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Authors' Response

The Boundaries and Frontiers of Perceptual Presence

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> Abstract • In our response, we demonstrate how theoretical constructs of philosophical phenomenology do not correspond to findings from lived experience. We provide additional subjective reports illustrating the active nature of perceptual presence, and how this phenomenon can be considered a socially reinforced mastery of veridicality. Finally, we outline future directions for computational modelling.

"Man's perceptions are not bounded by organs of perception, he perceives more than sense (tho' ever so acute) can discover." (William Blake 1988: 2)

Introduction

« 1 » We thank the commentators for their insightful contributions to our discussion on perceptual presence (PP). As the commentators pointed out, PP represents a toolbox with which we can further investigate many phenomena within cognitive science. It is therefore not surprising that the commentaries are extremely varied. They can be, however, grouped into three camps:

- Questions about inconsistencies across ideas about PP from philosophical and empirical phenomenology (partially **Oren Bader** and **Oliver Lukitsch**);
- Discussions of how our findings can inform questions within philosophy of mind (partially **Bader**, **Florian Klauser**, and **Davood Gozli**) and cognitive anthropology (**Andrea Franchetto** and **Ela Praznik**); and finally,
- Pointing towards future neurophenomenological studies (**Moritz Kriegleder**).

We first address the divergent findings across philosophical and empirical phenomenologies. Then, we provide additional subjective reports regarding the (en)active nature of PP. In the third section, we discuss the intersubjective dimension of PP as accessible through specific cultural practices. Finally, we outline how a computational approach might be used to investigate PP in the future.

Hold infinity in the palm of your hand: Empirical reflections on principled cases

« 2 » When it comes to the study of experience, we can roughly distinguish between *philosophical* and *empirical* phenomenologies. Philosophical, or in **Lukitsch**'s (§1) words, "armchair" phenomenology establishes logically sound principles governing consciousness (typically by observing the experience of the thinking philosopher herself). Conversely, empirical phenomenology systematically gathers subjective reports from participants. (For a notable exception to this division, see Chapter I in Sartre 2010). The relationship between philosophical and empirical phenomenologies is tenuous (Kordeš 2016, 2021). While we hold that empirical data would benefit from being interpreted within philosophical frameworks (e.g., as we did in §39), it may also be that individual speculations about consciousness do not always correspond to people's lived experience (e.g., Jean-Paul Sartre's fallacy of interpreting his own anxiety as a general property of experience). In what follows, we explore this issue in some detail.

« 3 » To begin with the first principled case, **Lukitsch** argues that *fractality* is amodal. The main force of his argument is based on *sensorimotor intentionality* and *horizonal hallucinations*. We reject this claim on an empirical basis. In the following example, one participant was sampled while packing. She was planning to ascend the stairs to get something from her room. The object was present to her, but not as amodal, conceptual knowledge, but as a bodily feeling:

PPPP-II-01-D03-S01: I also felt that my body and my muscles and everything is kind of orienting so that I could get up and go there. [...] I was still sitting on the floor and packing my backpack. [...] I wasn't already about to go there [...] It was this, erm, kind of getting ready in my muscles to [pause] to get up and go there.

« 4 » As we note in §§66f, it is possible to attend to experience in (at least) two ways: focusing on what this experience corresponds to in one's body, and what it corresponds to in the perceived world (see §7). In the latter dimension, the participant experiences the following:

PPPP-II-01-D03-S01: [T]his location is somehow salient. Or has some sort of importance to me. [...] I didn't see it or anything. [...] It is more like, like some sort of force or some sort of power that I feel maybe on the parts of my body that are closest to that location. Yeah, it is like some sort of not really a full pulling sensation, but it is something I feel on the outside of my body.

« 5 » Sensorimotor intentionality is therefore present in lived experience as either a bodily feeling (*affordance awareness*) or salient space (*structure of lived space*). The former is modal (bodily feelings), whereas the latter is transmodal (see §25).

« 6 » Second, **Lukitsch** refers to horizonal hallucinations to argue that fractality is amodal. In §22, he writes that "[a] horizonal hallucination of one's spouse may, for example, consist of the experience that this very spouse is present, so that one would only have to turn around to see the person." Consider the following sample, where a participant was aware of her spouse, demonstrating the transmodal nature of horizonal hallucinations:

PPPP-II-07-D04-S01: [B]ecause I can hear him walk, and I can hear the floor move, and also, there is a great deal more of that kind of invisible attraction [...] I can feel the floor. [...] I feel my body move. [...] [I] hear him. [...] I think what it is mostly for me is the [pause] the sense of something being spatially located [...] within a space that I am in. [...] Someone, something being located close to me, spatially located close to me. [...] I know this, erm, but without looking. [...] And I can sense it there [...]. [T]here I can sense a solidity. A sense of solidity nearby.

« 7 » In §3 of his commentary, **Bader** wonders why we have not integrated Husserlian time consciousness into our exploration of PP. There is a simple answer to that: Our data suggest that in lived experience, temporality and spatiality collapse into a single aspect of consciousness. In other empirical phenomenological studies of working memory that we have conducted (Oblak & Kordeš 2018; Oblak 2020a, 2020b), an aspect of experience termed *impression* was observed. *Impression* is an experience of a disappearing stimulus leaving a non-visual trace, an echo (reflecting the Husserlian *retention,* or *just present*). Similarly, the experience of *leaning forward* was observed, wherein an attentional gesture is made into the future, anticipating the appearance of some task stimulus (corresponding to Husserlian *protention*).

« 8 » However, both *impression* and *leaning forward* have a marked spatial quality. They are, respectively, an awareness of something having been in front of the participant, and something being bound to emerge there. The collapse of spatial and temporal experience into a single experiential domain has received considerable empirical support in David Abram's (1996) phenomenological ethnography of animism. Unlike many philosophical phenomenologists who leave their method of reflection opaque (for a discussion on this issue, see Kordeš et al. 2019), Abram presents a detailed roadmap for how to observe experience to reach his understanding of spatio-temporality. Thus, we feel safe in proposing that Husserlian time consciousness may amount to a theoretical abstraction that differs from lived experience of time.

« 9 » On a concluding note to this section, we address **Kriegleder**'s **Q2** about whether *structure of lived space* and *affective resonance* can be explained as priors in a process of (en)active inference. While this may very well be the case, we have purposefully avoided making strong claims about this issue (although see similarities between our findings and *counterfactual richness* in Seth 2014). At this juncture, our data are merely experiential and as such can only address phenomenological theories. In the absence of data on PP that span multiple levels of description, this case cannot be made without risking making such overstatements as were discussed in the present section.

To see a world in a grain of sand: Actively presenting the objects of perception

« 10 » An aspect of experience that several commentators have (at least tacitly) pointed to is how PP is *enacted,* or what, in §17, **Klauser** refers to as "perceptual presenting." He proposes that the enaction of mental imagery begins with *knowing,* then develops into *imageless seeing, imagery (not fully enacted),* and finally, into *inner seeing.* Indeed, this dynamic was apparent in our study, as well (for instance, PPPP-III-01-06 in SM-A: 807–809). In this section, we respond to **Klauser**'s **Q1** by exploring this enactive dynamic in veridical objects.

« 11 » In the case of observing veridical objects, it may be more precisely stated that the unravelling of details begins with the Husserlian notion of the *field of consciousness* as noted by **Bader** (§§4f). Consider the report of one participant interacting with a computer:

PPPP-II-09-D08-S03: The visual world was present as this huge open space in front of me. As this field of potential physical and attentional interactions that is kind of cascading out of me in front of my body.

Another participant describes how she is aware of the space behind her as a field of potentialities that may be reified into concrete objects when observed:

PPPP-I-12-01: There's a feeling present that I can look there. That's how I know. I know I can turn into that direction, and that something will be there. (Our translation)

« 12 » Additionally, it may be that knowing and field of consciousness can also amount to an awareness of the possibility of

movement. One participant described being in the same room with another person thus:

PPPP-III-08-01: When we are in the same room together, we can – with our interaction, our attention, with how we move around each other, create what I call the space of togetherness. It's a tension in space. In this space, you can recognize the potential to talk, to interact. If we were partners, we could touch each other. [...] It's a space of shared affordances. (Our translation)

« 13 » As pointed out by **Klauser** (§16), potentialities can become thematized into concrete objects through a series of mental gestures. In his §3, **Gozli** notes how the experiential categories that we constructed could be used as a toolbox to investigate the experience of visual conferencing. In one interview, a participant provides an aside as to how he experiences an entity in his perception being alive as dependent on experiential micro-gestures. By employing attentional modulations, he can see the interviewer either as animate or inanimate:

PPPP-III-01-02: [I]f I look at your eyes, I don't look quite at your eyes, but I look, like beyond them, where I would expect your point of view to be. [...] And then I could also make the same modulation and look at your eyes as like a geometrical shape on the computer screen. [...] And that happens when I look sort of, on the surface of you. [I]t's a depth thing – it's definitely a depth thing.

« 14 » In §3 of his commentary, **Gozli** wonders what the potential disadvantages of video conferencing might be. Perceiving animacy in virtually present people being tied to a stream of micro-gestures may be associated with a toll on mental resources (in particular when it comes to phenomena such as empathy).

« 15 » The experiential dynamics whereby we start with an awareness of potentiality and then, through mental gestures, reach an experience of a fully enacted object, bears a striking resemblance to the notion of *gist* (Lipič & Kordeš 2017). Gist, in this sense, is a phenomenological modality wherein individuals are aware of the potentiality for some experience. This experience is brought to the foreground of their awareness either by simply attending to it, waiting for its emergence, or by interrogating it with a specific intention. Gist itself is thus not present in the same modality as the object it refers to. It takes a process of unfolding for these aspects of experience to translate themselves into a modally present object.

« 16 » How experience can be unfolded through active gestures can help us address **Praznik**'s **Q1** about whether we understand concepts as the possession of words or discriminative ability. Urban Kordeš and Ema Demšar (2018, 2021) have developed a detailed account of how belief about our experience is enacted. They argue that we are always experiencing something from a particular vantage point. Crucial for our purpose is their notion of *epistemic irreversibility*, i.e., the idea that once an observation of some part of our experience is made, it cannot be unmade. In Phase 1, Participant 6 was especially curious about the difference between imaginary and veridical objects. His detailed reports about this difference all pointed to what ultimately became the experiential category *fractal structure of experience*. In the third interview (PPPP-I-06-03), he employs the word *lame* (Slovene *bedno*, also connoting *bad*, *pathetic*, *uncool*). In subsequent interviews, this word became his shorthand to refer to the *fractal structure of experience*. However, based on the interviews, the concept was accessible to him even in the absence of the term. First, he observed the apparent richness of detail in veridical objects, and then assigned a term to it. Thus, at least when it comes to the practice of observing experience, we understand concept possession as a discriminative ability.

Throughout all these human lands: Perceptual presence as a mastery of veridicality

« 17 » Three commentators have raised issues regarding the relationship between social cognition and the experience of PP. **Bader** (§§6–9) emphasizes that experience is intersubjective. In the space between agents, it is not only that objects arrange themselves as they appear to us, but we are also aware of how they might appear to others, which, in turn, allows for coordinated action (**Gozli** §4). **Bader** singles out joint attention as a paradigmatic example of the intersubjectivity of presence. We suggest that patterned practices, discussed by **Praznik** in the latter half of her commentary, and imaginal architectural devices (IADs), a notion developed by **Franchetto**, similarly constitute culturally reinforced aspects of PP. Joint attention, patterned practice, and the experience of the divine can be addressed within PP research by positing that presence amounts to a kind of *mastery of veridicality*. We will defend this position by going beyond the data provided in the target article and refer to reports from a follow-up study (study code is Altered Experience of Presence: AEP) looking into non-normative experience of PP.

« 18 » First, our data suggest that, at least in some cases, joint attention is experienced as a particular arrangement of lived space. A participant in the follow-up study describes his experience of social anxiety. He is chopping wood, and, when his activity is witnessed by another person, becomes afraid of doing it wrongly:

AEP-09-01-04: When I say *joint* [attention] it's that it feels like I became aware of that part of the wood to the left through her [...] So, she is like the catalyst that sort of [...] expanded my attention. [...] When I was working [...] all the space that was present there, was this, maybe meter-by-meter space in front of the furnace [...] And then she comes and there is this joint attention moment that happens [...] My attention goes there and reveals the space, but on the other hand, what also happens is that the space materialized itself in my awareness.

Thus, parts of the world can become salient to us through others.

« 19 » Further, **Franchetto** discusses the notion of IADs, i.e., spatially felt structures that are brought about by ritualistic practices, which have no corresponding veridical objects, and that can, crucially, constrain our embodied behavior. We have no direct empirical support suggesting that ritualistic practices alter the arrangements of lived space. However, we have observed similar

phenomena associated with psychopathologies. One participant with depression and social anxiety manifested her favorite writer to help her go through difficult times. The writer was not present to her in the visual mode, but as a sense of space arranging itself into the form of a person. Following her constructing of the writer, she reports her experience as follows:

AEP-14-02-01: My experience of space changes. He is now behind me. There's a force to him, a shape. And the space feels different. It really feels as if [the space] is more occupied. As if there is now two of us there, and there's fewer cubic centimeters available. [...] Before, it was empty. The space was letting me know that I am alone [metaphor removed]. And then [pause] this space fills up. It fills up with what I need. (Our translation)

« 20 » She reports a specific mental gesture that engenders the appearance of the imaginary writer. She attends to a space that she wants to be occupied by him. This gesture parallels the findings of Anna Corwin and Cordelia Erickson-Davis (2020), who explored the experience of divine presence among Catholic nuns. They propose an interactive theory of PP. They report on the nuns reciprocally engaging with space, forming a "dynamic interaction of a perceiver-environment system" (ibid: 168) (paralleling our category of *affective resonance*). They go on:

"the nuns' experience of God includes a sense of proximate closeness, a God who dwells 'here,' in space and time with them, sometimes even within their very bodies, or 'engulfing them.'" (ibid.)

« 21 » Based on these empirical data, we can now suggest that PP constitutes a *mastery of veridicality.* Taking seriously Anil Seth's (2014) proposition that all perception is hallucinatory, with some perceptions being weighed by environmental constraints, this mastery constitutes a socially reinforced and acquired understanding of which arrangements of lived space amount to veridical phenomena. As such, this mastery can be unlearned. Andy Clark (2016) proposes that schizophrenic experience can be understood as a misattribution of weights concerning which phenomena are self-generated and which are constrained by the environment. This faulty weighing of signals, however, does not happen overnight. Rather, it occurs over a longer period. Tanya Luhrmann (2020) proposes a similar etiology for the experience of divine voices. She describes hearing God as a learned practice. Worshippers start by imagining the voice of God. This practice is later socially reinforced within the Church. Ultimately, worshippers no longer distinguish between imagining and hearing the voice of God.

« 22 » In response to Franchetto's Q2, it may be beneficial for our understanding of PP that, if we accept that IADs are perceptually present, future studies employ participants who have this type of mystical experience (Ataria, Dor-Ziderman & Berkovich-Ohana 2015). Following the summary of our research design by Gozli in §1, an ethno-phenomenological approach might be beneficial, keeping track of different ritualistic contexts and the level of skill practitioners have. It may be insightful to additionally gather measures of neural activity to provide further neurophenomenological understanding of PP (Kriegleder's Q1, see below, as well).

« 23 » A second example of how the experience of veridicality can be altered through patterned practice comes from scholarship on multiple personality disorder. Ian Hacking (1995) has explored how the prevalence of multiple personality disorder increased from a handful of patients to several thousand within the span of a century. He suggests that psychiatric diagnoses are *interactive kinds*, i.e., that once individuals are diagnosed with multiple personality disorder, they begin conceiving of themselves in different ways, such that their experience of multiple personalities is reified and strengthened. This dynamic is most evident in contemporary practice of *tulpamancy,* wherein individuals can use specific meditation techniques and social practices to willingly develop *tulpas* or multiple personalities (Veissière 2016).

The fruits of the two seasons: Towards a neurophenomenology of perceptual presence

« 24 » Finally, in §§1–3, Kriegleder raises questions regarding future directions of empirical investigations of PP, specifically when it comes to the project of neurophenomenology. Neurophenomenology is a methodological attempt at understanding how conscious experience can arise from non-conscious matter by constraining first- and third-person data (Varela 1996). While third-person data are typically understood to be neuroscientific, attempts have also been made to make use of computational modelling (Van Gelder 1999). Due to the spatial limitations of this response, we will be addressing Kriegleder's Q1 only through this perspective.

« 25 » We propose to further investigate PP by employing agent-based modelling and ontological engineering. In such an approach, an artificial environment is created and subsequently populated by several agents. The agents can perceive and move in the environment. Taking cues from the Wumpus world (Russell & Norvig 2010), the environment contains obstacles, enemies, and rewards. The agents have two sensors: a *proximal* and a *distal sense*.

« 26 » Agents represent their surroundings on two different world maps (Hall 1966): a proximal world and a distal world. Inspired by our phenomenal data, the agents' world maps contain probabilities about where objects might be, where they have been, and where they are likely to be (referring to Footnote 7 in the target article, it may be that the proximal sense offers more accurate probability estimations than the distal sense). In responding to Franchetto's Q1, such a model would *a priori* assign a higher value to veridical objects, as phenomenal data suggest that these are associated with the highest degree of *solidity* in terms of their *structure of lived space.*

« 27 » The essential novelty of such a model is that a third world map is implemented: a spatial map. In the spatial map, objects are integrated from their proximal and distal representations (representing *structure of lived space*). A potential method of integration is Bayesian inference, although other approaches, such as representing it as a Markov blanket (Kirchhoff et al.

2018), are possible as well. The agent queries the spatial map when deciding which actions to take.

« 28 » In further steps, this model might be used to simulate specific psychopathologies (such as those discussed in the previous section). It would then be possible to observe the behavior of an artificial agent inflicted with, for example, social anxiety. The simulated pathological behavior could serve to generate hypotheses, which would be compared with observational studies of patients with anxiety. This comparative approach would provide evidence on whether the (neuro)phenomenological theory of PP that we are constructing is viable.

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