimal fit for their environment, and thus against the notion that our sensory systems can accurately represent the environment since they themselves are not optimally fit for representation. Again, I found this really frustrating to read because most of their criticisms against an "optimal fit" theory of evolution are also correct. To be fair, they're not even saying anything particularly new, but in general their chapter on evolution could have been excellent, if its sole purpose wasn't to argue that if you accept what they say about evolution you have to accept what they say about representation. Sure, evolution is not involved in optimization.

They describe it perfectly; "selection discards what is not compatible with survival and reproduction. Organisms and the population offer variety; natural selection guarantees only that what ensues satisfies the two basic constraints of survival and reproduction." I.e - what is selected for is not what is optimal, but what is viable.

I see this happen all the time in philosophy, whether it's in consciousness studies or epistemology. Someone will come out with a brilliant work detailing all the problems in the popular theories, explaining in a more comprehensive way how things actually do work, and then simply throwing out the baby with the bathwater. Varela, Thompson, and Rosch are right on in what is a future action oriented process approach to cognition. Perception is not a passive process of representing the world, but an active process of construction. Objects aren't represented by sensory signals, objects present affordances for action through the sensorimotor coupling of a biological system interacting with sensory signals in the environment. None of this means representation doesn't exist. It means that our naive conceptions of representation as "sensory encodings" must be put behind us. It means that representation isn't "of things", but emerges from an internal process facilitated by "contact" with things. It means these insights into how cognition actually works themselves need to be accounted for in a theory of representation. I don't suggest this is easy, but look where getting rid of gets these authors. There is no pre-given objective reality. Not only that, but they have no account, not even a mention, of anything to do with consciousness or subjective experience.

Way ahead of its time, this is the book that coalesced the embodied mind paradigm. There were others that came before such as Bateson's "Mind and Nature" and Maturana & Varela's "The Tree of Knowledge" but this volume was first to set out against both cognitivism and connectionism as being different versions of the representationalist-computationalist-disembodied view of mind to lay out an agenda for a biological-body-environment- and dynamical system-based view of mind and cognition.

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