Sentience and Sapience: The Place of Enactive Cognitive Science in Sellarsian Philosophy of Mind

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Abstract: Philosophers working in the wake of Sellars, such as Brandom and McDowell, agree that there a fundamentally important distinction between sapience and sentience. At least in Sellars, both sentience and sapience are "transcendental" structures – they are posited to explain our cognitively significant experience, including (but not limited to) empirical knowledge – but they must also be adequately reflected in, or realized in, causal structures. Sellars' critical realism, according to which sense-impressions causally mediate our perceptual encounters with object, is grounded the attempt to specify the causal structures in which the transcendental distinction between perceiving and thinking is reflected. Here I contrast critical realism with recent work in the enactivist approach to the philosophy of cognitive science, which conceives of direct realism in terms of the relations between sensorimotor abilities and features of the environment. The hybrid approach, "embodied critical realism", treats sensorimotor abilities as taking the place of the productive imagination, such that the dynamic unfolding over time of the relation between sensorimotor abilities and environmental features explains how perceptual awareness of objects is explicated in terms of expectations and suprisals.

0. Introduction

It has become something of an orthodoxy amongst philosophers working in the wake of Sellars – especially Brandom and McDowell -- that there is a fundamentally important distinction between sapience and sentience. Sapience concerns our ability to make assertions and

other normatively governed speech acts with inferentially articulated propositional contents, and to entertain thoughts with analogous structure. By contrast, sentience concerns our ability to discriminate perceptually between motivationally salient stimuli and act in correspondingly appropriate ways.[1] At least in Sellars himself, both sentience and sapience are 'transcendental', in the following highly restricted sense. Transcendental reflection is an inventory of the most general kinds of cognitive capacities and incapacities necessary for the kind of cognitively significant experiences for beings such as ourselves or any being that we are capable of recognizing as being like ourselves. [2] (Those cognitive experiences include but are not limited to knowledge.) As a result of this reflective process we are led to introduce the distinction between sentience and sapience. However, Sellars should also be read as having as a methodological principle that "transcendental structures must be realized in causal structures" (deVries 2011, 61-62). That is, whatever structures and processes that we posit in transcendental inquiry must be causally implemented by structures and processes that are empirically confirmed and, to the extent possible, consistent with a scientific view of the world, however broadly conceived.

Within this generally Sellarsian framework, I aim to criticize how Sellars conceptualizes the nature and role of sentience in perceptual experience. Sellars maintains that perceptual experience involves both conceptual and nonconceptual content. In contrast to both direct realism and sense-datum theories, Sellars defended a version of *critical realism* –a view that depends heavily on Sellars' interpretation of what Kant called "the productive imagination" (§1).

[1] I do not mean to dismiss the possibility that a perceptual capacity that was selected for its role in detecting motivationally relevant stimuli can also be used to detect motivationally irrelevant stimuli. Likewise, a sentient animal born without any motor capacities might be able to discriminate between stimuli, though to a severely attenuated degree.

[2] For this understanding of 'transcendental', and esp. of Sellars as a transcendental philosopher in this sense, see Westphal (2010).

Sensations are not epistemic intermediaries between us and things (*contra* sense-datum theories), but causal intermediaries (*contra* direct realism, which denies that philosophical reflection on experience requires any intermediaries between us and things[3]). Nevertheless, recent work in embodied cognitive science by Alva Noë, Mark Rowlands, and Anthony Chemero, motivated by the ecological psychology of J. J. Gibson, makes direct realism a more attractive view than critical realists recognize (§2). I will show how Sellarsian critical realism and Gibsonian direct realism can be integrated in what I call *embodied critical realism* (§3).

1. The Role of Embodiment in Sellars' Theory of Perception

Most discussions of Sellars' theory of perception have focused on the role of concepts and sense-impressions in the overall account – thereby generating much discussion over how to read Sellars in light of the debate between conceptualism and nonconceptualism (see O'Shea 2010). However, less attention has been given to the details of how Sellars understands how concepts and sense-impressions are supposed to fit together (with the notable exceptions of Coates 2007 and Levine 2016). This part of the theory is most fully developed in Sellars' late essay, "The Role of Imagination in Kant's Theory of Experience" [IKTE], to which I now turn by taking up the following questions. What role does "the productive imagination" play in Sellars' theory of perceptual experience? What problems is it invoked to solve? What is the role of the perceiver's own body in this theory? And how does the perceiver's body relate to the constraining role of 'sheer receptivity' that sense-impressions play in perceptual takings?

[3] The direct realist need not deny that there are causal intermediaries at the subpersonal level of cognitive machinery; she denies only that a philosophical account of perceptual experience *at the personal level* requires epistemic or causal intermediaries.

As Sellars sets up the exposition of visual perception, he draws our attention to the fact that our visual experience appears to immediately represent three-dimensional entities in space and time, causally interacting with other such objects, even though what we immediately see *of* those objects is their facing sides. How, then, do we experience the interiors and non-facing sides of objects that do not immediately confront us in visual perception? One answer that Sellars quickly rejects is that unseen interiors or non-facing sides are merely believed in, just as one might believe in any other non-existent object that can be thought about (e.g., a golden mountain). But such 'intentional inexistence', Sellars quickly notes, does not do justice to the phenomenology of visual experience. To use Sellars' own example, when we see a red apple, we see it *as* containing a volume of white, and also *as* juicy and cool, though the whiteness, juiciness, and coolness are not seen *of* the apple; only the red facing surface is seen of the apple. As Sellars puts it, "[a]n actual coolness is bodily present in the experience as is an actual volume of white" (IKTE II.20/KTM p. 422). This, in turn, raises the further question as to how that particular red facing surface is seen as the red facing surface *of the apple*, since an apple is a physical object and not a facing surface.

Since the interior whiteness (as well as many other occurrent sensible properties) of the apple are not merely believed in, and they are not what is immediately seen of the apple, what is their mode of presentation in perceptual consciousness? Sellars' answer is that they are present in perceptual consciousness by virtue of being *imagined*. Concepts are also at work, since the applehood of the apple is neither sensed nor imaged but conceived of. Thus Sellars remarks that "[r]oughly, imagining is an intimate blend of imaging and conceptualization, whereas perceiving is an intimate blend of sensing *and* imaging *and* conceptualization" (IKTE II.23/KTM pp. 422-423). To perceive an apple *as* an apple is to be perceptually aware, simultaneously, of what is

sensed (the red facing surface), what is imaged (the white interior, the red non-facing side, the juiciness and coolness), and what is conceptualized (the apple *qua* physical object with causal and modal properties). The role of imagining here is crucial, since it supplies what Sellars thinks is not conceptualized. Though we might not introspect being aware of the interior whiteness of the apple, our awareness of it consists in a reservoir of expectations of what *would* be sensed if we were to bite into it. This expectation is not an application of concepts, since the expectation would persist even if one had no grasp of the relevant causal and modal properties of "apple" embedded in material inferences. Put otherwise, even beings that lacked the concept of apple would still be able to imagine the interior whiteness when visually presented with occurrent red facing surfaces.

The synthesis of sensing, imaging, and conceptualizing is performed by what Sellars, here closely following Kant, calls "the productive imagination". The role of the productive imagination in perceptual consciousness involves "the *constructing of sense-image-models of external objects*" (IKTE III.25/KTM p. 423; emphasis original). Two important features of image-models must be stressed. Firstly, the image-model of an object is *perspectival*, whereas neither bare sense-impressions nor the concept of an object are; secondly, the construction of an image-model of an object necessarily involves the construction of the image-model of the perceiver's own body. There is nothing essentially perspectival to the concept of a dog, but the image-model of a dog (whether imagined or perceived) is necessarily that of a dog as seen from a particular point of view indexed to the position of the perceiver's body in relation to the dog as imagined.[4] Since "the construction is a unified process guided by a combination of sensory input

[4] Though sensations may encode perspectival data, our understanding of that encoding is part of our scientific theory of sensations. Sellars' concern at this point in the dialectic is phenomenological, not explanatory – precisely in order to reveal the limits of phenomenological description.

on the one hand and background beliefs, memories and expectations on the other" (IKTE III.25/KTM p. 423), we should say that the role of sensory input – whether stimulation on the retina, as in visual consciousness, or the triggering of any other sensory-receptors – is to guide or constrain the construction of image-models. The image-model of the perceiver's body and the image-models of the perceptual objects *together* transform the array of sense-impressions ("stimulations of the retina") into *perspectives* on a three-dimensional object that persists in Space and Time.[5] This is not to say simply that we always perceive from some particular perspective, but also that we always perceive from some particular perspective *by virtue of* how the productive imagination simultaneously constructs the image-model of the perceiver's own body *together with* the image-model of the perceptual object. (Though one might be able to acquire a concept of a physical object in the absence of proprioception or body-schema, one would not be able to *use* that concept in generating image-models.) The functioning of the productive imagination here is nicely enriched by Coates's (2005; 2009) argument that the productive imagination is not just static but *temporal*: the sense-image-models ground one's expectations, anticipations, and preparations for subsequent sensations.

In this way Sellars appears to have an adequate account of the role of embodiment in perception, and thereby the intimate relation between action and perception that has long been stressed by thinkers in the pragmatist tradition. Sellars notes as much when he says that the acquisition of knowledge of objects "also involves action in relation to these objects – if only by changing one's relative position – is a point to which he [Kant] pays less attention that it deserves. Compare C. I. Lewis's treatment of this topic in the first chapter of *An Analysis of Knowledge and Valuation*" (KTE II.13n3/KTM p. 271). In other words, action is at work in

[5] If the only perceptible objects were such that no one could physically interact with them, the productive imagination would function completely differently – if at all.

perception by virtue of the relations between the perceiving subject and perceived object captured by the respective image-models of the perceiver's body and of the object as perceived – though it must be noted that this involvement should not be understood as a necessary or essential relationship.[6]

In his sophisticated defense of critical realism, Coates (2005) argues at length that perception involves both nonconceptual, purely phenomenal episodes – states of the perceiver's consciousness – and concepts (even if very low-level) that are both *caused* by the phenomenal episodes and *refer to* the physical objects that cause the phenomenal episodes. Only this view, Coates argues, does full justice to the distinction between perceiving and thinking. It also allows us to understand the difference between veridical and non-veridical perception. In veridical perception, the intentional object of the conceptual representation is the same as the physical object that causes the phenomenal episodes; in non-veridical perception, some "deviant causal chain" (e.g. a drug or illness) has caused the very same kind of phenomenal episode. A crucial component of Coates's argument is his rejection of direct realism, which he understands in terms of a *wholly non-causal* relation between perceptual takings and perceptible objects.[7]

On Coates's view, one of the chief difficulties with direct realism is that it must resort to disjunctivism in order to treat the difference between hallucinations and perceptions; in having a complex visual hallucination, one does not see but only seems to see. Coates objects to disjunctivism because it is committed to what he calls "the qualitative indistinguishability thesis": that "sameness of experience in the qualitative sense does not guarantee sameness of

[6] Hanna and Maiese (2009) argue on transcendental grounds that perception involves embodiment metaphysically necessarily, but not logically necessarily. Nothing in the present essay depends on this strong modal claim.

[7] The direct realist need not deny that there are causal intermediaries in the subpersonal cognitive machinery modeled by cognitive scientists of perception; she holds only that causal intermediaries play no role in what is explicated from within the standpoint of experience.

experience in the ontological sense" (p. 65). The disjunctivist is committed to this thesis just because she holds that a perceiver can be in same qualitative state whether perceiving veridically or non-veridically. By contrast, the critical realist holds that the qualitative and the ontological do not come apart this way; as an ontological claim, perceptual experiences supervene solely upon what is inside the skull, and the difference between veridical and non-veridical perceptual experiences lies solely in how they are causally brought about.[8]

I conclude the discussion of the productive imagination by briefly noting a cost in Sellars' account of embodiment. Since veridical perception requires that the productive imagination be guided by sensations, the productive imagination itself functions *identically* in perception and imagination in the narrow sense (as when I dream, hallucinate, or deliberately construct a mental image). The difference is that in veridical perception, the construction of image-models (both of the object and of my own body) is guided by sensory input, and in non-veridical perception, it is not primarily guided by any worldly inputs. As a result, our very embodiment is neutral to whether perception is veridical; the image-model of my own body is constructed by my productive imagination, whether constrained by sensory input or not. The body is present in perceptual consciousness as imagined, and is constrained by the inputs of senses that are curiously disembodied -- at any rate, not as fully and richly embodied as they are in earlier American pragmatists (esp. Dewey) and in certain figures in the phenomenological tradition (e.g. Merleau-Ponty). Sellars' account of the productive imagination does not explicitly attend to the formation of cognitive processes requires that the organism develop the right interconnections between motor impulses and sensory receptivity, or that veridical sensory input is important for *acquiring* an image-model of one's own body in the first place.

[8] Rockwell (2005, pp. 69-81) argues for embodied cognition by criticizing the assumption that we can clearly distinguish between supervenience and causation – an assumption on which Coates relies.

I now want to turn to Sellars' analysis of the role of sense-impressions in perception. In keeping with the general strategy sketched by deVries – that "transcendental structures must be realized in causal structures" – I want to distinguish between, on the one hand, the project of reflecting on the necessity of external constraint on perception, and, on the other hand, any specific account of the causal items that play this constraining role.[9] To identify the necessity of constraint, Sellars introduces the concept of "sheer receptivity", whereas Sellars thinks of "sense-impressions" as the corresponding causal items that play this constraining role *in rerum natura.* That is, we have a transcendental reflection on the nature of our cognitive activity, which shows that empirical content as such requires that the agent have the capacity for sentience as well as sapience. This reflection counts as "transcendental" in the weak sense that any cognitive agent, if it is to have the kinds of cognitive experiences that we have, must be able to form judgments about a world that is external to and independent of it. But in addition to this transcendental notion, Sellars also thinks that we need a causal explanation of sense-impressions or sensa as items that are introduced, via theoretical postulation, as having the right causal powers to implement the role assigned by transcendental reflection to sheer receptivity as such.

The transcendental reflection that motivates the concept of sheer receptivity is grounded in Sellars' interpretation of the Kantian distinction between "intuitions" and "concepts". Sellars argues that in addition to intuitive conceptual representations – that is, conceptual representations of *particulars* or of *individuals*, modeled on singular demonstrative phrases – there is a different sense of "intuition" in the receptivity of the senses, which must be *non*-conceptual in order to the requisite role of "guiding" thoughts. Thus, the productive imagination, i.e., the understanding insofar as it is playing the role of guiding sensibility, produces 'this white

[9] Though this is close to McDowell's (1998) distinction between constitutive and enabling explanations, McDowell does not seem to think that cognitive science is relevant to epistemology or philosophy of mind; as will be made clear, that is not my view.

cube' (an intuition) modeled on 'this cube is white' (a judgment). But if intuitions, in one of their roles, are already informed by the deployment of concepts, then we need an account of "receptivity proper" to explain how our beliefs and judgments are answerable to a world that we do not create, but discover. Resolving this ambiguity in Kant's concept of intuition is important not only for understanding what Kant was trying to do, but also for understanding why subsequent thinkers did not correctly understand Kant:

> Indeed, it is only if Kant distinguishes the radically non-conceptual character of sense from the conceptual character of the synthesis of apprehension in intuition … and accordingly, the *receptivity* of sense from the *guidedness* of intuition that he can avoid the dialectic which leads from Hegel's *Phenomenology* to nineteenth-century idealism. (Sellars 1967, 16)

and, much more seriously:

> Kant's failure to distinguish clearly between the 'forms' of receptivity proper and the 'forms' of that which is represented by the intuitive conceptual representations which are 'guided' by receptivity – a distinction which is demanded both by the thrust of his argument, and by sound philosophy – had as its consequence that no sooner had he left the scene than these particular waters were muddied by Hegel and the Mills, and philosophy had to begin the slow climb 'back to Kant' which is still underway. (Sellars 1967, 29)

That is, the distinction between the receptivity of sense and the guidedness of intuitions allow us to recognize that intuitive conceptual representations are 'guided' by something else – what he calls "receptivity proper" or "sheer receptivity".[10] When I perceptually take in how things are, my productive imagination organizes perceptual experience so that I am suitably disposed to make a claim about what I perceive. But this can be the case only if my sensory receptivity to the world has just enough structure for it to guide the productive imagination, since guidance

[10] Cf. 'the pattern of Kant's thought stands out far more clearly if we interpret him as clear about the difference between *general* conceptual representings (sortals and attributive), on the one hand, and on the other, *intuition* as a special class of *non-general* conceptual representings, but add to this interpretation that he was *not* clear about the difference between intuitions in this sense and sensations'. (KTE II.15/KTM p. 272).

requires constraint, and constraint entails structure. That structure, Sellars concludes, must be *representational* structure: only if sheer receptivity consists in nonconceptual representations can it possibly guide or constrain the productive imagination's deployment of concepts. To preserve the distinction between receptivity and the products of the productive imagination (which draws upon the understanding), we must distinguish between intuitive (i.e., singular) conceptual representations and radically non-conceptual representations. The latter is how Sellars construes sensations as playing a causal role "neither epistemic nor physical" (EPM §7/SPR p. 133), but as causally efficacious states of non-apperceptive consciousness that constrain the activity of the productive imagination by virtue of being nonconceptual representations.[11]

The proper status of sense-impressions in Sellars' thinking therefore turns on a methodological principle and a transcendental result. It is a methodological principle that all transcendental structures must be reflected in causal structures, and it is a transcendental result that sheer receptivity is a transcendental structure. Hence there must be some causal structure in which sheer receptivity is reflected. On this basis Sellars then argues that sense-impressions, as causally efficacious episodes of consciousness, are the right causal structures to reflect the transcendental structure of sheer receptivity. However, it is one thing to think both that there is a transcendentally justified commitment to sheer receptivity *and* to try to locate the right causal structures for implementing that role; it is quite another to think that sense-impressions are the best candidates for doing so. In the next section, I will turn to embodied cognitive science to offer a somewhat different account of perception, one that requires revising critical realism.

2. Sensorimotor Abilities as The Productive Imagination

[11] See Schellenberg 2006 for a sophisticated justification of this interpretation.

In recent years, the major debate within cognitive science between symbolic or computational models of the mind and connectionist models of the mind has been contested by the rise of *enactivism*. The term "the enactive approach" was coined by Francisco Varela in *The Embodied Mind* (Varela, Thompson, and Rosch 1991), which contrasts with computationalism and connectionism (as traditionally understood) by focusing on cognition as an ongoing process that links animals with environments, rather than as an activity that transpires entirely or mostly within brains.[12] Accordingly, Rowlands (2010) refers to both computationalism and connectionism as "Cartesian cognitive science" (pp. 2-3), in contrast with the focus on "4E cognitive science", or mind as "embodied, embedded, enacted, and extended" (p. 3) – a contrast nicely echoed by Wheeler's (2005) distinction between 'Cartesian cognitive science' and 'Heideggerian cognitive science'.[13]

If enactivism promises a new research program for cognitive science, we shall need to understand why that research program ought to be preferred. At present, the strongest arguments for enactive cognitive science rely on philosophical rather than strictly scientific grounds.[14] Enactive cognitive science begins with the idea that the existential phenomenology of Heidegger or Merleau-Ponty (as well as its pragmatist cousin in Dewey) is a better description of what it is to be a cognitive agent, or a better description of mindedness as such, than competing

[12] I say "as traditionally understood" because more recent work in the philosophy of cognitive science undermines the contrast between computational approaches and embodiment approaches; see esp. Clark (2016).

[13] The enactive approach is further developed in Chemero (2009), Noë (2004), Stewart et al. (2010), and Thompson (2007) and with similar approaches taken in Clark (1997; 2016), Rockwell (2005), and Wheeler (2005).

[14] Gallagher (2015) argues, following a suggestion by Cecilia Heyes, that enactivism is more of a 'philosophy of nature' than 'scientific research program': "On the one hand, enactivism makes empirical claims … and in this sense it resembles a research program that can suggest new experiments and new ways of interpreting data. On the other hand, its emphasis on holism [e.g. brain-body-environment dynamics – CS] presents problems for empirical investigations. One does not get far in experimental science without controlling for variables. With respect to its holistic approach, enactivism resembles a philosophy of nature" (p. 295).

descriptions drawn from Descartes, Hume, or Kant. That is, enactive cognitive science takes the descriptions found in Heidegger's *Being and Time* or Merleau-Ponty's *Phenomenology of Perception* as explicating the *explanandum* for cognitive science. The proper task of cognitive science, thus conceived, is to propose and test models of subpersonal cognitive machinery that causally underpins the person-level functions described by existential phenomenology.

At the subpersonal level, then, enactivist cognitive scientists are committed to two theses: that at least some subpersonal cognitive mechanisms are constituted by their role in extra-cranial functions (the *embodiment* thesis) and that at least some subpersonal cognitive mechanisms are constituted by their role in extra-somatic functions (the *embeddedness* thesis). To be a cognitive agent—to be *minded*—is to be embodied and embedded. This means that there will be at least some cognitive mechanisms that exhibit a causal 'spread' beyond the brain into the body and/or into the environment. These two theses then constrain the choice of models for thinking about the mechanisms of mindedness. Whereas computationalism treats the mind as a symbol-processing system analogous to a Turing machine, and connectionism treats the mind as a neural network, enactivism treats the mind as an embodied dynamic system (Thompson 2005, p. 4), such that "cognitive processes emerge from the nonlinear and circular causality of continuous sensorimotor interactions involving the brain, body, and environment" (ibid., pp. 10-11). We are therefore led to a new metaphor for guiding construction of testable models.

Thus, while an embodied-and-embedded cognitive system could be modeled according to functionalist principles, the requirements of embodiment and embeddedness would require a different kind of functionalist approach than those that dominated the literature in the 1970s. Likewise, although enactivists are commitment to anti-representationalism (Varela et al. 1991; Chemero 2009), in what follows I shall put this emphasis to one side; emphasizing the

embodiment thesis and the embeddedness thesis does *not* require abandoning representationalism wholesale, if one were to conceive of representations as affordance-detecting and action-guiding functions of neurodynamical systems. (However, I will not comment on how some version of representationalism *could* be made compatible with Chemero's antirepresentationalist account of direct perception.)

Turning to the enactivist account of perception specifically, Noë (2004) emphasizes the crucial role of *sensorimotor skills* in perceptual experience: "intuitions – patterns of stimulation – without knowledge of the sensorimotor significance of these intuitions – is blind. Crucially, the knowledge in question is practical knowledge; it is know-how. To perceive you must be possession of sensorimotor bodily skills" (p. 11). If the 'must' is restricted to what we take to be paradigmatically 'normal' cases and not inflated into logical necessity, the enactivist claims that one can learn how to perceive objects only by interacting with them over time; it is not the imagination per se which is doing the relevant work, but the acquisition of sensorimotor skills. Contra Sellars, it is not the application of concepts and construction of images by the productive imagination which imbues sensations with cognitive significance and thereby constitutes perceptual experience; rather it is the sensorimotor skills of a living animal which play this role, crucial to which is coming to understand the way in which one's sensations co-vary or would co-vary with one's actual or possible movements (p. 15).

But what is thereby perceived, according to this style of explanation? Chemero (2009), much like Noë, grounds direct realism in the theory of how sensorimotor abilities contribute to perception. Unlike Noë, however, Chemero carefully criticizes and revises the theory of "affordances" promoted by the ecological psychologist J. J. Gibson. According to Gibson, affordances are something like the detectable properties of an environment relative to an

organism. Chemero's revision – what he calls "Affordances 2.0" – is that "affordances are relations between abilities to perceive and act and features of an environment" dynamically over the time-scales of behavior and of development (p. 150-151). Since affordances are what an animal directly perceives, an animal directly perceives the relation between its sensorimotor abilities and features of its environment. This counts as "direct", by Chemero's lights, just because the animal does not construct an inner representation of the perceptible object, as for example the visual processing theory of David Marr would have it; instead, the information necessary for suitably adjusting actions to the environment is available at the sensory receptors themselves.[15]

On this basis Noë and Chemero can give a different account of Sellars' problem of perceptual presence: how are the unobserved properties of perceived objects (e.g. interior volumes and non-facing sides) manifested in perceptual consciousness? Whereas Sellars argues that the unperceived properties are present in virtue of being imagined, Noë and Chemero can suggest that they are present by virtue of the accumulated store of implicit know-how of sensorimotor contingencies. This bodily know-how allows us to perceive the red apple as containing a volume of white that is juicy and cool, because that is how we *would* sense it if we were to cut it open or take a bite out of it. The counterfactual occurrent sensing is explained in terms of the modality of sensorimotor skills. The same skills are also drawn upon in allowing us to see *as* three-dimensional objects with which we have no first-order bodily interactions, such as clouds or perhaps the moon.

Though Sellars clearly notes the role of the body-image in constructing the relevant image-models, Noë proposes a much more intimate coordination of sensing and moving; the relevant

[15] See Rowlands (2010) for a comparison of the 'internalism' of Marr and the 'extenalism' of Gibson in their respective theories of perception (pp. 26-30; 33-37).

bodily skills are *sensorimotor*, not mere sensations that have to be taken up first and then be synthesized in accordance with the concept of the perceiver's body and the concept of the object. In short, Sellars' model of the productive imagination is a "top-down" model – the concepts provide the recipes that constrain how the sensations are synthesized into image-models – whereas Noë's model is a "bottom-up" model, according to which sensorimotor skills constitute perceptual intelligibility independently of the Understanding, assuming that the latter is construed as the capacity to apply concepts as predicates of possible judgments. The enactive approach stresses, with Merleau-Ponty, that 'to perceive is not to judge'.[16] Here it must be stressed that *perception* does not involve the logical functions of judgment, *not* that sensation does not. On Merleau-Ponty's account of perception subsequently adopted by enactivists, we should reject the idea that perception is a synthesis of sensation and conceptualization; instead it is a bodily activity with its own structures and norms distinct from those of propositionally articulated thought. Correspondingly, the task of enactive cognitive science is to propose and test models of the subpersonal mechanisms that implement embodied perceiving.

One might worry, however, as to how well justified enactivism is. Enactivism is justified, to the extent that it is, by the promise of locating subpersonal cognitive mechanisms that cohere with the person-level descriptions found in existential phenomenology. Enactive cognitive science could therefore be undermined in two different ways. First, it could be undermined if Heidegger or Merleau-Ponty are radically and fundamentally mistaken about what it is to be minded at the personal level – though I stress that it would need to be a quite radical undermining, and not simply pointing out that the phenomenology of embodiment *in their texts* fails to take into account factors such as gender, race, or disability. Likewise, enactive cognitive

[16] Cf. Merleau-Ponty: "to perceive in the full sense of the word (as the antithesis of imagining) is not to judge, but rather to grasp, prior to all judgment, a sense immanent in the sensible" (2012), p. 36.

science could be undermined if it turned out that orthodox 'Cartesian' cognitive science yielded better explanations of subpersonal cognitive mechanisms. If epistemically virtuous scientific explanations entailed that no cognitive mechanisms were constituted by their causal spread into body or environment because all putative cases of constitution were better understood in terms of coupling, enactive cognitive science as currently formulated would have to be discarded.[17]

3. Embodied Critical Realism

We have seen that embodied cognitive science holds that an animal directly perceives affordances, understood here (following Chemero) as the relation between its sensorimotor abilities and features of its environment. The sensorimotor abilities that enable direct perception of affordances function much like the productive imagination in critical realism. According to Coates (2009), "the imagination produces in the perceiver an implicit awareness, or set of expectations, of the likely ways in which the phenomenal, or sensory, aspect of an experience will be transformed" (p. 96); in just the same way, "an animal's sensorimotor abilities manifest themselves in embodied action that causes changes in the layout of available affordances, and those affordances will change the way abilities are exercised in action" (Chemero 2009, p. 151). The question naturally arises whether the Gibsonian direct realism advocated by Noë and Chemero is preferable to the critical realism of Sellars (*peré et fils*) and Coates.

In a detailed criticism of Noë, Coates (2007) observes that Noë must help himself to a concept of phenomenal consciousness that he does not adequately explain: "unless experience can be factored into an occurrent actual component, as well as a potential component, it would be

[17] The "coupling-constitution fallacy" takes it that it is a fallacy to infer, from "x is coupled to y", that "x and y constitute z"; see Adams and Aizawa (2001); for a critical response, see Rowlands (2010).

completely puzzling what the claim about 'access' to an object could amount to" (p. 102). It will not suffice to appeal simply to sensorimotor skills or abilities as a theory of perception, because that can explain at most the potential of perception, and not what is actual or occurrent to sensory consciousness. My perceptual awareness of my smartphone is partly constituted by the expectations of what I would see if I were to pick it up, or swipe the screen, and those expectations are grounded in my sensorimotor abilities that can be coupled to the smartphone's perceptible features. I do indeed directly perceive the smartphone-affordances. But Coates rightly objects that Noë takes perceptual *presence*, what is *actual* in sensory consciousness, as a primitive – as indeed does Chemero, though Chemero's explanation of sensorimotor abilities is vindicated by experiments in ecological psychology rather than human perceptual pathology.

We can, however, bring direct realism and critical realism together in what I call *embodied critical realism*. Embodied critical realism is what one gets when sensorimotor abilities take the place of the productive imagination, such that the dynamic unfolding over time of the relation between sensorimotor abilities and environmental features explains how perceptual awareness of objects is explicated in terms of expectations. When one sees a cat moving towards its food bowl, what makes that a genuine perceiving through the visual modality, and not just a visual sensation, is the implicit awareness that if one were to get up and move about, one's sensations would be expected to reliably co-vary with movement of one's body and of the objects perceived. This requires that possible movements — and the expectations, anticipations, preparations, etc. that are grounded in them — turn sensations into perceptual takings. But what is perceptually taken – the content of perceptual experience – is not the phenomenal episode *per se* but rather the affordances *qua* relations between features of the environment and sensorimotor abilities of organism.

As noted above, critical realism holds that sensations are *inner* episodes, states of sensory consciousness or of the perceiver. From the perspective of embodied critical realism, Coates's critical realist critique of direct realism conflates an insight with an error. For while Coates is right to object to Noë (and by extension Chemero) that perception requires something *occurrent* and not just *potential*, it does not follow that what is occurrent must be intrinsic, let alone intrinsic to consciousness. Relations can also be occurrent. Embodied critical realism agrees with critical realism that perception requires that there be something occurrent as well as possible (expectations, anticipations, preparations, surprisals, etc.), but reconceives these occurrent phenomena as specific actualizations of the coupling between sensorimotor abilities and environmental features. Sensations are thus relational properties rather than intrinsic properties of sensory consciousness; they are *of* but not *in* sensory consciousness.[18] (It remains to be seen whether embodied critical realism must accept some version of disjunctivism, though *prima facie* the position implies that hallucinations do not, *contra* critical realism, share a phenomenal component with perceptions.)

Do sensations, thus reconceived, causally mediate between conceptually structured perceptual takings and physical objects, as the critical realist maintains? Recall that the critical realist holds that physical objects cause episodes in sensory consciousness which in turn guide the deployment of concepts, via the construction of sense-image-models, and it is those concepts that then refer, in veridical perception, to the physical object that caused the phenomenal episode. Embodied critical realism accepts that there is something right about the occurrent/potential contrast but understands it in terms of occurrent and possible *relations*. The

[18] Neurobiologically, sensations are encoded egocentric spatio-temporal information about actual features of one's environment over time. On Clark's (2016) intriguing "predictive processing" model, we can think of sensations as encoding information so as to enable prediction errors to be transmitted to cognitive maps 'upstream'. The relation between predictive processing models and sensorimotor contingency theory lies outside the scope of this paper.

occurrent relation (obtaining over a temporal interval detectable to consciousness) functions as a causal 'anchor' that is colored by a penumbra of possibilia: the implicit awareness of possible sensorimotor actions due to the animal's sensorimotor abilities. Whereas critical realism then envisions the difference between what is occurrent and what is possible in terms of the nonconceptual, purely phenomenal states of consciousness and the imagined actions grounded in the productive imagination, embodied critical realism takes even sensations themselves be occurrent relations that "anchor" the possible relations of further embodied action in response to features of that environment.

For example, when I perceive my cat stalking a red dot emitted by a laser, both the cat and myself are described in terms of the occurrent relation between the specific posture, shape, orientation of our bodies at that moment and the specific layout of that environment (insofar as it is detectable by organisms with our sensory receptors). This occurrent relation then causally mediates the further deployment of our respective sensorimotor abilities in relation to that environment as she attempts to catch the moving dot that continually eludes her.[19]

What, then, of the conceptual component of perception, according to embodied critical realism? Here we face a problem familiar to readers of Sellars and McDowell: if perception is not conceptually structured at all, then it has no epistemic function, but if it has the same conceptual structures as discursively articulated thought, then it is unclear how to account for the real differences between perceiving and thinking.[20] Embodied critical realism suggests that sensorimotor abilities in sapient animals constrain the discursive activity that underpins inferentially articulated propositional contents (and hence also attitudes towards those contents).

[19] Unbeknownst to her, her inability to do is due to my subtle hand gestures as well as the physics of light, but this is a distinction in our respective conceptual powers rather than in our respective perceptual powers *per se*.

[20] For the latter concern, see esp. Baz (2003).

Yet we should notice that receptivity proper, in the sense that contrasts with spontaneity, requires only the Kantian view that spontaneity characterizes the Understanding, which in turn is paradigmatically bound up with judgment, and with discursively articulable concepts as predicates of possible judgment. Nothing in that conception of spontaneity requires that receptivity be utterly devoid of activity of its own distinctive kind.

Indeed it is an empiricist conviction, retained by Kant and indeed by Sellars, that only that which is passive can count as genuinely receptive. I do not think this need not be so; on the contrary, I find myself in basic agreement with Kukla and Lance (2014) when they write, "receptivity should not be equated with passivity — my encounter with objects is receptive, not to the extent that I play a passive role in this encounter, but instead to the extent that I find or discover them to be a certain way in a direct encounter with them" (27). Indeed, nothing would be essentially lost in Sellars' contrast even if, as Noë argues, sensorimotor skills were conceptual insofar as they involve the ability to generalize across a plurality of cases, classify diverse stimuli as correlated with a single motor routine, and conversely correlate diverse motor routines with a single or small class of stimuli. We would simply require a distinction between two different dimensions of conceptual content: a dimension at work in sensorimotor skills and another at work in propositional content, whether as non-inferred content suitable for premises in inferences (what Sellars calls "language-entry transitions") or as conclusions of practical inferences (the corresponding "language-exit transitions").

Thus far I have argued only that we can push critical realism towards embodied critical realism if we were to take on board key ideas from embodied cognitive science as an alternative to mainstream cognitive science. Why, however, should Sellarsians *prefer* it? Within the problematic pursued here, one important response is that it offers guidance on an omission in

Sellars' theory of perception: the genesis of the productive imagination. Although Sellars (1980) excelled in recognizing that the incoherence of the Given meant that the problem of how language is transmitted from generation to generation had to be resolved within the then-new explanatory framework of behaviorism, he did not recognize that the same is true for the productive imagination itself. Instead, by restricting himself to explicating the productive imagination within roughly Kantian terms, Sellars deprived himself of recognizing the need for a parallel account of how the developing organism acquires the capacity to construct image-models in accord with an image-model of the perceiver's own body.

Enactive cognitive science offers a solution to this problem in two respects. Firstly, by taking the explication of what it is to be a cognitive agent from Heidegger, Merleau-Ponty, and Dewey, rather than from Kant, enactive cognitive science begins a description of mindedness as always embodied and embedded. Secondly, by focusing on the role of sensorimotor skills as always in relation with environmental features, enactive cognitive science offers an account of how the productive imagination is brought forth: it comes into being as sensorimotor skills are gradually acquired over the course of early cognitive development. The developing organism learns which actual and possible movements are correlated with which actual and possible sensations as it navigates its environment through trial-and-error. Though this suggestion is at best a promissory note, without the explanatory resources of enactivism, there is a real danger than the productive imagination will be treated as Given, in the pernicious sense that Sellars enjoins us to avoid. In that regard enactive cognitive science should attract the attention of contemporary Sellarsian philosophers, whether or not they find embodied critical realism a proposal deserving of serious consideration – though of course that is to be hoped as well.[21]

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