

Perceptual presence enacted. Commentary on Seth's predictive processing theory of sensorimotor contingencies

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Abstract. We challenge the necessity of the representationalist assumptions underlying Seth's predictive processing account of sensorimotor contingencies. We point at an alternative embodied/enactive conception of perception, and at the possibility of nonrepresentational sensorimotor accounts of both sensory presence and synaesthesia.

Is cognition, in a broad sense which includes perception, always and everywhere underwritten by representations? Cognitivist theory, including the increasingly influential "predictive processing" branch as exemplified in Seth's target paper [1], answers that question in the affirmative. Hohwy expresses this felt necessity for representation by stating: "The brain needs to represent the world so we can act meaningfully on it", quickly connecting with the "Bayesian brain" idea by adding: "that is, it has to figure out what in the world causes its sensory input. Representation is thereby a matter of causal inference" [2].

Many embodied/enactive theorists (E-theorists, for short) defend the opposed idea that much intelligent action is possible without representation (e.g. [3, 4, 5]). They hold that one can perceive the world, and act meaningfully in it, without representing it. They will agree with Bayesian modellers like Hohwy and Seth that intelligent action requires that an organism is systematically sensitive to the statistical structure of their environment. But they will hold that the presence of such sensitivity does not imply that the organism has to contain some inner description or model of those probabilistic patterns. Organisms respond to or enact that relevant structure in their adaptive actions, without relying, and without needing to rely, on representations that prescribe what to do, much like the solar system "acts out" Newton's laws of planetary motion without in any way representing them. E-theorists think that, for a large share of intelligent activity (including perception), it is just as unnecessary to resort to explanations in terms of representations, as it is unnecessary to see planetary motion as driven by inner astronomical models.

A prominent cognitivist motivation for the need for representation is the observation that some cognitive phenomena, also of perceptual stripe, can occur outside of their normal contexts – as in hallucinations, or in synaesthesia. If it is beyond doubt that one is not experiencing an environment in these cases, mustn't one then be experiencing a representation of the environment then? In response, the E-theorist can point out that quasi-perceptual phenomena like hallucination or synaesthesia should be construed as re-enactments of perceptual

experiences, be it in the absence of the external patterns normally causing them. From the perspective of the E-theorist, the enactment of perceptual experience is nonrepresentational, and the re-enactment of perceptual experience is so too. Presence or absence of characteristic patterns in the environment doesn't change the status — representational or not — of the experience.

A fully nonrepresentational version of the sensorimotor contingency theory will explain the feeling of perceptual presence by an organisms' interaction with a situation which shows bodiliness and grabbiness: a situation in which an organism's movements, as well as changes in the environment, will have systematic changes in the way it is perceptually affected by the environment (e.g. [6]). An organism experiences a tree as a real, solid and three-dimensional object, because it is attuned, in its further interaction with the tree, to the properties the tree genuinely has – which the organism can encounter in its further interactions with the tree. In addition, there are properties particular to the mode of interaction itself, such as that in vision, closing the eyes makes the sensory stimulation temporarily come to an end. Attunement to properties, so the E-theorist insists, is possible without representation of those properties. Attunement can be misaligned, and an organism can act and experience in a way attuned to a tree— when what's in front of it is not a tree. In a richly interactive situation, further interaction will counteract misaligned attunement. An organism will quickly find its misalignment caused by a reflection of a fly in the pond when it moves to catch it. But if nothing counteracts a misalignment, it might linger on, perhaps even become systematic. Of course, not being counteracted isn't the same as being supported by the environment – as a genuine experience of a fly could or would be. Merely non-counteracted experiences are objectively different from supported experiences, and that difference can show up in experience as a difference in felt presence.

It seems therefore, that, contrary to the assumption that the sensorimotor account "struggles to explain instances of perception, such as synaesthesia" (as in the abstract of the target paper), it does have means to account for the difference in felt presence between perceptual and synaesthetic experience. Synaesthetic experiences might be merely not-counteracted experiences, different from genuinely perceptual experiences in that only the latter are congruent with patterns in the environment. Such congruence need not be understood in the match of an inner model with a structure in the world. It can consist in nothing more than the enactment of a pattern of interaction which unfolds in the way it has unfolded in the organism's past.

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