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EVOLVING ENACTIVISM

Basic Minds Meet Content

Evolving Enactivism

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Daniel D. Hutto and Erik Myin

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For the children of the revolution,
Natura non facit saltum

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Preface

Our entire picture of the world has to be altered even though the mass changes only by a little bit. This is a very peculiar thing about the philosophy, or the ideas, behind the laws. Even a very small effect sometimes requires profound changes in our ideas.

—Richard Feynman, *The Feynman Lectures on Physics*

Classical physics got it wrong. Mass isn't a constant, independent of speed—it increases with velocity, but only appreciably as its velocity approaches the speed of light. Does this matter? Feynman's answer is clear: "Well, yes and no. For ordinary speeds we can certainly forget it and use the simple constant mass law as a good approximation. But for high speeds we are wrong, and the higher the speed, the more wrong we are. Finally, and most interesting, philosophically we are completely wrong with the approximate law" (Feynman, Leighton, and Sands 1963, p. 1–2).

Of course, discovering we are completely wrong philosophically is what spurs on truly "profound changes in our ideas." Feynman concludes that sometimes revolutions in thought ensue from what may seem, for most practical purposes, only small or marginal changes to a theoretical framework.

We couldn't agree more. In the spirit of moving philosophy and science ahead by making well-targeted adjustments to familiar ways of conceiving of mind and cognition, this book starts where its forerunner, *Radicalizing Enactivism: Basic Minds without Content*, left off. Our previous effort was devoted to promoting the fortunes of a Radically Enactive, Embodied account of Cognition, aka REC—an account that conjectures that there could be, and very probably are, forms of cognition without content.

REC holds that some forms of cognition are content-involving in the sense that they represent the world in ways that might not obtain—that is, they represent it in ways that can be true or false, accurate or inaccurate, and so on. Yet it denies that the most fundamental forms of cognition involve contentfully representing the world or being contentfully informed about it in the sense of instantiating correctness conditions of some kind.

Making this twist to how we think about cognition is, from some angles, only a small adjustment, but it is also one that—as we aim to demonstrate in the pages ahead—if accepted, could profoundly change our thinking about thinking.

In distinguishing basic, contentless from content-involving minds, REC seeks to tell the story of mind in duplex terms—as a multi-storey story. In this REC opposes, and is flanked by, more common single-storey stories. It is flanked on the right by accounts of cognition that hold that Cognition always and everywhere Involves Content, aka unrestricted CIC. And it is flanked on the left by those theories that seek to eliminate content across the board—for example, Really Radical Enactive, Embodied accounts of cognition, or RREC.

The changes REC aims to install in the way we think about thinking require theoretical adjustments to our conception of

cognition, not mere verbal tweaks. Notably, some philosophers—such as Huw Price—substantially agree with REC in thinking that there are two types of representation at large in cognition. Thus Price recognizes that there is a fundamental difference between responding to and keeping track of covariant information and making contentful claims and judgments that can be correct or incorrect. As he makes clear,

These two notions of representation should properly be kept apart, not clumsily pushed together. It takes some effort to see that the two notions of representation might float free of one another, but I think it is an effort worth making. ... Once the distinction between these two notions of representation is on the table, it is open to us to regard the two notions as having different applications, for various theoretical purposes. (Price 2013, 37)

Although Price and REC stand terminologically apart, we are together theoretically. It is unimportant that Price uses *representation* as a common label to describe what lies at the heart of two essentially different kinds of cognitive activity. Channeling our inner Freges, we think using the same label in such cases may invite confusion within the sciences of the mind. Still, in the end we follow Shakespeare on this score: Roses by other names!

Once its implications are recognized it is easy to see how REC's proposal excites fundamental disagreements about the character of cognition and the substantive properties that different forms of it are thought to have. For example, REC firmly disagrees with the unrestricted CIC view, now extremely popular in some quarters, that brains, oculomotor systems, and scientists, in doing their primary work, are all doing the same thing—that is, they all put forward contentful hypotheses about how things stand with the world (see, e.g., Hohwy 2013; Gerrans 2014; Clark 2016).

By REC's lights, this is a mistaken view. According to REC, the basic sorts of cognition that our brains help to make possible are fundamentally interactive, dynamic, and relational. REC's signature view is that such basic forms of cognition do not involve the picking up and processing of information that is used, reused, stored, and represented in the brain. The usual form of what REC calls basic, contentless cognition is nothing short of organisms actively engaging with selective aspects of their environment in informationally sensitive, spatiotemporally extended ways. The complex and cascading neural activity that enables this engagement does not involve representing how things stand with the world, but only anticipating, influencing, and coordinating responses in a strong, silent manner.

In promoting its peculiar bifold vision of cognition, *Radicalizing Enactivism* advanced a series of arguments explicitly targeting opposing views, giving the lion's share of attention to the thesis of unrestricted CIC. That book placed a high priority on critiquing mainstream cognitive science's foundational commitment to content-based information processing accounts of mind. It did so because raising doubts about the truth of unrestricted CIC was necessary in order to make the logical space for, and to motivate taking seriously, REC's positive vision of cognition.

Consequently, it is easy to see why those working in the field, such as Sutton (2015), have criticized REC for having an unhealthy concern with providing negative conceptual critiques. Speaking of REC, in his estimation, "In the context of enactivist philosophy ... the engagements with science are too heavily weighted toward the critical mode ... [where] cognitive science is discussed primarily to correct its conceptual confusions" (p. 412).

REC's putative obsession in this regard, Sutton holds, is the reason it has failed, to date, to contribute positively to the many progressive developments in the sciences of the mind. As he sees it, by targeting the question of representational content to the exclusion of all else, RECs have systematically missed out on opportunities to positively connect with and contribute to forward-looking developments in cognitive science.

We are beyond that now. Our radicalizing manifesto was always conceived of as a prolegomenon, one that prepared the ground for a more positive account. Its arguments opened the door to positively rethinking cognition: now, we intend to step through it.

This book decidedly accentuates the positive. Still, as Johnny Mercer's famous song reminds us, accentuating the positive (promoting REC's fortunes) is just the flipside of eliminating the negative (exposing the problems with unrestricted CIC). And, of course, we don't want to mess with Mister In-Between (embracing a Conservative Enactive, Embodied account of Cognition, or CEC). Hybrid accounts tend to inherit weaknesses rather than resolving fundamental problems—so, where possible, it is best to steer clear of CEC's halfway-house proposals.

What is required in order to get our understanding of cognition on a positive footing? Presumably, the optimal account would do all the required explanatory work without adding any superfluous—and potentially distracting—ornaments.

But how does one know what to keep and what to remove? Such decisions can be tricky. Compare the choices that have to be made in designing an automobile for entry in a highly competitive race. Assessing whether to add certain features to the car—such as spoilers—to improve its chances of being first across

the finish line is a complicated business, one that requires a balanced assessment of all relevant factors.

There are always pros and cons to take stock of when deciding what to keep and what to remove in order to maximize results. Designers aiming for superior automobile aerodynamics generally seek to reduce the coefficient of drag, a vehicle's overall resistance to airflow. Spoilers generate negative lift—a downforce—and thus increase drag, but in doing so they can improve grip on the road. Knowing whether such additions are a boon or bane in any given case cannot be decided without getting into the devilish details.

This should remind us that there is no a priori reason to suppose, in keeping with the principle of Occam's razor, that slicing away elements from a theory is necessarily a negative move: slicing away does not always result in weaker or less positive explanatory products. Sometimes less is more. Sometimes the leaner car wins the race.

Deciding what a satisfactory account of cognition should include is no less delicate a business than deciding what the most efficient automotive design of a race car should be. Both require making careful, painstaking, all-things-considered assessments.

Victors write histories. But no one is in a position to write the history of cognitive science yet. So we must be careful not to prejudice outcomes. And, in this regard, it is important to be mindful that evaluating the worth of a theoretical framework is not an all-or-nothing affair. Even a framework that gets things wrong in fundamental respects can be of practical and scientific value. Such a framework might provide productive and useful insight into some phenomena, even if this insight proves

limited—even if such a framework only allows us to see what we are dealing with through a glass darkly.

There are explanations, and then there is the best explanation. The latter is, of course, the gold standard. How to get at the best explanation of cognition? Philosophy has a major part to play in that enterprise. Philosophy and science must be productive partners if we are to fashion a view of cognition that is without explanatory gaps—one that is empirically adequate and conceptually elegant.

Philosophical work is needed to move our understanding of cognition forward, but deep-seated philosophical convictions can also hinder progress. They can distract and detract. We must beware of unchecked and unsupported philosophical assumptions. As we reveal many times in this book, we must be especially on guard against a priori intuitions that are products of “musty” thinking—intuitions about what cognition “must” be like. This is especially so when these intuitions masquerade as legitimate naturalistic demands on theorizing.

Confusion on this score is the greatest single obstacle to providing sophisticated analyses and open-minded investigations into how best to understand cognition, looking at it both high and low. Such work, done properly, requires adopting—as best we can—a perspective from which all things are considered, and attending to, rather than shying away from, matters of deep theory.

The six chapters of part I aim to clarify REC’s duplex account of cognition and to motivate its acceptance.

Chapter 1 sets the scene. It provides a sliding-scale analysis of the degree to which E-positions deviate from the traditional assumptions of cognitivism, revealing why and in what sense REC is radical. It also sets out the basic rules of naturalistic play,

reminding the reader why attempts to dismiss REC by appeal to a priori intuitions about what is essential to cognition violate the methodological scruples of naturalism.

Chapter 2 introduces REC's Equal Partner Principle, according to which invoking neural, bodily, and environmental factors all make equally important contributions when it comes to explaining cognitive activity. In line with that principle, it is made clear how REC can accept that cognitive capacities depend on structural changes that occur inside organisms and their brains, without understanding such changes in information processing and representationalist terms.

This chapter also sees the return of the Hard Problem of Content, aka the HPC, which made its debut in *Radicalizing Enactivism*. The HPC is an intractable theoretical puzzle for those explanatory naturalists who hold that information can be distilled from the world through environmental interactions, where such distillation contentfully informs concrete representational vehicles. It is revealed how the need to deal with the HPC can be avoided by adopting REC's revolutionary take on basic cognition, and why going this way has advantages over other possible ways of handling the HPC.

Chapter 3 explicates REC's modus operandi of attempting to incorporate the best resources from other existing accounts of cognition, representationalist and antirepresentationalist alike, to augment its positive explanatory framework. This incorporation is made possible by REctification—a process through which the target accounts of cognition are radicalized by analysis and argument, rendering them compatible with REC. The REctification of the Predictive Processing account of Cognition, or PPC, is offered as a shining example of how this procedure works in action. We show how the central ideas of PPC can be given a

REC rendering by abandoning standard cognitivist interpretations, and why this crucial adjustment to PPC is theoretically well-motivated and justified.

Chapter 4 provides further examples of RECTification, this time with the aim of showing how REC can fruitfully ally with and strengthen two prominent nonrepresentational E-approaches to cognition—Autopoietic-Adaptive Enactivism and Ecological Dynamics. These examples of RECTification reveal REC's capacity to marshal and combine powerful resources for explaining basic minds in naturalistic terms. The chapter concludes by discussing the need to show how basic, contentless minds can connect with contentful minds. Doing so is necessary in light of REC's commitment to two ideas: that some cognition is content-involving and that organisms become capable of content-involving cognition by mastering special socio-cultural practices.

Chapter 5 explains how it is possible to make sense of REC's proposal that basic minds are contentless while nonetheless holding on to the claim that such minds exhibit a kind of basic intentionality. It situates REC's notion of Ur-intentionality within the larger history of attempts to explicate the notion of intentionality simpliciter, showing that there is conceptual space for a nonrepresentational understanding of intentionality.

The second part of the chapter provides a fresh analysis of how and why this most basic kind of intentionality can be best accounted for in naturalistic terms by means of a RECTified teleosemantics—one stripped of problematic semantic ambitions and put to new and different theoretical use, namely, that of explicating the most basic, nonsemantic forms of world-involving cognition.

Chapter 6 sets out REC's core commitments concerning content-involving cognition and lays out the broad outlines of its proposed explanation for the Natural Origins of Content, or NOC. The chapter also defuses critics' concerns about REC's NOC program in order to establish that it is a tenable way of explaining the natural emergence of content and where content can be found in nature. This requires showing that REC's NOC proposal is neither defeated by the HPC, nor entails evolutionary discontinuity. The chapter concludes by giving a basic sketch of how the NOC program might be pursued, paving the way for further research.

Having cleared the theoretical air, the four chapters in part II pick up the gauntlet thrown down by REC's skeptics and critics and show the explanatory advantages of adopting its duplex vision of cognition. REC puts its positive story into action, showing how its unique resources provide powerful means for understanding perceiving, imagining, and remembering without introducing any scientific mysteries into the mix.

Chapter 7 opens with a reminder that the only properly naturalistic way of debating about the nature of cognition is to stay firmly focused on what is required to explain the relevant phenomena. The chapter then looks again at PPC, in a bid to refute claims that, as matter of fact, tenable versions of PPC need to make indispensable appeal to mental representations. It attempts to defuse arguments that the explanatory punch of PPC requires characterizing perceptual processes and products in representational terms. Such work is necessary, for if that should prove true then REC's attempted appropriation of the main explanatory apparatus of PPC would be thwarted. The final part of the chapter shows how REC, when understood properly, can adequately explain how intramodal and intermodal forms of perceiving can

interface and integrate with content-involving modes of perceiving without representational contents forming part of the basis for such explanations.

Chapter 8 begins by arguing that there is no naturalistically respectable way to rule out the possibility of contentless imaginings on purely analytic or conceptual grounds. Hence there is no a priori barrier to understanding contentless, purely sensory-based imaginings in terms of perceptual reenactments involving simulations that are wholly interactive and non-representational in character. Indeed, it is argued that when it comes to understanding basic sensory imaginings and how they manage to do their cognitive work, the focus needs to be on how such imaginings acquire their anticipatory and interactional profiles through embodied engagements with worldly offerings.

The chapter also defends the view that the specific content and correctness conditions of nonbasic, hybrid imaginative attitudes only arise from a combination of basic, purely contentless sensory-based imaginings and the surrounding contentful attitudes of imaginers. Such hybrid states of mind have the right properties to explain the many and varied kinds of cognitive work that imaginings do for us in our daily lives.

Chapter 9 adopts a similar strategy and explores how REC's duplex account of cognition yields special advantages for understanding the many and varied forms of memory—enactive, embodied procedural remembering; pure episodic remembering; and narratively based autobiographical remembering. The chapter argues, on empirical and theoretical grounds, that autobiographical memory is not only content-involving but is a perfect example of a kind of cognition that depends on the mastery and exercise of narrative capacities. In defending this strong claim

about autobiographical memory, drawing on REC's understanding of contentless imaginings, it is shown how it is possible to make sense of pure episodic forms of remembering that operate before and below the capacity to autobiographically narrate the past. The chapter concludes by considering general arguments, motivated by empirical findings, that compel a rethinking of purely CIC representationalist and content-based views of the primary function of remembering.

The epilogue takes a last look at the possibility that REC may be leaving out something explanatorily important because it says nothing about information that many believe is acquired, processed, pooled together, mapped and remapped, and generally made use of by the brain. It is argued, focusing on a prominent case in point, that even the groundbreaking research on the positioning systems in rat brains can be accommodated within the REC framework—which assumes the brain is informationally sensitive but does not process informational content—without explanatory loss and with the explanatory gain of not having to deal with the HPC. It is then shown how the view about neurodynamics that REC recommends is wholly compatible with REC's position that cognitive phenomena are fundamentally extensive and world-involving, such that it is possible for some minds, at least, to loop into society and culture and vice versa.

In all, our efforts in the chapters of this book illustrate the positive advantages of adopting REC's duplex vision of mind and the many ways in which enactivism “keeps evolving by incorporating new empirical studies and theoretical perspectives” (Colombetti 2014, p. xiv).

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Abbreviations

| | |
|-----------|--|
| AAE | Autopoietic-Adaptive Enactivism |
| CIC | Content Involving account of Cognition |
| CEC | Conservative Enactive, Embodied account of Cognition |
| HPC | Hard Problem of Content |
| MET | Material Engagement Theory |
| NOC | Natural Origins of Content |
| PPC | Predictive Processing account of Cognition |
| REB | Radically Enactive, Embodied account of Behavior |
| REC | Radical Enactive, Embodied account of Cognition |
| RREC | Really Radical Enactive, Embodied account of Cognition |
| SIT | Social Interaction Theory of Autobiographical Memory |
| Ultra CEC | Ultra Conservative Enactive, Embodied account of Cognition |

1 Revolution in Mind?

You say you want a revolution
Well, you know
We all want to change the world
—The Beatles, “Revolution”

E Is the Word

E is the letter, if not the word, in today’s sciences of the mind. E-approaches to the mind—those that focus on embodied, enactive, extended, embedded, and ecological aspects of mind—are now a staple feature of the cognitive science landscape.

A strong motivation that has spurred on the E-movement has been the need to develop theories that can overcome well-known problems encountered when attempting to understand and model the fluid and plastic nature of cognition. These limitations are especially conspicuous when trying to explain the intelligence of fast-paced, spontaneous, but skilled performance in terms of classic reasoning processes involving the manipulation of in-the-head, amodal symbols and propositions (Sutton et al. 2011). Even assuming that such forms of reasoning may be tacit, they are still deemed too slow, rigid, and abstract to

properly account for the dynamically updated character of real-time intelligent activity. Researchers in the field have turned to E-approaches for a better characterization of the contextualized sensitivity and responsiveness of such intelligence, thinking of it in terms of embodied, enactive know-how about situations that does not involve positing “a clunky set of internalized propositions” (Sutton and McIlwain 2015, 100; see also Dreyfus 2014).

Another major catalyst for E-theorizing has been the need to accommodate new empirical findings that reveal that a great deal of cognition is—in some centrally important respects—connected, and sensitive, to facts of embodiment. Experimental findings of this sort—those that Goldman (2012) makes much of—include the use of circuits associated with motor control functions in higher-level language comprehension tasks (Pulvermuller 2005); the reuse of motor control circuits for memory (Casasanto and Dijkstra 2010); the reuse of circuits that mediate spatial cognition for a variety of higher-order cognitive tasks (e.g., the use of spatial cognition for numerical cognition) (Hubbard et al. 2005; Andres, Seron, and Olivier 2007); mirroring phenomena, including not only motor mirroring but also the mirroring of emotions and sensations (Rizzolatti et al. 1996; Rizzolatti and Sinigaglia 2010; Keyzers, Kaas, and Gazzola 2010); and sensitivity to perceiver’s own bodily states when estimating properties of the distal environment (Proffitt 2008).

As part of the larger E-turn, many productive scientific research programs are trying to understand the significance of E-factors for the full range of cognitive phenomena, with new proposals about perceiving, imagining, remembering, decision making, reasoning, and language appearing apace (Wilson and Foglia 2016).

Some hold that these developments mark the arrival of a new paradigm for thinking about mind and cognition, one radically different from cognitive science as we know it.¹ Others maintain that accommodating E-factors, while important, requires only very modest tweaking or, at most, some crucial but still limited revisions to the business-as-usual cognitive science framework. By conservative lights, radicals vastly exaggerate the theoretical significance of the so-called E-turn. Moderates hold that whatever changes may be required they will fall short of reconceiving cognition.

Old School Cognitivism

Before assessing the scale and magnitude of the theoretical changes that may need to be wrought in order to properly accommodate E-findings, it is important to be clear about which traditional assumptions are potentially at stake. That task entails getting clear about the central tenets of cognitivism, which has enjoyed the status of the default approach for conceiving of cognition in the sciences of the mind since the 1950s.

Contemporary cognitivism takes it to be axiomatic that “the mind represents and computes” (Branquinho 2001, xv). In doing so it endorses an intellectualist vision of minds that made its debut in early modern times, making representationalism and computationalism the two main pillars of cognitivism.²

These twin pillars of cognitivism rest on a more foundational substratum. Cognitivism is methodologically committed to providing explanations of a mechanistic variety. According to the early modern take on mechanistic explanation, explaining a phenomenon always involves two steps. First, it is necessary to identify, through analysis, component parts and their principles

of interaction. Second, it is necessary to show, through synthesis, how the interactions between such parts generate some phenomena (Horst 2007, 16–17).

In a similar vein, today's mechanists also emphasize the need to discover the parts, operations, and organization of the mechanisms that underlie and causally generate phenomena of interest (Bechtel 2008; Bechtel and Richardson [1993] 2010; Craver 2007; Kaplan 2015). In the sciences of the mind this general idea is embraced in a specific version, namely the assumption that cognitive mechanisms are distinct from, and produce, intelligent behavior. This assumption "was among the defining features of the cognitive revolution" (Aizawa 2015, 759).

Today's cognitivism tends to make a further, more specific assumption about the location of the mechanisms responsible for intelligent activity—namely that cognitive processes that give rise to such activity take the form of brain-based computations over internal mental contents. A familiar line of thought is that if one allows that "cognition is a cause of behavior, one can better appreciate why it might be something realized in the brain alone" (Aizawa 2015, 756).

To assume that representational-computational mechanisms are neural is to endorse an I-conception of mind that is methodologically and metaphysically committed to Individualism, Intellectualism, and Internalism. From such a perspective, cognition only goes on in the intellectual interior of individuals.

Degrees of Radicality

With these reminders about the core features of the dominant cognitivist framework in place, it is possible to gauge to what

extent and precisely how existing E-theories are more or less conservative or revolutionary with respect to it.

Some E-theorists see no need for any revisions to standard cognitivism—neither to the two pillars of cognitivism nor to the I-conception of mind. In attempting to make good on this idea they argue that cognition can be, and often is, grounded in embodied representations—representations whose content is about the body and is carried by vehicles in embodied formats (Goldman and de Vignemont 2009; Gallese and Sinigaglia 2011; Alsmith and de Vignemont 2012; Goldman 2012, 2014; Gallese 2014).

E-theories of this kind offer an Ultra Conservative Embodied account of Cognition, or Ultra CEC. Ultra CECers attempt to accommodate the wealth of empirical findings about the contribution E-factors make to cognition while still holding on to the idea that cognition is wholly representational-cum-computational and grounded in entirely brain-based mechanisms.

They are persuaded by a wealth of evidence showing that, in Goldman's words (2012, 72), "embodiment would seem to be realized to a significant degree, a degree quite unanticipated by cognitive science of two or three decades ago."

By calling on the construct of embodied representations, Ultra CEC theorists claim to have the resources needed to explain how and why embodied cognition is so pervasive. They attempt to do so by appealing to the fact that the brain gets a great deal of its cognitive work done by reusing or redeploying embodied representations for many and varied cognitive tasks.

In essence, the Ultra CEC assumption is that "cognition is embodied in the sense that the mechanisms for perception and action are the same as the mechanisms for concept manipulation and reasoning" (Aizawa 2015, 758). If embodied

representations with the aforementioned properties exist, then it is potentially possible to explain how and why cognition sensitive to embodied factors plays such a prevalent role in so many cognitive domains. Through this means, Ultra CECers hold that the real work of cognition is surprisingly often E-ish while still only a matter of the manipulation of representations in the brain. For their approach to work, Ultra CECers must make good on the idea that some neural representations have rather special E-ish contents and formats.

Other E-theorists are more daring in moving away from old school cognitivist commitments. They hold that nonneural, temporally extended embodied engagements can feature in, and perhaps even constitute, cognition. A familiar version of such an approach, promoted by advocates of the extended mind hypothesis, is that the vehicles of cognition might sometimes extend across the nonneural body and environment and bear some of the cognitive load in enabling the completion of specific tasks (Clark and Chalmers 1998; Clark 2008b; Rowlands 2009; Wheeler 2010).

Extended mind theorists heavily stress the transformative potential of external tools, which range from spoken to written words and other symbols, computers, and actual or possible bodily extensions such as brain implants. The production of abstract art is a case in point (as discussed in Clark 2003; see also Myin and Veldeman 2011). Research by van Leeuwen, Verstijnen, and Hekkert (1999) on the role of sketchpads in the production of certain forms of abstract art reveals that the creation of multiply interpretable elements in drawing, typical in such art, is essentially dependent on the use of external sketches.

This is due to limitations of our biologically unsupported imaginative capacities. Producing certain kinds of abstract art

requires dealing with multiple and competing interpretations of images simultaneously. But it is apparently not possible to hold such images in the mind at once (Chambers and Reisberg 1985). Without supplement, our natural mental equipment is simply not up to that task by itself. The production of art of the relevant kind depends on external support: making use of sketched images is necessary to guide the design process in a reliable way. The use of sketchpads makes certain forms of artistic creation possible—artforms that would not have existed otherwise.

On the standard extended functionalist interpretation, the environmental contributions that make such artistic production possible are best understood in terms of extended vehicles of cognition—extended vehicles that play specific computational roles as part of larger information processing mechanisms (Clark 1997, 2008a, 2008b).

Importantly, a guiding assumption of extended mind theorists is that in “limiting embodied cognition to some sort of information processing ... it is not that literally any causal contributor to performance realizes cognition ... [but] only causally relevant informational contributions to performance realize cognition” (Aizawa 2015, 769). Proponents of the extended functionalist view of mind thus retain the idea that cognition consists in representationally informed computational processes, but unlike advocates of Ultra CEC, such E-theorists do not assume such processes are always wholly neural and brainbound.

Sensorimotor enactivism, as canonically formulated in Noë 2004, goes further still in breaking faith with traditional cognitivist thinking.³ It holds that central forms of cognition are constituted by and supervene on wide-reaching, temporally extended, interactive embodied engagements with the world.

Yet it steers clear of any form of computational functionalism. Committed to the idea that idiosyncratic features of our embodiment matter to the character of our cognition, it abandons a central tenet of functionalism—the thesis of multiple realizability—in holding that “to perceive like us ... you must have a body like ours” (Noë 2004, 25).⁴

Whereas extended functionalism allows that internal models sometimes underpin perception, sensorimotor enactivism rejects the idea that we form rich and detailed inner representations when perceiving. Sensorimotor enactivism’s big idea is that perceiving “isn’t something that happens in us, it is something we do” (Noë 2004, 216; see also O’Regan and Noë 2001). Although it deems activity in neural substrates to be necessary for perceiving or having perceptual experience, perceiving is nevertheless understood to be “realized in the active life of the skilful animal” (Noë 2004, 227; see also Silverman 2013). Even so, as originally formulated sensorimotor enactivism remains conservative in clinging to the idea that “for perceptual sensation to constitute experience—that is for it to have genuine representational content—the perceiver must possess and make use of sensorimotor knowledge” (Noë 2004, 17).

Despite their substantial challenges to the tradition, both the extended mind thesis, construed under the auspices of functionalism, and sensorimotor enactivism are Conservative Enactive, Embodied accounts of Cognition, or CEC. Extended functionalism is the more conservative of the two positions when it rests on the two pillars of cognitivism, even though it relinquishes a complete commitment to the I-conception of mind. Sensorimotor enactivism goes much further, not only in giving up on the I-conception more thoroughly than extended mind theorists, but also in questioning computational functionalism. Still, it

too—at least in Noë's (2004) rendering—maintains representationalism about the character of even the most basic kinds of cognition, such as perception.

The most radical view—the one that makes the cleanest break with the cognitivist tradition—is a Radically Enactive, Embodied account of Cognition, or REC. REC theories ask us to rethink—root and branch—old school conceptions of cognition, demanding that we revise our views of the mind's core work and how it gets done. Like sensorimotor enactivism, REC theories understand cognition as something that organisms do. Cognition is a kind of embodied activity that is out in the open, not a behind-the-scenes driver of what would otherwise be mere movement. REC theories conceive of the basis of cognition in terms of extensive and dynamically loopy processes that are responsive to information in the form of environmental variables spanning multiple temporal and spatial scales.

Crucially, REC theories construe cognition as unfolding, world-relating processes rather than as a series of content-bearing states and their interactions. Cognitive processes unlike states have spatial reach and unfold over time. Importantly, unlike a state or event, a process is “something which goes on through time and can change as it does so” (Steward 2016, 76).⁵

Our version of REC is part of a wider movement, one inspired by scientific developments in robotics, dynamical systems theory and ecological psychology and which finds philosophical support from the phenomenological, American naturalist, and Buddhist traditions of thought. In recent years this movement established itself most prominently through the seminal work of Varela, Thompson and Rosch (1991). REC is thus part of a larger family of approaches to cognition encompassing any and all which maintain that (1) cognition is a kind of situated enactive,

embodied activity, and that (2) enactive, embodied activity does not always and everywhere involve thinking about the world in contentful ways.

Embracing these two tenets is the minimal commitment—the lowest common denominator—of any REC-style view. These twin tenets are the theoretical core—the philosophical nucleus—shared by a wider set of radically embodied, enactive and ecological theories, each of which is distinguished by the specific explanatory resources that they bring to the table (Thompson 2007; Di Paolo 2009; Chemero 2009; Froese and Di Paolo 2011, Hutto and Myin 2013, Bruineberg and Rietveld 2014).

With and without Content

Supporters of REC disagree with CECers on a pivotal issue about the nature of basic minds. RECers deny that all forms of cognition, and in particular its root forms, are content-involving. It rejects the Content Involving account of Cognition, or CIC, in its unrestricted form.

What is the central notion of content that radically minded RECers deny is a feature of basic minds? It is any notion of content that assumes the existence of some kind of specified correctness condition. To be in a contentful state of mind is to take (“represent,” “claim,” “say,” “assert”) things to be a certain way such that they might not be so. This generic idea of content is the notion that analytic philosophers and classical cognitive scientists commit to when they suppose that cognizers “represent things as being thus and so—where, for all that, things need not be that way” (Travis 2004, 58).

It is usual for analytic philosophers of mind to assume that content so understood equates with propositional content.

Brogaard (2014), for example, tells us that “perceptual experience is accurate or inaccurate. If it’s accurate, it’s accurate in virtue of some proposition *p* being true. If it’s inaccurate, it’s inaccurate in virtue of some proposition *p* being false. But that *proposition p just is the content of perceptual experience*” (p. 2, emphasis added).

Brogaard’s comments give voice to the pervasive tendency among analytic philosophers to understand content in essentially propositional terms. Thus in the passage above she equates accuracy conditions with truth conditions. Yet the notion of content is elastic enough to allow that the relevant correctness conditions might be understood in terms other than truth: say, in terms of accuracy, veridicality, or some other kind of satisfaction condition where these are taken to differ from truth conditions (see, e.g., Crane 2009; Burge 2010).

The notion of content that REC denies is a feature of basic minds is therefore somewhat elastic—but it is not so elastic as to include every conception of content that abounds in the philosophical literature.

For example, it does not automatically include what is sometimes called phenomenal content. It cannot be taken for granted that to enjoy an experience with a certain phenomenal character is to be in a state of mind with representational content. A great deal of argument would be needed in order to establish such a reduction or identity.

Nor, in a similar vein, can it be simply assumed that contentful states of mind are always in play whenever an agent stands in a cognitive relation to, or has attitudes directed at, specific objects or states of affairs. Here too, some philosophers—especially those inspired by the phenomenological tradition—speak of intentional content when describing such states of

mind. But it does not follow that the notion of intentional content they invoke reduces to representational content possessing any kind of correctness conditions. For instance, in speaking of intentional content Dreyfus (2002, 414) draws a deliberate contrast between states of mind that are merely world-involving and those that possess satisfaction conditions, thus maintaining that “there are inner states of the active body that have intentional content but are not representational.”

The foregoing observations reveal that some philosophers use the word *content* so liberally that it just picks out the object of experience, perception, or thought, whereas others use the notion in a restrictive sense that entails the existence of some kind of satisfaction conditions. These two uses must not be conflated. Certainly, lax and liberal use of the notion of content should not mask the fact that a great deal of argument would be needed to establish that all acts of world-engaging experience, perceiving, or thinking involve contents with conditions of satisfaction.

REC assumes that some cognitive attitudes are contentful in the restrictive sense of possessing correctness conditions. REC holds, for example, that we sometimes think thoughts that refer to things beyond themselves—thoughts that can be true or false. Nevertheless, it denies that having thoughts with content—so understood—is fundamental to all cognition. By REC’s lights, acquiring the capacity for cognition that involves content is a special achievement. Creatures capable of contentful cognition, in the REC view, will have had to master very special kinds of scaffolded practices—practices involving public norms for the use of symbols, where such norms depend for their existence on a range of customs and institutions (see Hutto and Satne 2015).

REC thereby distinguishes basic from nonbasic minds by appeal to the requirement that the latter are content-involving. It takes the former, elementary kinds of mind to be phylogenetically and ontogenetically fundamental. Importantly, REC holds it is possible to go quite a long way, cognitively speaking, without involving content in the specified sense. For example, not all kinds of culturally shaped acts of cognition are content-involving. Being influenced in what one perceives to be a threat and the way one does so can be culturally shaped without always and necessarily involving content.

Crucially, REC holds that there are interesting varieties of basic perceiving, imagining, and remembering—which can come in the form of embodied activity or reenactments—that involve no content (Hutto 2014, 2015b, in press). Hence, importantly, being basic minded in the REC sense does not entail that one is operating with only a low-grade form of cognition.

Naturalist Rules of Engagement

Is it coherent to hold that there could be minds that lack content? Is a nonrepresentational theory of cognition possible? Is the notion even conceptually coherent? REC requires conceiving of basic cognition in noncontentful terms. Some believe that is not simply a bad idea but an impossible one: accordingly, the revolution in thinking that REC seeks to bring about isn't just a nonstarter or something to be dismissed on empirical grounds, it is literally unimaginable and thus can be ruled out a priori as inherently conceptually confused.

This will be the reaction of those who take it that bearing mental content is the true mark of the cognitive. Anyone who accepts this condition must deny that the sciences of the mind

could ever go radical. There is an apparently serious problem for REC if it is assumed that the existence of mental states that bear content defines and demarcates the subject matter of cognitive science (Shapiro 2014a, 2014b). Those persuaded by this criterion will find it simply unthinkable that cognitive science could ever abandon the idea that basic states of mind are content-involving.

This unrestricted CIC assumption about the mark of the cognitive is widespread and easy to find in the literature. The following quotations capture its core commitments and highlight its perceived importance:

Admittedly, delimiting the scope of the “cognitive” is not an easy matter, but ... it seems adequate to specify that cognitive states, structures, and capacities are mental entities with representational content. (Khalidi 2007 93)

Without representation cognitive science is utterly bereft of tools for explaining natural intelligence. We would go further: without representation there is no cognitive (as distinct from behavioral, biological, or just plain physical) science in the first place. (O’Brien and Opie 2009, 54)

Drawing on this unrestricted CIC assumption about the nature of cognition, it has been claimed that REC cannot possibly provide an account of basic cognition but only, at most, an account of contentless forms of complex behavior. Accordingly, going radical about basic cognition is simply not a live option and any proposed radical rethinking of cognition can be known, in advance, to be not false but incoherent. By this logic, E-accounts are only candidate theories of cognition if they adhere to CEC. As Shapiro (2014a, 219) states, because REC violates this condition it is not clear how it “could be a science of the mind rather than, say, behaviour.”

Thus, if the REC revolution were to succeed, cognitive science would have to trade in its sole concern with its traditional subject matter—cognition—and take up an interest in behavior as well. Surely, as Aizawa (2014, 19) says, “That would be a real revolution.”

By these lights REC is conceptually debarred from being a genuine rival to an unrestricted CIC account of cognition. If cognition is defined as always and everywhere involving content then, as a matter of logical necessity, the two frameworks must be interested in different explananda—different explanatory targets—and employ different explanantia—different kinds of explanations. If this were so then REC’s talk of basic cognition would be a misnomer. By this reasoning, it would be simply impossible for REC to qualify as an account of basic cognition. As such REC proposals about basic cognition would necessarily reduce to REB—a Radically Enactive, Embodied account of Behavior.

Anyone who holds that conceiving of cognition in the absence of content is simply impossible treats unrestricted CIC as an already-known, conceptually based analytic truth.

Is ruling out the very possibility of REC in this analytic, a priori manner justified? Not for naturalists. An analytic defense of unrestricted CIC is not open to anyone who adopts the kind of naturalistic approach to philosophy that cognitive science demands. Attempts to defeat REC by appeal to an unrestricted CIC mark of the cognitive—namely by appeal to that assumption as an axiomatic first principle—violate naturalism by committing a serious methodological foul.

Defending unrestricted CIC by invoking unrestricted CIC as a demarcation criterion that articulates the “mark of the cognitive”—one that defines the subject matter of cognitive

science—is blatantly circular. Whether such a move is viciously or virtuously circular is beside the point for, as Ramsey (2014, 4) observes, it is, in any case, “not supported by a proper scientific outlook.” Worse still, as Ramsey emphasizes, this move is bound to lead to bad consequences, such as (1) unnecessarily restricting our theorizing about cognition, (2) undermining the empirical nature of the representational theory of mind, and (3) encouraging substantial weakening of the notion of representation.

To illustrate how this demarcation gambit leads to bad outcomes, consider how Noë’s evolving views on perception would have to be handled by anyone endorsing the unrestricted CIC demarcation criterion.

Building on O’Regan and Noë 2001, Noë 2004 offered a sensorimotor theory of perceiving, one that centrally incorporated many enactivist insights. As noted earlier, Noë’s 2004 theory is clearly CEC. This is because it conservatively retains commitment to the idea that perceiving is content-involving in a fully representationalist sense.⁶ Importantly, those who claim that REC must reduce to REB do not see Noë’s CEC approach as falling afoul of a similar fate. Why not? Any E-theory of a CEC kind, such theorists hold, is safe to the extent that it endorses unrestricted CIC.⁷ Thus Noë’s 2004 theory—which holds that perceiving is contentful—qualifies as a bona fide theory of cognition for anyone who plays the unrestricted CIC demarcation card.

There is a problem, though. In subsequent writings, Noë (2009, 2012) has apparently abandoned his earlier CIC take on perception. For example, Noë (2009, 99) advances the view that “to perceive something is not to consume it, just as it isn’t a matter of constructing, within our brains or minds, a model or picture or representation of the world without. There is no need. The world is right there and it suffices.”

Noë (2012) too shows some clear signs of endorsing REC over CEC (or for the sake of argument, let's just assume that this is so). The question is: Would such a change in thinking entail that Noë's new theory of perception no longer concerns cognition? Does it automatically thereby convert into a theory of behavior?

Surely not. Perceiving is a paradigmatic cognitive phenomenon: to think it becomes non-cognitive and converts into mere behavior when understood by REC's lights as lacking content is absurd. By a similar token, shifting the nature of the explanans from CEC to REC footing doesn't change the target explanandum—what a theory is about and seeks to explain. Even if by going radical the theory should turn out to be empirically false, what would be on offer would still be a failed theory of perception and hence cognition. The only change would be that non-CIC tools would be offered for understanding the same cognitive phenomenon that is of interest to REC's rivals. The moral is that the extensional target of theorizing—what we are interested in understanding as opposed to how we understand it—is not determined by the nature of proposed explanantia.

Another analytic demarcation move is to try to secure the truth of unrestricted CIC in advance of empirical developments by designating that whatever is actually discovered to play the relevant role in explaining intelligent activity must be, by definition, a "contentful representation." Used in this way the label "contentful representation" is guaranteed to pick out anything that, in the end, best explains cognition.⁸ The problem with trying to secure unrestricted CIC's truth in this way is that it results in "an utterly vacuous outlook" (Ramsey 2014, 10). Unless the properties content has and the precise role such properties play

in explaining behavior are specified, representational theories of mind are rendered empirically empty. Under such conditions, unrestricted CIC theorizing about the mind reduces to a mere wait-and-see game of bestowing the label “representation” on the properties that actually turn out to characterize cognition.

In sum, these considerations illustrate how in various ways adopting an a priori, analytic demarcation stratagem leads to all of the bad consequences identified by Ramsey (2014). Ultimately, such analytic moves break faith with a properly naturalistic methodology. Naturalist theory building is meant to be substantive and speculative: it takes risks and goes beyond pure forms of conceptual analysis. The test of the tenability of a proposal or hypothesis about the nature of cognition is that it accommodates existing data better than rivals. This requires making comparisons with competing theories in order to assess a theory’s empirical adequacy and global fit with surrounding theories so as to generate hypotheses and test which theory provides the best explanation (see, e.g., Carruthers 2011, xiii; Sterelny 2012, xi).

The bottom line, as concerns basic cognition, is that a good naturalist cannot both demonstrate the superiority of unrestricted CIC proposals empirically and, at the same time, rule REC out analytically. They must abide by Ramsey’s Rule, which legislates that in this naturalistic contest, “You can’t treat representational posits as both interesting explanatory constructs *and* as a necessary condition for a legitimate account of the phenomena you are trying to explain” (Ramsey 2014, 8).

It should now be clear that if REC could be ruled out from the philosophical armchair in this way then any such perceived victory for unrestricted CIC traditionalists would be scientifically hollow. To defeat REC in such a dismissive manner would

be to sacrifice a win that demonstrates unrestricted CIC's substantive, superior explanatory power for a win by analytic stipulation. The only naturalistically respectable way to defeat REC is to give it its day in empirical court, determining, in the end, whether it or unrestricted CIC offers the best account of various cognitive phenomena, all things considered. This requires active investigations conducted in an open-minded way. We will come to that.

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