

## Radically Embodied Introspection

### Abstract

Introspection is often conceptualized as a “purely inner” activity, whereby the introspector temporarily breaks their coupling with the external world to focus on their “inner world”. We offer a substantially different picture of introspection. Inspired by radically embodied cognitive science, we argue that introspective processes delivering substantial self-knowledge consist of embodied, world-involving activities wherein the introspector remains coupled with the world in specific, controlled ways. Our argument unfolds as follows: after a brief introduction (§1), we provide a minimal account of introspection (§2) followed by a brief introduction to radically embodied views of the mind (§3). Then, in (§4), we present in detail a case of radical embodied introspection (§4.1); we argue that that case is indeed a case of introspection (§4.2), and finally we defend our claim from some foreseeable objections (§4.3). In (§5) we offer other examples, showing that radically embodied introspection is a widespread and varied phenomenon. Lastly, (§6) concludes the paper sketching some morals to be drawn from our examples.

**Keywords:** Introspection, self-knowledge, radical embodiment, sense-making, therapy

### §1 - Introduction

“Introspection” (the word) derives from the latin *spicere* (to look) and *intro-* (inside), conveying the image of the mind’s eye turning-inward, to observe one’s thoughts and feelings. The dictionary definition of introspection conveys a similar idea, characterizing it as a “reflective *looking inward*, an examination of one’s thoughts and feelings”.<sup>1</sup> Unlike processes that help us gain knowledge of the external world, introspection should be a “distinctive process that generates knowledge of one’s own mind *only*” (Schwitzgebel 2024, italics added); hence a process insulated from the external world and worldly affairs.

This traditional view seems widely - though not universally<sup>2</sup> - endorsed. Introspective psychologists, for example, depicted introspection as a quasi-observational “seeing” of one’s current mental states (James 1910; Mill 1882; Titchner 1910), willfully insulated from the environmental contingencies to which these states are connected. The introspective agent “steps away” from the environment, focusing instead on the mental states found “inwards”. A century later, De Vlieger & Giustina defend a similar outlook:

Imagine you are drinking some flavory herbal tea while reading this. If you are to describe your taste experience based on introspection, you need, first, to switch your attention from the reading to the experience – arguably, you cannot accomplish the task if all or most of your attentional resources are directed toward the text. (De Vlieger & Giustina 2022, p. 7)

This “quasi-observational” view is not universal. Yet, even its detractors require introspective processes to be somehow *insulated* from the agent’s external environment. Consider, for example Carruthers (2010):

<sup>1</sup> See <https://www.merriam-webster.com/dictionary/introspection>. Italics added.

<sup>2</sup> Accounts of self-knowledge stressing “transparency” (e.g. Evans 1982; Moran 2001) are an exception to this general trend. We will briefly discuss them in (§4.3).

I shall understand “introspection” quite broadly, to encompass a variety of potential processes postulated by different types of account. There are just two key ideas. One is that introspection is a higher-order process, issuing in awareness or knowledge of (or at least beliefs about) the occurrence of token mental states. [...] The other key idea is that introspection is not an interpretative process. [...] To say that introspection isn’t an interpretative process doesn’t necessarily mean that it isn’t inferential, however. [...]. *What is crucial is just that these inferences should not be ones that appeal to facts about the subject’s own behavior and circumstances as premises.* (Carruthers 2010, pp. 76-77, references omitted and italics added)

Whilst Carruthers rejects a “quasi-observational” view of introspection, introspection remains inward-looking, as the processes constituting it are informationally decoupled from the subject’s outward behavior and situational embedding. Whether or not introspectors engage in “quasi-observing” within themselves, they have to *decouple* from the environment in order to introspect. Such a decoupling seems so essential to the concept of introspection, that accounts of self-knowledge ignoring it are not considered *introspective* accounts of self-knowledge (e.g. Evans 1982).

We paint an alternative picture of introspection. Taking the vantage points of radically embodied cognition, we argue that certain agent-environment couplings qualify as full-blown cases of introspection, at least according to a fairly conservative and minimal conception of it.<sup>3</sup> Introspection, we will show, is *something we do* while writing in our diaries, while talking to ourselves (or with friends) to clear our minds, when confronting our deepest desires and fears with a therapist, or when creating art to explore our feelings in a mindful way. Introspection, we show, is not a detached, decoupled “looking-inwards”, but a worldly, self-exploratory activity of an embodied, enculturated agent embedded in a specific environment. To be clear, our claim here is *not* to argue that introspection is *never* a form of detached “quasi-observation”. We only claim that introspection isn’t *usually* like that.<sup>4</sup> In many real-world, concrete cases, introspection is an embodied, coupled activity. This is what we want to show here.

Our paper unfolds as follows: first, we provide a minimal, arguably uncontroversial, account of introspection (§2) to then introduce radically embodied views of the mind (§3). Then, in §4, we present in detail a case wherein an agent explored her thoughts through embodied interactions with the worldly entity - a diary (§4.1), argue that that case is indeed a case of (radically embodied) introspection (§4.2), and defend the claim from some foreseeable objections (§4.3). In (§5) we provide further cases of radically embodied introspection, showing how widespread and varied it is. Lastly, (§6) concludes the paper sketching some morals to be drawn from our examples.

One clarification before our analysis starts. Here, we are *not* interested in the *epistemology* of introspection, or in uncovering the factors as to why one can know oneself with some special, first-personal, authority. Our inquiry is purely *psychological*: we are interested in the

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<sup>3</sup> Notice: the truth of radical embodied cognitive science is *assumed* - so we won’t defend it. Readers hostile to it can still read us as making the following *conditional* claim: if cognition is radically embodied, then introspection is the worldly activity of self-exploration of an embodied, embedded agent.

<sup>4</sup> *A fortiori*, we are not committed to the claim that radically embodied introspection is the only way for us to gain self-knowledge.

79 *psychological goings on* that produce such such knowledge. Thus, throughout the rest of the  
 80 manuscript, we will use the term “knowledge” and related terms in the way that *cognitive*  
 81 *scientists* use them; that is, to indicate *both* what philosophers would call knowledge and  
 82 belief.<sup>5</sup>

## 83 § 2 - On introspection

84 When it comes to the *psychology* of introspection, philosophers of mind have spoken about  
 85 it in two main ways (cf. Schwitzgebel 2024).

86 *Stricto sensu*, they speak of introspection as “quasi-observing”; that is, as a specific mental  
 87 faculty or psychological process directly and immediately detecting our mental states,  
 88 thereby delivering us knowledge about them. *Stricto sensu* views often see introspection as a  
 89 special, *sui generis* direct epistemic relation delivering infallible knowledge of the  
 90 introspected state (e.g. Balog 2012a; Giustina 2022),<sup>6</sup> and more rarely as an ordinary self-  
 91 monitoring process of the brain (Armstrong 1968).

92 *Latu sensu*, “introspection” refers to *any* psychological process delivering us some, typically  
 93 direct, knowledge of our own mental states, whether such process is guided by a distinctive,  
 94 “quasi-perceptive” faculty or not (Schwitzgebel 2012; Carruthers 2010). Such views of  
 95 introspection are more varied. *Inferentialist* accounts of introspection take it to be a matter  
 96 of inferring one’s own mental states from one’s behavior (see Peirce 1868 a,b). Other  
 97 accounts take introspective acts to *express* the presence of mental states, rather than as  
 98 *reporting* their presence before the “mind’s eye”. Wittgenstein (1953/2019), for example, is  
 99 often credited with such a view, where statements such as “I feel a knee pain” are *expressions*  
 100 of the knee pain just like “ouch!”, only more socially regimented.<sup>7</sup> Others still seem to take  
 101 introspective self-knowledge to *commit* an agent to certain actions, behaviors or dispositions;  
 102 just like by telling the waiter that I want a salad, I now am committed to *really wanting* it and  
 103 ordering it (e.g. Dennett 1991; Coliva 2012). Pluralistic accounts of introspection take  
 104 introspective acts to be realized by a motley crew of multiple, different processes that need  
 105 not be constant even across introspective acts. Introspecting a desire to change career may  
 106 involve decision making and inference from behavioral evidence, whereas introspecting the  
 107 taste of this whisky as “smoked” may involve sensory processing and semantic knowledge  
 108 about whisky (see Schwitzgebel 2012).

109 This plurality of accounts reflects a plurality of different conceptions of introspection, none of  
 110 which trump the other in terms of popularity, intuitivity, or philosophical support.<sup>8</sup> Which  
 111 conception of introspection should we adopt? To avoid begging the question against *any*

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<sup>5</sup> This helps us avoid repeating the clunky phrase “knowledge or belief”, and it is entirely consistent with our aims.

<sup>6</sup> Importantly, acquaintance views of introspection limit themselves to the introspection of phenomenally conscious mental states.

<sup>7</sup> Though perhaps this is an oversimplification of Wittgenstein’s view, see (Finkelstein 2008).

<sup>8</sup> See (Kammerer & Frankish 2023) for an attempt to chart the conceptual space of (non-radically embodied) views of introspection.

112 account, we choose the fairly minimal conception of introspection offered by Schwitzgebel  
113 (2024).<sup>9</sup>

114 Schwitzgebel's regimented view is a disjunctive set of 5+1 conditions for a process to count  
115 as introspective:

- 116 1. **Mentality:** Introspection generates knowledge about *token mental states*  
117 *and processes*;
- 118 2. **First-person:** Introspection generates knowledge about *one's own* token  
119 mental state or processes;
- 120 3. **Temporal proximity:** Introspection generates knowledge about one's own  
121 *present (or recently occurred)* token mental states or processes;
- 122 4. **Directness:** Introspection generates knowledge about such things *directly*  
123 *and immediately*. Whilst the introspective process can be causally  
124 mediated, it can't be *epistemically* mediated: one does not *need to know*  
125 *or be aware* of any other piece of information in order to know something  
126 introspectively;
- 127 5. **Detection:** Introspection is attuned to and detects *independently existing*  
128 token mental states and processes, whose existence is temporally prior to,  
129 and ontologically independent from, the process of introspection itself;
- 130 6. **Effort:** Introspection is not an effortless, automatic, constant or otherwise  
131 trivial process. To introspect (and thus to know, or at least form a belief  
132 on) one's mental states is a *non-trivial cognitive achievement*.

133 Conditions **(1)-(6)** are fairly minimal and almost self-explanatory. **(1)** and **(2)** require one's  
134 introspection to deliver knowledge of one's own (token) mental states; that is, self-  
135 knowledge. **(3)** Imposes that introspection yields knowledge about *recent* mental states,  
136 separating it from mnemonic processes.<sup>10</sup> **(4)** imposes that introspection needs to be direct:  
137 acquiring introspective knowledge does not require one to be aware of, or know, anything  
138 over and above the introspected mental state. **(5)** foregrounds the idea that introspection  
139 detects "what's already there in our mind", without *creating* or otherwise influencing the  
140 detected mental states. And **(6)** differentiates genuine introspection from the sort of pre-  
141 reflective, non-attentive awareness that seemingly accompanies many of our conscious  
142 mental states (e.g. Zahavi 2006; Kriegel 2009).

143 Why say that this is a disjunctive set of 5+1 conditions? Because whilst all of the accounts of  
144 introspection above satisfy **(1)-(3)**, many satisfy only *two* of **(4)-(6)**. This is equivalent to saying  
145 that the account requires the conjunction of **(1)-(3)**, plus at least two of the inclusive  
146 disjunction of **(4)-(6)**, giving us a *disjunctive* set of conditions. And existing accounts of  
147 introspective processes do make use of this disjunction. Inferentialist accounts of  
148 introspection violate **(4)**: inferentially acquired knowledge is mediated (minimally) by the  
149 premises of the inference. Expressivist views, like the one attributed to Wittgenstein, and

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<sup>9</sup> Such a conception is admittedly a bit monolithic in that it "hides under the rug" various nuances of the current philosophical debate on introspection. On the plus side, however, it is relatively neutral: it is able to subsume all views of introspection previously sketched - and it is thus arguably compatible with anyone's view.

<sup>10</sup> It is worth noticing, however, that common parlance still considers as introspective cases wherein a subject obtains knowledge about their own *past* mental states (e.g. one's realizing that they were *really in love* with their teenage crush).

views of introspection based on making public commitments violate (5), as strictly speaking no *detection* takes place. Lastly, some “quasi-perceptual” accounts like Brentano’s (2012) violate (6), as they take the “quasi-perception” to automatically accompany all mental acts. So, many accounts of introspection satisfy only *five* requirements of Schwitzgebel’s conception. Hence, we take that to satisfy (1)-(3) plus two conditions between (4)-(6) is *sufficient* for a process to be genuinely introspective.

Accounts of introspection also differ in *scope*: for example, acquaintance-based accounts often apply only to phenomenally conscious states. Inspired by Cassam (2014), we take that a good account of introspection should be restricted in scope to *substantial self-knowledge*. Substantial self-knowledge can be understood as the self-knowledge that is *existentially relevant* to the subject, and whose possession helps the subject to live an authentic life; that is, a life whose course is not largely determined by superficially held beliefs and conventions. When we introspect (willingly and deliberately), we typically do not care about knowing the sort of trivial mental states analytic accounts of introspection often focus on, such as whether we really believe that the capital of France is Paris, whether we are seeing a blue triangle, or whether we are in pain. What we typically aim to introspect are matters substantial to our existence, such as whether one *really* wants this job, or whether one *really* has romantic feelings for a colleague, and so forth. Any adequate account of introspection must thus be able to capture *this* sort of case. Cases whereby one introspects to gain substantial self-knowledge shall thus be our *privileged* targets.

The discussion of introspection has thus far been silent on the embodiment and environmental embedding of the introspector, considering these aspects as irrelevant to the process. But there is now ample empirical evidence that embodiment and environmental embedding are *essential* to understanding an agent’s psychology (e.g. Newen et al. 2018). We think they are also relevant for introspection. In what follows, we will show that certain embodied activities of an environmentally embedded agent *do* qualify as introspection in the relevant sense; that is, they satisfy (1)-(3) and two amongst (4)-(6) conditions, and deliver substantial self-knowledge to the agent enacting them. But first, we need to introduce some main tenets of radical embodiment.

### § 3 - On radical embodiment

From the 90’s on, the standard functionalist, cognitivist (computation- and representation-based) understanding of the mind analytic philosophers tended to endorse came under heavy pressure due to the emergence of *embodied*, *embedded*, *extended* and *enactive* accounts of cognition (Newen et al. 2018; Gallagher 2023). The relevant sense in which the mind is *embodied* is that its functioning constitutively and essentially depends on the agent’s bodily (i.e. extra-cerebral) features (Kyselo & Di Paolo 2015), which directly take care of cognitive or mental functions (cf. Bongard & Pfeifer 2007). Cognition is *embedded* in that it is heavily dependent on specific environmental factors. We constantly engineer our environment so as to create cognitive and affective niches scaffolding our mental activity (Bertolotti & Magnani 2017; Colombetti & Krueger 2015), e.g., by creating mnemonic devices that embed our mental activity in a specific cultural and social context. Minds are also *extended* in the environment, meaning that at times, environmental factors are so important to our mental functioning and so deeply intertwined with our neural apparatus that the two form a single coupled system which is the physical basis of at least some of our mental processes (cf. Clark

& Chalmers 1998). When this happens, then, the relevant aspects of the environment become part of the physical basis of our minds (Clark 1997; 2008). Finally, the mind is also *enactive* in that its functioning does not primarily consist in the representing of a pre-given world, but in an embodied activity of exploration which establishes a meaningful perspective on the environment and makes sense of it in various terms - as pleasurable or displeasurable, friend or foe, good or bad (cf. Froese & Di Paolo 2011). It means that the mind's primary task is not that of constructing an "inner simulacrum" of reality (cf. Clark 2017; Anderson 2017), but that cognition is a *sense-making activity* whereby the agent comes to establish the meaning of what they encounter (Thompson 2007; Thompson & Stapleton 2009).

Importantly, embodied, embedded, extended and enactive views of the mind vary in radicality (cf. Gallagher 2011). *Moderate* views (e.g. Clark 2008) remain somewhat committed to some cognitivist assumptions, like representationalism and computationalism. *Radically embodied* views eschew these commitments, conceiving cognition as a dynamical, interactive process of agent-environment interaction (Chemero 2009; Hutto & Myin 2013, 2017; Gallagher 2017; Di Paolo et al. 2017).<sup>11</sup> They emphasize the situated nature of cognition and the idea that cognitive processes are inseparable from the context in which they occur: our cognitive activities are shaped by the specific situations, environments, and interactions that we experience. We aim to provide an account of introspection of this latter kind.

To have an idea of how radically embodied cognition can explain introspection, let us sketch how radically embodied views typically explain mental phenomena. Usually, they rely on the explanatory tools of complexity sciences and dynamical modeling (see Chemero 2009; Bruineberg & Rietveld 2014; Lamb & Chemero 2018; Favela 2024). Without getting into the mathematical detail, such tools tend to quantitatively and qualitatively capture the way in which the agent and environment interact, thereby identifying the neural, bodily and environmental parameters governing the unfolding of agent-environment interactions.

Such a style of explanation is deeply embodied and environmentally embedded, as it naturally highlights the various ways in which concrete bodily features and aspects of the sociomaterial environment regulate the unfolding of cognitive exchanges. For example, radically embodied views of perception might stress the role of one's *actual leg length* and *actual step height* in judging whether a step is perceived as climbable or not (e.g. Warren 1984). This explanation also shows that cognitive activities are often extended, as they are realized by various neural, bodily and extra-neural components in the interaction (see Silberstein & Chemero 2012; Palermos 2014; Favela et al. 2021). This explanation is also enactive, as it stresses that cognition does not consist in the correct representation of an external (or internal, in the case of introspection) reality, but a process of interaction with the world. Through such interactions, the agent makes sense of the world, encountering it in meaningful and relevant ways (Thompson 2007; Thompson & Stapleton 2009; Froese & Di Paolo 2011; Weichold & Rucińska 2021).<sup>12</sup> Sense-making bears an obvious connection to emotional valence, thus

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<sup>11</sup> Notice, for the sake of clarity, that radically embodied view denies only the existence of inner, mental representations. They are perfectly fine with *external, public* representations (see Myin & Van den Herik 2021).

<sup>12</sup> A somewhat "alternative" tradition within radical embodiment (see Baggs & Chemero 2021) describes the world in terms of *affordances* - that is, possibilities for the agent to interact with the world in given ways (e.g. Turvey 1992; Chemero 2009). For the most part, we will not call upon affordances in this paper. The reason is purely pragmatic: we do not find them *useful* to make our claim. We recognize, however, that the point we wish to articulate *could* be made in terms of certain affordances for "higher cognition" (Bruineberg *et al.* 2019), and

radically embodied cognition is also *emotional* (c.f. Colombetti 2014). Sense-making, being situated, also need not be a solitary endeavor. Sometimes it is possible to make sense of a situation together with others (see De Jaeger & Di Paolo 2009). A horror movie, for example, may frighten an isolated viewer, but it can be seen as hilarious or comical when watched with friends. The introspective agent is also embedded in a specific linguistic environment, where language serves as a potent tool for (joint) meaning making: talking is a (joint) sense-making activity in continuity with more basic, sensorimotor meaning-making activity (Jensen 2014, Rucińska & Weichold 2022). This perspective emphasizes that language use - even whilst introspecting - is not static, but continuously shaped and transformed through social exchanges and contextual interactions.

In short, radical embodied cognition offers a very externally-oriented view of the mind and of cognition. While a comprehensive explanatory (dynamical) model of radically embodied introspection could be delineated, we leave such work for future research. Here, we simply aim to *show* what introspection would look like from such a radically embodied perspective. For example, does going “radically embodied” mean rejecting the position that the mind has an “interior” aspect, one that can be experienced by an individual and does not show in interactions with the “external” world? Not at all. It simply reconceives “interiority” in terms of internalized practices, habits and techniques (Leontiev 1981; Podolskiy 2012; see also Rucińska 2022).<sup>13</sup> Our interiority is not something hidden within our cranium, but rather the product of the sedimentation of our experiences and interactions. By being “molded” by various experiences and interactions, we are able to bring them to bear in novel contexts. Hence, for example, our memory and imagery consist in our ability to re-enact specific past interactions when needed (Hutto & Myin 2017; Gallagher & Rucińska 2021), not in the inner observation of stored pictures in a “mental photo album”. Similarly, internalizing language (and social acts) can be cashed out as a public capacity of using language and speaking, but done silently, without expressive behavior (Geurts 2018).

With this general introduction to radical embodied cognition at hand, it is now possible to look at introspection from a radically embodied perspective.

#### § 4 - Radically embodied introspection

*Prima facie*, nothing could be further from radical embodiment than introspection. How can one’s discovery of one’s mental states be a kind of situated sensorimotor activity of sense-making? We start answering this question with one example of writing one’s thoughts down in a diary (§4.1). We then (§4.2) analyze this case, showing that it is *really* a case of introspection in the relevant sense spelled out above (§2). Then, (§4.3) addresses major objections to treating our account as genuine introspection that we foresee, followed by our rebuttals. This sets the stage for considering further cases (§5), showing that radically embodied introspection is rather common and almost ubiquitous.

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that most likely calling upon affordances offers us the *best* way to explain the difference between various forms of radical embodied introspection (see §4.3 below). At present, however, we do not aim to *explain* these differences. Our aim is, in a way, more fundamental: we wish to establish that radical embodied introspection is real and that it is indeed introspection.

<sup>13</sup> A view strongly inspired by (Vygotsky 1934; Mead 1934), which requires further argument that is beyond the scope of this paper. Toon (2023) has recently put a fictionalist spin on this idea.

#### 269 § 4.1 - All about Eve's diary

270 Eve is a young woman that harbors some resentment towards her mother. Her resentment is  
 271 fueled, and (according to Colombetti and Roberts (2015), whose example we are here building  
 272 upon)<sup>14</sup> *partially realized* by a diary, where Eve records her thoughts and insights about the  
 273 upsetting behavior of her mother.

274 Consider an hypothetical entry in Eve's diary, regarding Eve's *viva voce* successful defense of  
 275 her Ph.D. thesis. On such an important day, all that Eve's mother said to her was: "Too bad  
 276 you wore *that* dress; it made you look fat and its color really did not suit your complexion".  
 277 What could the corresponding entry in the diary look like? It will hardly be a simple, "neutral"  
 278 recording of the event. More likely, as Colombetti and Roberts argue, it will be emotionally  
 279 charged and bilious towards Eve's mother. It could reasonably look something like this:

280  
 281 "I defended my *viva* today and all she said the whole day was: «you look  
 282 fat, that dress doesn't suit your complexion». I HATE HER. She hurts me  
 283 so much. I really hoped that she would say she's proud of me. I still hope  
 284 she will say something nice - that I've done well - but nothing, she's the  
 285 usual let down. I feel so stupid for expecting more of her."

286 What should we think about Eve's writing? One could take it as a *recording* of what she feels  
 287 about her mother: Eve first remembers her mother's behavior, then she introspects how she  
 288 feels about it, and lastly she writes it in her diary.

289 This "recording" view is possible, but unlikely. Our working memories are very limited (Miller  
 290 1956), and they can rarely store complex conjoined texts in memory *before* writing them  
 291 down. Moreover, phenomenologically speaking, writing a diary does not *feel* like mere  
 292 recording or offloading of figured-out feelings. We (the authors, but we suspect that the  
 293 reader will agree) typically have some ideas about what we want to write, but figure out the  
 294 details of what we want to say by engaging in the actual writing, often through repeated  
 295 writing-reading-rewriting cycles. We rarely simply write down pre-existing thoughts,  
 296 especially when these thoughts are complex and/or emotionally salient. As Colombetti &  
 297 Roberts (2015, p. 1257) persuasively argue, it seems more likely that Eve starts with a  
 298 somewhat vague and imprecise idea of what she wishes to write in her diary, and that idea  
 299 gets precisified and refined *in the very act of writing*. Thus, it is far more likely that Eve "figures  
 300 out" what she feels *by writing* it down. For example, she figures out that she has such strong  
 301 feelings of hate towards her mother by using those precise words "I hate her". This judgment  
 302 clearly does not come out of the blue: indeed, something is grounding her negative  
 303 introspective thoughts about her mother (Eve's feeling of upset). But, whether the feelings  
 304 are of hate, or "just" resentment or something else, is precisely what is being "figured out"  
 305 *by Eve using* these specific words. In addition, the writing down of the words "I hate her"  
 306 allows Eve to consider if she actually feels this way. Perhaps Eve felt release, for she managed  
 307 to precisely make sense of what she felt. Or perhaps she felt remorse for using such strong  
 308 language, and realized that she doesn't hate her mother after all, even if she thinks she has  
 309 good reasons for it at this moment. This points to the co-constructing view of writing practices  
 310 - writing being a means of sense-making. Thus, Eve discovers she harbors hate towards her

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<sup>14</sup> The example was initially mobilized to defend an extended account of emotions. Here we will not defend it (though, of course, we are sympathetic to it). We are simply re-purposing their example.

311 mother not by “looking inside” her mind, but by writing; that is, by engaging sensomotorically  
 312 with a prop in a languaging activity. This, we want to suggest, is an act of radically embodied  
 313 introspection.

314 Let us consider the ways in which Eve’s writing is radically embodied, enactive, embedded  
 315 and extended. Firstly, Eve’s acts of introspection are embodied and enactive, for she  
 316 discriminates her emotions in an “interpretative”, *sense-making* activity, wherein actual  
 317 bodily signals are constitutively involved. This is supported by our best emotional science,  
 318 according to which we discriminate emotions by sense of our bodily signal in terms of the  
 319 *emotional concepts* we master (cf. Barrett 2017a, b; see also Seth 2013; Seth & Friston 2016).  
 320 The concepts, importantly, are not concepts in the *psychological* sense of the term; that is,  
 321 they are not inner representations such a prototypes or exemplars (cf. Machery 2009). They  
 322 are just non-representational flows of cerebral neural activity aimed at regulating our body,  
 323 keeping us in an appropriate state of action-readiness (Barrett 2017a,b).<sup>15</sup>

324 Thus, the usage of such concepts does not consist in the mere *labelling* of pre-formed and  
 325 pre-existing mental states. Rather it consists in the *regulation* of one’s internal (and external)  
 326 milieu in a way that *establishes a meaningful perspective* on oneself and one’s situation (see  
 327 esp. Barrett 2017a; Seth & Friston 2016). And the act of applying these concepts is not a purely  
 328 cerebral affair - indeed, it is something that takes place *in Eve’s writing*, and that is thus deeply  
 329 embedded in a material, social and cultural environment and that constitutively involves  
 330 certain interaction with it.<sup>16</sup> Let us expand.

331 Eve’s acts of introspection are embedded in a specific environment. For, Eve writes *a diary* -  
 332 which situates her both in a material environment *and* in a socio-cultural environment.  
 333 Materially, Eve is situated because certain physical artifacts - the diary and a pen, say - must  
 334 be present in order for her to write her diary. But writing a diary also situates her  
 335 socioculturally, for writing a diary is a culturally sanctioned act, and a culturally specific form  
 336 of writing, wherein the absence of a reader (other than one’s future self) allows one to be  
 337 particularly radical and uncompromising in one’s expression. Moreover, the language Eve  
 338 deploys situates her even further. Different cultures “carve up” emotional experiences in  
 339 different ways, developing different emotional concepts (in the sense seen above) and  
 340 different corresponding emotional words (Mesquita & Frijda 1992; Mesquita & Walker 2003;  
 341 Mesquita 2022). As Eve is not inventing her own language, but using emotional words  
 342 stemming from her culture, Eve’s private sense-making activity is embedded in a specific  
 343 cultural niche, which shapes the boundaries of the possible senses Eve may make of her own  
 344 mental states. Eve’s act is also environmentally embedded and situated in more material and  
 345 “pragmatic” ways: Eve will realistically write only when certain material and situational  
 346 conditions obtain - e.g., when she’s alone, in a tranquil space, in the right mood, and with a  
 347 well-working pen. Eve won’t realistically write while driving, when at work, or at a party. Eve’s  
 348 diary entry will also look different if the ink in her pen starts to run out and she switches to  
 349 typing her diary entry on her phone. Eve’s writing is thus an act deeply embedded in a fairly

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<sup>15</sup> See (Downey 2018, Facchin 2021) for convincing non-representational readings of that flow of neural activity.

<sup>16</sup> A possible wrinkle: *how*, if concepts are just *cerebral* flow of neural activity, can they be applied *in writing* (i.e. in a process that takes place outside the brain)? The answer, in extreme succinct terms, is that the form of control enabled by concepts (in this sense) is extended and can span brain, body and world, (for example, see Clark 2024).

350 specific material and sociocultural niche that sustains and makes possible Eve's writing (see  
351 Krueger 2014b).<sup>17</sup>

352 Eve's introspective act is also extended, as it *constitutively* involves certain environmental  
353 interactions, such as the manipulation of the relevant external tool (diary). Her writing is in  
354 fact an *epistemic action*, aimed at attaining some specific epistemic goal (plausibly, gaining  
355 knowledge of Eve's own thoughts and emotions), rather than a pragmatic action, aimed at  
356 bringing about a desired worldly state of affairs (e.g. having a diary full of inscriptions).<sup>18</sup>  
357 Epistemic actions, however, are a prime case of *extended* cognitive activities: their  
358 performance is not just an aid to an agent's cognition, but *part of* the agent's cognitive  
359 processing (Clark 2008; Kirsh 2019; Chalmers 2019). The external, environmental props  
360 involved in such actions are thus extremely important - a malfunctioning pen may, for  
361 instance, irritate Eve, leading her to choose different, shorter words to capture her anger. Or,  
362 by writing on a computer, Eve might be writing too fast to really concentrate and ponder her  
363 feelings, leading her to different, perhaps *shallower* sense-making activity (not to mention  
364 the 'aid' of computer-induced 'autofill' function that may suggest words to her).

365 We take these claims as *descriptive* claims, and we won't defend them here in depth. As said  
366 above, we *assume* the truth of radical embodiment, and move from there. What we wish to  
367 do now, then, is to show that such an embodied, enactive, embedded and extended act is  
368 indeed an act of *introspection*.

#### 369 § 4.2 - Why this is indeed introspection

370 §2 minimally defined introspection in terms of six conditions: introspection **(1)** generates  
371 knowledge about token mental states, that **(2)** are the introspector's own, that **(3)** are  
372 temporally proximal to the act of introspection, and **(4)** such knowledge is direct, **(5)** detects  
373 pre-existing mental states and **(6)** such knowledge is effortfully gained. Also recall that these  
374 six conditions really are "5+1": in order for a process to be genuinely counted as introspective,  
375 it is sufficient that it meets **(1)-(3)** plus *two* of **(4)-(6)**.

376 It's easy to see that Eve's writing satisfies **(1)-(3)**. By writing in her diary, Eve makes sense -  
377 and thus knows - of *token mental states* that are *her own*. Also, she is currently *tokening* these  
378 mental states, which are thus *present*. What about criteria **(4)-(6)**? We propose that Eve's case  
379 satisfies **(4)** and **(6)**, but fails **(5)**. And, as said above, this is *sufficient* for the case to be counted  
380 as a case of introspection.

381 Consider first **(4)**. Is Eve's self-knowledge direct, in the sense of not requiring awareness of  
382 anything else to be attained? We think so. We don't claim that Eve gains self-knowledge by  
383 *reading* what she writes - which arguably entails the mediation of sensory awareness of the  
384 written entry, and its interpretation. Rather, Eve gains self-knowledge *by writing*: it is in the

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<sup>17</sup> Friends of affordances will be quick to point out that Eve's material environment must afford her writing, and thus afford the real, physical activity whereby she applies her concepts. But affordances, we wish to remark, are only a part of the story. There are *prima facie* non-perceivable, cultural aspects of the environment as well (e.g. a certain culturally determined lexicon of emotional concepts and words), which influence her sense making activity in a way that the notion of affordance seems ill-suited to capture - unless one wants to extend the concept of affordance so much as to risk emptying it of any determinate sense (for more on this discussion, see Segundo-Ortin & Heras-Escribano 2024).

<sup>18</sup> On the distinction between pragmatic and epistemic actions, see (Kirsh & Maglio 1994).

385 act of writing wherein she makes sense of her state, thereby generating the relevant self-  
 386 knowledge. Her writing drives in a particular way the application of the relevant emotional  
 387 concepts, whereby she makes sense of her own situation in terms of her harboring hatred  
 388 towards her mother. She doesn't have to *read* it to know it - writing it is enough.

389 Eve's writing is also neither effortless nor automatic, and thus satisfies (6). To write, we need  
 390 to exert many of our cognitive abilities and be focused on what we write, trying to find the  
 391 right words and structuring them in the right way. Eve must fetch for the world "hate" in order  
 392 to make sense of her state in a satisfactory way. Neighboring words like "strong dislike" and  
 393 "disappointment" won't do - they don't capture her feelings in the precise way. Similarly,  
 394 "loathe" or "spite" may convey *too much* hostility. Writing is hard, and Eve's case is no  
 395 exception, especially given the fact that by writing she is actively engaging in making sense of  
 396 our own mental life.

397 What about (5)? Isn't Eve detecting a pre-existing feeling of hate towards her mother? As  
 398 prefaced above, radically embodied accounts can't answer this question positively. Sense-  
 399 making activities are, in an important way, *constructive*. In sense-making, an agent does not  
 400 discover a pre-existing "meaning" that inhabits the world independently from the agent.  
 401 Rather, the agent establishes the meaning of something, based on the interactions that this  
 402 thing affords (Thompson 2007; Thompson & Stapleton 2009). Of course, this is not an  
 403 arbitrary creation of meaning *ex nihilo* - after all, the space of possible interactions is  
 404 constrained by the actual features of the agent and the environment - but still, it is not a  
 405 *discovery* of a *pre-existing* meaning. In Eve's case, she doesn't "notice" an "hate token" in her  
 406 mind. Indeed, pre-categorized emotion tokens for the agent to report may not even exist  
 407 (Barrett 2017b; Masquita 2022). Rather, Eve engages in a complex activity whereby she makes  
 408 sense of her bodily states and her condition in terms of specific, culturally sanctioned  
 409 concepts, such as the concept of "hate". These states and conditions clearly pre-exist Eve's  
 410 writing and introspection, but their meaning *as hate* - the mental states which she introspect  
 411 - is at least in part a product of her writing.

412 If the analysis above is correct, then Eve's writing satisfies all (1)-(6) but (5), and it thus  
 413 qualifies as radically embodied *introspection* in the relevant sense.

414 Let us now examine and defuse some intuitive objections to this claim.

#### 415 § 4.3 - Major objections and rebuttals

416 One objection we foresee is that Eve's writing is not really introspection because, whilst it  
 417 allows Eve to know her own mental states, that is not its *function*. Presumably, introspective  
 418 processes don't just *accidentally* make us know our mind, they have the *function* of delivering  
 419 such knowledge. And Eve's writing may seem to lack it. So, whilst Eve's writing satisfies (1)  
 420 and (2), (1) and (2) are too weak and should be functionally re-interpreted.

421 However, even functionally re-interpreted, (1) and (2) are satisfied by Eve's writing.  
 422 "Functions" are mainly interpreted in two ways, and Eve's writing plausibly fits both.  
 423 According to a "system function" view of functions, the function of an item or a process is just  
 424 the causal role that item or process plays in a larger whole (Cummins 1975; Preston 1998).  
 425 And according to a notion of function based on "selected effect", the function of an item or  
 426 process is the effect the item or process has had, and in virtue of which novel tokens of such

427 items or processes are continuously produced (Millikan 1984). Eve's writing, however, *does*  
 428 allow Eve to know her own mental states, and it is part of the process whereby she gets to  
 429 know them (or so we argued). Thus, it satisfies the "system function" notion of function. And  
 430 it seems reasonable to say that Eve *keeps writing* in her diary at least in part because her  
 431 writing lets her know herself better. If so, then Eve's writing has also the "selected function",  
 432 amongst other things, of letting Eve know herself.

433 One may further contend that Eve's writing plays (and is designed to play) a different function  
 434 than delivering self-knowledge, such as the function of *expressing* Eve's *emotions* (or  
 435 'venting'). Surely the "I HATE HER" written in all caps suggest that her writing plays an  
 436 expressive role as well. Alternatively, one may contend that Eve's writing has the function of  
 437 supporting her *self-control*: her writing plays the function of a sophisticated squeeze ball  
 438 forcing Eve to calm down.

439 We find this a non-issue. On the one hand, something can be *both* an expression and a report  
 440 - the two are not mutually exclusive. A child shouting "I want teddy now!" is both *expressing*  
 441 and *reporting* their desire for their teddy bear. On the other hand, *bona fide* accounts of  
 442 introspective self-knowledge do describe introspective events as involving processes and  
 443 mechanisms having (also) functions not related, or in addition to, introspection. For example,  
 444 general faculties for ratiocination have functions *other* than delivering self-knowledge: they  
 445 may, for example, have the function of grasping general truths, or of enabling certain flexible  
 446 forms of behavior. Yet they *also* have the function of delivering introspective self-knowledge,  
 447 at least on introspectionist accounts (Peirce 1986 a,b). Attention plays a variety of functional  
 448 roles, but its inclusion in "quasi-perceptive" accounts of introspection (e.g. De Vlieger &  
 449 Giustina 2022) does not make these accounts and the processes they describe *less*  
 450 introspective. In general, it is likely that introspective processes are complex processes having  
 451 various moving parts, few of which will have *exclusively* the function of introspecting  
 452 (Schwitzgebel 2012).

453 One may also worry that allowing radically embodied introspection to subserve *also*  
 454 behavioral control or expressive purposes will make these processes unfit to deliver  
 455 (introspective) self-knowledge. Exigences of control and expressive urges may alter what's  
 456 introspected, distorting it in a way that prevents the subject from acquiring introspective self-  
 457 *knowledge*.

458 Two points in reply. First, the problem (if it is a problem) is not unique to radically embodied  
 459 introspective processes. For example, many introspective reports seemingly created purely  
 460 "in the head" appear to be *post-hoc* rationalizations of one's behavior, rather than reports  
 461 detailing what one "sees" with one's "mind's eye" (see Chater 2018 for a nice collection of  
 462 cases). Our "in the head" beliefs about ourselves, our capacities, dispositions and character  
 463 traits are notoriously optimistically biased (Sharot 2011). So, *if* there is a problem here, the  
 464 problem plagues radically embodied and disembodied views alike. Secondly, as mentioned  
 465 above, we're using "knowledge" as cognitive scientists use the term (e.g. when they talk  
 466 about knowledge representation), which is what a philosopher would call "knowledge or  
 467 belief". This reading of "knowledge" entirely defangs the objection: distorted introspection  
 468 still generates (distorted) *beliefs*.

469 A more pressing worry is that radically embodied introspection can't deliver self-knowledge  
 470 because there is no introspection-independent target to be known. If radically embodied

introspection does not consist in the representation of an introspection-independent mental state, one may worry that sense-making devolves in an unconstrained form of *self-shaping*, whereby the agent “makes up” a story about certain mental states, and then commits to it so as to acquire certain patterns of behavior. As an example of self-shaping, take the following vignette offered by Dan Hutto:

“Consider the case of Katrina. She is a nervous flyer but has to take lots of long-distance flights for her job. She knows that flying is safer than many other things that she regularly does but she can’t shake off her irrational fear of it. So, Katrina settles on the following trick: She decides to try to pretend to be the sort of person who loves to fly rather than fears it. Moreover, she enters into this pretense for the express purpose of making herself into the sort of person who loves to fly.” (Hutto 2022, p. 1173).

The apparent similarity between self-shaping and radical embodied introspection is compounded by the fact that substantial self-knowledge (i.e. the kind of self-knowledge radically embodied introspection delivers) has an existential, and thus *practical*, value. It thus can be thought to commit the introspector to action in a way similar to self shaping. Relatedly, the objector may contend that radical embodied introspection is not different from certain “transparent” ways to gain self-knowledge, which depict self-knowledge as a form of (or as essentially tied to) practical deliberation. When one gains self-knowledge “transparently”, one considers *the subject matter* the mental state is about, rather than searching through one’s mental states. So, for example, to “transparently” know whether one believes that *p*, one considers one’s evidence to the effect that *p*, and whether it is enough to warrant their belief. In this way, one explicitly *makes up one’s mind* about *p*, thereby knowing whether or not *p* is believed. The similarity between such “transparent” self-knowledge and radical embodied introspection is apparent. After all, when writing in her diary, Eve was presumably addressing *her mother’s behavior*, rather than conducting an internal search through her mental states (§4.1). And, just like self shaping, “transparently obtained” self-knowledge comes with a call to action - if one discovers that one is warranted to believe *p* or desire *q*, one should start to behave accordingly (cf. Moran 2001).

Or reply is nuanced. We acknowledge that these similarities are real, but we also think that they are *shallow*. For, these similarities strike us as due merely to the “non-inner-looking” character of these ways to obtain self-knowledge. In other words, they share a *negative* feature, namely the fact that they all do *not* conceive a subject’s attainment of self-knowledge as an act of “looking inward”.

The differences between radically embodied introspection, self-shaping and transparently attained self-knowledge are more significant. For one thing, they are bound to, and regulated by, different constraints. For example, Eve (§4.1) *can’t just* make sense of her feelings towards her mother in terms of *joy* or *feeling emotionally drained by her* because she’s actually in a psychophysical state with negative valence (which excludes *joy*) and high arousal (which excludes feeling drained). In self-shaping, however, the agent’s activity does not abide by these constraints - indeed, it positively ignores them. When Katrina self-shapes as a flight enjoyer, she has to *disregard* the negatively valenced psychophysical state all things plane-related evoke in her (see Facchin & Rucinska 2024). Her activity does indeed try to *suppress*

that state to eventually allow for a positively valenced one to replace it. Similarly, the (radically embodied) introspector need not abide by the same constraints on rationality and consistency that are essential for gaining self-knowledge transparently. The person “transparently” gaining self-knowledge should *rationally conclude*, on the basis of evidence, whether *p* is believable or *q* is desirable. The radically embodied introspector has no such constraints - indeed, it is perfectly possible to introspect radically opposite mental states in regards to the same matter. The heartbroken may introspect that they both love and hate their ex-lover, as Catullus once did. And Eve (§4.1) *hopes* her mother will call, while *believing* she will not. When we gain self-knowledge “transparently”, we *rationally deliberate* on some matter, in a way that is *consistent* with the information at our avail. When we introspect, we *make sense* of ourselves in a concrete situation - but we are fallible, limited and messy beings, and so we can’t always make sense of ourselves in a rational, coherent way.

Additionally, these processes and the self-knowledge they deliver have quite different ties to action and decision-making. Self-shaping consists in acting in certain ways so as to (in a way) instate a mental state. To shape-herself as a flight-enthusiast, Katrina *has to behave as if* she likes flying. To transparently obtain a piece of self-knowledge, on the other hand, is, in a sense, a process of decision-making, whose tie to action is way less direct. When transparently getting to know whether one believes that *p*, one *rationally deliberates* - and so rationally decides - whether or not *p* is believable and then makes up one’s mind accordingly. Action, however, does not *necessarily* follow from these deliberations. For instance, most addicts are convinced that their addiction is bad for them and that they should quit their bad habit, but still they cannot abstain from the substances they consume (what Moran (2011) describes as “estrangement”). Lastly, radically embodied introspection is constituted by certain agent-environment interactions, thus, it is “made of” certain actions. Radically embodied introspection can *lead* to decision-making, rather than directly to some courses of action. For instance, once Eve introspects that she hates her mother, she still has to decide what to do with that knowledge. She could take up an antagonistic stance towards her mother, or remain quiet to avoid the stress of confrontation - and everything in between.

Lastly - and, in the current context, most importantly - whilst radically embodied introspection is indeed *introspection* (a specific *psychological* process), self-shaping and “transparently” acquired self-knowledge are not introspective. Self-shaping violates (3): when Katrina self-shapes as a person who enjoys flying, she’s not coming to know a present, or recently occurred, mental state. She is trying to induce a *future* one. “Transparently” obtained self-knowledge violates (4) and (5). It violates (5) because the agent is not *detecting* the transparently known mental state. And it violates (4) because knowledge here is far from direct - indeed, it is acquired by *deliberation*, after rationally considering (i.e. making inferences upon) the subject matter of the relevant mental state. Thus self-shaping violates one between (1)-(3), which no account of introspection is supposed to violate. And “transparent” self-knowledge violates two of (4)-(6), whereas genuine introspection can violate at most one.

What about directedness? Does Eve’s writing deliver self-knowledge in a way that is sufficiently *direct* to satisfy (4)? One may worry that (4) does not obtain because Eve must be aware of her diary and writing tools, and that a degree of sensorimotor mediations is involved in a way that prevents it from satisfying (4).

559 This challenge can be met by calling upon upon well-established phenomenological idea that,  
 560 when skillfully used, objects are not given to the users' conscious awareness: they become  
 561 "transparent" and cease to be consciously apprehended (Heidegger 1927/2010; Merleau-  
 562 Ponty 2009; Wheeler 2019; Hauser & Naeem 2024). Even philosophers doubting this idea  
 563 concede that the usage of external props can still be automatized and fluent enough to be  
 564 non-inferential (and in some sense not "consciously controlled" at all, see Andrada 2020;  
 565 Facchin 2024): the subject need not *think of* how to use the tools to deploy them. And this  
 566 seems to be the case of Eve's diary. So, no inference is needed. Phenomenologically speaking,  
 567 it's also worth stressing that writing a diary surely does not *feel* inferential. When consciously  
 568 inferring something, we typically hold the relevant premises and inferential rules in mind, or  
 569 are at least able to indicate them if asked. But Eve may not be able to provide the relevant  
 570 folk psychological "law" which would license the conclusion that she *hates* her mother. And  
 571 indeed, what could that generalization be? Something like "if M is socially expected to be very  
 572 emotionally close to, and supportive of E but M remains emotionally unavailable to and  
 573 unsupportive of E, then E may hate M" could do - but we obviously do not have anything *like*  
 574 *that* in mind when we realize that we hate someone, nor that is something we are likely to  
 575 say if someone where to ask us how do we know that we hate someone else.

576 Doesn't, however, Eve's writing count as indirect if compared with the kind of "*quasi-*  
 577 *observing*" and/or *acquaintance* that characterizes many cases of introspection as "inner  
 578 observation", whereby through one "internally observing" one's mental states, one *simply*  
 579 *comes to know them*?

580 We agree that while Eve's writing is (presumably) more causally mediated than any form of  
 581 "quasi-observing". But we contest that *causal* mediation is the relevant kind of mediation  
 582 here, for two reasons. First, processes that are *direct* (in the relevant sense) remain direct as  
 583 the number of causal intermediaries arise. If perception is direct, it remains direct even when  
 584 one wears sunglasses. Thus, adding or removing causal mediators does not change the  
 585 directness of perception. Secondly, for the physicalist, *every* process must be causally  
 586 mediated (cf. Carter & Pritchard 2018) - including, importantly, acquaintance states (see  
 587 Russell 1912). So, unless one is willing to take one's account of introspection to entail a form  
 588 of anti-physicalism - something not even acquaintance theorists desire (e.g. Balog 2012b) -  
 589 the relevant sense of mediation can't be *causal*.

590 But, there is no obvious *other* sense in which Eve's writing is more mediated than any form of  
 591 "quasi-seeing". Eve's writing is not *epistemically* mediated: Eve doesn't need to know any  
 592 particular proposition in order to write, and thus, to introspect.<sup>19</sup> Eve's writing is also not  
 593 *inferentially* mediated, and indeed it can't be easily described as an inference. Inference is  
 594 often characterized as a "reasoned change in view" (e.g. Harman 1986; Boghossian 2014). But  
 595 Eve is not *changing* her view (at best, she is "discovering" it), and even if she were, her writing  
 596 seems more expressionistic and descriptive than any inferentially sanctioned form of  
 597 reasoning. Couldn't perhaps Eve's writing be mediated in that it involves *unconscious*  
 598 inferential steps, or be *representationally* mediated? Our answer here is also negative.  
 599 Without entering in the "representation wars", we simply point out that we currently lack any  
 600 naturalistically respectable account of mental representations (see Hutto & Myin 2013; 2017),

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<sup>19</sup> She must, of course, *know how* to write, and possess the relevant skills for writing. But "quasi-seeing" can involve skills and know-how too (see Boring 1953).

and that the ones we have do not seem to apply very well to our internal cognitive engine (see Anderson & Champion 2022; Facchin 2021, 2023). But unconscious mental representations are *needed* in order to have unconscious inferences.<sup>20</sup> And whilst Eve's writing can plausibly be *modeled* as an inferential process, *everything* can be so modeled, even very simple mechanical systems (Baltieri, Buckley & Bruineberg 2020).

Of course, defenders of acquaintance and/or "quasi-seeing" can always *define* directedness in terms of acquaintance; and once such a definition is in place, then Eve's writing would be indirect (not being a case of acquaintance). But it's on the defenders of acquaintance and "quasi-seeing" to persuade us to accept this definition. On our part, we simply notice that *if* such a definition is accepted, then many *bona fide* accounts of introspection would violate *two* conditions of (4)-(6); and so, they would *all* fail to be accounts of introspection. This, we contend, offers us a compelling reason to hold that such an austere reading of directedness gives rise to a too narrow concept of introspection, which seems ill suited to capture how humans introspect *in the real world* - for example, by writing in their diaries.

Having addressed what we consider to be the most fundamental worries, we reiterate that Eve's case is a case of radically embodied introspection in good standing. Yet, could it be an odd, marginal, or deviant case, and radically embodied introspection is a marginal phenomenon with no import for introspection *writ large*? We disagree: radical embodied introspection is frequent, and indeed the *default* mode of introspection. Or so, at least, we shall soon argue.

## § 5 - A plurality of (radically embodied) introspective practices

Thus far, we've argued that radically embodied introspection exists, that is indeed introspection, and that it can defend itself against criticisms doubting it. Let us now show that radically embodied introspection is more widespread than one might suppose.

Eve's case is somewhat idiosyncratic in revolving around a diary. But such a tool is clearly not *needed*. Imagine Eva - Eve's counterpart who, rather than writing a diary, introspects her mental states by *talking to herself* (whether out loud, or "in her head"). Her self-directed stream of words would propel her judgments and force her to apply her relevant emotional concepts, just as Eve's writing in her diary does. Thus, considerations such as the one made above for Eve's case apply to Eva as well, and if Eve's case is a case of radically embodied introspection, so too is Eva's - even when Eva's self-talk is not explicitly verbalized. And, we contend, Eva's case is *way* less far-fetched than Eve's - we do *often* talk to ourselves to make our minds clear! Such practices are just internalized social practices of engaging in a dialogue, as mentioned above (see Geurts 2012; Vygotsky 1934; Mead 1934; Podolskiy 2012).

That self-talk is likely a radically embodied process is extremely important to notice, for it shows how introspection can be radically embodied even when the introspector is not *obviously* interacting with the world. Defenders of radical embodied introspection, then, need not commit to the (arguably easily falsifiable) claim that introspection always involves some occurrent sensorimotor interaction with the environment.

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<sup>20</sup> For this reason, Eve's writing is not *representationally* mediated.

640 Jumping to the other end of the spectrum, radically embodied introspection may also be  
 641 realized *with other people*. Consider the case of Sarah. Sarah has a history of self-hatred and  
 642 depression, which lead her to develop a grim, negative self-narrative that further lead her to  
 643 self-harming behaviors. She systematically belittles her own achievement, hides her positive  
 644 character traits, and emphasizes the negative ones. Yet, Sarah also regularly goes to a  
 645 therapist to talk about these aspects of her personality. The therapist interrogates Sarah on  
 646 her negative self-narrative, in a way that prompts her to re-evaluate it and gain novel insights  
 647 about herself.

648 What would their dialogue look like? Consider the reports of their conversations in Michael  
 649 White's book *Maps of Narrative Practice* ( 2007, pp. 26-27, 43-59). White, who is a therapist  
 650 himself, asked questions to Sarah that offered her a chance to unravel the negative  
 651 conclusions she drew about herself, making novel sense of her situation in terms of different  
 652 mental states and character traits. In this way, she made sense of her self-hatred as something  
 653 *imposed upon* her "from the outside" (White 2007, p. 27).

654 Sarah's dialogue with her therapist, we contend, is a genuinely introspective process. Sarah  
 655 makes new sense of herself by making sense of the mental states she currently harbors, in a  
 656 way that satisfies **(1)-(3)**.<sup>21</sup> Moreover, the processes whereby Sarah interacts with her  
 657 therapist are not trivial or automatic, thereby satisfying **(6)**. The self-knowledge Sarah gains  
 658 is also direct in a way that satisfies **(4)**. For, Sarah gains her insight about herself by *answering*  
 659 the therapist's questions, which scaffold and support Sarah's sense-making, affording a space  
 660 wherein Sarah can (verbally) make novel sense of herself.<sup>22</sup> Sarah's answers and the self-  
 661 knowledge they express are self-generated in the same way Eve's self-knowledge was. So, if  
 662 the latter is direct, so too is Sarah's. The relevant self-knowledge is not "inferred" from what  
 663 the therapist says, nor is it passively obtained by listening to the therapist's insights. The  
 664 therapist's questions simply afford Sarah a novel way to make sense of herself and causally  
 665 prompt her self-exploration.

666 So far, our examples focused on the usage of language. But the usage of *words* isn't necessary  
 667 for introspection. Consider the case of Camille: a woman who is dealing with the grief of losing  
 668 a loved one. To manage her grief and make sense of her pain , Camille painted a "grief map"  
 669 on a canvas (see Camille's "final" grief map in **figure 1** below). Camille painted and re-painted  
 670 the map numerous times, trying to specify the way in which the various "spheres of feelings"  
 671 (as she called them) are related to each other. And whilst at times Camille's painting aimed at  
 672 achieving some aesthetic need, she confessed to her therapist that she was mostly painting  
 673 to explore her deepest feelings. For her, painting was more than a way to *express* her grief or  
 674 "vent it away": it was a way to get to know her grief and the way it impacted her life. This  
 675 case again shows that painting can be used as means of genuine- *and* radically embodied -  
 676 introspection.

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<sup>21</sup> Notice that the therapist is not "discovering" *his own* mental states - so for him **(2)** fails to obtain, and so the process does not count as a case of introspection for him.

<sup>22</sup> See (Rucińska & Fondelli 2022) for a more detailed discussion.



**Figure 1:** Camille's grief map. Picture taken by Camille.

We have just presented a small number of different radically embodied introspective practices, and more are yet to be explored.<sup>23</sup> While a full-bodied account of radically

<sup>23</sup> Recently, Rolla (2024) has offered a novel, radically embodied account of self-knowledge based on resistance training. We are of course sympathetic to it, and we think that Rolla's analysis does a great job in highlighting how certain *prima facie* non-introspective practices actually are the pathways whereby we come to know ourselves. We are, however, concerned that Rolla may operate under an excessively narrow idea of the possible targets of *radically embodied* self-knowledge. For, he seems to claim that, to count as *radically embodied*, self-knowledge must concern a person's body (Rolla 2024, p. 2). We don't think this is the case. To count as radically embodied, one's self-knowledge must "just" be acquired through non-representational, non computational means. That's typically what "radically embodied" means. Compare: a radically embodied account of math (e.g. Zahidi & Myin 2016) need not claim that mathematical knowledge is somehow knowledge of our bodies. It "only" needs to claim that such knowledge is acquired non-inferentially, non-computationally and non-representationally. This is why, whilst we fully acknowledge that Rolla was the first to deal with self-knowledge from an embodied perspective, we think that our view is distinct, and preferable, to his. Another important difference that tells apart our proposal from Rolla's is the *focus* of these proposals. Here, we are mainly interested in pursuing a psychological project dealing with *introspection*. Rolla seems to be more interested in dealing with an *epistemological* problem concerning self-knowledge.

embodied introspection will have to wait for another time, the above suffices to deliver on our claim that radically embodied exists, and that it is quite common.

## § 6 - Conclusion: the sketches of an account

In this paper, we have offered a radically embodied picture of introspection. Introspection, we have argued, is not a de-coupled process whereby the mind's eye turns inward, to "quasi-observe" the token mental states already present in an agent's head. Rather, in many cases introspection is constituted by specific agent-environment interactions - interactions whereby an agent *makes sense* of her own state in terms of certain relevant mental states.

We now conclude this paper by sketching some lessons to be learned from radically embodied take to introspection.

A first thing to notice is that radically embodied introspection is *opportunistic*: it recruits materials and props on the spot, so as to pursue the agent's introspective goals.<sup>24</sup> As §5 shows, it can recruit diaries and canvases, or self-talk - and, we suspect - everything in between. Since radically embodied introspection consists of various different processes involving various different external medias and props with which the introspecting agent interacts in different ways, there likely are many *diverse* radically embodied cognitive processes, only loosely tied by a family resemblance to each other, or only by the mere fact that they all deliver substantial self-knowledge. An account of radically embodied introspection, then, needs to be *pluralistic* (*à la* Schwitzgebel 2012), and recognize the variety and diversity of radically embodied cognitive practices.

Pluralism, of course, is no anything-goes-ism. It is not the case that *any* agent-environment interaction is a case of radically embodied introspection. Minimally, cases of radically embodied introspection must satisfy (1)-(6) in the way seen above. So, for instance, sipping tea or cooking rice, on their own, won't count as cases of radically embodied introspection. Moreover, radically embodied introspective activities are subject to multiple constraints. They are subject to *bodily constraints*, as they are influenced by the history and the state of the introspector's situated body. They are also subject to *material constraints*, as the concrete, physical materials and media involved in the introspective act partially determine the bounds of the introspector's sense-making activity (e.g., Eve's diary affords a way to make sense of what happens, which differs from the one a therapist's question may afford). They are also subject to *cultural* and *linguistic* constraints, as the cultural upbringing, and the style of languaging, influence the sense making activity as well (e.g., if Eve knows that there is a possibility that her mother could read her diary, she might inadvertently *not* make sense of her feelings towards her mother in terms of "hate"). From the radically embodied perspective, introspection - just like all cognitive phenomena - is not an activity that is ever detached from the context in which it occurs.

At times - and in virtue of their opportunism - radically embodied introspective processes also abide by different constraints. Camille's grief map, for example, was abided by aesthetic constraints. Similarly, Sarah's insight gained at the therapist's room was abided by her desire to improve her wellbeing. It is not unreasonable to presume that Eve is also at least in part *venting* as she is writing her diary, and thus that her writing serves an *expressive* purpose.

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<sup>24</sup> As most (radically) embodied cognitive processes are (see Anderson 2014; Clark 2017).

Thus, radically introspective processes can also be *multifunctional*: at times, they don't "just" deliver self-knowledge, but they do also something else, such as allow the introspector to express themselves (artistically or otherwise), improve their well-being, or serve to maintain a positive self image (Sharot 2011). This means, as we have noticed in (§4.3), that in many cases introspective processes cannot be neatly separated from the non-introspective ones.

Are we claiming that introspection is *in all cases* radically embodied? As said in the introduction, we don't exclude that there are other, non-radically embodied, introspective processes.<sup>25</sup> Other cases of introspection may be possible - but if they exist, they are not central. By focusing our account on them, we would obtain a more limited, less interesting and *less veridical* picture of what introspection is. Thus, whether or not such processes exist, we contend that our account of radically embodied introspection captures what introspection is and what "introspecting" typically means *better* than other, non radically embodied accounts. The *bulk* of introspection, we think, consists in radically embodied activities whereby an introspector aims to gain substantial self-knowledge.

There is an added value of embracing the radically embodied account of introspection as well, aside from the fact that it captures the majority of our introspective practices. It is that it has pragmatic value. If introspecting can be achieved with different means, these means can be purposefully introduced into various therapeutic techniques. As we showed above, introspection need not only be gained in talking therapy; other toolkits can be used by therapists to help their clients gain self-knowledge and further insights. The practical implications of our view to institutional practices are to be discussed in future work.

#### **Appendix: Situating radical embodied introspection in the epistemological landscape**

We have argued that introspection often consists of embodied activities wherein the agent interacts with the world so as to *achieve* some piece of substantial, existentially relevant, self-knowledge. But what's the *epistemology* of these interactions?

Sadly (for the epistemologically minded reader) we won't answer these questions here.<sup>26</sup> Of course, a *complete* account of radical embodied introspection will have to deal with the epistemology of introspection but to provide such a complete account is well beyond the scope of this paper. Our paper has a modest objective: to show that radically embodied introspection *exists*.

Still, whilst an in length analysis of the epistemology of radical embodied introspection is outside the scope of our analysis, it is possible to roughly indicate where radically embodied introspection sits in the current epistemological landscape. To do so, we will resort to the partition of the epistemological landscape offered in (Finkelstein 2008). He broadly distinguishes between four major approaches to the epistemology of introspection (and self-knowledge): (i) detectivism, (ii) constitutivism, (iii) a middle position between detectivism and constructivism and (iv) expressivism.

We think that (i) detectivism does not mesh well with radical embodied introspection, which is an activity whereby one *makes sense* of oneself in context and so does not detect pre-

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<sup>25</sup> Thus introspection may be a disjunctive kind to be dissolved in more unified sub-kinds, see (Ramsey 2021).

<sup>26</sup> Rolla (2024), however, directly confronts this issue.

761 existent mental states. We have discussed these points above, and we won't rehearse them  
762 here.

763 We also do not take radically embodied introspection to mesh well with (iv) expressivism.  
764 Expressivism, like detectivism, also arguably presupposes the existence of pre-formed, pre-  
765 existing mental states that the introspector simply expresses. As argued in (§§ 4.1-4.2) we are  
766 skeptical about the existence of such pre-formed mental states, and they don't fit in with the  
767 overall framework of radically embodied cognitive science. For this reason, we don't think  
768 that detectivism or expressivism are promising philosophical positions to develop the  
769 epistemology of radically embodied introspection.

770 In this regard, position (ii) constitutivism is more promising. Following Finkelstein, we take  
771 constitutivism to be the broad view that our introspective awareness of our mental states is  
772 *partially constitutive* of the states that they are. Introspecting a belief that *p* is part of what  
773 makes it the case that the introspector *has* a belief that *p*. This fits with radically embodied  
774 introspection in that it does *not* presuppose pre-formed mental states to be detected or  
775 expressed. On the other hand, it *does not* fit with our radically embodied introspection view,  
776 in that it takes the introspective activity whereby we know our mental states to be akin to a  
777 *free choice* of what we introspect (Finkelstein 2008, pp. 29 and ff). This strikes us as a mistake.  
778 Eve (§4.1) or Camille (§5) do not seem *free to decide* what they introspect. On the contrary,  
779 their introspective activity responds to a series of constraints, such as, for example, bodily  
780 states of arousal and valence.

781 It seems, then, that the best match to develop an epistemology of radical embodied  
782 introspection is that of a *tempered* or *constrained* constitutivism, such as the constitutivism  
783 tempered by detectivism Finkelstein describes for (iii), the middle position. Constitutivism is  
784 right in recognizing that our (radically embodied) introspective activity does not passively  
785 register a pre-existing mental reality, but partially constitutes it. But, as detectivism stresses,  
786 introspection is not an act of *free choice*. It is constrained by some "hard data", such as one's  
787 bodily states and one's sociocultural context. We cannot make sense of ourselves *as we wish*.

788 The above considerations hold for the epistemology of sense-making *at large*. Consider a  
789 paradigmatic case of (minimal) sense making, such as the activity of a bacterium that makes  
790 sense of glucose as a nutrient (Thompson 2007). In and by itself, glucose is *not* a nutrient.  
791 And, in fact, we have no trouble imagining that it could be *lethal* for an alien being with a  
792 different internal chemistry. That glucose *is* a nutrient (for the bacterium) is, in a sense,  
793 *established* by how the bacterium interacts with it, and how their interaction unfolds. But of  
794 course, the bacterium is not *free* to make sense of things as it pleases - else, it would be quite  
795 puzzling to understand why many bacteria "decided" to make sense of penicillin as lethal.

796 It seems, then, that radically embodied introspection - and more generally sense making - will  
797 occupy a middle ground between constitutivism and detectivism. How such a middle ground  
798 should be articulated, however, is a topic better left for a different paper.

## 799 References

800 Anderson, M. L. (2017). Of Bayes and bullets: An embodied, situated, targeting-based account  
801 of predictive processing. In T. Metzinger & W. Wiese (Eds.). *Philosophy and Predictive*  
802 *Processing*: 4. Frankfurt am Main: MIND Group. doi: 10.15502/9783958573055

- 803 Anderson, M. L. (2021). *After Phrenology: Neural Reuse and the Interactive Brain*. MIT Press.
- 804 Anderson, M. L., & Champion, H. (2022). Some dilemmas for an account of neural  
805 representation: A reply to Poldrack. *Synthese*, 200(2), 169.
- 806 Andrada, G. (2020). Transparency and the phenomenology of extended cognition. *Límite: revista de filosofía y psicología*, (1), 2.
- 808 Armstrong, D. (1968). *A Materialist Theory of the Mind*. Routledge.
- 809 Baggs, E., & Chemero, A. (2021). Radical embodiment in two directions. *Synthese*, 198(Suppl  
810 9), 2175-2190.
- 811 Balog, K. (2012). In defense of the phenomenal concept strategy. *Philosophy and*  
812 *Phenomenological Research*, 84(1), 1-23.
- 813 Balog, K. (2012b). Acquaintance and the mind body problem. In *New Perspectives on Type*  
814 *Identity: The Mental and the Physical*, Christopher Hill and Simone Gozzano (eds.), (pp. 16-  
815 43)
- 816 Baltieri, M., Buckley, C. L., & Bruineberg, J. (2020, July). Predictions in the eye of the beholder:  
817 An active inference account of Watt governors. In *Artificial Life Conference Proceedings 32*  
818 (pp. 121-129).
- 819 Barrett, L. F. (2017a). The theory of constructed emotion: an active inference account of  
820 interoception and categorization. *Social Cognitive and Affective Neuroscience*, 12(1), 1-23.
- 821 Barrett, L. F. (2017b). *How Emotions are Made: The Secret Life of the Brain*. Pan Macmillan.
- 822 Bertolotti, T., & Magnani, L. (2017). Theoretical considerations on cognitive niche  
823 construction. *Synthese*, 194, 4757-4779.
- 824 Boghossian, P. (2014). What is inference? *Philosophical Studies* 169(1) 1-18.
- 825 Bongard, J., & Pfeiffer R. (2007). *How the Body Shapes the Way We Think*. The MIT Press.
- 826 Boring, E. G. (1953). A history of introspection. *Psychological Bulletin*, 50(3), 169–189
- 827 Brentano, F. (2012). *Psychology from an Empirical Standpoint*. Routledge.
- 828 Bruineberg, J., & Rietveld, E. (2014). Self-organization, free energy minimization, and optimal  
829 grip on a field of affordances. *Frontiers in Human Neuroscience*, 8, 599
- 830 Bruineberg, J., Chemero, A., & Rietveld, E. (2019). General ecological information supports  
831 engagement with affordances for ‘higher’ cognition. *Synthese*, 196, 5231-5251.
- 832 Carruthers, P. (2010). Introspection: divided and partly eliminated. *Philosophy and*  
833 *Phenomenological Research*, 80(1), 76-111.
- 834 Carter, J., & Pritchard, D. (2018). Extended self-knowledge. In P. Pedrini & J. Kirsch (eds), *Third*  
835 *Person Self-Knowledge, Self-Interpretation, and Narrative* (pp. 31-49). *Contributions To*  
836 *Phenomenology*, vol. 96, Cham: Springer International Publishing.

- 837 Cassam, Q. (2014). *Self-Knowledge for Humans*. Oxford: Oxford University Press.
- 838 Chalmers, D. (2019). Extended cognition and extended consciousness. In M. Colombo, E.  
839 Irvine, & M. Stapleton (Eds.), *Andy Clark and His Critics* (pp. 9–21). New York.
- 840 Chater, N. (2018). *Mind is Flat: The Remarkable Shallowness of the Improvising Brain*. Yale  
841 University Press.
- 842 Chemero, A. (2009) *Radical Embodied Cognitive Science*. The MIT Press.
- 843 Clark, A. (1997). *Being There*. The MIT Press. Clark, A. (2006). Language, embodiment, and the  
844 cognitive niche. *Trends in Cognitive Sciences*, 10(8), 370-374.
- 845 Clark, A. (2008). *Supersizing the Mind*. Oxford University Press.
- 846 Clark A., & Chalmers D. (1998). The extended mind. *Analysis*, 58(1), 7-19.
- 847 Clark, A. (2017). Busting out: Predictive brains, embodied minds, and the puzzle of the  
848 evidentiary veil. *Noûs*, 51(4), 727-753.
- 849 Clark, A. (2024). Extending the predictive mind. *Australasian Journal of Philosophy*, 102(1),  
850 119-130.
- 851 Coliva, A. (2012). One variety of self-knowledge: constitutivism as constructivism. *The self and*  
852 *self-knowledge*, 212-242.
- 853 Colombetti, G. (2014). *The Feeling Body*. The MIT Press.
- 854 Colombetti, G., & Roberts, T. (2015). Extending the extended mind: the case for extended  
855 affectivity. *Philosophical Studies*, 172, 1243-1263.
- 856 Cummins, R. (1975). Functional analysis. *The Journal of Philosophy*, 72(20), 741-765.
- 857 Dennett, D. (1991). *Consciousness Explained*. Little Brown.
- 858 De Vlieger, B., & Giustina, A. (2022). Introspection of emotions. *Pacific Philosophical*  
859 *Quarterly*, 103(3), 551-580.
- 860 De Jaegher, H., & Di Paolo, E. (2007). Participatory sense-making: An enactive approach to  
861 social cognition. *Phenomenology and the Cognitive Sciences*, 6, 485-507.
- 862 Di Paolo, E., Buhrmann, T., & Barandiaran, X. (2017). *Sensorimotor Life: An Enactive Proposal*.  
863 Oxford University Press.
- 864 Di Paolo, E. A., Cuffari, E. C., & De Jaegher, H. (2018). *Linguistic bodies: The continuity between*  
865 *life and language*. MIT press.
- 866 Downey, A. (2018). Predictive processing and the representation wars: A victory for the  
867 eliminativist (via fictionalism). *Synthese*, 195, 5115-5139.
- 868 Evans, G. (1982) *The varieties of reference*. Oxford University Press/Clarendon Press

- 869 Facchin, M. (2021). Predictive processing and anti-representationalism. *Synthese*, 199(3),  
870 11609- 11642.
- 871 Facchin, M. (2023). Neural representations unobserved—or: a dilemma for the cognitive  
872 neuroscience revolution. *Synthese*, 203(1), 7.
- 873 Facchin, M. (2024). Phenomenal transparency, cognitive extension, and predictive processing.  
874 *Phenomenology and the Cognitive Sciences*, 23(2), 305-327.
- 875 Facchin, M., & Rucińska, Z. (2024). Public charades, or how the enactivist can tell apart  
876 pretense from non-pretense. *Erkenntnis*, 1-23.
- 877 Favela, L. H., Amon, M. J., Lobo, L., & Chemero, A. (2021). Empirical evidence for extended  
878 cognitive systems. *Cognitive Science*, 45(11), e13060.
- 879 Finkelstein, D. H. (2008). *Expression and the Inner*. Harvard University Press.
- 880 Froese, T., & Di Paolo, E. A. (2011). The enactive approach: Theoretical sketches from cell to  
881 society. *Pragmatics & Cognition*, 19(1), 1-36.
- 882 Gallagher, S. (2011). Interpretations of embodied cognition. In W. Tschacher and C. Bergomi  
883 (Eds.), *The Implications of Embodiment: Cognition and Communication* (pp. 59-70). United  
884 Kingdom: Imprint Academic.
- 885 Gallagher, S. (2017). *Enactivist Interventions: Rethinking the Mind*. Oxford University Press.
- 886 Gallagher, S. (2023). *Embodied and Enactive Approaches to Cognition*. Cambridge University  
887 Press.
- 888 Gallagher, S., & Rucińska, Z. (2021). Prospecting performance: Rehearsal and the nature of  
889 imagination. *Synthese*, 199(1), 4523-4541.
- 890 Geurts, B. (2018). Making sense of self talk. *Review of Philosophy and Psychology*, 9(2), 271-  
891 285.
- 892 Giustina, A. (2022). Introspective knowledge by acquaintance. *Synthese*, 200(2), 128.
- 893 Harman, G. (1986). *Change in view: principles of reasoning*. The MIT Press.
- 894 Hauser, J., & Naeem, H. (2024). Phenomenal transparency and the boundary of cognition.  
895 *Phenomenology and the Cognitive Sciences*, 1-20.
- 896 Heidegger, M. (1927/2010). *Being and Time*. Suny Press.
- 897 Hutto, D. (2022). Getting real about pretense: A radical enactivist proposal. *Phenomenology  
898 and the Cognitive Sciences*, 21(5), 1157–1175.
- 899 Hutto, D., & Myin, E. (2013). *Radicalizing Enactivism*. The MIT Press.
- 900 Hutto, D., & Myin, E. (2017). *Evolving Enactivism*. The MIT Press.
- 901 James, W. (1890). *The Principles of Psychology* (vol. 1 & 2). Harvard University Press.

- 902 Jensen, T. W. (2014). Emotion in languaging: languaging as affective, adaptive, and flexible  
903 behavior in social interaction. *Frontiers in Psychology*, 5, 720.
- 904 Kammerer, F., & Frankish, K. (2023). What forms could introspective systems take? A research  
905 programme. *Journal of Consciousness Studies*, 30(9-10), 13-48.
- 906 Kirsh, D. (2019). When is a mind extended?. In M. Colombo, E. Irvine, & M. Stapleton (Eds.),  
907 *Andy Clark and His Critics* (pp.128–142). New York: Oxford University Press.
- 908 Kirsh, D., & Maglio, P. (1994). On distinguishing epistemic from pragmatic action. *Cognitive*  
909 *Science*, 18(4), 513-549.
- 910 Kriegel, U. (2009). *Subjective Consciousness: A Self-representational Theory*. Oxford: Oxford  
911 University Press.
- 912 Krueger, J. (2014b). Emotions and the social niche. *Collective Emotions*, 156-171.
- 913 Kyselo, M., & Di Paolo, E. (2015). Locked-in syndrome: a challenge for embodied cognitive  
914 science. *Phenomenology and the Cognitive Sciences*, 14(3), 517-542.
- 915 Lamb, M., & Chemero, A. (2018). Interaction in the open: where dynamical systems become  
916 extended and embodied. In A. Newen, L. de Bruin, S. Gallagher (Eds.), *The Oxford Handbook*  
917 *of 4E Cognition*, (pp. 147-162). New York: Oxford University Press.
- 918 Leontiev A. N. (1981). *Problems of the Development of Mind*. Progress.
- 919 Machery, E. (2009). *Doing Without Concepts*. Oxford University Press.
- 920 Mead G. H. (1934). *Mind self and society*.
- 921 Merleau-Ponty, M. (2002/1945). *Phenomenology of Perception* (C. Smith Trans.). London:  
922 Routledge.
- 923 Mesquita, B. (2022). *Between Us: How Cultures Create Emotions*. WW Norton & Company.
- 924 Mesquita, B., & Frijda, N. H. (1992). Cultural variations in emotions: a review. *Psychological*  
925 *Bulletin*, 112(2), 179.
- 926 Mesquita, B., & Walker, R. (2003). Cultural differences in emotions: A context for interpreting  
927 emotional experiences. *Behaviour Research and Therapy*, 41(7), 777-793.
- 928 Mill, J. S. (1882). *Auguste Comte and Positivism* (Vol. 16). Classic Books.
- 929 Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity  
930 for processing information. *Psychological Review*, 63(2), 81.
- 931 Millikan, R. G. (1984). *Language, Thought and Other Biological Categories*. The MIT Press.
- 932 Moran, R. (2001). *Authority and estrangement: An essay on self-knowledge*. Princeton  
933 University Press.
- 934 Myin, E., & Van den Herik, J. C. (2021). A twofold tale of one mind: revisiting REC's multi-  
935 storey story. *Synthese*, 198(12), 12175-12193.

- 936 Newen, A., De Bruin, L., & Gallagher, S. (Eds.). (2018). *The Oxford Handbook of 4E Cognition*.  
937 Oxford University Press.
- 938 Palermos, O. (2014). Loops constitution, and cognitive extension. *Cognitive Systems Research*,  
939 27, 25-41.
- 940 Peirce, C. S. (1868a). Questions concerning certain faculties claimed for man. *Journal of*  
941 *Speculative Philosophy* 2 (2), 103-114.
- 942 Pierce, C. S. (1868b). Some consequences of four incapacities. *Journal of Speculative*  
943 *Philosophy* 2 (3), 140-157.
- 944 Podolskiy A. (2012) Internalization. In N. M. Seel (Ed.), *Encyclopedia of the Sciences of*  
945 *Learning*. Springer.
- 946 Preston, B. 1998. Why is a wing like a spoon? A pluralist theory of function." *The Journal of*  
947 *Philosophy*, 95 (5): 215-254.
- 948 Rolla, G. (2024). Self-knowledge from resistance training. *Phenomenology and the Cognitive*  
949 *Sciences*, 1-18. <https://doi.org/10.1007/s11097-024-10020-z>
- 950 Rucińska, Z. (2022). Imaginary friends play in light of enactivism. *Theory & Psychology*, 32(2),  
951 202- 220.
- 952 Rucińska, Z. & Fondelli, T. (2022). Enacting Metaphors in Systemic Collaborative Therapy.  
953 *Frontiers in Psychology: Psychology for Clinical Settings*. Doi: 10.3389/fpsyg.2022.867235
- 954 Rucińska, Z. & Weichold, M. (2022). The roles of language in pretend play: A praxeological  
955 enactivist approach. *Journal of Applied Psycholinguistics*, 22 (2), 17-29.
- 956 Russel, B. (1912). *The Problems of Philosophy*. Oxford: Oxford University Press.
- 957 Schwitzgebel, E. (2012). Introspection, what?, in D. Smithies & D. Stoljar (Eds.), *Introspection*  
958 *and Consciousness*. Oxford: Oxford University Press.
- 959 Schwitzgebel, E. (2024). Introspection. In E. N. Zalta & U. Nodelman (Eds.), *The Stanford*  
960 *Encyclopedia of Philosophy* (Summer 2024 Edition).
- 961 Segundo-Ortin, M., & Heras-Escribano, M. (2024). The risk of trivializing affordances: mental  
962 and cognitive affordances examined. *Philosophical Psychology*, 37(7), 1639-1655.
- 963 Seth, A. K. (2013). Interoceptive inference, emotion, and the embodied self. *Trends in*  
964 *Cognitive Sciences*, 17(11), 565-573.
- 965 Seth, A. K., & Friston, K. J. (2016). Active interoceptive inference and the emotional brain.  
966 *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1708), 20160007.
- 967 Sharot, T. (2011). The optimism bias. *Current Biology*, 21(23), R491-R495.
- 968 Silberstein, M., & Chemero, A. (2012). Complexity and extended phenomenological-cognitive  
969 systems. *Topics in Cognitive Science*, 4(1), 35-50.
- 970 Thompson, E. (2007). *Mind in Life*. Cambridge University Press.

- 971 Thompson, E., & Stapleton, M. (2009). Making sense of sense-making: Reflections on enactive  
972 and extended mind theories. *Topoi*, 28, 23-30.
- 973 Titchener, E. B. (1910). *A Text-book of Psychology*. New York: Macmillan.
- 974 Toon, A. (2023). *Mind as Metaphor*. Oxford University Press.
- 975 Turvey, M. T. (1992). Affordances and prospective control: An outline of the ontology.  
976 *Ecological psychology*, 4(3), 173-187.
- 977 Vygotsky, L. S. (1934/1987). *Thinking and Speech*. The collected works of Lev Vygotsky (Vol.  
978 1). New York, NY: Plenum Press.
- 979 Warren, Jr., W. H. (1984). Perceiving affordances: Visual guidance of stair climbing. *Journal of*  
980 *Experimental Psychology: Human Perception and Performance*, 10(5), 683-703.
- 981 Weichold, M., & Rucińska, Z. (2022). Pretense as alternative sense-making: a praxeological  
982 enactivist account. *Phenomenology and the Cognitive Sciences*, 21(5), 1131-1156.
- 983 Wheeler, M. (2019). The reappearing tool: transparency, smart technology, and the extended  
984 mind. *AI & Society*, 34(4), 857-866.
- 985 White, M. (2007). *Maps of narrative practice*. WW Norton & Company.
- 986 Wittgenstein, L. (2019/1953). *Philosophical Investigations*. Routledge.
- 987 Zahavi, D. (2006). Two takes on a one-level account of consciousness. *Psyche*, 12(2), 1-9.
- 988 Zahidi, K., & Myin, E. (2016). Radically enactive numerical cognition. *Embodiment in evolution*  
989 *and culture*, 57-71.