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### PERCEPTION AS SOMETHING WE DO

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### ABSTRACT

In this paper, I want to focus on the claim, prominently made by sensorimotor theorists, that perception is something we do. I will argue that understanding perceiving as a bodily doing allows for a strong non dualistic position on the relation between experience and objective physical events, one which provides insight into why such relation seems problematic while at the same time providing means to relieve the tension. Next I will show how the claim that perception is something we do does not stand in opposition to, and is not refuted by the fact that we often have perceptual experience without moving. In arguing that cases of motionless perception and perception-like experience are still doings it will be pointed out that the same interactive regularities which are engaged in in active perception still apply to them. Explaining how past interactive regularities can influence current perception or perception-like experience in a way which remains true to the idea that perception is a doing, so I will argue, can be done by invoking the past—the past itself, however, not its representation. The resulting historical, non-representational sensorimotor approach can join forces with Gibsonian ecological psychology—provided that such is also understood along lines that don't invoke externalist remnants of contents.

### 1. The Perception-is-Doing Claim

The sensorimotor approach has characterized perception and perceptual experience with such sayings as:

"Seeing is something we do, not something that happens in is us" (O'Regan &Noë 2001b , p. 80)", and

"experience is not something that happens in us but is something we do " (O'Regan &Noë 2001b, p. 99).

In many instances, the sensorimotor approach has also described perception as "a mode of exploration of the world (...) mediated by "knowledge (...) of (...) sensorimotor contingencies" (O'Regan & Noë 2001a, p. 940).

This proposal to "treat vision as an *exploratory activity*" was offered as an alternative to the assumption "that vision consists in the creation of an internal representation whose activation somehow generates visual experience" (O'Regan & Noë 2011a, p. 940), or the generally believed "thought that somewhere in the brain an internal representation of

the outside world must be set up which, when it is activated, gives us the experience that we all share of the rich, three dimensional colourful world." (O'Regan & Noë 2001a, p. 939). Moreover, in the presentation of the sensorimotor theory given by O'Regan & Noë 2001a,b the idea of perceptual experience as "something we do, rather than something that happens in us" — the perception-is-doing claim, for short— was proposed as one leading to insight in both the problem of phenomenal consciousness as well as into a scientific programme for studying perception. "The activity based approach", so it was claimed "enables us to overcome the problem of what has been called "the explanatory gap"(...)—that is, the problem of understanding how something physical like the brain, can generate something non-physical, namely experience. We have solved the problem by noting that experience is not generated in the brain at all." (O'Regan & Noë 2001b, p. 80). Moreover, the authors claimed that the approach "sheds a new light on a number of problems in vision science", and, relatedly, "makes empirical predictions" (O'Regan & Noë 2001b, p. 80). b.

The perception-is-doing claim has been received with much puzzlement. One of the most common critiques it has drawn is that it is obviously false, because we often don't do much, in the manner of making movements, when we perceive or undergo perception-like experiences — one need only think about dreaming or mental imagery (see for example Prinz 2006, 2009). Moreover the idea that the perception-is-doing-claim can form a key to resolving philosophical worries about phenomenal consciousness has been scrutinised, and rejected. In fact, critics have argued it is be groundless because the obstacle to naturalising consciousness applies regardless of whether perception is construed as a brain process or something we do. Both brain processes and actions are objective processes "out there", and the gap between them and subjective phenomenal feeling applies to both in the same measure (again, see Prinz 2006, 2009).

In this paper, I will focus on the perception-as-doing claim. I will argue that seeing perceiving as a bodily doing allows for a strong non dualistic position on the relation between experience and objective physical events, one which provides insight into why such relation seems problematic while at the same time providing means to relieve the tension. Next I will show how the claim that perception is something we do does not stand in opposition to, and is not refuted by the fact that we often have perceptual experience without moving. To show that cases of motionless perception and perception-like experience are still doings I will point out that the same interactive regularities which are engaged in in active perception also apply to them. Explaining how past interactive regularities can influence current perception or perception-like experience in way which remains true to the idea that perception is a doing, so I will argue, can be done by invoking the past—the past itself, however, not its representation. Such a historical, non-representational sensorimotor approach can join forces with Gibsonian ecological psychology—provided that such is also understood along lines that don't invoke externalist remnants of contents.

# 2. A different duality

The perception-as doing-claim, is used to contrast "something we do" with "something that happens" or is "generated" "inside us". Moreover sensorimotor theorists posit that the seeing-as-doing claim helps overcome the explanatory gap. . But how can that be?

Prima facie, construing perception as something we do is not that different to construing perception as a brain process, because things we do, are, in the end, just objective processes, and in that respect are not essentially different from the relevant processes that happen inside us, namely brain processes. Doings might be objective processes that happen on a somewhat different time-scale than brain processes, and they might involve external bodily movement, but that does not seem to provide a key difference with respect to neural events which allows to advance on hard questions of phenomenal consciousness.

This line of reasoning would be compelling if there were no other important difference between doings and happenings. But there is. This concerns the different perspective we have on "things we do" and "things that happen." The issue can be clarified by the contrast philosophers from the phenomenological tradition have formulated between the "lived" and the "objective" (see for example Merleau-Ponty 1945). According to this, most of the time, we "live" or "enact" our bodies to encounter a world of "objective", not-lived objects. In this process of interaction with the world, our body is not one more object amongst those encountered in the world, it is us-in-action, rather than something we act on, or are acted on by. We can interact from an external position on objects, but we don't relate to our body in the same way. The lived body is not an instrument for us, operated upon from the outside by some "self" standing outside it. We don't act by moving on or with our body, but we do what we do by being a moving body.

Consider further that, according to the lived/objective distinction, while objects like stones fall into only one category of "objective", bodies like ours are special in they can be both lived and objective. Though we normally relate to our own bodies in the lived way, we can relate to some bodies —dead ones, the bodies of others and sometimes our own body— in the objective mode (Merleau-Ponty 1945). That is, we can relate to bodies from the same external point of view as with respect to inanimate objects, and we can relate to our own body in the objective mode. Importantly, however, the objectification of in particular our own bodies can only be partial. Following Husserl, Merleau-Ponty (1945, p. 81, 126) has famously illustrated the lived versus objective contrast and its inherent ambiguities with respect to one's own body by considering the example of a person touching with one hand the other hand. One of the hands is exploring the other as object. Though a measure of ambiguity applies to both hands, the one that is touching and exploring exemplifies the lived pole, while the other hand exemplifies the objective pole. Though it might do so momentarily, it never totally loses the fact that it is a means of tactile exploration too, even in being touched. Crucially, the same hand can't be fully touching and touched: when it switches to the touched mode, it is no longer touching: it can't be fully lived and experienced as objective at the same time. The same applies to the body as a whole. We all live our bodies, in living our lives, and then our bodies are "transparent" in the sense that they "are us"—, rather than that they are objective means used as an instrument from without by some distanced "self". We also achieve objectification of our own bodies when they become objects of thought or "reflection" (Merleau-Ponty 1945). Then we can take distance from our body, and relate to it as an object in space and time, which once didn't exist, and once will exist no longer. Yet, even when a thinker singles out her own body as an object of reflection, she also remains a body that is engaged in doing something, namely thinking. In that sense, just as in the hand example, the duality between lived and objective can, for organisms

like us, never be fully overcome: it is impossible to relate completely in the "objective" mode to our own body, and still perceive it, or still have a thought about it<sup>1</sup>.

Now one can see that, if perception, and perceptual experience is something we do, and if the things we do are bodily, we can take two different perspective with respect to perception and perceptual experience: we can live or enact our perceptions and perceptual experiences, but we can also objectify those perceptual doings in thinking about them. Importantly, we can never take both perspectives at the same time on the same perceptual doing. Either we enact the perceptual doing, or we objectify it in thought. Like in the example of the hands, we are never able to fully occupy both perspectives at once.

If all that is true, this puts us in a position to construe the alleged gap between perceptual experience and the objective as a perspectival, rather than ontological. Reading the perception-as-doing claim in the way described here, allows us to understand the philosophical difficulties surrounding the relation of perceptual experience to the physical as deriving from a difference in perspectives, rather than an ontological difference—it construes what dualists conceptualise in ontological terms as a distinction between perspectives. From this view of the relation of experience to the physical, it is a mistake to think that what is missing in our current scientific understanding of reality is some objective link between subjective facts and objective facts. What is mental, or experienced, is the body in its "lived" mode, it is not a different kind of objective stuff. Calls for finding a solution to the gap between experience and the physical within the objective, physical sciences, for example by means of some objective mechanisms which would "generate" consciousness, are built on a misunderstanding of the relation between the lived and the objective perspective as a relation not between different perspectives, but between different kinds of things or events, between which some objective connection must be found.

Sensorimotor theorists have been very clear that, according to them, the question of the generation of the "phenomenal" from the "physical" is a bogus problem. After having listed a number of physical mechanisms which have actually been proposed as allowing for the generation of consciousness, O'Regan and Noë (2011a) go on to claim the futility of the very enterprise these mechanisms were called into service for. It is worth rehearsing the full passage:

A number of proposals have come forth in recent years to suggest how this might come about. For example, it has been suggested, from work with blindsight patients, that consciousness in vision may derive from a "commentary" system situated somewhere in the fronto-limbic complex (taken to include the prefrontal cortex, insula and claustrum; cf. Weiskrantz 1997, p. 226). Crick and Koch (1990), Llinas and Ribary (1993), Singer (1993), and Singer and Gray (1995) suggest that consciousness might be correlated with particular states of the brain involving coherent oscillations in the 40–70 Hz range, which would serve to bind together the percepts pertaining to a particular conscious moment. Penrose (1994) and

<sup>&</sup>lt;sup>1</sup> As a consequence, Nagel's famous ideal of an "objective phenomenology" is anathema to a phenomenologist like Merleau-Ponty (Nagel 1989).

Hameroff (1994) suggest that the locus of consciousness might be a quantum process in neurons' microtubules. Edelman (1989) holds that reentrant signaling between cortical maps might give rise to consciousness. A variety of other possibilities that might constitute the "neural correlate of consciousness" has been compiled by Chalmers (1996).

A problem with proposals of this kind is that they do little to elucidate the mystery of visual consciousness (as pointed out by, for example, Chalmers 1996). For even if one particular mechanism – for example, coherent oscillations in a particular brain area – were proven to correlate perfectly with behavioral measures of consciousness, the problem of consciousness would simply be pushed back into a deeper hiding place: the question would now become, why and how should coherent oscillations ever generate consciousness? After all, coherent oscillations are observed in many other branches of science, where they do not generate consciousness. And even if consciousness is assumed to arise from some new, previously unknown mechanism, such as quantum-gravity processes in tubules, the puzzle still remains as to what exactly it is about tubules that allows them to generate consciousness, when other physical mechanisms do not.

(O'Regan & Noë 2001, p. 839-840)

What comes to the fore here is a refusal to play what Hutto & Myin (2013, Chapter 8) have referred to as the "generation game" or trying to explain how subjective experiences can derive from objective processes that generate them. Such a refusal is logical within a non-dualist approach, for if experience *is* bodily (including neural) activity, then the question of how the one (experience) is generated by the other is misplaced. There are no two terms of which one generates the other, or is generated by the other—they simply are identical. However, as per the phenomenological point, they are factually identical, but they don't look identical when they are considered from a lived perspective, or enacted, versus considered—in reflexion, as Merleau-Ponty would say—as objective phenomena.

We should be clear on what the line of thought spelled out here does and does not achieve. It does not, in any way, provide a knockdown argument against any form of dualism, or the existence of a genuine ontological difference between the experiential aspects of experience and the physical. Rather, it achieves two things. First, it explains how a something like an explanatory gap can arise in the first place. Second, it provides motivation for believing in specific phenomenal/physical identities. To start with the first, the line of argument sketched provides support for a non dualistic ontology, by showing how, even if dualism is false, there still exists a seeming tension between the subjective and mental on the one side and the objective and physical on the other side. From the point of view laid out here, the problem of the subjective-objective "gap", or the abyss between the phenomenal and the physical becomes a consequence of the fact that one can never fully take the lived and the objective perspectives at once, at once just like one hand can not be both touching and touched, or like one can not completely "step outside one's body" to consider it as the object of reflection. The gap becomes a fact of to the human condition, without creating an ontological schism.

In other words, the insight gained by pursuing the lived/objective difference does not offer first principles from which some form of identity between perceptual experience

and physical happenings be derived, but it can lead to seeing how barriers for disbelieving such identities can be overcome. The point is made in Hutto and Myin (2013), p. 177):

Continued hesitance to believe in such identities stems largely from the fact that experiences—even if understood as activities—are differently encountered by us: sometimes we live them through embodied activity and sometimes we get at them only descriptively.

If this is a correct analysis of the mind/body relation, the problem of the relation between the two is explained away, rather than needing to be solved. As with the phenomenological concept strategy proposed by analytical philosophers (see Hutto & Myin 2013, Chapter 8 for a discussion of it from a related point of view), we are offered an explanation of why the issue of the subjective versus the objective appears so puzzling, which at the same time implies that seeking a solution is misplaced—without having to buy into the commitments about the semantics of natural language which are taken by pursuers of the phenomenological concept strategy.

Though it may look at first sight like an unlikely alliance, pursuing this proposed reading of the perception-is-doing claim can thus combine the point derived here from phenomenology with a broadly construed identity theory. In fact, it is the identity of the perceiving and thinking beings which we are, with our active bodies that makes it impossible to step outside it and objectify it fully. When we live our bodies, or enact our experience, we do so from within those bodies—never able to become fully detached from them. In fact, if our active bodies don't appear as objects in the lived mode, this is *because* we are identical to them. Of course, the original identity theory as formulated in Place (1955) or Smart (1959), was narrowly brain-based, while the analysis given here emphasizes the role of bodily doings, and thus a broader, body-and possibly environment spanning identities.

So, besides accounting for a seeming gap between the phenomenal and the physical, the line of argument laid out here, also adds plausibility to particular identities between bodily doings in their phenomenal guise—that is as enacted— and bodily doings in their objective guise—as they appear as they are reflected upon (a point made in Hutto and Myin 2013, Chapter 8). For, despite the tension between perspectives which can arise in philosophical reflection, our natural phenomenal experiences take place when we engage in particular bodily interactions with our environments, which can be characterized by particular sensorimotor contingencies. The phenomenal feel of roughness is experienced in a situation in which we move our hand over a rough surface, for example. Experiencing darkness happens in particular situations—those in which the environment is or parts of it lack light—either by not receiving or by not reflecting it. It goes with ways of interaction such as coming closer or removing whatever obscures the light, which are non arbitrary and specific to those circumstances and those phenomenal experiences—which is a reason why it is difficult to imagine the possibility of spectral inversions of experience when complex contexts of interaction are involved (Hurley 1998, Chapter 8, Myin 2001). A purely neural identity theory lacks this motivating potential. For even if there would be stable correlations between specific kinds of bodily interactions, specific phenomenal experiences and specific neural processes—a possibility about which at this point we don't know whether it's true or

false—neural processes don't carry that interactive profile on their sleeves. It would still require to consider the specific organism-environment interactions which the neural process would play a stable role in, to obtain a plausible connection from the neural events to the phenomenal feel. In other words, as argued in Hutto & Myin (2013) a doing-based identity account holds an advantage over a purely neural identity theory, because the former is able to motivate belief in the relevant identities by foregrounding "the ways in which environment-involving activities are required for understanding and conceiving of phenomenality" (Hutto & Myin 2013, p. 177).

# 3. Doing, not moving

But *is* perception a bodily doing? For clearly, we can perceive without doing much. We only have to keep our eyes open. And then we don't even need to do that, for having perception-like experiences such as dreaming or imagining. How, in the light of such obvious facts, can it be maintained that perceiving is doing?

This line of criticism would be valid only if doing something meant the same as making movements. But it doesn't. The things organisms do are the things organisms engage in; start and stop; continue and pause, consider, refrain from and so on. Eating, grasping with mouth, paw or hand, running, walking, tracking, chasing and talking, are amongst the things various organisms do. Many of those things involve movement, but not necessarily all of the time and in some cases not at all. Holding still is something we do, but obviously without moving—if we move, we stop or fail to hold still.

The fact that things we do can but need not involve movement can be used to silence those criticisms of the sensorimotor approach which claim that perception can't be something we do, because we can have perception-like phenomenology, without doing anything, as in imagery, dreaming or paralysis (see O'Regan and Block 2012 for a recent instalment). This criticism fails to appreciate the categorical nature of the perception-is-doing claim, i.e. that it construes perception as belonging to the kinds of things which organisms or persons do, such as walking, talking, attending, or making their minds up. This is a category which, to use Alva Noë's apt characterization, forms part of, and can only be understood in the context of an organism's or person's "active life" (Noë 2004, p. 231). Clearly, in this categorical sense, to imagine, for example, is an activity. Just like walking, it is something a person starts to do, can do in response to external circumstances, can get bored with, stop, and so on. Thinking that imagining is not something we do because we don't move when we imagine, relies on a confusion of the notion of activity with the notion of movement.

Of course, perceiving often involves movement, and specific ways of perceiving involve specific movements —such as redirecting one's gaze, coming nearer to see the fine detail of a texture, or bringing an object close to view. Movements of the observer can create a succession of changes which are typical for, and can help the perceiver to identify objects or properties. As a consequence, perceiving a certain object, such as a cube, or a certain property, such as a colour, are *specific* things we do, with their characteristic interactive changes, or specific sensorimotor contingencies. When actually seeing a

cube, or the colour red, in normal circumstances, those signature changes would happen, were one to make the appropriate movements<sup>2</sup>.

This is not the case for imaging a cube, or imagining the colour red: actual movements will, normally, not produce the required changes. Sensorimotor theorists have pointed out that it is because of differences such as these that perceiving something and imagining something are different kinds of doings (O'Regan, Myin & Noë 2005a,b). Yet they must point to something in common to seeing and imagining a cube too (a point pressed by Ned Block in O'Regan & Block 2012). They can answer that demand, because both seeing a cube and imagining a cube share the same relations—which can be actual or only counterfactual—between continued perception or imagination. Just as the perceived cube, if actually walked around, would turn out to have a perceived backside, the imaginary cube, if imaginarily walked around, would have an imaginary backside.

So although visual imagining is something we do without necessarily moving, visually imagining something specific does have connections with specific movements or bodily interacting. This occurs, indeed with more immediate obviousness in imagery in nonvisual sensory modalities than vision, in particular touching, tasting or smelling. Imagining touching something soft or sharp seems difficult without invoking an imagined tactile interaction with a soft or sharp object, and the same seems to go, even if perhaps to a lesser degree, for imagined taste and imagined smell. In this sense, forms of sensory imagery seem to be derived from perception(Myin & Degenaar 2014, p. 96), which, in Beaton's (2013) felicitous phrase share the same "structure".

The phenomenon of touch can, however, lead to a more subtle criticism of the perception-as-doing claim. For we can be touched in a passive way—consider your skin being stroked with a feather by someone. How could such a predominantly passive tactile experience be considered a doing? And what about pain? How can perceiving the onset and persistence of a headache be assumed to be an activity? Doesn't this invalidate the sensorimotor approach, or at least severely restrict its scope? No, it doesn't. The perception-is-doing claim as construed here is by no means restricted to typical human voluntary actions. The doings can be bodily doings, and can be purely motivating rather than motivated—as long as they remain forming part of the organism's active life. So, while it is true that the experience of being touched as when one's skin is stroked by a feather does not share some of the features of paradigmatic voluntary actions, such as singing, it nevertheless is a bodily doing: a specific and active in which the body reacts to a specific kind of stimulation. The body's reaction is active in the sense that it is contextualized, and sensitive to "cognitive, emotional and evaluative contributions" (Ben-Zeev 1984). This is clearly the case for pain as well. Ben-Zeev cites Melzack:

The psychological evidence strongly supports the view of pain as a perceptual experience whose quality and intensity are influenced by the unique past history of the individual, by the meaning he gives to the pain-producing situation and by his "stage of mind" at the moment ... In this way pain becomes a function of the

<sup>&</sup>lt;sup>2</sup> Though these changes needn't be the same in all cases of seeing a colour, or a cube. See the discussion of "invariants" in the fourth section.

whole individual, including his present thoughts and fears as well as his hopes for the future (Melzack [1973], p. 48).

That pain is situationally sensitive, is indicated by the finding that as many as 37% of the patients arriving at an emergency clinic reported a period, normally of about an hour but lasting up to nine hours, of absence of the experience of pain after the injury —a finding lending support to the fact that athletes and soldiers sometimes succumb to serious injury, but they report being unaware of the pain until the end of the competition or battle (Beecher, H.K. (1956),)<sup>3</sup>. Pain is also clearly anticipatory. Rather than being invariably a reaction to actual tissue damage, pain also occurs whenever there is the threat of tissue damage (Melzack, 1996; Moseley, 2007a; Wall, 1999). For example, it has been shown that nociceptive neurons in area 7b of the monkey brain, respond with increasing strength to temperatures between 47 and 51.8 C that is. just below the level at which tissue damage occurs (Dong et al., 1994). In addition, it has been proposed that the fear of pain and (re)injury may be more disabling than pain itself, with these pain-related fears being one of the possible origins of chronic pain for some patients (see Vlaeven and Linton, 2000, for a review). Without developing the issue further here, these observations run counter to what Ben-Zeev calls "a passivity assumption" regarding touch and pain, and indicate that to conceive of these experiences in terms of doings—be it bodily doings—is the more plausible option.

Unpacking the perception-is-doing claim in this second way thus leads to the view that perception is categorically organismic activity, characterized by signature interactions. On this view, one doesn't need to engage in all those activities at once in order to be perceptually experiencing something, or any of these activities in order to be imaging something. Yet, even imaginings owe their specific character to specific interactions. How is that possible? Answering that question will allow more to bring into focus how studying perception-as-doing scientifically in a way consistent with the two readings just discussed, gives a fundamental role to history.

# 4. The long reach of the past

The question that needs to be answered is how characteristic interactions can determine perception and perceptual imagery while these characteristic interactions are not, or not all currently engaged in. If the sensorimotor approach is to remain coherent, the answer to that question must remain true to the perception-is-doing claim as unpacked in the previous sections.

For a traditional cognitivist, the answer to the question of how not currently engaged in interactions can determine perception now would follow how she typically deals with current influences of "the absent", namely via representation (see Clark and Toribio (1994) for a well known statement of this standard credo of cognitivism, and Degenaar & Myin (2014) for arguments against its validity). Absent interactions, absent sensorimotor contingencies can only play a role in current "cognition" if they are represented (on further standard cognitivist assumptions, inside the brain). In this vein, after admitting that some experiences, such as having a tactile experience of softness,

<sup>&</sup>lt;sup>3</sup> This passage on pain borrows from Auvray, Myin & Spence (2009).

normally involves activities like squishing a sponge, Block claims his cognitivist view has the advantage of handling imagined experiences as represented activities. He writes:

The "phenomenist" view I advocate allows that the experience of the activity of feeling something soft involves representing an activity even in dreams and images. " (O'Regan and Block 2012, p. 105)

Cognitivists tend to argue that there cannot be an alternative, as the only available choices are to equate cognition with movement or rigid stimulus-response pairs, or to buy into the cognitivist picture of cognition as the behind-the–scenes information processing activity which infuses movement with intelligence. A recent formulation of that view can be found in O'Brien and Opie 2015, p. 724:

It just isn't possible to explain the ability of evolved creatures to selectively engage with features of the environment—in other words, engage in targeted behaviour—without supposing they employ internal states that in some way represent those features.

The reason non-representational explanations are "just not possible", according to these authors, is "that moment-by-moment stimuli are simply too impoverished to account for the richness, variety, and specificity of the behaviours that animals exhibit".

The sensorimotor position, as presented and defended by its originators<sup>4</sup>, sometimes seem to go along with this cognitivist line (Hutto 2006). For it has been stated that there are "encodings of the laws of sensorimotor contingency" which are said "to mediate" current perception (e.g. O'Regan & Noë 2001a, p. 942, p. 970, p. 973). The assumption that " the brain has completely encoded the person's past history, in particular of seeing red things" is also invoked to account by O'Regan to account for perceptual experience in the absence of a normal environment (O'Regan & Block 2012, p. 106). As Block notes in that discussion (e.g. p. 100), formulating the sensorimotor position in this way makes it hard to distinguish from a cognitivist one.

Moreover, accepting that such encodings of laws —constituting "knowledge of sensorimotor contingencies" — and attributing them a theoretical role, makes the sensorimotor approach a hybrid between a nonrepresentational theory of - in Orlandi's (2014) terms - "the product of perception" or "the percept", and a representational theory of "the processes of perception" which lead to the product. Such a hybrid theory raises concerns about coherence, for it implies the need to argue why the reasons to reject representations in the one case don't apply in the other case<sup>5</sup>. Further, and more

<sup>&</sup>lt;sup>4</sup> As well as in some places in which I was one of the authors, see for example Myin and O'Regan 2009), p. 194.

<sup>&</sup>lt;sup>5</sup> Orlandi (2014) defends the converse hybrid position: representational for the products but non representational for the processes. The problem of justifying why representations are needed in one, but not the other case arises for her as well. Mole and Zhao\_(2015) have argued that her position is problematic because the reasons on the

basis of which she accepts of product representations should lead her to endorse process representations as well. I think the opposite holds: the reasons why she rejects representations for the process, apply as well to the product, so she should hold a full

importantly, if the term "encodings" is used in any substantive sense, encodings must be encodings of something. They must be representational because they carry a content, which can be true or false, inaccurate or inaccurate—in other words, the encodings must have truth or accuracy conditions. But, as detailed in Hutto & Myin (2013), this canonical idea of representation must be shown to have naturalistic credentials. It should be shown how supposedly representational phenomena—such as brain processes—come to have truth or accuracy conditions. Despite much philosophical efforts in recent decades, no such attempt at "naturalizing content" has yielded the hoped for results. What was considered to be the most promising candidate, the appeal to natural selective processes, can provide biological norms of adaptivity, but these fall short—so it is generally agreed (e.g. Burge 2010, Orlandi 2014 chapter 3)—of being truth or accuracy conditions. In a nutshell: we can perhaps say that a certain structure serves an adaptive function in a certain context, but that does not mean that that structure represents that context (for more details, see Hutto & Myin 2013). The upshot is that an appeal to representational structures or vehicles is an appeal to naturalistically unexplained entities. As a consequence, if the sensorimotor approach refers to encodings of sensorimotor laws in its explanations, it incurs a debt which it cannot—unless the naturalization of content project would succeed— repay on naturalistic terms and conditions.

Also, there is no need for a sensorimotor approach to appeal to representations. For the idea of perception-as-doing has sufficient explanatory muscle to explain both situated perception, and perception-like experiences as in imagery or dreaming. That is, despite the insistence of cognitivists like O'Brien and Opie, there *is* an alternative to cognitivist explanations not only of perception, but also of imagination in terms of representations. It is possible to retain the insight that past sensorimotor contingencies, or past interactions play a role in current perception or imagination, without subscribing to the cognitivist formula of representations "standing in" for the now absent past. This is to see the organism or person as adapted, or attuned to those past interactive regularities or interactions, without representing those past interactive regularities or sensorimotor contingencies<sup>6</sup>. It is to say that an organism has acquired, on the basis of a history of interactions, a sensitivity in its perception and action for such interactive generalities as for example for the ways cube or color stimuli change with the organism's movement. Acquiring such sensitivity doesn't need to be conceived of in representationalist terms: the past is not playing its role in the present as represented past – as mediated by representations of the past. What the organism has become sensitive to, are certain external conditions which it has encountered in the past and which it partially (or perhaps not at all, as in imagery) encounters now again. Acquiring sensitivity to these conditions requires (most probably) changed conditions in the organism—even if one can become sensitive to external conditions too merely by external changes. The mere existence of external and internal aspects of the process of becoming sensitive to do not necessitate representational description, however. It is not because an organism has become sensitive, in its current actions, to certain external circumstances that it represents those circumstances by some internal means. This is obvious in non-

non representational position as defended in Hutto & Myin\_(2013). A more detailed treatment will be provided in Hutto & Myin (in preparation, chapter 7) <sup>6</sup> The passage from here on, including a part of the next section, relies on Myin and Degenaar (2014).

cognitive evolutionary adaptations: a bird's wings partially constitute the bird's internal conditions for moving appropriately—in a way which is sensitive for the external conditions— in an aerial environment, but this does not imply that the bird or its wings represent these external conditions. Analogously, in the cognitive case, there is no logical need to describe the internal conditions that mediate cognitive attunements as representing the external circumstances the organism shows sensitivity to. Without being representational, these changes can still retain their causal powers and allow for a bridge between the past and the present. In this way, the sensorimotor approach can offer an account of how past regularities can play a role in current perception or imagination, which remains consistent with the perception-is-doing claim as unpacked in the previous section.

## 4. The science of vision-as-doing

If it was on target, the proposed unpacking of the perception-as-doing claim has shown how the sensorimotor approach can move from studying how the environment is represented, or how brain processes give rise to phenomenal consciousness, to studying what environmental variables organisms are sensitive to in their perceptual interactions, and how they have become sensitive to such variables. The sensorimotor approach has shown how to conduct such study in, for example, its account of "expanded vision". "Expanded vision" concerns the kind of visual experience one has when standing in front of a scene and overseeing it, looking at a large screen, or holding a book opened in one's hand and having the experience of seeing both pages. Expanded vision is characterized by the spatial and temporal continuity of what is visually experienced. Essentially, seeing a scene coincides with being in visual contact with a certain extent of the world. Though expanded vision comes very naturally to us, certain well-known facts seem to stand in the way of a straightforward explanation of it. One relevant finding is that subjects are not continuously visually accessing the whole scene in the same high-quality way, due to such factors as differences in the spatial distribution of receptors in the retina, and the presence of the blind spot where the optic nerve leaves the retina (O'Regan, 1992, 2011). The absence of uniform or smooth simultaneous access is further highlighted by results from studies on change blindness and inattentional blindness, which have made clear that large changes in a scene can remain unnoticed to viewers, for example when other changes are particularly "loud".

One way to explain expanded vision in the face of these facts is to assume that the experienced homogeneity is due to the production of a homogeneous "internal representation of the outside world" (reiterating a point made in O'Regan 1992, and O'Regan and Noë, 2001). The distorted and gappy retinal image would then be "filled in" to produce a smooth and complete representation, to which or through which simultaneous access would still be possible. Clearly, however, this is a cognitivist solution, which is unavailable for a sensorimotor theorist, for it would mean a denial of the claim "that vision is something we do, rather than something that happens in us".

Instead, the sensorimotor approach accounts for continuity in terms of sensorimotor interactive regularities. One should not be misled by the fact of instantaneous access: perceivers have high-quality momentary access to only limited parts of the scene, while momentary access to other parts of the scene is of low quality. Crucially, however,

according to the sensorimotor approach, perceivers are set up to react to sudden changes in visual characteristics, so that, normally, any such significant change will not go unnoticed, but will lead the perceiver to focus on it. The trick to a successful change-blindness experiment is to tamper with this "grabbiness" or "alerting capacity" (O'Regan, Myin, and Noë, 2005a,b) of environmental changes, by introducing an even larger visual alteration such as a blank screen between two pictures of a scene before and after changes. Seeing the scene in an expanded way, then, is not the consequence of an expanded representation, but of one's ways and capacities of interacting with the scene.

In its search for the relevant environmental variables, the sensorimotor approach doesn't stand alone. It can count itself in the company of, amongst others, ecological perception theorists of Gibsonian stripe. Much of their research efforts have indeed been precisely aimed at the identification of those interactive variables which perceivers are sensitive to for their perception of specific properties. Zooming in on some aspects of that program will again underline the role needed for a historical dimension to approaches that construe perception as doing, since, as with the sensorimotor approach, the Gibsonian programme will without reference to history find it difficult to avoid repeating, albeit it in a different format, mistakes made by cognitivism.

One prominent way in which the Gibsonian research program has been articulated and executed is in terms of looking for invariant properties in the optic array—"invariances" for short. They are patterns in the ambient light, which often have a temporal dimension, and might involve movement of the organism. The way the outlines of objects grow in size when one approaches them, form a prominent example of such an invariant. Invariants are then said to specify affordances, or "possibilities" for action, such as the possibility to be climbed in (which might be afforded to an animal by a tree), or to be walked upon (which might be afforded to an animal by the ground). One can see how an affordance can be linked to an invariance by considering the fact that "time to contact" with a surface which one is moving toward,—a highly relevant feature for gannets who retrieve their wings at the latest possible moment when flying towards the water—is claimed to be correlated with an invariant in changes in the ambient array, known in the literature as Tau (Lee 1976, see Tresilian 1999 for a critical perspective). It has become a distinctively Gibsonian claim that affordances can be perceived directly, meaning without inference, via invariant-based perception. Because they are sensitive to the corresponding invariants, organisms are then said to directly (i.e. without inference) perceive that trees are climbable, grounds walkable, or fruits edible. Clearly, the idea that affordances can be perceived directly, via sensitivity to invariants is meant to run counter to cognitivism, as perception being direct is meant to be in opposition that it is inferentially mediated (i.e.made possible because of the brain's inferential processing of what is sensorily registered).

Yet, in proposing this account of direct perception, and arguably in the very assumption of invariant properties, some Gibsonian theorists have been driven to a position—or to formulations which imply this position— which appears to propose externalist, world-involving, instead of brain-involving, versions of cognitivist posits. In particular, Gibsonian theorists have described invariants in what are essentially semantic terms, namely invariants as *being about* affordances or the environment, where affordances are understood as action possibilities.

As van Dijk et al (2015) show, one can find these apparent appeals to content in the writings of Gibson himself. In several earlier passages (some of which are identified in van Dijk et al 2015)<sup>7</sup>, Gibson explicitly writes about physical variables in the light as "carrying information *about* the environment from which the light comes", and further states:

By "carrying information, I mean only that certain variables in an array, especially a moving array, will correspond to certain properties of edges, surfaces, things, places, events, animals, and the like—in short to environmental facts. They will not, of course, replicate but only specify such facts." (Gibson 1961, p. 259, as quoted in van Dijk et al 2015).

The language of "being about" and of "specifying" belongs to the semantic sphere, or the language with which content-carrying representations are characterized. It is the distinguishing property of representations to "be about" and to "specify". Several theorists attempting to further develop Gibson's approach have made use of semantically-laden vocabulary. For example, in Fajen et al. (2008) use "specification" in a similar way to that found in the Gibson passage quoted above. They write that "properties of the world are specified in patterns of stimulus energy", and that " information (...) specifies action-relevant properties of the environment" (Fajen et al 2008, p. 81). Further, they also seem to rely on a semantic view of what affordances are, when they state: "Affordances describe the environment in terms of how animals can act." (Fajen et al 2008, p. 88)

This way of construing invariants and affordances in terms of semantic information is problematic, because it paints a metaphysical picture in which meaning or *being about* —is inherent in the natural world as established by relations of co-variance or specification. This is to confuse co-variance relations with meanings, or to sin against what Hutto and Myin (2013) called the "co-variance doesn't constitute content" principle. In short it is not because an effect E is reliably caused by a cause C, that E *is about*, or *describes* C. In the analysis made by Hutto and Myin, the crucial foundational weakness of cognitivism is that it invokes contentful representations in explanations for cognition without having an account of how these representations came to be contentful in the first place. In standard versions of cognitivism, contents are just posited, not explained.

For all the intended and real differences, there is something common to talking about invariants and affordances in terms of specification (understood as description) and a cognitivist outlook. In both cases, perceptual experience gets explained in terms of something that already carries content or has meaning. That is, while a Gibsonianism developed along these lines avoids the standard cognitivist practice of explaining perception and perceptual experience in terms of the manipulation of subpersonal representations "in the head", it holds on to the main characters of the picture, content-carrying vehicles, locating these in the outside world instead of the head. Seen from this angle, cognitivism and the Gibsonianism at issue are complementary: cognition —or

<sup>&</sup>lt;sup>7</sup> van Dijk et al (2015) also point out that Gibson's later work contains correctives to such use of "information".

better intelligence— is projected where it isn't, in one case in the brain, in the other case the outside world.

Just as locating contents in the brain is incompatible with the categorical reading of the perception-as-doing claim, so is locating it externally. If the mistake is similar, the remedy is too. It is to move out of the now, and into the history.

Environmental properties don't *by themselves* specify "that something can afford this or that". But an organism that has a history of interactions with those properties can have *found out* that this or that action was *actually* afforded in the past, and this can be the basis on which its current perception of its environment can have become sensitive to these environmental properties. As this paper has explained, representations in the brain are not needed to explain the organism's enriched sensitivity. Just as history allows us to exorcise cognitive content carrying descriptions from the head, it can be used to exorcise them from the environment. Once history's role is understood, there's no longer a need to describe environmental variables as themselves "specifying" or "describing" other properties. Organisms, in their history of interactions, by actually undertaking the appropriate actions, zone in on the relevant environmental properties.

Invoking history to help explain how we perceive affordances adds a further temporal dimension to the idea that perception-is-doing. Perception becomes something we do, in the light of the things we've done before. Perception, so it can be said, is also what we *have* done.

Once a role for history is fully incorporated into an account of affordances, doubt can also be cast on the assumption, ingrained in some strands of Gibsonianism (see e.g. Turvey 1990), that the environmental interactional variables need to be invariant, in the sense that there is one specific "signature" interactive variable that the organisms have become sensitive to. What unifies all those things the perceiving of which can lead to specific actions (like climbing or eating), is that the action has been performed in the past upon perceptual contact with certain variables. Different environmental variables can allow for the same action. What makes those variables belong to the same class is not some physical "signature" property, but the fact that the same action has been found out to have been possible. It is the interactive history of the animal and its environment, not environmental physics *per* se, which carves nature into kinds<sup>8</sup>. (See Withagen &

<sup>&</sup>lt;sup>8</sup> The idea that more proximal properties *specify* in the sense of 'describe' might derive some of its plausibility from the supposition that a specific and unique more proximal variable (such as Lee's famous Tau, see Lee 1976) correlates rigidly with some more other property (such as "time to contact"). Such thinking would be continuous with a long tradition of trying to ground meaning in some form of natural causal correlation (Dretske 1995). Pending further development, this program has not achieved the results it was set up for. For, as detailed in Hutto & Myin (2013), co-variation does not constitute content. That E is caused by C doesn't imply that, therefore, E describes, or carries meaningful content about E. Moreover, Hutto & Myin (2013) have claimed that nothing is added by incorporating a function for the correlation—that still doesn't generate content.

Chemero 2009 for steps in this direction, and van Dijk et al (2015) for a fuller elaboration of this point).

The functional, pragmatic nature of the relevant interactional variable for perception, comes to the fore in what the sensorimotor theory' approach has showcased as an empirical phenomenon conspicuously favouring it: sensory substitution. For if it is possible to visually perceive by means of tactile stimulation, this shows that different environmental properties can acquire the same pragmatic functionality. That such a "switch", if occurring within one person, requires a learning history, underscores again the role of history, or the fact that perception is something we do now, in the light of what we have done before<sup>9</sup>.

## 5. Conclusion

Conceiving of perception as doing, allows for an account of perception which explains both how dualistic worries about perception arise, and how they can be avoided. Construing perception as an activity does not mean claiming that perceivers must make movements whenever they perceive. Perceptual and perception-like experience is possible without movement. Experiences such as imagery have a structure which is derived from interactive patterns actually engaged in by active perception. Accounting for how absent interactive patterns can play a role in current experience can be achieved in a way which honours the non representationalism which motivated seeing perception as doing in the first place, by invoking history. Seeing perception as doing thus opens up a scientific research program which focuses on patterns of and interaction and their history. In such a program, perception is genuinely a matter of doing, rather than of representing.

<sup>&</sup>lt;sup>9</sup> One could question the importance of history for the mind by invoking the possibility of a "swamp mind" that could come into existence without having any history at all. Ned Block uses such tactics in O'Regan and Block (2012), to argue that neural properties instead of sensorimotor contingencies explain the phenomenal character of experience. However, it seems nothing about the mind gets explained in a swamp brain scenario, either by the brain, or by anything else. In a swamp brain scenario, everything is just an accident, and an unexplained one for that. Imagining that a slice of momentary brain state would coincide with a slice of momentary phenomenal experience would do nothing to *explain* the experience. Under a brain-mind identity theory, which holds that phenomenal experiences are brain states, this absence of explanation gets a clear diagnosis: to say that the brain state occurs is just to say that that the phenomenal experience occurs. It is a statement of a fact, not an explanation of that fact. Still one could argue that a swamp brain scenario shows that minds are not metaphysically dependent on history-even if this dependence holds when it comes to offer explanations. This move relies on conceiving of metaphysics in a way in which metaphysical truths about phenomena are cut loose from the explanatory connections and contexts of these phenomena. This conception of metaphysics should be justified. It can't just be taken as for granted that "for metaphysical purposes" explanatory considerations become irrelevant. Clearly, in the current context, building one's case for the irrelevance of history on such a construal of metaphysics amounts, if no further justification is provided, <del>amounts</del> to begging the question.

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