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Evolving Enactivism. Basic Minds Meet Content, de DANIEL D. HUTTO AND ERIK MYIN, CAMBRIDGE, MA, MIT PRESS, 2017, xxvii + 328 pp.

After the publication of their first manifesto [*Radicalizing Enactivism: Basic Minds Without Contents* (2013)], which served to set up the basis of what Hutto and Myin [H&M hereafter] consider a radical approach to the embodied cognition, *Evolving Enactivism: Basic Minds Meet Content* (2017) aims to develop the next steps of H&M's philosophical program.

Grounded on an explicit commitment to explanatory naturalism [see Chapter 1], the argument that originally motivates Radical Enactivism [aka "REC"] is the so-called "Hard Problem of Content" [pp. 41-53; see also Hutto & Myin (2013), Chapter 4]. The Hard Problem of Content, H&M claim, makes whatever theory that posits representational contents at the basis of cognition naturalistically intractable. Put bluntly, the problem is that no theory of information based on biological functions or causal covariances can explain how organisms can gather information from the environment in order to represent and manipulate it. If H&M are right, that cognition is *always and everywhere* representationally-driven is an unjustified and unexplained assumption.

Nonetheless, two caveats need to be considered here. First, as H&M warn us [p. 89], we should avoid the temptation of reading the Hard Problem of Content as an attempt to deny that any form of cognition involves contents. Instead, REC defends a more nuanced thesis: it holds that content-involving cognition is a special achievement, and therefore denies that representation and information-processing are essential features of all forms of cognition. Second, we should not see REC as a completely new, alternative version of enactivism that tries to develop its own explanatory tools. Rather, H&M conceive of REC as a theoretical project that aims to move "philosophy and science ahead by making well-targeted adjustments to familiar ways of conceiving of mind

and cognition” [p. xii]. Part of the positive program of REC is thereby built on its discussion with other embodied theories of cognition.

Chapters 3 and 4 aim to put this positive program in action. They do so by engaging on a philosophical analysis of Predictive Processing [Clark (2016)], Autopoietic-Adaptive Enactivism [Di Paolo (2005); Thompson (2007)] and Ecological Dynamics [Chemero (2009)]. The goal of this analysis is to show how other relevant approaches in embodied cognition can be “REctified”— that is, how they can be sanitized from their vestiges of representationalism and integrated into a REC framework [see also Hutto (2015)].

H&M’s first target is Predictive Processing [Chapter 3]. According to them, understanding the organisms’ anticipatory behavior in representational terms leads to serious explanatory troubles [p. 64]. Against this background, H&M’s REC take on Predictive Processing “assumes that such embodied anticipations are grounded structurally and functionally in neural and other changes wrought through an organism’s history of interactions” [p. 70] while denying that they need to be “representationally based and evidence driven” [p. 71]. In a nutshell, even though H&M acknowledge the causal relevance of embodied expectations in accounting for intelligent, adaptive behavior, they see no obvious reasons to think that such anticipations are based on neurally-implemented statistical models and Bayesian inferences.

A similar analysis is made regarding Autopoietic-Adaptive Enactivism and Ecological Dynamics [Chapter 4]. In this case, H&M target a series of potentially misleading concepts these approaches introduce. First, H&M focus on the enactivist notion of “sense-making” and analyse the different ways this notion can be understood as involving representational states. H&M offer, instead, a purely *know-how* account according to which organisms interact with their environment in non-neutral ways as a consequence of their phylogenetic and ontogenetic history. Such interactions, however, require neither evaluating needs nor generating meaning [p. 82]. Later in the chapter, H&M turn to Ecological Dynamics. According to them, the use of notions such as “meaning”, “specificity” or “information pickup” suggests “an underlying commitment to an information processing story that is certainly inconsistent with REC” [p. 86]. Therefore, Ecological Dynamics needs to be REctified as well.

It does not seem, however, a fair analysis of Ecological Dynamics. On the one hand, even though concepts such as meaning, specificity or information pickup are certainly part of the Gibsonian tradition — not only of Chemero’s Ecological Dynamics — it is highly debatable that this

entails a commitment to information-processing and representationalism. Take for instance the notion of meaning. When Gibsonians say that perception is meaningful what they mean is that agents don't perceive mere objects but the opportunities for interaction these objects afford in a specific situation [see e.g., Richardson et al. (2008), p. 168]. This perception, moreover, is meant to be direct as it depends on detecting [or picking up] informational invariants that are already available in the agent's sensory array as a consequence of the physical interaction between agent and environment.¹ Having this in mind, it is unclear where and how information-processing enters the picture and H&M offer no reasons as to why this is the case. On the other hand, it appears that just eschewing notions such as meaning or specificity hardly suffices to see how Ecological Dynamics can fit into REC. Some additional work is indeed required to show how crucial theoretical posits of Gibsonians, namely affordances or the ecological notion of information,² can be integrated into the REC framework. Unfortunately, H&M offer no clues regarding this second problem either.

Yet REC's positive program does not reduce to RECTifying other e-approaches. Indeed, it is a virtue of this book that it fully develops ideas that are crucial for REC and that were only briefly introduced in its prequel. First, this book provides a clear and extended account of what "basic cognition" means and how it connects ["REConnects"] with content-involving forms of cognition. Second, it offers a hypothesis that, pending further research and confirmation, might serve to explain the origins of contents and contentful cognition in a naturalistic way. Both ideas demand, I think, a careful analysis.

To begin with, H&M assert that "basic cognition is a matter of sensitively and selectively responding to [covariant] information, but it does not involve picking up and processing information or the formation of representational contents" [p. 92]. According to H&M *all* organisms display basic [contentless] intentional attitudes or directness towards certain aspects of their environment.

Moreover, H&M argue that it is possible to offer a naturalistic explanation of basic intentional directness by appealing to a RECTified version of Teleosemantics,³ aka "Teleosemiotics". By hypothesis, REC's Teleosemiotics offers us a way to account for basic intentional directness "in terms of active, informationally sensitive, world-involving engagements, where a creature's current tendencies toward active engagement are shaped by its ontogenetic and phylogenetic history" [p. 92]. Such Teleo-

semiotic explanation, in addition, does not require featuring contentful states or representations.

We should avoid, nonetheless, doing an oversimplistic reading of REC's account of basic cognition. First, it is important not to reduce "basic cognition" to the kind of cognitive processes that non-human animals display when dealing with the environment. Instead, as H&M assert, "plenty of human cognition is basic in the sense that it is contentless" [p. 135]. REC's notion of basic cognition appeals to its fundamental roots, that is, to a series of cognitive capabilities that are shared across the species [p. 138] and that are ontologically and phylogenetically prior to sociocultural scaffolding. All organisms are, according to H&M, capable of basic cognitive processes whilst contentful thought is a special achievement. Second, we should avoid reading basic cognition in purely behavioral terms. Rather, basic cognition "also applies to central forms of human cognition, such as perceiving, imagining, and remembering both in children and adults" [p. 90].

Yet, we might ask, if cognition is contentless in its basis, how can we explain the emergence of contentful thought? How could content-involving cognition have emerged from contentless minds? At first sight, this question seems especially tricky for RECers as they explicitly state that "content-involving cognition has special properties not found elsewhere" [p. 136]. However, if that is the case, is REC not positing an unbridgeable break between basic and representationally enhanced minds? RECers' answer to this question is negative. H&M hypothesize that it is possible to offer a gapless and fully naturalistic explanation of the emergence of contentful cognition by focusing, first, on the special characteristics of human beings' social cognition, and second, on the scaffolding influence of sociocultural practices.

REC's natural account of the origins of contentful cognition can be summarised as follows [Chapter 6; see also Hutto & Satne (2015)]. Once stated that all forms of cognition share the same basic features "in terms of their deep, nonrepresentational, interactive nature" [p. 135], H&M hypothesise that as a consequence of the natural evolution of human beings, our ancestors developed the resources to engage in simple forms of social cooperation and learning [p. 139]. H&M's major empirical bet is therefore that REC's Teleosemiotics can also account for human beings' abilities for "emulation, imitation, and regulation [...] in ways that make basic forms of social learning possible" [p. 140]. Basic social cognition, if REC is right, does not require contentful mind-reading or simulation.

Yet explaining basic social cognition in contentless terms certainly offers no account of how basic minds meet contents. H&M then introduce their second hypothesis: “Content only arises when special sorts of sociocultural norms are in place” [p. 145]. More specifically, they assert, “[t]he norms in question depend on the development, maintenance, and stabilization of practices *involving the use of public symbol systems* through which the biologically inherited cognitive capacities can be scaffolded in particular ways” [p. 145]. It is therefore when these basic forms of social cooperation get a certain grade of sophistication that they lead to the stabilization of certain sociocultural practices that involve mastery of public symbols. And it is the stabilization and engagement in these sociocultural practices that causes the emergence of content-involving cognition. Of special importance, H&M assert, are the kind of practices that involve “claim-making” as they require forming full-fledged contentful thoughts about the world that can be the object of scrutiny and correction by other members of the community [see also Hutto (2008)].

Therefore, H&M conclude, accounting for the special ability of human beings to engage in these sociocultural practices allows us to explain the natural origin of content-involving cognition without positing breaks or chasms. Yet, as H&M acknowledge, solely appealing to the explanatory resources of biology and physics does not suffice to account for this phenomenon. Rather, explaining the natural origin of content requires a more relaxed naturalistic approach — that is, “one that avails itself on the full range of scientifically respectable resources, drawing on the findings of a wide variety of sciences that include not just the hard sciences but also cognitive archaeology, anthropology, developmental psychology, and so on” [p. 124].

It is important to emphasize, however, that REC’s account of cultural scaffolding is not one of transformation but of addition. According to H&M, mastering the crucial sociocultural practices “can, quite dramatically, augment and add our cognitive capacities”, but “it does not change the fundamental nature or ultimate basis of cognition” [p. 91]. If so, even for organisms capable of contentful thought, cognition remains fundamentally dynamical, enactive and world-involving.

Chapters 7, 8 and 9 put this dual account of cognition in action. Chapter 7 focuses on perceiving. After arguing in favour of understanding perception in contentless, non-representational terms, H&M argue nonetheless that perceiving can be affected by other contentful attitudes. Take the example of the famous camouflaged Dalmatian dog optical ef-

fect. According to H&M, “interaction and history explain what, why, and how we perceive” [p. 172]. If so, for those unfamiliar with the picture, it is impossible to see anything coherent in it at first sight. However, if the agent is warned that there is a dog camouflaged in the picture her attention will focus on looking for patterns that might reveal the dog. In the end, the image of the dog will eventually pop out, and she will probably keep on seeing the dog on the successive encounters with the picture. Crucially, H&M argue, explaining this phenomenon does not require positing any internal mechanism of cognitive penetrability or supposing that perception involves inferences. Instead, a simpler explanation is to say that capacities for perceiving are attuned and augmented when the agent meets the relevant contentful thoughts.

Chapters 8 and 9 apply the same hybrid explanatory strategy to make sense of the different forms of imagining and remembering. After arguing that basic forms of remembering [procedural remembering] and imagining [sensory imagining] can be explained in terms of world-involving, contentless, perceptual re-enactments, H&M show how engaging in sociocultural practices can bring forth other, more sophisticated forms. It is argued, for instance, that autobiographical memory is a consequence of the mastery of certain discursive and narrative practices. Of course, a much more detailed analysis is needed in order to prove or disprove H&M’s dual account of cognition. However, chapters 7, 8 and 9 illustrate well how REC’s account of the relation between basic and non-basic forms of cognition can account, without gaps, for the way that engaging in sociocultural practices might scaffold basic cognitive abilities.

The book ends with an epilogue that provides some programmatic notes about what a REC’s theory of neurodynamics might look like. In H&M’s own words, “[n]eurodynamics, understood à la REC, takes the form of informationally sensitive, well-connected neural activity that plays influencing and mediating, as opposed to representational, roles in enabling organisms [...] to “get a grip on the patterns that matter for the interactions that matter” [p. 237]. By hypothesis, well-calibrated neural activity — as a consequence, once again, of the past biological and cultural history of the organisms — influences agents’ sensitivity and responsiveness to certain aspects of the environment, but it does so without representing or processing informational content. Even though H&M don’t mention it in the epilogue, REC might benefit from exploring Anderson’s Neural Reuse Theory [2014] as a natural theoretical ally for REC’s extensive, embodied neurodynamics.

A relevant room is reserved in the epilogue for discussing the ground-breaking research on “place cells”. According to H&M, that some brain cells fire when rats occupy a specific location is not evidence that these cells work as a model of the environment that rats’ brains can consult in order to guide subsequent behavior. Indeed, they argue, there is no explanatory pay-off in supposing that it is the case. It would be better “to say that the positioning system has properties that are map-like and those properties are exploited in extremely complex ways by various neural activities, enabling the organism to respond to the relevant navigational possibilities” [p. 241].

To conclude, we can say that *Evolving Enactivism* introduces some provocative hypotheses that, although still programmatic and pending future investigation, can serve to feed the relevant current debates in philosophy of mind and cognitive science. It is, therefore, an important contribution to the literature and a fruitful reading even for those who disagree with the idea that cognition, at least in some of its forms, can be explained without appealing to mental representations.

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NOTES

¹ A classic example of an ecological informational invariant is TAU [Chemero (2009), pp. 124-125; see also Lee & Reddish (1981)]. When an agent approaches an object, the object expands in her retina. A series of simple mathematical operations show that, when speed is constant, the ratio of expansion equals the time that remains until contact. According to ecological psychologists, detecting this ratio of expansion suffices to detect time-to-contact directly — i.e., without inferences. This detection, in addition, serves to directly modulate subsequent behavior.

² H&M are explicit in claiming that the kind of information that basic cognitive processes are sensitive and selective to is covariant information. According to this notion of information, a state of affairs A (e.g., the number of rings in a trunk) carries information about another state of affairs B (the age of the tree) if and only if the occurrence of both states A and B lawfully covaries. It