Perception in Action: Radicality in Cognition and How to Resist it

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Abstract. The divide between cognitivism and enactivism can be assessed by looking at their respective commitments to understanding perception as based on knowing-that, as opposed to knowing-how. While for the cognitivists perception can be framed as a propositional process [7] form of a radical anti-representationalist view [25]. This anti-representationalist stance has been inherited by the sensorimotor contingency approach [18, 17], according to which perceiving is a way of detecting the possibilities of action in the environment based on a practical knowledge of sensorimotor contingencies [17]. According to this view, no propositional medium stands between perception and action, and object recognition is a direct process non-mediated through representations. Indeed, Noë [17] often treats sensorimotor contingencies as Gibsonian affordances [9]: realizing what an object is (in the visual dimension) is realizing what we can do with it (in the motor dimension). However, Hutto [10] has argued that the sensorimotor contingency approach can be completely reformulated in terms of explicit propositional knowledge, hence it is still committed to representationalism. Thus, he has proposed to radicalize enactivism, by definitely dropping every propositional residue in the cognitive sciences [10, 11]. More recently, Butterfill Sinigaglia [2] have introduced a kind of non-propositional format of representations they call motor representations. Following them I suggest that there is room for an intermediate position between Hutto's radical enactivism and the standard representationalist approach to cognition [5, 6]. In particular, research at the neural level of analysis shows that perceiving motor possibilities in the environment relies on a kind of representational, although non-propositional, process. Accordingly, I show that affordances and sensorimotor contingencies are detected through motor representations, which are not in conflict with the enactivist view of perception.

Through this paper I first distinguish between descriptive (perceptual) representations, which have a mind-to-world direction of fit and a world-to-mind direction of causation, and prescriptive (action) representations, which have a world-to-mind direction of fit and a mind-to- world direction of causation [1, 23]. Then, I introduce the concept of subpersonal visuomotor representations (SVR). These on the one hand resemble the non-conceptual part of perceptual representations (visual percept) because they encode visual properties of objects, and on the other hand resemble action representations because they anticipate the state of the visual world that will be brought about by the action. In other words, SVR do not acquire explicit knowledge about the visual world, but represent objects as goals for actions. More precisely, SVR operate automatically to achieve the desired goal and do not reach subject's conscious awareness, having non-conceptual content [13, 12].

Thus, while scholars have denied the presence of representations in perception [4], suggesting that neuroscientists usually mistake covariance, or informational semantics–explained purely by way of causal interactions– for content–information within a system [11]–and, in particular, Chemero [3] has argued that affordance perception can be described in purely dynamical terms, without positing any form of representational mechanism, in § 2 I confirm the presence of visuomotor representational mechanisms at the cortical level by offering evidences about the linkage between the dorsal visual pathway and the intraparietal area (AIP) and between AIP and the area F5 in the ventral premotor cortex [14]. Indeed, the dorsal visual pathway realizes visuomotor transformations [24, 15], making it possible to detect affordances in the environment [22, 16, 19, 20, 21]. These data strengthen the action/perception coupling: seeing an object is getting at the same time its visuomotor priming (i.e. the visuomotor representation of its affordance), and the internal simulation of one of the actions we could perform upon it (i.e. the most suitable motor program required to interact with it), even if no action execution is actually occurring [8, 13].

In § 3, I show that visuomotor representations are non-conceptual and non-propositional (contrary to classical representations), since their motor format is realized by a "computation" that do not represent something that can be true or false with respect to the external world (e.g., that that mug exists). Contrariwise, this "computation" represents the suitability of a potential motor act to act upon what we find in the external world (the way I can grasp, say, that mug). Actually, the relation between intentions and (visuo)motor representations resembles the relationship between the representation of a route on a map and the instruction 'follow this route'(the route on the map): this instruction does not describe the route but merely defers to a representation of it [2]. Similarly, acting on an intention requires that the outcome is specified by (visuo)motor representations: the concept of grasping involved in the intention refers by deferring to a (visuo)motor representation of grasping. In this section I will also offer a formulation of SVR in terms of teleosemantics, suggesting that, concerning motor perception, motor neuroscience is not dealing with mere informational semantics.

Summing up, I agree with the enactivists that perceiving is a way of acting based on a form of non-propositional knowing-how. However, my point is that perceiving possibilities of action in the environment requires non-propositional visuomotor representations. So, after all, we must still grant a role for representations.

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