

## Converging enactivisms: radical enactivism meets linguistic bodies

this is a post-print of a paper accepted for publication at *Adaptive Behavior*. Please quote the published version: <https://doi.org/10.1177/10597123211020782>

Giovanni Rolla (UFBA)

Jeferson Huffermann (UFRGS)

### Abstract

We advance a critical examination of two recent branches of the enactivist research program, namely, *Radically Enactive Cognition* (Hutto & Myin, 2013, 2017) and *Linguistic Bodies* (Di Paolo et al. 2018). We argue that, although these approaches may look like diverging views within the wider enactivist program, when appraised in a conciliatory spirit, they can be interpreted as developing converging ideas. We examine how the notion of know-how figures in them in order to show an important point of convergence, namely, that the normativity of human cognitive capacities rests on *shared know-how*. Radical enactivism emphasizes the diachronic dimension of shared know-how, and linguistic bodies emphasizes the synchronic one. Given that know-how is a normative notion, it is subject to success conditions. We then argue it implies *basic content*, which is the content of the successful ongoing interactions between agent(s) and environment. Basic content does not imply accuracy conditions and representational content, so it evades Hutto & Myin's (2013) Hard Problem of Content. Moreover, this account is amenable to the central claim by Di Paolo et al. (2018) that the participatory sense-making relations at play in linguistic exchanges are explained in continuity with explanations of biological organization and sensorimotor engagements.

**Keywords:** radically enactive cognition; linguistic bodies; shared know-how; unintentionality; participatory sense-making; basic content.

### 1. Introduction

One can depict enactivism in very broad strokes as a research program that takes action to be constitutive (and not merely causally relevant) to cognition. Such a description, however, misses the distinctive features of the rich varieties of enactivism that have sparked since Varela et al. (1991/2016) foundational work (for a discussion, see Ward et al., 2017). Two recent and highly ambitious developments of the core enactivist ideas are exemplified in Daniel Hutto and Erik Myin's books on *Radically Enactive Cognition*, or simply REC (Hutto & Myin, 2013,

2017), and in Ezequiel Di Paolo, Elena Cuffari and Hanne de Jaegher's book *Linguistic Bodies*, or simply LB (Di Paolo et al., 2018).<sup>1</sup>

Both REC and LB are genuine attempts to enhance the enactivist program, but they do so in very different ways. REC initially directs new criticisms to representationalism (the so-called Hard Problem of Content) as well as to enactivist theories that, according to RECers, retain representations as important explanatory tools (Hutto & Myin, 2013). One of RECers' specific targets is what they call 'autopoietic enactivism' (see Hutto & Myin, 2013, pp. 32-36), for the latter is committed to the claim that organisms make sense of their environments through autopoiesis and sensorimotor autonomy, thereby establishing meaningful environmental encounters. Hutto and Myin see the talk of 'meaning' and 'sense' as suspiciously representational, thus motivating REC's departure from the more canonical view on enaction that puts autonomy and autopoiesis at center stage of cognition and life. In their second book, Hutto and Myin (2017) advance a more positive view by developing radically enactive accounts of other cognitive capacities, such as memory and imagination. LB, on the other hand, presents an account of language as emerging from the social interactions between sensorimotor agents, claiming a continuity from biological autonomy and sensorimotor engagements to linguistic competence. LB, therefore, expands on the very idea that organisms make sense of their environments through self-organization and autonomy, which makes them not only living beings and sensorimotor bodies, but linguistic bodies as well. Thus, at first glance at least, REC and LB may look like widely different takes on enactivism—as far as divergences within the same research program go—for they deal with different problems, draw on different influences and offer seemingly diverging prospects (not to mention a noticeable difference in their vocabularies). Critics may take this as evidence of a fragmented research program, where two incommensurable branches compete for hegemony.

In order to counter that appearance of fragmentation, in this paper we advance a critical examination of both REC and LB. Our main motivation is to show that, although these may look like competing views, when appraised in a conciliatory spirit, they can be seen as

---

<sup>1</sup> Although throughout this paper we use 'LB' to refer to the book but also to the theory developed therein (which is sometimes also called 'linguistic enactivism', see Figueiredo, 2021), context suffices to specify what we mean by that acronym.

developing fundamentally similar ideas.<sup>2</sup> In particular, the notion of *know-how*, which figures in both approaches, shows an important point of convergence and paves the way for a prolific collaboration. We argue that, for both REC and LB, the normativity of all human cognitive capacities—from perception of one’s immediate environment to performances that require language use—rests on *shared know-how*. This perspective is “radical” in the sense of REC because it does not rely on mental representations in order to explain cognition in general. Moreover, it is amenable to the central claim by LB that participatory sense-making relations at play in linguistic exchanges are explained in continuity with explanations of biological organization and sensorimotor engagements. Importantly, our motivation for arguing that REC and LB can converge is not to provide better grounds for either view separately, but to offer an optimistic outlook on the enactivist research program as a whole. If successful, our argument shows that enactivists are not at odds with each other and that enactivism is not facing an internal rupture. Crucially, we are not claiming that there are no differences between REC and LB. We are, instead, focusing on their affinities and attempting to show the first steps for a possible reconciliation

This paper is structured as follows. In the next two sections, we present REC and LB in their details. We examine how both REC and LB claim, in their own ways, that shared know-how is the key to understand linguistically articulated cognition. In section 2, we present REC’s scale-up strategy and show how REC’s teleosemiotics represents an emphasis on a *diachronic* dimension of shared know-how. In section 3, we discuss LB’s account of how linguistic exchanges emerge from relations of participatory sense-making, which are continuous to more basic modes of biological and sensorimotor organization. Thus, a *synchronic* dimension of shared know-how is more salient in LB’s analysis of participatory sense-making relations, which is the cornerstone for linguistic exchanges brought forth by historically constituted linguistic bodies. In the fourth section, we argue that, because *know-how* is a normative concept, it involves success conditions that permeate all levels of cognitive performance. We then introduce the notion of *basic content*, that is, the non-representational and non-conceptual content that emerges through the open-ended ongoing interactions between agents and their

---

<sup>2</sup> Even though we do not tackle REC’s objection that sense-making smuggles representationalism into the enactivist picture, one straightforward way to defuse it is to emphasize that meaning (as in ‘meaningful organism-environment encounters’) does not carry semantic undertones. ‘Meaning’, in this context, refers to the more fundamental idea that organisms are sensitive to environmental situations that favor their ongoing self-organization, as well as to environmental encounters that are detrimental to their systemic identity.

environment. We conclude by pointing out that, although each approach deals with the two dimensions of shared know-how, the diachronic and the synchronic one, they do so with different emphases. Taking both of them into account allows us to contemplate the bigger enactivist picture, as well as its finer and intricate details.

## **2. REC, the scaling objection and the emergence of content**

REC's central claim is that a large class of cognitive performances are constituted by the organism's exploratory actions of its immediate environment. Perception, for instance, is a matter of directly accessing environmental structures. As such, it is not open to the assessment of its accuracy or inaccuracy, its truth or falsity, because: '[...] the biologically basic modes of organismic responding don't involve content, where content is understood in terms of either reference, truth, or accuracy' (Hutto and Myin, 2013, p. 78). Moreover:

A truly radical enactivism – REC – holds that it is possible to explain a creature's capacity to perceive, keep track of, and act appropriately with respect to some object or property without positing internal structures that function to represent, refer to, or stand for the object or property in question. Our basic ways of responding to worldly offerings are not semantically contentful (Hutto and Myin, 2013, p. 82).

As the passage above indicates, REC attempts to offer a more economical explanation of cognition compared to the representationalist ones. Accordingly, in Hutto and Myin (2013), their defense of REC was largely indirect, based instead on their criticisms of representationalist assumptions, as they appear in old-school cognitivism but also in enactivist-friendly approaches. The Hard Problem of Content (2013, chapter 4) is thus presented as an argument against the possibility of naturalizing mental content. Instead of aiming directly at representational content, however, REC criticizes the notion of *information* implied by it. If representational content (at the very least) implies accuracy conditions, then the information it conveys is semantic information, information *about* something else. But, as far as our knowledge of the natural world goes, we cannot simply assume that semantic information can be reduced to physical states, because the only respectable notion of information is covariation, where two or more states of affairs covary nometrically or reliably enough. And, as Hutto and Myin stress, covariation is not sufficient for content. To use a battered example: to say that the number of rings in the trunk of a tree covaries with its age is not to say that the rings themselves

carry information *about* the tree's age. An external observer may say so, but the rings themselves are silent. Which means that covariation does not constitute semantic content. We could add: content is in the eye of the beholder.

There are two important points to highlight in REC's anti-representationalist maneuver. Firstly, note that for REC content is necessarily representational, so any form of contentful cognition is taken to be semantically laden. As we will see in the following section, this narrow construal of 'content' raises an important issue concerning the normativity involved in what REC takes to be contentless cognition, given its reliance on *know-how*. Know-how, we will argue, involves correctness conditions and therefore can be characterized as *basic content*, without thereby implying accuracy conditions and representational content.

Secondly, RECers do not follow Brooks (1991) and other proponents of radically embodied cognition, such as Chemero (2009), in claiming that mental representations are not always needed to explain cognition. That would be an *epistemological* claim against representationalism, and it would need to be backed up by a case-by-case analysis of cognitive performances that do not call for representational content (see Chemero, 2009, p. 67-68).<sup>3</sup> Instead, REC seems to be making an *ontological* claim, namely, that mental representations cannot be found in nature (see Hutto & Myin, 2013, p. 59). It offers a wholesale argument against representationalism, and even if it is more effective than the epistemological alternative, it comes with a higher price. For it is clearly possible to engage in cognitive performances involving representations—as in some cases of remembering, imagining and inferring, for instance. In these cases, one's mind is directed at potentially absent targets, hence the idea of 'higher' cognition, as opposed to engagements with here-and-now physical structures. Clark and Toribio (1994) have labelled these cases as 'representational-hungry' tasks. Explaining this kind of performances seems to require positing something to stand-in for absent targets<sup>4</sup>. But if mental representations cannot be naturalized, how could REC explain higher cognition? In other words, how could REC *scale up*?

---

<sup>3</sup> Other enactivists and ecological psychologists proceed similarly, examining for instance episodic memory (J. D. Kiverstein & Rietveld, 2018) and imagination (Bruineberg, Chemero, & Rietveld, 2019) in ecological, enactive or ecological-enactive terms.

<sup>4</sup> One that adheres solely to the epistemological claim could accept an explanatory pluralism and allow that, in principle at least, some cognitive performances may require representations (see Chemero, 2013)—unless, of course, some further evidence defeats that assumption.

In their second book, Hutto and Myin (2017) set out to answer the scaling objection. They offer a “duplex” or two-levels account, which is based on Hutto & Satne's (2015) and Hutto & Myin's (2013) teleosemiotics view on intentionality (which is already present in Hutto (2006) under the heading of ‘biosemiotics’). Teleosemiotics is the non-representationalist heir of teleosemantics, the project of naturalizing mental representations. Proponents of teleosemantics (Dretske, 1988; Millikan, 1984, 2004, 2005; Papineau, 1987) typically claim that mental representations are natural structures selected in virtue of affording organisms to engage successfully with their environments. But as Fodor (1990) shows, and RECers endorse, biological selection is underdetermined by the specific description we ascribe to a particular engagement, and *this* is crucial for a naturalistic explanation of representational content. Despite that, teleosemantics theories have shown something interesting, namely, that grounding explanations of intentionality on biological selection may favor a non-representational account of intentionality. Following that possibility, Hutto and Satne (2015) claim that, at a basic level, an organism is directed toward its objects by what they call *ur-intentionality*, viz., the outcome of adaptations and developments that enable successful, non-accidental engagements with the environment. It is, therefore, through inherited and developed biological traits that we interact intelligently with the world without representing it.

Based on those considerations, Hutto and Myin's (2017, chapter 6) strategy for scaling up basic cognition goes as follows: organisms capable of *ur-intentionality* acquire full-blown intentionality (aboutness proper, representational content) as they become part of a sociocultural setting with shared rules for engagement. Higher cognition is thus explained by appealing to the kind of intentionality at play in basic cognition plus sociocultural engagements. Whatever the necessary biological dispositions for sociocultural interactions are, at the very least they involve some capacity for language use, shared action, and symbol recognition, which would explain why not all socially endowed creatures have developed higher-cognitive abilities like modern humans. Moreover, note that representations are not naturalized by reducing them to the physical inner properties of cognitive agents. Hutto and Myin (2017) do not give up on their former (2013) claim that covariation does not imply content. Accordingly, representational content can only exist as external symbols embedded with meaning and manipulated by specific kinds of socially endowed creatures, and not as internal states.

At this juncture, it is important to notice that REC posits a stark division between *basic* and *contentful* minds. Basic minds are directed to their environment through *ur-intentionality*, which does not involve content. Contentful or higher cognition, on the other hand, necessarily involves representations and sociocultural scaffolding. Therefore, in their view, there is a difference of kind—as Hutto and Myin put it, a ‘profound functional *discontinuity*’ (2017, p. 134, emphasis added)—between basic and higher cognition.

This profound functional discontinuity between basic and contentful minds has been met with criticism. As Moyal-Sharrock (2019) observes, the line drawn by Hutto and Myin between basic and higher cognition turns out to be the divide between (non-human) animal cognition and distinctively human cognition, where only the latter involves language use. Moyal-Sharrock observes that this is problematic in virtue of empirical evidence suggesting that some animals, such as vervet monkeys, do engage in contentful behavior, even though they do not master symbolic uses of language. Vervet monkeys, she claims, have specific vocal signals for different predators, and their signaling is understood among themselves.<sup>5</sup>

Myin and van den Herik (2020) construe that objection as pointing to an alleged gap between human and non-human animals, which stems from what seems to be an *interface problem*. Taking literally the idea that there are two *minds*, or two levels of mentality within a single subject, and that these two minds or levels are radically different from each other (as Hutto & Myin, 2017, may seem to suggest); it would indeed be a mystery to explain how they could come together. Moreover, and that is Moyal-Sharrock’s point, it would ensue an evolutionary gap between humans and other animals.

Myin and van den Herik (2020) address those worries first by emphasizing that ‘content’, strictly understood, requires representation. More specifically, it requires narrative or truth-telling practices, that is, practices that involve the question of truth and falsity. This excludes what Moyal-Sharrock considers to be the content-involving cognitive performances of vervet monkeys. Curiously, however, it also renders the phrase ‘representational content’ redundant, despite being widely used in Hutto and Myin’s earlier work (2013, 2017). But Myin and van

---

<sup>5</sup> This problem was already anticipated by Clark and Toribio (1994) when they discuss that rhesus macaques are able to evaluate possibilities of conflict with other monkeys by remembering whether their foes have groomed high-ranking females in their group (*ibid.*, p. 419). While this seems to be a matter of higher cognition (for the grooming behavior is no longer present, it has to be recalled), monkeys are clearly unable to engage in symbolic uses of language.

den Herik’s crucial step is acknowledging that talking about ‘two minds’ is misleading. There is only one mind, they claim, and it is “divided” in different levels only in the sense that it exercises different kinds of abilities. But cognition is fundamentally a matter of exercising certain abilities. Accordingly, ‘All forms of cognition, irrespective of whether they are basic or content-involving, are a matter of the exercise of abilities, competence and know-how. At the same time, there are different kinds of abilities, competences and know-how.’ (Myin & van den Herik, 2020). So, what links together cognitive performances of different kinds is the presence of *know-how*, both in basic cognition and in content-involving cognition. Whereas in the case of basic cognition normativity is strictly biological, i.e., understood in terms of ur-intentionality, referring to inherited and developed traits; when it comes to content-involving cognition, normativity is socioculturally based. Consequently, there is no interface problem, nor an evolutionary gap between humans and other animals. Evolutionary speaking, there is a continuity with a kink that sets humanity apart due to content-involving abilities, which are socioculturally scaffolded rather than strictly biologically based.

Thus, in order to avoid an interface problem, REC explicitly emphasizes that cognition is fundamentally a matter of know-how—or as Myin and van den Herik (2020) put it: ‘exercises of abilities, competences and know-how’. Notice, however, that neither Myin and van den Herik (*ibid.*) nor Hutto and Myin (2013, 2017) define ‘know-how’ and explain the relations between know-how and abilities (and other similar notions). Minimally, of course, know-how does not imply belief and other representational or semantic concepts, but their use still lacks a more positive construal. We will turn to this issue in section 4. Another important aspect of REC’s explanation of the emergence of semantic content is that it fundamentally depends on three conditions: displaying ur-intentionality, having biological dispositions that enable social interactions, and effectively becoming socioculturally scaffolded. For our argument, it is crucial to highlight that REC’s view on how we inherit and develop the abilities to successfully engage with our immediate environment—which is broadened through sociocultural scaffolding in order to encompass so-called higher cognition—refers to the *diachronic aspect of shared know-how*. This is so because how individuals successfully direct themselves to environmental settings (and even towards potentially absent targets, when it comes to higher cognition) answers to the inheritance and development of their abilities at play. Biological inheritance in particular happens over large timescales involving multiple other individuals. Hence the *diachronic* aspect of a know-how which is fundamentally *shared* with others. It is this chain of cumulative refinement that determines the correct way of directing oneself: it sets

the parameters for successful directedness, even if it leaves open a significant leeway for individuals to come up with new and unique ways of accessing their environments, thereby adapting their actions to unforeseen circumstances.

The diachronic aspect of *shared* know-how is successfully picked up by radical enactivists, even if they never use that phrase. It is clear that they also allude to a *synchronic* aspect of shared know-how through the ideas of ur-intentionality and sociocultural scaffolding, for social engagements necessarily happen concomitantly between two or more individuals. However, proponents of REC do not sink their teeth into this issue, for they do not explain in finer details how one goes from *having the requisite biological dispositions for social interactions* to *becoming socioculturally scaffolded*. As we see in the next section, LB is capable of filling in this gap.

### **3. Shared know-how and the continuity between life and language in LB**

*Linguistic Bodies* (LB) explains the emergence of linguistic engagements from social interactions and sensorimotor agency in continuity with the more traditional enactivist explanation of biological autonomy. This is important because it allows us to address the gap mentioned above by explaining how two or more individuals conjointly bring forth social interactions and coregulate themselves through language. But it is not only REC that benefits from an approximation to LB. The same thing happens the other way around: as Gastelum (2020) correctly points out, LB lacks evolutionary arguments to establish the continuity between biological, sensorimotor and linguistic cognitive engagement. It relies mostly on a view of the organism and its relations with the environment as the source of different domains of interaction and novel forms of cognition. The continuity between life and language that LB brings forth is a continuity in terms of its conceptual framework, as we explain here, not a continuity in evolutionary narrative.<sup>6</sup> Although the specific enactivist tradition within which

---

<sup>6</sup> But why would an evolutionary narrative be necessary in the first place? If we are, as LB claims, historically constituted linguistic bodies, we need to be able to tell that history, and this involves considering the evolutionary scale (as well the developmental one). Notice that this is REC's emphasis. Thompson (2018) is correct in claiming that adaptationism—according to which adaptation is the only mechanism responsible for evolution—is inimical to enactivism, and this may raise suspicion against REC. For adaptationism focuses on the selection of *traits*, thus ignoring the organismic whole and what the organism does (Gould & Lewontin, 1979; see Varela et al., 1991/2016 especially chapter 9). But enactivists in general, and RECers in particular, need not rely on adaptationism in order to develop an explanation at an evolutionary scale. Instead, enactivists can situate their evolutionary views within the Extended Evolutionary Synthesis (EES) (K. Laland et al., 2015), which acknowledges the importance of adaptation alongside other processes. Within EES, niche construction theory (Laland et al., 2016; Laland et al.,

LB is situated does explore the relevance of large timescales in cognition (thus acknowledging a diachronic dimension of shared know-how), this is usually done in reference to the developmental scale (see Di Paolo et al., 2017 especially chapter 4). With REC's evolutive emphasis, a larger (evolutionary) timescale is taken into account. Combining the two approaches affords us a more complete perspective. For that reason, LB benefits from REC's diachronic account, as we explore in the next section.

Differently from REC, LB claims a more direct affiliation with the beginnings of the enactive research program laid out in Varela et al., (1991/2016). LB is conceived as a development and continuation of the enactive perspective to sensorimotor agency (Di Paolo et al., 2017) and intersubjectivity and social cognition (De Jaegher & Di Paolo, 2007). The topic of social cognition itself has received a lot of attention in recent enactive research, notable examples are Kyselo's work (2014) on the social constitutive aspect of the human self and De Jaegher and Froese work (2009) on how social interactions can shape the individual agent on which they depend. What Di Paolo et al. (2018) offer is a way of understanding language and a variety of concrete tensions of human life through an analysis of the material enabling conditions for the emergence of cognitive phenomena that are traditionally taken to be of a 'higher-level' or 'uniquely' human by other approaches (such as REC). LB is, therefore, an attempt to account for the complexity of human bodies and the conditions that enable bodies to enact language (or 'linguaging' as the authors prefer in the final chapters of the book). Language, they claim, is not a disembodied or decoupled activity of higher minds, but it emerges from the social interaction between sensorimotor agents.

LB's approach avoids the representational talk as much as possible, and that is noteworthy for two reasons. First, it claims that knowing a language is fundamentally a matter of know-how without claiming that linguistic competence is *mere* know-how. A good point of contrast is the view put forth by Michael Devitt (2011). He claims that linguistic competence is not reducible to knowledge-that because it is a skill of back and forth *translation* between meaningful representations and the language in question; it is a skill required in order to have knowledge-

---

2000; Odling-Smee et al., 2003) is particularly well-suited for enactivist goals, for it explains how organisms *literally* bring forth their worlds by modifying them through their actions and creating ecological (environmental, non-genetic) changes that can be inherited by their offspring, thus ensuing new selective pressures. This is an interesting line of reasoning that we cannot develop further due to space constraints, but it suffices to say that teleosemiotics can be adjusted to fit EES. We thank an anonymous referee for pointing this out.

that (since a proposition is always expressed in a language). LB's approach to language focuses instead on the interactive dynamics of social agents and their know-how involved in successful interactions. This alternative approach also concerns us here because the analysis of language advanced in the book is independent from a theory of content. As we saw, RECers claim that all content is, at the very least, *representational*. But unlike REC, LB makes no claim about the nature of content. Instead it puts forth an enactive account of the so-called 'higher-level' cognitive phenomena that is neutral regarding its putative contentful nature. As such, LB marks an even more radical departure from cognitivism than REC does.

Fundamentally, LB reconceives of living bodies as operationally closed and precarious systems. The basic idea is that the relations between parts and whole of a living body are circular means-end relations (relations of closure). Following the seminal work of Francisco Varela (1979), operational closure is also the technical definition of autonomy, what allows Di Paolo et al. (2018) to say that living bodies are precarious autonomous systems, continuously striving for their self-maintenance. Accordingly, living bodies are composed of dynamical processes that are related in a network in which all the processes depend on each other to occur. Being so closely connected, the processes form a recognizable unity, i.e., the organism (F. J. Varela, 1979). Different interactions between organism and the environment have different demands and, as organisms self-individuate and keep their systemic unity, those demands become interests for the organism. This allows us to talk of organisms in terms of plans and purposes: 'Organisms are natural purposes, whose teleology is immanent: they follow purposes and norms that are their own.' (Di Paolo et al., 2018, p. 24). All the processes that make up the system are enabled by other processes of the system. It follows that no process is freestanding or self-sufficient.<sup>7</sup> Organisms are precarious networks of enabling relations that are constantly changing, a characterization that is iterated upwards to social interactions, as we see below.

Since organisms are conceived as having purposes relating to their self-maintenance, the engagement with the environment has value, at least a polar structure of positive and negative values regarding the continuation of the network of enabling relations. In other words, the living body in interaction with the environment has to make sense of it. At this point we can

---

<sup>7</sup> That being said, processes that do not belong to the unity can enable processes within the network, but they are *external* because they themselves continue to exist without the network. Sunlight enables photosynthesis (a part of the organism), but the Sun exists independently of the plants. Organisms are precarious networks of enabling relations that are constantly changing.

talk of a primitive kind of intentionality, much like RECers' notion of ur-intentionality, *viz.*, a non-representational directedness that recognizes and creates valence in organism-environment encounters.<sup>8</sup> At the level of the living body, we can talk of the emergence of vital norms or “natural purposes” that drive the organism’s dynamical environmental exchanges and continuous self-production.

As organisms exhibit different levels of organizational complexity, they develop different adaptive coupling strategies with their co-specified environments. Their metabolic processes are enhanced by the organism’s adaptively coping with environmental offerings and constraints (a similar idea is put forth by Werner, 2020). Organisms thus become sensorimotor agents, *i.e.*, forms of life that are constituted as ‘self-sustaining, habitual organizations in the structural and functional interrelations between their acts, skills, and dispositions’ (Di Paolo et al., 2017, p. 7). The norms constraining habituation and skills create a new domain of agency, sensorimotor agency. Novel forms of agency emerge in new domains of interaction, in feedback loops between exercises of agency and their domains,<sup>9</sup> so novel forms of skillful coupling quite literally change the systemic unity. In this sense we can understand the idea of human beings as being in constant becoming (Di Paolo, 2020). We are all different bodies exercising different agencies (sometimes at odds with each other).

But how do we go from sensorimotor agency to linguistic cognition without smuggling in representations and such? LB addresses this worry by explaining how social interactions constitute a new domain of agency (compared to sensorimotor agency), and it is at this new domain that linguistic agency takes place. Whereas sensorimotor agency minimally involves the adaptive coping by an organism in its environment, social interactions naturally involve more. For LB, a social interaction is the co-regulation between agents for their joint coupling by following social norms in a given environment. This joint coupling is called *participatory sense-making* (De Jaegher & Di Paolo, 2007). Social interaction thus occurs as at least two sensorimotor agents enter participatory sense-making relations. Compare the following cases:

---

<sup>8</sup> Di Paolo et al. (2018) refer to ‘agency’ instead of ‘intentionality’. However, both LB and REC are concerned with distinguishing between *action* and mere physical-chemical happenings in an anti-representational way, which shows that these differences are nominal rather than conceptual.

<sup>9</sup> All bodies (living, sensorimotor, linguistic) display agency. However, not all bodies are linguistic. Linguaging (or enacting language) becomes an ever more dominant phenomena as one partakes in a linguistic community. (see especially Di Paolo et al., 2018, chapter 9). In a sense, linguistic bodies are in continuous becoming. They are always expanding the possibilities of linguistic interaction, both at the level of a specific body as well as the possibilities of the linguistic community as a whole. We return to this topic at the end of section 4.

imagine that a caretaker puts a toy in the field of vision of a toddler who then starts to play with it. So described, that would be merely a case of perceptual interaction, where the child either takes or ignores the object made available in her vision field. It is an interaction between the toddler and her toy. A genuine case of social interaction would be the similar situation in which the caretaker offers a toy to the toddler by holding it closer to them, and the child either accepts or denies it. In the second scenario, sensorimotor agents *act together*; the relevant action is the *offering* of a toy, a partial act that becomes a joint act when the child responds to the caretaker's offer to play, either positively or negatively.

Moreover, a social interaction is a material process: the actions performed and the environmental features that constrain their performance make it so that the social interaction always produces its own internal dynamics. One example is the familiar situation in which two people coming from opposite directions have to cross each other in a narrow corridor and they get stuck in alternate lateral movements that prevent them to carry on walking (De Jaegher & Di Paolo, 2007, p. 493). Both agents want to pass (or to let the other to pass) but for a few seconds they engage in an awkward 'dance' given the constraints of the environment and a lack of complete control over the consequences of their movement. That example also illustrates another important feature of social interactions, namely: the autonomy related to co-regulating agents. The activity of participatory sense-making brings forth an interactive process that gains a life of its own; social encounters acquire a fleeting operationally closed organization, a certain degree of autonomy in relation to the participants involved (De Jaegher & Di Paolo, 2007, p. 492).<sup>10</sup> To facilitate the coregulation, portable regulatory acts emerge in the interactions (gestures indicating things like 'you go first'). Such acts are portable because they can be used recursively in similar situations and gain broadened regulatory powers (what relates to the topic of sedimentation, as seen below).

The social interaction of the narrow corridor example is marked by dissonance, a negative tendency between the individual agent and the interaction that leads to interactive breakdown. But the 'life of its own' of social interactions can also generate synergy, that is, a positive tendency between agent and interaction in which agents try to sustain the social encounter.

---

<sup>10</sup> A further requirement for the interaction to be properly social (requiring then participatory sense-making activities) is that the 'individuals involved are and remain autonomous as interactors' (De Jaegher & Di Paolo, 2007, p. 493). So, the social domain of interaction where social agency is exercised is the interactive domain in which the agents maintain their autonomy and the interaction itself acquires a life of its own (autonomy relative to the goals and purposes of the participants).

Imagine that you are on a date and you say something that ends up being insulting or hurtful to the other person because, unbeknownst to you, it triggers a past experience of theirs. You notice something is wrong, you apologize and try to amend. To correct this kind of mismatch between individual sense-making and patterns that emerge in the interactive dynamics, the agents in a social interaction exercise their *social agency*:

a specific kind of participatory sense-making whereby the agents not only regulate their own couplings and influence other agents, but they also jointly regulate the mutual coupling following norms that pertain to the interactive situation, such as being sensitive to interactive breakdowns and attempting to recover from them jointly with other participants. (Di Paolo et al., 2018, p. 146)

It is in the domain of social interactions, specifically through social agency, that linguistic engagements emerge—and, as we have seen, this resonates REC’s point that individuals become capable to engage in linguistic cognition by becoming socioculturally scaffolded. In order to understand linguistic agency, we must first account for social agency, for linguistic agency is itself a kind of social agency.

Social agency pertains to the individual participant, but it can only exist as one aims to act with others. For LB, it requires a shared know-how of the interactive situation, i.e., the sensitivity to breakdowns and the skills to recover from them (as in the date scenario above). Crucially, for our argument, shared know-how is taken in LB to be irreducible to the individual know-how of the participants: ‘shared know-how does not amount to the sum of the individuals’ know-hows nor does it strictly “belong” to any of the participants.’ (Di Paolo et al., 2018, p. 75). The reason for this is that the performance of a social act necessarily depends on the enactment of partial acts that unfold in a given environment. Accordingly, the coordination of the partial acts is jointly enacted in a way that there is no completely independent social agent. The successful production of the social act, therefore, relies on the participants’ know-how in relation to the interactive dynamics that emerge in that context. Consider the example of scoring a goal in a football match (adapted from Carvalho, 2021). In this case, the interactive dynamics that interfere in goal scoring opportunities involve what the other participants from both teams do. They also indirectly depend on how the participants are affected by the weather conditions, the quality of the field, the reactions from the coach, the cheering from the supporters and so on. To put it in other words, no individual agent strongly regulates the social

act *alone*—the goal, in that example—, so the shared know-how mobilized in it is not reducible to the individual players’ know-how. Instead it emerges in the interactive domain and it “belongs” to the teams in action. In virtue of the emphasis on the *ongoing* interplay between individual agents in shared know-how, we take LB to highlight its *synchronic aspect*, which is necessary for social agency. We further explore the synchronicity of know-how in relation to what we have interpreted as REC’s emphasis on diachronicity in section 4 below.

Now, linguistic agency is a specific kind of social agency whereby the participatory sense-making involved requires increasingly more sophisticated forms of shared know-how by the social agents. So construed, LB’s notion of linguistic agency seems overly broad, and one may wonder how (and whether) linguistic cognition as it is traditionally conceived—typically associated with contentful cognition—enters the play. The first thing to notice is that there is a *sedimentation* of novel sensorimotor schemes through the activity of participatory sense-making, an entrenchment of know-how that was originally applied to particular contexts of interaction. Accordingly, the relevant know-how is increasingly shared by the members of proportionally enlarged groups. The sedimentation of skills of coordination allows for each participant to develop a sense for the *rightness* or *appropriateness* relatively to paradigmatic sets of actions (the aforementioned portable acts), be it the rightness of the agent’s performance or of other participants. Thus, the engagement in social encounters alters the specialized repertoire of actions available to an agent, thereby altering their sensorimotor structure, enabling a ‘readiness to interact’ (Di Paolo et al., 2018, p. 134). It is through this process of the sedimentation of practices that paradigmatic acts of coregulation look increasingly more like our typical grammatical structures.<sup>11</sup>

During sedimentation, repertoires of acts embedded in social interaction form classes of acts that are complementary and equivalent, which in turn create the possibility of navigating different local normativities. That ensues a tension between who is the regulator of the social interaction and who is the one being regulated. Linguistic bodies co-regulate their coupling dialogically through *utterances*, where sometimes an agent assumes the regulatory role and

---

<sup>11</sup> Tomasello (2014) has described a process similar to sedimentation at an evolutionary scale: as modern humans from around 200.000 ya developed highly cooperative engagements to cope with demographic pressures, individuals enhanced their chances of survival by incorporating the practices of their groups through active imitation. This minimized their risk of being ostracized. Accordingly, these incorporated practices have a shared normativity that eventually lead to cultural norms and highly complex languages.

sometimes they are the ones being regulated.<sup>12</sup> An utterance is a social act enacted by a producer to an audience, in which both agent and audience recognize themselves as such and normally switch roles through the different stages of exchanges. Notice, moreover, that utterances are not necessarily verbal. They are social acts, which also includes gesture, smiles, intonations, and which are usually directed to someone.<sup>13</sup> They also have person-constituting powers: in incorporating utterances in your linguistic life you incorporate styles, voices, types of reasoning, values that become (to some extent) your own. Accordingly, *linguistic bodies* are autonomous agents constituted by utterances directed to self and to others. Thus, in linguistic interactions we have producers of utterances and audiences assuming regulatory and regulated roles.

Notice, moreover, that the coupling by means of exchanges of utterances is only successful if both the producer and the audience are sensitive to the *participation genres* they are in. For instance: a business meeting, a Zoom class and a socially distant encounter with a friend are material contexts that constrain the possibilities of interactions in a myriad of ways. Know-how is clearly crucial for cases in which we need to adapt “on the fly” to new participation genres. Imagine a situation where you suddenly encounter a former partner in a social event and you need to decide how to engage—a light conversation, a more intimate talk or no conversation at all. Successfully adapting one’s action in circumstances like these can only be done smoothly if one is well-versed in the relevant know-how. However, nowhere in LB the authors specify exactly what *know-how* is (for a commentary, see Carvalho, 2021). For the time being, we can assume that know-how involves detecting, at a very basic level, what ‘feels right’ in a given social encounter and acting accordingly. We will return to this issue in the next section.

The foregoing entails that, in order to successfully engage in sense-making by utterances, agents need to be at least somewhat sensitive to the participation genres constraining their engagement and to be able to adapt to possibly novel sociomaterial constraints and local normativities that emerge as social interactions unfold. All forms of sense-making (which

---

<sup>12</sup> Although their (Di Paolo et al. 2018) proposal relies on the notions of *dialogue* and *dialectics*, we do not explore them because they are not needed for the approximation between REC and LB that we advance here. Another relevant aspect of LB that we do not explore here is the difference between the pragmatic and the expressive aspects of utterances. This distinction is important, among other things, to avoid an expressivist view in which utterances merely indicate subjective attitudes of the speakers (approval, disgust, assertion and so on).

<sup>13</sup> Together with the sense of rightness or appropriateness and the readiness to interact, linguistic bodies develop social control and the skill to engage linguistically with themselves.

includes linguistic cognition) ‘requires by definition both *sensitivity* to and *regulation* of the virtual field of possibilities’ (Di Paolo et. al., 2017, p. 229). In the case of linguistic bodies, both sensitivity and regulation have an inescapable social dimension ‘At behavioral timescales, languaging is one form of participatory sense-making that becomes ever more dominant with increasing participation in a linguistic community’ (Di Paolo et. al., 2018, p. 217).<sup>14</sup> From an epistemic standpoint, that amounts to acquiring and changing shared linguistic practices. It requires shared know-how.

In other words, much like REC (as we saw above), for LB full blown linguistic agency (displayed by most adults born into linguistic communities) fundamentally presupposes shared know-how of linguistic practices—*knowing how* to use the utterances shared within one’s community and being open to new utterances and participation genres without losing one’s autonomy. *Linguistic Bodies* thus claims that, at the fundamental level of linguistic interactions, lies a sophisticated form of shared know-how, and the authors do so without invoking mental representations.

#### **4. Know-how and basic content**

As we have seen, *know-how* is a fundamental concept for both REC and LB, but neither approach offers an explicit and comprehensive explanation (let alone a definition) of that concept. Naturally, both brands of enactivism must follow Ryle (1949) in rejecting intellectualist accounts that aim to reduce know-how to propositional knowledge, otherwise their views would entail pervasive propositional (and *a fortiori* representational) content. In fact, explicit non-intellectualist conceptions of know-how are put forth in predecessors of both LB (see Thompson, 2007; Varela, 1999) and REC (see Hutto, 2005)<sup>15</sup>. However, there is a

---

<sup>14</sup> Take, for example, the common occurrence of babies starting to smile ‘suddenly’ and ‘for no reason’ at caretakers and other adults when they are about a month old. At first the existence of a linguistic community sounds irrelevant and the interaction does not look linguistic at all. However, it is common when the caretaker interacts with the baby and introduces the baby to other adults to do this smiling and making silly faces. Smiling back makes the caretaker and adults sustain the interaction and increases the attention given to the infant. And this kind of attention is, in a sense, necessary for the baby’s survival. That creates a behavior pattern and soon enough babies start to smile and stop smiling suddenly as if trying to get the adults undivided attention. At least behaviorally, this type of interaction is part of the continuous and ongoing process of becoming a linguistic body, the baby is increasingly becoming a member of that linguistic community by successfully exchanging utterances (for now only smiles) with the adults around.

<sup>15</sup> We thank an anonymous reviewer for pointing that out.

noticeable absence of a positive characterization of know-how in this literature, which is presumably due to the enactivist tenet about the centrality of action. Accordingly, enactivists straightforwardly assume that know-how essentially involves an agent effectively acting in an environment. This would rule out cases in which the individual is systematically unable to actively engage with their surroundings, despite their retention (let us assume) of explicit rules on how to achieve certain goals or to conclude certain tasks. On the same basis, it also excludes Noë's (2004) sensorimotor account of perceptual consciousness. In Noë's terms, perceptual consciousness is constituted by one's practical understanding of the sensorimotor contingencies involved in action. But this, in turn, makes room for the possibility that an agent could retain their understanding of how certain perceptual events *would* unfold without *effectively* exercising their sensorimotor abilities, thus ensuing an undesired reintroduction of mental representations under the label of 'practical understanding' (see also Hutto, 2005; Rowlands, 2010).

So, know-how essentially involves acting, but obviously *not all actions entail know-how*—after all, one can get something right by luck. Secondly, if know-how were simply equivalent to action, then there would be no conceptual gain in resorting to it, as REC and LB do in their respective accounts. For enactivists are *already* committed to the centrality of action as a starting point. But then what else is needed for an action to be considered a case of know-how? A brief analogy with propositional knowledge may be enlightening. It is typically assumed that propositional knowledge entails true belief, but it is not equivalent with it, because arriving at true beliefs by chance does not constitute knowledge. Similarly, it is plausible to assume that know-how requires successful acting, where *success* here is the broader notion of which *factivity*—the more familiar notion to epistemologists—is a specific case. But some actions may be fortuitous enough to achieve their desired goals by chance. Know-how, we take it, requires more than success: it implies *stability*, i.e., regularly achieving successful results in varying situations and under similar constraints (for a similar idea, see Rolla, 2019). To know how to do a somersault, for instance, is to successfully perform a pattern of acts that result in the full rotation around one's horizontal axis. And this can be done across a wide range of conditions—but naturally not across *all* conditions. An experienced gymnast must be able to do it more or less regardless of the path or terrain they are in, be it rubber flooring, vinyl or hardwood floor, for instance. But obviously we do not expect them to be able to do a somersault standing in a rocky terrain, or confined in a crowded room with a very low ceiling, for instance. A novice who does a somersault by chance at their first attempt, on the other hand, does not

know how to do it because they do not meet the stability condition. We do not expect them to be regularly successful after a fortuitous first try. So conceived, therefore, know-how rules out actions which are successful merely by luck. That is, know-how entails stable success, just like know-that entails non-accidentally true belief.

Our analysis of know-how can be compared to the notion of *mastery* put forth by Di Paolo et al. (2017, chapter 4).<sup>16</sup> Inspired by Piaget's theory of equilibration, they provide an intricate dynamicist explanation of how agents acquire mastery, thereby understood as perceptual learning. Although they explicitly relate mastery and know-how (p. 78), they do not delve into definitional issues, for their primary focus is to explain how agents learn to perceive and engage with unforeseen circumstances, given that perception and action are enabled and constrained by previously established sensorimotor schemes. Earlier in that book they define a sensorimotor scheme as: 'an organization of [sensorimotor] coordination patterns that is regularly used by the agent because it has been evaluated as preferable (along some relevant normative framework) for achieving a particular goal' (Di Paolo et al., 2017, p. 58). Implicit in this definition is that sensorimotor schemes always involve both an agent side *and* the environment, which is constituted by all those aspects that can influence the agent's performance. To summarize an idea that they develop at great length and detail, mastery is an ongoing process of equilibration, in which sensorimotor schemes are adjusted to deal with environmental encounters and internal tensions, thus becoming self-sustaining and possibly habitual (in case they are also precarious, i.e., needing to be reenacted in order to continue to exist).

Three points are important in comparing Di Paolo et al. (2017) notion of mastery as equilibration with our definition of know-how as stable and successful actions. First, there is the unequivocal agreement between our views concerning the following idea: for an agent to know how to do something, or to master a skill, they must act—say, by exercising their sensorimotor schemes (at least in cases of perceptual know-how)—in a *successful* manner. This of course does admit a graduation, because one can be more or less successful in doing something, and increasing this rate of success is precisely what mastery is about. Secondly, the idea that sensorimotor schemes must be adjustable to varying environmental conditions (e.g., by overcoming obstacles) can be cast in modal terms: to conceive an exercise of a sensorimotor

---

<sup>16</sup> We thank an anonymous reviewer for this suggestion.

scheme as an instance of know-how is to say that it is successful across a certain range of situations and constraints, as in the example of somersault discussed above. We used the notion of stability precisely to capture this idea, which is implicit in LB's notion of *sedimentation* of a practice as the basis of grammatically articulated linguistic know-how, an issue we return to below. Finally, there is an important difference of theoretical goals between the account by Di Paolo et al. (2017) and ours: whereas they provide an enactivist account of *perceptual learning*, thereby emphasizing the operational conditions of the *process* of mastering sensorimotor schemes, one could say our focus is the more general idea of an enactivist *epistemology*. That is, our discussion about know-how is intended to make the epistemological concepts underlying the enactivist literature more explicit. Moreover, as mastery refers to a process of honing a sensorimotor skill, whereas know-how refers to successful and stable performances in general. For that reason, in order to understand all levels of cognitive activity, a broadly defined notion of know-how is more adequate than mastery of sensorimotor schemes, for there are cases in which cognition is enabled by, but not restricted to, sensorimotor regularities—and yet, it involves know-how.

Another crucial consequence of conceiving know-how in terms of success and stability is that, in so doing, we highlight that know-how is a *normative* notion (in tune with Di Paolo et al. 2017 quote above). Accordingly, there are correct (better, more fluid, more successful, etc.) ways of acting, which are relative to the agent's goals, their bodily morphology, momentary dispositions, acquired preferences and their specific environmental circumstances.<sup>17</sup> Normativity, so conceived, is embodied and situated—for it is enabled and constrained by one's bodily morphology, abilities and environment (for a discussion, see Rietveld, 2008). But it is also *internal* in the sense that the agent is sensitive to the correct ways of acting in their

---

<sup>17</sup> The reader may find our account similar to the Skilled Intentionality Framework (SIF) (Bruineberg et al., 2019; Bruineberg & Rietveld, 2014; Rietveld & Kiverstein, 2014). In fact, when scaling-up their framework to language, Kiverstein and Rietveld note a similarity with the enactive view of language as participatory sense-making (Kiverstein & Rietveld, 2021, fn. 1). In that paper, they focus on the way in which the affordances of the human ecological niche are interwoven with practices of speaking and writing. They thus argue for linguistic cognition in terms of a skillful engagement with an *enlanguaged* environment. Our focus here is on the agent that acts in this type of environment. In tune with SIF, we aim to provide, through concepts put forth by REC and LB, an account of how agents normatively regulate their coupling by exercising their cognitive capacities—from perception of one's immediate environment to performances that involve language. However, we can point to two differences between our approach and SIF. First, we are interested in fleshing out the underlying epistemology of enactivism, that is what instigates the zooming in on the notion of know-how. Secondly, we deliberately avoid bringing affordances and other notions from ecological psychology into the enactivist mix, because examining the similarities and differences between these traditions is outside the scope of this article. It is an interesting matter to see whether (and to what extent) our account of shared know-how and SIF are compatible, but that is another project altogether. We thank an anonymous referee for pointing this out.

circumstances, and this is what enables them to perform increasingly nuanced and successful interactions in rapidly changing environments. This means that cognitive norms are not mere criteria for an external observer to assess someone else's behavior. Stable and successful actions are 'normative in themselves' (Di Paolo et al, 2017, p. 155), for they guide and inform one's engagement in an adaptive manner. To say that normativity is internal in this sense naturally does not mean it is *private*. As we have argued in the previous sections, norms for successful acting are very much publicly shared among others both at a phylogenetic level (in the case of biologically basic modes of directedness) and an ontogenetic level (in the case of acquired skills, including linguistic engagement).

Moreover, normativity also means that things *can go wrong*: an agent can fail to achieve their goals. To use Di Paolo et al. (2017) terminology once more, perceptual failures can occur when sensorimotor schemes fail to adjust to environmental conditions—say, by not overcoming obstacles adaptively, or by executing the relevant sensorimotor schemes out of order, thus failing to maintain a match between the agent side and the environmental side of a sensorimotor scheme. And if failures are substantial or uncorrectable, then the relevant engagement (sensorimotor, social, linguistic) falls apart. This is why know-how is a key theoretical aspect of enactivist accounts (as predecessors of both REC and LB have noticed): to talk about cognition in terms of know-how implies that the interactions between organisms and environment are not just random, for they require the ongoing effort by agents in order to continue to be stably successful.

If know-how is a normative notion, then there are conditions regulating how the agent acts, conditions that must be clearly distinguished from the ones at play in representational and propositional (or conceptual) content. We call those more basic conditions *success conditions*. And if Myin and van den Herik are correct in writing that '[a]ll forms of cognition, irrespective of whether they are basic or content-involving, are a matter of the exercise of abilities, competence and know-how' (2020), it follows that success conditions are pervasive to all kinds of cognitive performance. Assuming that some cognitive capacities involve representational content, and some involve fully articulate conceptual and propositional content, we can sketch the following scheme where know-how is present at all levels and where each level is specified by the addition of specific conditions (fig. 1). At the level of representational content, accuracy conditions are characterized by taking success conditions and adding further theoretical elements, which can be, for instance, the *isomorphism* between representations and their

targets, or the presence of *semantic structures* devoid of the generality typically associated with conceptual content. Notice that this is compatible with Hutto and Myin's (2017) account of representational content as essentially sociocultural, as we discussed in section 2, because the addition of isomorphism or non-general semantical structures to success conditions does not entail a commitment to *mental* representations. We can further specify accuracy conditions by adding whatever elements are typical to conceptual or propositional content (say, *syntactic structures* or *generality*), thereby giving rise to truth conditions.

[insert Figure 1.]

To use REC's phrase, even basic cognition—here and now exploration of the immediate environment—is normatively constrained by correctness conditions, more specifically, success conditions, which are fundamentally relative to our inherited and developed biological abilities. But if there are correctness conditions inherent to an agent's doings at this biologically basic level of engagement, then it makes sense to speak of content, albeit in a very deflationary sense. We call this very general level of content *basic content*. Basic content is the open-ended outcome of an agent stably and successfully engaging with their environmental features—thus exhibiting know-how—, and this is why the most fundamental mode of access to our environment is practical. In other words, the (basic) content of agent-environment engagements is achieved by exercising the relevant know-how. An object's 'presence', to use Noë (2012) phrase without its representationalist undertones, is brought forth by the successful and stable exercise of the agent's abilities. If that is the case, it means that what epistemologists have called knowledge by acquaintance (perceiving an object, a person or a place) is ultimately reducible to know-how. Plausibly, it is this sort of reductionist view that motivates Thompson's claim that '[w]hat it is to experience the world perceptually is to exercise one's bodily mastery or know-how of certain patterns of sensorimotor dependence between one's sensing and moving body and the environment' (2007, p. 257). So, if basic content involves success, it is because our engagement is subject to failure and disruptions; it demands effort, learning and adaptation. It is not given nor mediated by representations. Crucially, therefore, basic content is unspecified by, and logically prior to, accuracy and truth conditions. It follows that it is not understood in terms of reference, truth or accuracy—which is in perfect agreement with Hutto and Myin's (2013) point about the hard problem of *representational* content. Basic content only implies stable success in dealing with environmental contingencies, nothing more.

Clearly, this move marks a departure from RECs claim of contentless cognition, for content, according to RECers, always involves representation. Our argument above shows that content can have success conditions without entailing representations. This is important because it allows us to see how higher (representation/conceptual) cognition is continuous with basic cognition, the latter being contentful, but non-representational. Basic and higher cognition, as our scheme above shows, involve success conditions, and that is why they are in continuity, even if something else (isomorphism, generality, etc.) is added at each level. And it is exactly this kind of continuity that we may take Myin and van den Herik (2020) to be alluding to when they claim that know-how is pervasive of all cognition, from basic to higher-level. For, as we have seen, know-how is a normative notion, it implies very general correctness conditions. These are also present at higher levels of cognition, albeit refined through further specifications that are relative to our sociocultural scaffolding.

Notice that, even though our defense of basic content is a terminological revision about what should be called ‘contentful’, it works in REC’s favor. For it allows REC to block criticisms from other enactivists such as Thompson (2018), who claims that REC’s notion of contentless cognition obviates how phenomenologists and other embodied cognitive scientists have argued for non-representational content at play in basic (nonlinguistic) cognition. By emphasizing that all levels of cognition involve know-how, REC must accept that basic cognition involves content, which we propose to characterize as a form of non-representational content.<sup>18</sup> And, given that LB does not commit to a particular theory of content—as we have mentioned in section 3—, our conception of basic content as scalable to representational and propositional content through know-how is compatible with LB’s account of linguistic practices as continuous with biological and sensorimotor autonomy. Therefore, we suggest the addition of the notion of *basic content* to the enactive thinking as part of the effort of approximation between REC and LB. The idea is that, at the most basic level of cognitive performance, the agent is stably and successfully engaging with their environmental features, and this is the cornerstone that connects both views.

---

<sup>18</sup> Importantly, Thompson (2018) thinks of non-representational content in terms of the phenomenological notion of *noema*, which he interprets as the object of experience in its givenness (Thompson, 2007, p. 446, fn 9). Whether basic content, in our characterization, is compatible with the phenomenological views Thompson has in mind is an open question that we do not explore here due to space constraints. We appreciate the suggestion of an anonymous reviewer to highlight this point.

Finally, as we have hinted at before, REC's account of teleosemiotics aims to explain how organisms are capable of ur-intentionality, a form of basic (non-representational) directedness that is realized through the exercise of inherited and developed biological abilities. This is fundamentally a matter of *knowing how* to engage in certain activities by exercising the relevant abilities with success and stability. Additionally, the norms that determine how these activities can be successfully performed (their success conditions) are historically dependent *on many other individuals* that have helped to shape these abilities through a multitude of engagements. Teleosemiotics, therefore, entails that *shared* know-how is pervasive in cognition. That is, RECers put (albeit implicitly) a *diachronic* emphasis on shared know-how, which ranges from basic to higher cognition.

Similarly, but from a different perspective, LB accounts for how social agents are jointly responsible for the regulative processes that take place in interpersonal engagements, thus collectively bringing forth a system with its own internal dynamics—the social interaction itself. Accordingly, the know-how of each participant in a social interaction is crucial for its successful unfolding, which in turn affects how social agents enact their respective parts. So 'as there is no completely independent social agent, nor a single individual regulating alone the social interaction, the social agency and the shared know-how must be in some way anchored in the participant's skills without being reducible to them' (Carvalho, 2021). In other words, the ongoing interplay of social agents regulates the dynamics of their social acts in ways that are not reducible to the know-how of each participant individually. Shared know-how, therefore, receives a *synchronic* emphasis in LB's account of linguistic cognition, thereby explaining how social interactions between creatures such as ourselves enable the development of our linguistic capacities.

Notice that humans living in linguistic communities are always instigated to engage in linguistic interactions. They are thus capable of linguistic cognition since an early stage of development. We can now say something about shared know-how and linguistic communities: it follows from LB's account that an individual's linguistic body can only be a linguistic body in a community with shared practices. The paradigm shift of talking about linguistic cognition in terms of linguistic *bodies* also changes how we talk more generally about language. The broader category of analysis in this enactive framework is the different groups of agents co-regulating their sense-making and its different linguistic practices, i.e., the linguistic bodies that we have been referring to as a linguistic community. Language in this approach is not

something simply handed down from one generation to another, it is a shared set of paradigmatic actions that endures in a process of continuous transformation. But which sets of paradigmatic actions end up resisting the test of time? At least a significant part of the enduring ones are those that afford stable successes in the coregulation of the members of the linguistic community; the ones that are contentful in one or more of the senses presented in Figure 1.

It also follows from this that the process of becoming a linguistic body (the development of linguistic cognition) is the learning of the shared know-how which pertains to the linguistic communities one is in. However, the possibilities of linguistic interaction are always expanding, so both linguistic bodies and linguistic communities are open-ended processes of becoming. Novels utterances and participation genres (sociomaterial constraints) are bound to happen given the “life of its own” which is inherent to social interactions. Consequently, the shared know-how of linguistic interactions is not reduced to the sum of the know-how of the participants in at least two senses. First, in several concrete cases of interaction (like the football match example discussed in section 3) no individual agent strongly regulates the interaction *alone*, so the shared know-how mobilized in it is not reducible to each participants’ know-how. Secondly, and more generally, since birth we are becoming linguistic bodies and, in this process, not only we become members of linguistic communities, but also transform them in return. LB has, therefore, an openness to a diachronic dimension of shared know-how in virtue of shifting the research on linguistic cognition from propositional content to historically constituted linguistic bodies.

Similarly, although REC focuses on the diachronic dimension of shared know-how in its explanation for the emergence of linguistic cognition, it also makes room for a synchronic dimension. This is so because becoming socioculturally scaffolded always involves two or more individuals acting together under a set of shared norms. This is why we say that LB and REC put forth different and supplementary *emphases* on how social interactions shape cognition, but naturally neither REC nor LB flat out ignore the diachronic or synchronic dimensions altogether. Thus, the explanations developed by REC and LB can be put to work together, for they account for how linguistic cognition emerges as individuals become socioculturally scaffolded by focusing on different levels or dimensions of social interaction.

## 5. Concluding remarks

Like any other research program that has withstood the test of time, enactivism has its internal disputes. In particular, it may seem that REC and LB deal with different problems and have diverging prospects. We have argued that, despite their differences, these perspectives lead to the same fundamental idea of *shared know-how*, given that they fundamentally agree that the normativity relevant to know-how is irreducibly shared among others. To use a Wittgensteinian phrase in an enactivist framework, we can say that both REC and LB reject a notion of ‘private normativity’ when it comes to the ways through which we can direct ourselves to the environment and to others. That is why the enactivist program does not face an internal rupture and that perspectives that would otherwise seem to compete for hegemony can eventually be conciliated into a more robust and hopefully even more prolific paradigm.

### **Acknowledgements**

We would like to thank Eros de Carvalho, Nara Figueiredo and Pedro Noguez for reading and discussing previous versions of this paper. We would also like to thank two anonymous reviewers whose comments and criticisms greatly improved the quality of our manuscript.

### **Authors’ bios**

Giovanni Rolla is a professor of Philosophy at Federal University of Bahia (UFBA), Brazil. He is a permanent member of the Graduate Program of Philosophy at the same university, a founding member of the Cognition, Language, Enaction and Affectivity research group (Federal University of São João Del-Rei) and also a member of the Enactive Cognition and Narrative Practices research group (University of Wollongong). His interests are Enactivism, Ecological Psychology, Embodied Cognition, Philosophy of Cognitive Sciences and Epistemology.

Jeferson Huffermann is a PhD Candidate at the Philosophy Program of the Federal University of Rio Grande do Sul (UFRGS), Brazil. He is currently studying the contributions of the enactive approach to our understanding of perception and language and its epistemological consequences. Research areas of his interest are Philosophy of Cognitive Science, Embodied Cognition, Enaction, Theories of Perception, Philosophy of Science and Epistemology.

## References

- Brooks, R. (1991). Intelligence without Representation. *Artificial Intelligence*, 47, 139–159.
- Bruineberg, J., Chemero, A., & Rietveld, E. (2019). General ecological information supports engagement with affordances for ‘higher’ cognition. *Synthese*, 196(12), 5231–5251. <https://doi.org/10.1007/s11229-018-1716-9>
- Bruineberg, J., & Rietveld, E. (2014). Self-organization, free energy minimization, and optimal grip on a field of affordances. *Frontiers in Human Neuroscience*, 8. <https://doi.org/10.3389/fnhum.2014.00599>
- Carvalho, E. M. de. (2021). The shared know-how in Linguistic Bodies. *Filosofia Unisinos*, 22(1), 94–101. <https://doi.org/10.4013/fsu.2021.221.11>
- Chemero, A. (2009). *Radical Embodied Cognitive Science*. Cambridge, Massachusetts: The MIT Press.
- Chemero, A. (2013). Radical Embodied Cognitive Science. *Review of General Psychology*, 17(2), 145–150. <https://doi.org/10.1037/a0032923>
- Clark, A., & Toribio, J. (1994). Doing without representing? *Synthese*, 101(401–431).
- De Jaegher, H., & Di Paolo, E. (2007). Participatory sense-making. *Phenomenology and the Cognitive Sciences*, 6(4), 485–507. <https://doi.org/10.1007/s11097-007-9076-9>
- De Jaegher, H., & Froese, T. (2009). On the Role of Social Interaction in Individual Agency. *Adaptive Behavior*, 17(5), 444–460. <https://doi.org/10.1177/1059712309343822>
- Devitt, M. (2011). Linguistic Knowledge. In J. Bengson & M. A. Moffett (Eds.), *Knowing How: Essays on Knowledge, Mind, and Action*. Oxford: Oxford University Press.
- Di Paolo, E. A. (2020). Enactive becoming. *Phenomenology and the Cognitive Sciences*. <https://doi.org/10.1007/s11097-019-09654-1>
- Di Paolo, E., Burhmann, T., & Barandiaran, X. (2017). *Sensorimotor Life: An Enactive Proposal*. Oxford, New York: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198786849.001.0001>
- Di Paolo, E., Cuffari, E. C., & De Jaegher, H. (2018). *Linguistic Bodies: The Continuity Between Life and Language*. Cambridge, Massachusetts: MIT Press.
- Dretske, F. (1988). *Explaining Behaviour: Reasons in a world of causes*. Cambridge: MIT Press.
- Figueiredo, N. M. (2021). On the notion of dialectics in the linguistic bodies theory. *Filosofia Unisinos*, 22(1), 108–116. <https://doi.org/10.4013/fsu.2021.221.13>
- Fodor, J. (1990). *A theory of content and other essays*. Cambridge: MIT Press.

- Gastelum, M. (2020). Bringing Forth Languages: Enacting Humanity. Review of Linguistic Bodies: The Continuity Between Life and Language by Ezequiel A. Di Paolo, Elena Clare Cuffari and Hanne De Jaegher. *Constructivist Foundations*, 15(2), 194–198.
- Gould, S. J., & Lewontin, R. C. (1979). The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme. *Proceedings of the Royal Society of London - Biological Sciences*, 205(1161), 581–598.  
<https://doi.org/10.1098/rspb.1979.0086>
- Hutto, D. (2006). Unprincipled engagement: Emotional experience, expression and response. In R. Menary (Ed.), *Radical Enactivism: Intentionality, Phenomenology and Narrative: Focus on the Philosophy of Daniel D. Hutto*. Amsterdam: John Benjamins Publishing Company.
- Hutto, D. D. (2005). Knowing what? Radical versus conservative enactivism. *Phenomenology and the Cognitive Sciences*, 4(4), 389–405.  
<https://doi.org/10.1007/s11097-005-9001-z>
- Hutto, D. D., & Myin, E. (2013). *Radicalizing Enactivism: Basic Minds without Content*. Cambridge, Massachusetts: MIT Press.
- Hutto, D. D., & Myin, E. (2017). *Evolving Enactivism: Basic Minds Meet Content*. Cambridge, Massachusetts: The MIT Press.
- Hutto, D. D., & Satne, G. (2015). The Natural Origins of Content. *Philosophia*, 43(3), 521–536.
- Kiverstein, J. D., & Rietveld, E. (2018). Reconceiving representation-hungry cognition: an ecological-enactive proposal. *Adaptive Behavior*, 26(4), 147–163.  
<https://doi.org/10.1177/1059712318772778>
- Kiverstein, J., & Rietveld, E. (2021). Scaling-up skilled intentionality to linguistic thought. *Synthese*, 198(S1), 175–194. <https://doi.org/10.1007/s11229-020-02540-3>
- Kyselo, M. (2014). The body social: An enactive approach to the self. *Frontiers in Psychology*, 5(September), 1–16. <https://doi.org/10.3389/fpsyg.2014.00986>
- Laland, K., Matthews, B., & Feldman, M. W. (2016). An introduction to niche construction theory. *Evolutionary Ecology*, 30(2), 191–202. <https://doi.org/10.1007/s10682-016-9821-z>
- Laland, K. N., Odling-Smee, J., & Feldman, M. W. (2000). Niche construction, biological evolution, and cultural change. *Behavioral and Brain Sciences*, 23(1), 131–146.  
<https://doi.org/10.1017/S0140525X00002417>
- Laland, K., Uller, T., Feldman, M., Sterelny, K., Müller, G., Moczek, A., ... Odling-Smee, J.

- (2015). The extended evolutionary synthesis: Its structure, assumptions and predictions. *Proceedings. Biological Sciences / The Royal Society*, 282.  
<https://doi.org/10.1098/rspb.2015.1019>
- Millikan, R. (1984). *Language, Thought and Other Biological Categories*. Cambridge, Massachusetts: MIT Press.
- Millikan, R. (2004). *Varieties of meaning: The 2002 Jean Nicod lectures*. Cambridge: MIT Press.
- Millikan, R. (2005). *Language: a biological model*. Oxford: Oxford University Press.
- Moyal-Sharrock, D. (2019). From deed to word: gapless and kink-free enactivism. *Synthese*.  
<https://doi.org/10.1007/s11229-019-02218-5>
- Myin, E., & van den Herik, J. C. (2020). A twofold tale of one mind: revisiting REC's multi-storey story. *Synthese*. <https://doi.org/10.1007/s11229-020-02857-z>
- Noë, A. (2004). *Action in Perception*. Cambridge, Massachusetts: MIT Press.
- Noë, A. (2012). *Varieties of Presence*. Cambridge, Massachusetts: Harvard University Press.
- Odling-Smee, F. J., Laland, K. N., & Feldman, M. W. (2003). *Niche Construction: The Neglected Process in Evolution. Monographs in population biology, vol. 37*. Princeton; Oxford: Princeton University Press. <https://doi.org/10.2307/j.ctt24hqpd>
- Papineau, D. (1987). *Reality and Representation*. Oxford: Oxford University Press.
- Rietveld, E. (2008). Situated Normativity: The Normative Aspect of Embodied Cognition in Unreflective Action. *Mind*, 117(468), 973–1001. <https://doi.org/10.1093/mind/fzn050>
- Rietveld, E., & Kiverstein, J. (2014). A Rich Landscape of Affordances. *Ecological Psychology*, 26(4), 325–352. <https://doi.org/10.1080/10407413.2014.958035>
- Rolla, G. (2019). Knowing how one knows. *Logos and Episteme*, 10(2).  
<https://doi.org/10.5840/logos-episteme201910217>
- Rowlands, M. (2010). *The New Science of the Mind: From Extended Mind to Embodied Phenomenology*. Massachusetts: The MIT Press.
- Ryle, G. (1949). *The Concept of Mind*. London: Hutchinson University Library.
- Thompson, E. (2007). *Mind in Life: Biology, Phenomenology and the Sciences of the Mind*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Thompson, E. (2018). Daniel D. Hutto and Erik Myin Evolving Enactivism: Basic Minds Meet Content. *Notre Dame Philosophical Reviews*. Retrieved from <https://ndpr.nd.edu/news/evolving-enactivism-basic-minds-meet-content/>
- Varela, F. (1999). *Ethical Know-How: Action, Wisdom and Cognition*. Stanford: Stanford University Press.

Varela, F. J. (1979). *Principles of Biological Autonomy*. New York: Elsevier-North Holland.

Varela, F. J., Thompson, E., & Rosch, E. (2016). *The Embodied Mind* (Revised Ed).

Cambridge, Massachusetts: The MIT Press.

Ward, D., Silverman, D., & Villalobos, M. (2017). Introduction: The Varieties of Enactivism.

*Topoi*, 36(3), 365–375. <https://doi.org/10.1007/s11245-017-9484-6>

Werner, K. (2020). Enactment and construction of the cognitive niche: toward an ontology of the mind-world connection. *Synthese*, 197(3), 1313–1341.

<https://doi.org/10.1007/s11229-018-1756-1>