

## **Enacting the experience of space through perceptual supplementation devices: beyond the internalism/externalism debate**

Pierre STEINER, Université de Technologie de Compiègne ; Pierre.Steiner@utc.fr

My work in philosophy of cognitive science is realized in collaboration with Charles Lenay in Compiègne University. The work I am presenting today concerns the question of the nature of the space of perceptual experience.

It is first related to the workshop-question (2) (“how can empirical experiments with sensory augmentation devices be used to further philosophical and psychological enquiry into cognition and perception?”); but might also be partially linked with (1) (“are there rigorous techniques that can characterise the subjective experience of using sensory augmentation technology?”), since it aims at underlining the powerful importance of embodied and technologically-enhanced subjectivity in the constitution of spatiality (these powers can be (probably not isomorphically – that is the question!) described both from first-person and third-person perspective).

What we call in Compiègne “perceptual supplementation” systems (and not *sensory substitution* systems) are *enactive interfaces*. Enactive interfaces transform our possibilities of action, and thereby transform our lived experience, offering new capacities for perception, imagination, memory and reasoning. The study of their appropriation offers new insights on the genesis of perceptual modalities. But they also open the possibility of proposing new arguments in philosophical debates between vehicle-internalism and vehicle-externalism, especially on perceptual consciousness. According to « vehicle-externalism » (Hurley) or « active externalism » (Clark & Chalmers), cognitive activity, notably (but not necessarily)<sup>1</sup> perceptual activity and/or consciousness, is not exclusively localized in the head; it is rather distributed across the brain, the body, sensori-motor dynamics of concrete actions, the environment, and artifacts (extensions of our perceptual body (canes, glasses,...))

Still, we may remark that the opposition between “externalism” and “internalism” assumes a space within which the question in debate itself makes sense: a space where objects and living organisms perceiving/using them are both situated; a pre-given space which makes possible to ask, *afterwards*, if the perceptions/perceptual experience (or, more broadly, cognitive processes) are exclusively internal states of the organism (in the brain), or if they rather supervene in a distributed fashion on brain, body and environment. The opposition between externalism and internalism may take a radical turn if we question the nature and origin of this space.

How, where and when is there a constitution of the space *within which* an object, and the point of view on that object, are both localized? How, where and when is the distinction between an external world and an inner world constituted? We experience our perceptual environment as a spatial environment, being the tri-dimensional container of various states of affairs, things, properties, and relations. But how can we simultaneously experience both the presence of these objects and the space in which all these objects of experience appear and are localized? How can we have the experience of a space around, outside and beyond us, from our very own peculiar localization? This is the problem of the origin of the space of perception: accounting for the conditions in virtue of which we have an (experiential) sense of a space preceding our consciousness, not co-extensive with it (an objective space), and inside of which we perceive.

Part of my philosophical work consists in questioning the common assumptions of the debate between internalism and externalism by focusing on the question of the space of perception – with both philosophical and experimental means (relying on devices, which by virtue of their extreme minimalism induce an exhibition of the active, concrete constitution of a perceptual space).

Besides their foundational importance in the internalism/externalism debate, answering to the aforementioned questions is important in order to: (1) understand the functioning of enactive interfaces which lead to the constitution of new perceptual spaces; and, (2) to better understand cognitive technologies as technical devices and external inscriptions which participate to our cognitive activity.

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<sup>1</sup> Clark, for instance, expresses doubts about the possible extended character of perceptual experience.

A traditional answer to these questions considers space as being objective and preceding the agents that are immersed in it. Agents sense this objective space in virtue of subpersonal informational entities which represent parts of the environment (including spatial relations and properties) and which, collectively, realize the experience of space. In this model, brain is the sole (or at least the main) realizer of our experience of space.

Perceptual supplementation systems can help us to frame an enactive model of our experience of space. According to this model, the space we experience is neither primarily objective (independent from us), nor the result of some representational (re)production into an inner space; it is actively constituted (enacted) in the coupling between motor and sensory abilities exercised by the agent. The constitution we consider here is not constitution in a mereological sense<sup>2</sup> ( $x$  constitutes  $y = x$  is the *substratum* of  $y$ ), but in a phenomenological sense (as the bringing forth of space by an embodied and active subjectivity).

Our simple and minimalist experimental situations<sup>3</sup> concern the localization of objects. In these situations, a sense of spatiality (perceiving things *out there*) appears in correlation with the ability to localize targets (ability based on the mastery of sensori-motor strategies). Inspired by the sensory substitution devices of Bach y Rita, our minimalist system is composed of a single photo-electric cell triggering a binary tactile stimulator. When the incident luminosity, within a cone is greater than a threshold, the tactile stimulus is triggered. Even with such a simple device, the spatial location of luminous targets is still possible. The subject initially perceives only a succession of tactile stimuli that accompany his movements. But, along as he becomes familiar with the device, his sensations are progressively replaced by the perception of a target at a certain distance in front of him. The sensory information being only a temporal sequence of binary 1 and 0 with no spatial information, the perception of the localization of the target in direction and depth is only accessible by means of active exploration. The minimalism of the device forces a spatial and temporal deployment of the perceptual activity. From these experiments, coupled with phenomenological inquiries, several theoretical considerations on the space of perception may be defended:

1) The spatial exteriority of the target can only be constituted by the possibility of freely and reversibly coming and going around it, alternately leaving and finding contact. Spatial perception requires the synthesis of a temporal succession of actions and sensations. Space, in its *objective* character, appears as the structured domain of the sensori-motor invariants that emerge from the attempts of agents to localize targets. Our experiments might be used to translate some phenomenological insights inherited from Merleau-Ponty's theory of the *spatialité du corps propre* ("spatiality of one's own body", from which the objective space is derived). In our case, the abilities of the *corps propre* are supplemented by enactive interfaces (otherwise, objective space cannot be experienced):

« For us to be able to conceive space, it is in the first place necessary that we should have been thrust into it by our body, and that it should have provided us with the first model of those transpositions, equivalents and identifications which make space into an objective system and allow our experience to be one of objects, opening out on an "in itself"» (Merleau-Ponty, *Phenomenology of Perception*, p.142)

2) The space of perception is actively constituted before any spatial inner/outer distinction concerning particular objects and processes. Space appears as the systemic structure of reversible displacements of this point of view, and of objects relative to the point of view. The perceptual actions of a subject correspond to movements of his "point of view", i.e. the locus from which the object is perceived. The spatial localization of the target is simultaneously localization of the point of view and of its relative movements to the target. The subject, as an organism in movement, belongs to the space in which it is situated with respect to the target.

In an internalist approach of spatial perception, one would have to imagine that the localization of targets is the result of an internal calculation distributed over areas of the brain. Thus, the space of

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<sup>2</sup> Classically assumed by some critics of vehicle-externalism on perceptual consciousness such as J.Prinz, N.Block, F.Adams and K.Aisawa, P.Jacob, ("the causing-coupling fallacy")...

<sup>3</sup> Presented by Charles Lenay at the workshop

perception is distinct from the physical space of concrete actions. By contrast, in the experiments we described, there is only a single space for the perceptions and the actions (actions, moreover, taking place in the same space as the perceived objects). These very simple experimental situations provide both a precise definition, and a concrete functioning example, of the explanatory schema of perception as enaction. The perception of the object happens in the same space where the object is – an *enacted* space. It is from this enacted space that the distinctions between the inner and the outer can then make sense, but in a new way: is *inner* everything which moves with my point of view, whereas is *outer* what my point of view moves in comparison with. However, if one situates oneself in this space in order to distinguish and localize the point of view with respect to the objects of perception, our approach clearly becomes externalist in the sense that the perception of objects does not occur *behind* the point of view, but *in front of it*, in the very same space where the point of view moves itself.

The conventional approach consists of *presupposing* a separation between internal lived experience and external objectivity. By contrast, following our enactive externalism, this separation is actually constituted during the very process of concrete activity. As a result, the space of lived experience is co-extensive with the space of action and perception.

This enactive theory of the nature of the space of perception can provide good arguments for a broader externalist theory of cognition, since it might show how the space of the debate between internalism and externalism is itself already enacted by more than mere intracranial means.