

# Enactivist Interventions: Rethinking the Mind

## A book review

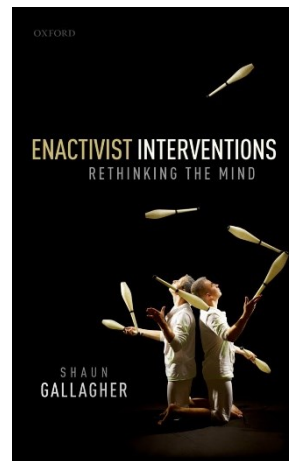
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*Enactivist Interventions* promotes the strengths of an enactive approach to cognitive science and philosophy of mind. In short, the book emphasises the key points of the enactivist tradition, which can be summed up in the following way: cognition is not reducible to brain processes alone, that cognition is principally embodied and embedded, and thereby, the science of the mind should include the body and environmental factors in an important way. Further, the book highlights the enactivist position to cognitive domains such as action, perception and free will. It gives a historical overview that includes the role of embodiment, phenomenology and pragmatism in shaping the enactivist conception of the mind. It also applies some of the modern findings in developmental psychology and neuroscience.

The objective behind all this is to address the current problems in the philosophy of cognitive science, especially dealing with intentionality and representation. Shaun Gallagher proposes a novel notion of intentionality, one that is not equivalent to representation, and attempts to show how to conceive of cognition without relying on the notion of mental representation. In the process, the author undermines the concept's explanatory role or, at

times, dismisses representational descriptions of cognition altogether. To make his arguments, Gallagher relies on the help of the ‘friends of the enactivism’ who are part of the E-cognition (embodied, extended and embedded cognition), as well as phenomenological and pragmatist accounts, and findings from the fields of sensorimotor processing, dynamic systems theory, ecological psychology or predictive processing. As such, the book is a great read for anyone not familiar with these fields. Gallagher’s writing style is clear and approachable, and supplemented with numerous everyday-life examples that illustrate his points. He clarifies the toughest issues to be found in philosophical psychology today, tapping into the latest research therein. With all this in mind, I will now summarise the crucial, to my view, aspects of each chapters, after which I will engage in a more detailed discussion regarding the impact of this book on modern philosophy of cognitive science.

After a comprehensive introductory chapter delineating the key messages of the enactivist conception of cognition and its place in the sciences (to which I will return later), Chapter 2 offers an analysis of various interpretations of embodiment and determines the place of the body in the enactivist philosophy. The overview of the notion of embodiment sheds light on how it can be appreciated even by representationalists, e.g., through the notion of ‘body representations’ (Goldman & de Vignemont, 2009), showing the uphill battle that enactivism has to fight. Importantly, the chapter clarifies that enactivism and embodiment do not automatically go in pair together. Gallagher engages in the discussion about extended embodiment (i.e., using our bodies to perceptually consult the information found in the environment), as well as proposals that even without the body, the information in the appropriate inputs can still produce the same experience, despite the fact that it is computed differently. Yet, Gallagher argues for the necessity of the body in the cognitive processing, taking the option of the ‘brain in a vat’ off the table, showing that such a proposal “fails to take into consideration the contributions of physical processes in peripheral and autonomic systems” (p. 39). The biological body delivers more, playing an indispensable role in the brain-body-world dynamic that enables intelligent action. The author then explores the similarities and differences between the enactivist account of embodiment and different theories of embodied cognition that are present in the modern literature.

Chapter 3 discusses in detail the role of the environment for enactivism. It discusses the roots of enactivism in pragmatism; for example, it relies on John Dewey’s (1916) notions of *situation* and *organism-environment unit*. This chapter reminds us that the enactive approach has a well-established tradition. Its pragmatic roots are reflected in the modern discussions within philosophy of mind and cognitive science. Applied within the enactivist framework, they counter the functionalist principles of embedded and extended cognition.

Chapter 4 addresses the question of intentionality and challenges the standard intellectualist reading of intentionality as the mark of the mental. Gallagher discusses neo-behaviourist (Dennett, 1971) and neo-pragmatist (Brandom, 1994) accounts of intentionality, suggesting their limitations and proposing the enactive interpretation instead. The neo-behaviourist position, as exemplified by Theory Theory, “depends on a framework that

endorses an internalist conception of mental states” (p. 70). Neo-pragmatists, such as Simulation Theorists, are not able to account for “our common sense ability to recognize intentionality in the behaviour of a variety of non- or pre-social entities” (p. 73). Enactive intentionality does not face these challenges. Being embodied and operative, it says that normative responses are already part of our primitive reactions to the world that guides actions directly (e.g., placing a foot on the break pedal in a car embodies in action an immediate understanding of the intention of the observed pedestrian, who is about to cross the road). Enactive intentionality is something that can also be discerned in the behaviour of other people. Following Maurice Merleau-Ponty’s ideas regarding intentionality (1945/2012), Gallagher clarifies that:

Intentionality is determined by what the agent is doing and what the agent is ready to do, and is constrained, for example, by the agent’s sensorimotor skills relevant to coping with the situation at hand, whether that’s stepping off a curb or stepping on the brake, or any interaction that might follow. [...] On the enactivist view, one doesn’t need to go to the realm of mental states (propositional attitudes, beliefs, desires), inside the head, to encounter intentionality—operative intentionality is intrinsic to the movement; it is in one’s action, in one’s environmentally attuned responses. This operative intentionality is the real non-derived, primary intentionality. (pp. 79–80)

It is with this notion of intentionality that the enactive approach to cognition is defined and can facilitate a better understanding of cognitive tasks, such as action and perception, both of which are the subject of the next two chapters.

Chapter 5 addresses a very specific cognitive domain, i.e., action, and argues for its non-representational interpretation. Similarly like in Chapter 2, where Gallagher argued against representational accounts of embodiment, this chapter dismisses minimal, action-oriented or pre-intentional representations in actions, showing that they do not need to play any role in accounting for our actions. Gallagher demonstrates why the “idea of a minimal representation no longer conforms to the criteria that would make it a representation” (p. 103). The key problem that he highlights is the dissonance between two features of representationalism: the emphasis on representational decoupleability from the environment (mental representations are supposed to stand in for the immediate environment), as proposed by the emulation theory, and the normative action-guiding feature of representations. Gallagher challenges the claim that minimal representations play a role for action, showing that the latter feature requires constant directedness to the environment in order to adjust for the normative role, which is in dissonance with it being truly ‘offline’ and decoupled from the ongoing context. In a similar vein, Chapter 6 argues against the classic model of perception, which is driven by ‘offline’ inferences, and incorporates Jesse Prinz’s (2004) account of neural plasticity that is attuned to situated environmental events. Chapter 7, in turn, addresses the relationship between motor control and free will, placing our understanding of free will in the integrative and the narrative timescales. In these chapters, Gallagher demonstrates convincingly that action, perception, and conscious choice are always embedded and situated in a context, which is in line with the enactivist principles.

Chapter 8 builds on the former chapters by bringing in the notion of affectivity and intersubjectivity into the enactivist approach to cognition. This short yet stimulating chapter gives a clear example of the enactivist intervention, i.e., not just accommodating the current data into enactivism, but rethinking how the brain itself works. As the author writes,

The organism has autonomic and peripheral nervous systems, and not just a central system. It attains an upright posture, which, in evolutionary terms, reshapes essential features, including the brain, allowing the person to cope with specific kinds of environments, and with other people. [...] The enactivist interpretation is not simply a reinterpretation of what happens extraneurally, out in the intersubjective world of action where we anticipate and respond to social affordances. An enactivist interpretation of the MN [mirror neuron] system, for example, points beyond the orthodox explanation of information processing to the possibility of rethinking not just the neural correlates of perception or intersubjectivity, but the very notion of neural correlate, and how the brain itself works. More than this, it suggests a different way of conceiving brain function, specifically in non-representational, integrative, and dynamical terms [...]. The enactivist view of how brains work is that brains are involved in worldly interactions such that they bear less of a cognitive load than assumed in the internalist and predictive coding models. Brains participate in complex worldly, affordance-oriented interactions in ways that shape perceptions and intentions, and guide actions. (pp. 160–161)

The final two chapters take another turn. Chapter 9 discusses themes that fit enactivism, such as the evolutionary accounts of standing and speech. Chapter 10 reveals possibilities for enactivist interventions. It considers the problem of scaling up, or whether and how enactivism can shed light on more complex cognitive capacities that are usually considered to be representation-hungry, including imagination and mathematical cognition. One example of an intervention is to update the enactive account with the affordance-based concept of imagining, and re-conceive imagination as a form of perception of possibilities for action. Another one is to consider reflection or reflective thinking as a dimension of the flow or expertise, or a skilful practice, and acknowledge once again the role of the body, as exemplified by grasping and gesturing, in our thinking practices.

In terms of the impact of *Enactivist Interventions* on the modern philosophy of cognitive science, the success of the book is that it shapes enactivism as a *philosophy of nature*. What is a philosophy of nature? Following Peter Godfrey-Smith, Gallagher states in Chapter 1 that:

[...] a philosophy of nature is a different kind of intellectual project from science, and although science may be its critical object, the two enterprises do not have to share the same vocabulary. A philosophy of nature ‘can use its own categories and concepts, concepts developed for the task of describing the world as accurately as possible when a range of scientific descriptions are to be taken into account, and when a philosophical concern with the underlying structure of theories is appropriate’ (Godfrey-Smith 2001, 284). A philosophy of nature takes seriously the results of science, and its claims remain consistent with them, but it can reframe those results to integrate them with results from many sciences. [...] Moreover, the requirements of such a reframing may indeed call for a vocabulary that is different from one that serves the needs of any particular science. Although to work out a philosophy of nature is not to do science, it can still *offer clarifications relevant to doing science, and it can inform empirical investigations*. In this sense, a philosophy of nature is neither natural

philosophy (in the traditional sense) nor the kind of naturalistic philosophy that is necessarily continuous with science. It offers critical distance and practical suggestions at the same time. In some cases it may make doing science more difficult. (pp. 22–23; emphasis added)

In short, the status of enactivism in the sciences is that it clarifies and re-conceptualises; it is a new lens through which to view the matters of the mind. It opens the doors for re-conceiving cognition in a non-intellectualist, non-representational way. For instance, with the enactivist approach, the explanandum of cognitive science changes. The key message that the book highlights is that standard approaches to cognition, which focus on the brain as the hub of the mentality, are wrong. As Gallagher writes:

The explanatory unit of cognition (perception, action, etc.) is not just the brain, or even two (or more) brains in the case of social cognition, but dynamic relations between organism and environment, or between two or more organisms, which include brains, but also include their own structural features that enable specific perception-action loops, which in turn effect statistical regularities that shape the structure and function of the nervous system. (p. 11)

Thus, the main intervention takes place on the level of re-description, i.e., what we consider to be cognition should be updated.

What the author does well in his book is that he introduces existing empirical programmes as enactive at heart. If Gallagher is right, all of cognitive science changes, and enactivism can appropriate the already existing findings. The example of trying to catch a ball (Chapter 1) is a case in point with regard to the enactivist explanation of how problem solving occurs. An enactivist rejects the interpretation whereby the speed and trajectory of the ball are calculated and reconstructed *in the brain* so that the instructions can be sent to the limb (a classic representational account), or that *calculations* are made online as we move (an action-oriented representational account). Instead, “the fielder solves the problem without representations, by vision and movement” (p. 14), which does involve online anticipatory processes. A ‘dynamical’ variant of how the predictive coding process works further backs this explanation (see section 1.5).

This interpretation of the predictive coding process is already shaped by taking on the favourable reading of the predictive processing story, as proposed by Andy Clark (2016). Hence, the enactive story is already part of the interpretation of how the active inference of the predictive coding mechanism works, which is used as an explanation with regard to solving the problem in action ‘online’. In fact, Gallagher even explains that “active inference is not an ‘inference’ at all, it’s a doing, an enactive adjustment, a worldly engagement” (p. 19).

In short, enactivist interventions occur on two plains: first, in reconceiving cognition as an enactive process (e.g., catching a ball as action-in-the-world), and second, in re-conceiving the lower-level explanations, such as the active inference in the predictive coding mechanism (also as action-in-the-world). Enactivism is allowed to do that, just as representationalism characterises the cognitive explanandum through representing, and describes the underlying explanatory posits through a representation-hungry lens. Representationalists describe the phenomena such as action, perception or imagination as representational (i.e., being ‘offline’), and posit mental representations (marked by commitment to content) in

their explanatory accounts. The merit of Shaun Gallagher's book is that it shows how enactivists can turn the tables and propose alternative explananda and explanans.

In the remainder of this review, I will propose questions and suggestions to be dealt with in future work, inspired by what Gallagher conceived. The most challenging discussion that the book provokes is one about potential applications of enactivism to the modern cognitive science research, or what kind of *pragmatic* interventions can be proposed by enactivism.

One follow-up question would be about how much scientific progress can be achieved through re-shaping the explanandum and the explanans in the enactive way. For example, Gallagher claims that the brain does not represent, but it 'adjusts' to the circumstances. He promotes a move away from internalist/intellectual vocabularies ('hypothesis', 'inference', 'representation') towards more embodied terms ('adjustment', 'attunement', and 'affordance'). One might wonder if the enactivist intervention is mainly terminological, but it seems that the author would oppose to that, since, as he states, "Such terms are not simply *substitutes* [...]; they change the way we think of the brain's engagement" (p. 21; emphasis added). However, the book does not specify how such jargon could intervene in the *bettering* of the field of modern cognitive science. More explicitly, and besides re-thinking what cognition means, how exactly do enactivist approaches to cognition practically influence the empirical and scientific methods applied in cognitive science today? Can the enactivist interpretation be tested against the other approaches?

One might think that real applications are not the purpose of enactivism; after all, enactivism has been presented as a philosophy of nature. But Gallagher is optimistic about its practical impact when he says that "even if enactivism were to be considered a philosophy of nature, it wouldn't be right to conclude that it cannot offer concrete hypotheses or raise novel scientific questions" (p. 24). An indication of what these hypotheses or scientific questions are, and a plan for their implementation, would put enactivism more firmly on the scientific map. As I see it, this is exactly a possibility that Gallagher's book opens up with regard to future research.

In what follows I will engage in a brief discussion of the difficulties and potentials of the prospective 'enactivist science' that *Enactivist Interventions* inspires.

Can enactivism serve as a scientific theory? Or could it serve as a research heuristic, guiding new methodologies? As Gallagher asks in the introduction, "Can there be an enactivist science of the mind?" (p. 1). These questions are relevant to all enactivists, and yet they do not have a straightforward answer.

For one, Gallagher provides positive proposals, or 'enactivist alternatives', to status-quo explanations, yet these explanations rest, in my view, primarily on the explanatory power not of enactivism as such, but of all of its friends. For example, the positive proposal accounting for action (Chapter 5) is one borrowed from pragmatism and one invoking dynamic systems theory. The enactive account of intentionality (Chapter 4) has been delineated by phenomenology. Perception (Chapter 6) is best explained, according to enactivists, with reference to sensorimotor theory, the free energy principle, and autopoiesis.

The clarification of free will (Chapter 7) requires fundamentals of narrative practices. The evolutionary accounts of speech and gesture (Chapter 9) are made clear by making use of the notion of affordances. And in Chapter 8, Gallagher acknowledges that the best explanation of brain function

[...] may be found in the vocabularies of Gestalt psychology, ecological psychology, dynamical systems theory, intersubjective interaction, embodied and situated cognition, and the anthropological insights found in discussions that extend from concepts of cultural niche to material engagement. (pp. 161–162)

While I support the concept of affordances as well as dynamical systems theory and all the other branches, I am left wondering what the unique contribution of the enactivist proposal is. What else does enactivism contribute that all those existing practices, such as phenomenology, pragmatism or ecological psychology together, do not already cover? Deprived of its allies, what kind of intervention does enactivism promote? Recognising that Shaun Gallagher's book is the best to date compilation of the differences that enactivism can bring to cognitive science, I ask what is a *sui generis enactivist* intervention as such.<sup>1</sup>

Other than this, there are many strands of enactivism itself that do not see eye to eye, which is why they play different roles in the modern scientific debates. As some authors point out,

[...] one can distinguish at least four quite distinct flavors of the enactivist framework: sensorimotor enactivism, which deems action as essential to perception and cognition (O'Regan and Noë, 2001); autopoietic (or classical) enactivism, which grounds cognition in autonomous organization of biological entities (Varela, 1979, 1997; Weber and Varela, 2002); participatory sense-making enactivism, which understands cognition as relying on interactions between autonomous agents (De Jaegher and Di Paolo, 2007; Di Paolo and De Jaegher, 2012; Thompson and Stapleton, 2009); and radical enactivism, which denies the role of mental representation in explanations of cognition (Hutto and Myin, 2013). (Miłkowski et al., 2019, p. 7).

In his book, Gallagher discusses all of these forms of enactivism. For example, he writes that “Enactivism aims to ground higher and more complex cognitive functions not only in sensorimotor coordination, but also in affective and autonomic aspects of the full body” (2017, p. 6). Autopoiesis is also referred to in the book; it is compared to John Dewey's concept of ‘situation’ (Chapter 3, p. 55). Radical enactive proposals of cognition are also

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<sup>1</sup> After all, the alternatives, or allies to enactivism, are not always that accepting. Apart from b-formatted representations (Goldman & Vignemont, 2009) or the representational readings of prediction coding mechanisms (Hohwy, 2013), most approaches that allegedly fit enactivism can also be read representationally (e.g., see Susanna Siegel's [2014] notion of affordances). What is more, the author separates enactivism from other E-cognition theories, such as the extended mind hypothesis, by highlighting that, unlike supporters of the latter, “enactivists reject functionalism and claim that the material specifics of bodily processes shape and contribute to the constitution of consciousness and cognition in a way that is irreducible to representations, even B-formatted representations” (pp. 6–7).

being featured (mostly throughout Chapter 5). Sensory-motor contingencies and environmental affordances are also discussed in the plea for the enactive perception. While Gallagher includes all forms of enactivism in his account, the extra step would be to indicate in what sense they are all needed for the enactivist philosophy of nature, what specific roles do they play in it, and, importantly, how they relate to one another.<sup>2</sup>

Thus, while one could be a pluralist about enactivist explanations, such a unified story of how different kinds of enactivism not only get along, but also need each other to formulate one coherent front, could be further developed. While the main idea behind enactivism on the whole, namely, that cognition is not reducible to brain processes alone and is principally embodied and embedded, suffices for Gallagher's conceptual point, the differences between these enactivist positions and their interdependencies might be of importance to those interested in the potential scientific success of the proposal. So far, the differences within the enactivist field are not noticed or addressed.

Perhaps all of the alternative explanations are part of the grand *enactivist intervention*. I imagine that Gallagher would respond by saying that this is exactly the strength of his enactivist position, which, similarly to a big umbrella, can bring together various modern areas of expertise (from biology and neuroscience to various philosophical proposals, including variations of enactivism) in a coherent way, making sense of cognition in a novel way. There is no question that as a philosophy of nature, enactivism does just that, i.e., it offers a new account of how to think of cognition. However, a philosophy that is detached from scientific merit is not what Gallagher wants out of enactivism either. As he states in the introduction, "Most enactivists call for a radical change in the way we think about the mind and brain, *with implications for methodology and for re-thinking how we do cognitive science*" (p. 5, emphasis added). Therefore, how can the enactivist intervention, being so encompassing, be put into practice? What is the explanatory strength of this broad enactivist framework? What exactly is its predictive power? One concern about bringing enactivism into sciences is that enactivism is not a theory of cognition as, among other things, it makes very few predictions. It has also been challenged with being not a good research programme (if a research program at all), since it fails to be empirically progressive, or at the very least, the rate of the progress is slow as compared to other programmes (Miłkowski, 2018). According to the critics, radical enactivism is yet to propose a prediction that would have an empirical potential; for example, the empirical consequences of radical enactivism that advocates non-representationalism are a matter of some dispute.

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<sup>2</sup> For example, it is not clear what purpose the reference to an autopoietic system (understood as an organised system that continuously realises the networks of processes in order to maintain its existence) has for sense-making activities of a complex organism that engages in social interactions. Presumably, autopoiesis is a lower-level description of autonomy of a biological organism; this autonomy then extends to social and more complex dynamical systems that engage in sense-making practices as well. Yet, social sense-making occurs at a different level of description, and, at least in principle, these two concepts, i.e., autopoiesis and sense-making, are mutually dissociable. Also, it is known that radical enactivism is not a necessary condition for being an enactivist.



With that being said, Gallagher seems to be aware of the challenges of the role of enactivism for cognitive science. For instance, he acknowledges that the holistic approach of enactivism is “difficult to operationalize”:

Neither experimental control nor the division of labor in science allows for all factors to be taken into consideration at once. Nor is it clear that there could be one single critical experiment that might decide the issue between the representationalist and the enactivist. On the one hand, enactivism makes empirical claims, for example, about the work of sensorimotor contingencies, and in this respect it resembles a research program that can suggest new experiments and new ways of interpreting data. On the other hand, its emphasis on holism presents problems for empirical investigations. (p. 21)

Even though enactivism is difficult to operationalize, it does not mean that it cannot serve as a research programme. However, Gallagher does not come up with effective solutions to the problems he poses. Rather, the focus in the book is on the “irreconcilable differences” (p. 44), such as one between weak EC proposals that dominate the field of the modern cognitive science and the radical EC proposals of enactivism. Can the latter replace the former in scientific experimentation? Or can they be integrated? We do not seem to get a straightforward answer to these questions.

One suggestion that the author does put forward is that enactivism could play a more empirical role in guiding research. How it could do this is by proposing a diachronic or compositional notion of constitution, where causality and constitution are not independent (p. 9), and which results in the fact that an “intervention that changes the causal relations in a dynamic system will also change the system as a whole” (p. 10). Gallagher’s introduction of a distinction in temporal and dynamic registers (the three timescales: elementary, integrative and narrative) captures different periods that scale from basic to complex actions and as such could be an important methodological contribution to studying cognition. Moreover, in terms of the implications that enactivism has for methodology, Gallagher proposes the use of dynamical systems theory, sensorimotor coordination, reliance on affordances, the Bayesian theory of prediction, and a reference to diachronic constitution (e.g., Kirchoff, 2015). In terms of how cognitive science should be done, the author encourages the study of the coupling and coordination between the brain, the body and the environment. It is the “dynamic causal relations [that] constitute the [cognitive] system” (p. 8). Thus, not only should enactivism appropriate the existing findings from cognitive science, but perhaps it is also able to suggest new methods and make new predictions about how to do cognitive science in a new way.

Some ideas for applying enactivism into the practice of cognitive science might be, for example, to study hand gestures not merely for the understanding of mathematical cognition (as inspired by Chapter 9), but in order to comprehend other, everyday forms of cognition as well. Another idea would be to design interventions whereby embodied, affective, and social factors will serve as temporally extended causal explanations. In order to make a significant contribution, enactivism should be able to demonstrate that mental representation is the effect and not a possible cause of the brain process, and propose its

own causal explanations while at the same time acknowledging, as Gallagher does, the difficulty with the causal-constitutive interdependency. And while this might not yet be technologically achievable just yet, the enactivist research programme should also express the need to develop methodologies for fMRI scanners of sort that can be worn on the head as the person engages in a cognitive task, which would make it possible to capture the brain-body-environment dynamics.

Saying that the brain is part of a larger embodied system (Chapter 8) is not a purely enactivist stance. Such a claim is consistent with a distributed cognition view as well as wider mechanistic interpretations of cognition. Gallagher himself does acknowledge it. As he further wonders,

Who would deny this?—an often-heard response to these enactivist claims. Very few people deny that the body and environment are playing some role in cognitive processes. That’s fine, but it also means that these factors have to enter into the explanation in the right way, and once they do they push in the direction of rethinking the nature of mind and brain. (p. 163)

That the larger embodied system should enter into scientific explanations in “the right way” is undoubted. However, what is this way? To my mind, Gallagher's work alludes to possibilities for the practical enactivist interventions within the modern cognitive science, but it could have done more to specify them, which would also be more in line with the book’s title.

To conclude, *Enactivist Interventions* is a fairly rich project that clarifies what the enactivist philosophy is and establishes its relevance for the sciences today. Shaun Gallagher’s book is a great introduction to the topic of enactivism as well as the fields related to it. It can also serve as an important stepping stone to the continuation of the work with regard to the enactivism’s philosophical potential on the one hand and its prospective scientific impact on the other. Still, it seems that a lot must be done to secure the role of enactivism in cognitive sciences. Altogether, *Enactivist interventions* is a successful starting point for enactivists as they try to make their mark in the cognitive sciences, showing how much of the enactivist thought has already been part of cognitive sciences, even though the book also shows how much is yet to achieve.

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