Is the sense of bodily ownership related to pre-reflective bodily awareness? A reply to Kuhle.

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Abstract

There are two ways in which we are aware of our bodies: reflectively, when we attend to them, and pre-reflectively, a kind of marginal awareness that pervades regular experience. However, there is an inherent issue with studying bodily awareness of the pre-reflective kind: given that it is, by definition, non-observational, how can we observe it? Kuhle claims to have found a way around this problem—we can study it indirectly by investigating an aspect of reflective bodily awareness: the sense of bodily ownership. Unfortunately, I argue, there is little reason to believe a relationship between pre-reflective bodily awareness and the sense of bodily ownership exists. Until more work is done, pre-reflective bodily awareness remains beyond our empirical grasp.
1. Introduction

There are two ways in which we are aware of our bodies: reflectively, when we attend to them, and pre-reflectively—a permanent, marginally conscious experience of the body, which has been the subject of philosophical interest for some time. In the target article, Kuhle rightly notes that empirical research is overly focused on the former, leaving the latter kind of bodily awareness woefully neglected. In this I agree with her, if we are ever to arrive at a complete understanding of how we experience our bodies, both these forms of awareness must be investigated.

That said, pre-reflective bodily awareness is notoriously difficult to study. Given that it is, by definition, non-observational, the problem of how to instruct subjects to report on this unobserved experience naturally arises. Kuhle endeavours to solve this seemingly insurmountable problem. She claims we can study the phenomenon indirectly, through measuring a particular type of reflective bodily awareness: the sense of bodily ownership in the rubber hand illusion. Although I agree with the spirit of her paper, it does not supply sufficient evidence in favour of a link between the sense of bodily ownership and pre-reflective bodily awareness. As such, her endeavour falls short.

2. Two kinds of bodily awareness

Kuhle begins the paper by introducing the classic philosophical distinction between two kinds of bodily awareness: observational and non-observational (2017, p. 8). This distinction is more regularly referred to as reflective/pre-reflective and Kuhle also uses the terms attentional/inattentional (p. 3) and the body as subject/the body as object (p. 8).

Observational bodily awareness involves “focusing on and reporting about the body or a part thereof. One is explicitly conscious of one’s body, and it becomes the object of attention” (p. 8). The concept of non-observational bodily awareness, on the other hand, is harder to pin down. Kuhle explicates the notion by providing the following quotes from Legrand:

The body-as-subject-in-the-world is transparent in the sense that one experiences the world through it, but transparency is not invisibility (Merleau-Ponty, 1945, p. 345; Legrand, 2005). It rather corresponds to a form of bodily-consciousness which goes beyond the body proper. (Legrand, 2009, p. 190)

In normal circumstances, rather than being explicitly conscious of our body and of the bodily thickness of our being-in-the-world, we project our gaze directly out towards objects in the external world. Nonetheless, the body-as-subject appears in experience, both as it discloses bodily projects and as the very perspective to which any experience is anchored. (Legrand, 2009, p. 190)

Kuhle concludes:

we are said to be non-observationally aware of our body as that through which we engage in the world. This form of bodily awareness is characterized as an inattentional awareness of the subjective body. It is a non-observational bodily awareness that is often described as an awareness of the body as subject. (p. 8)
With the tremendous explosion of empirical research into observational bodily awareness, Kuhle is right to observe that its non-observational counterpart has been somewhat left in the dark (p. 1). I share Kuhle’s opinion that it might be fruitful to redirect a modicum of resources towards exploring the kind of bodily awareness that so interested philosophers like James and Merleau-Ponty.

However, empirical researchers have good reason to shy away from research into this area. There is an inherent and seemingly insurmountable problem with studying non-observational bodily awareness, one that Kuhle correctly identifies:

Because of the nature of non-observational bodily awareness, it is seemingly impossible to study it directly—typically when we study awareness we ask subjects to attend to and observe something. Yet, the target of investigation here is non-observational. How can we investigate a non-observational phenomenon using paradigms that rely on observation? (p. 15)

Investigating inattentional bodily awareness falls prey to what’s known as the refrigerator light problem (Schwitzgebel, 2007). This name derives from the mistaken impression a child might have that the refrigerator light is permanently on, simply because it’s always on whenever she opens the door and checks it. Through the act of observation, the child has altered the state of the thing she is attempting to observe. Similarly, when we attend to our inattentional bodily experience, we change the nature of the experience itself—from inattentional to attentional. We can’t help but observe the wrong kind of experiential state.

In her paper, Kuhle makes the bold claim that she has found a way around this problem, that we can study non-observational bodily awareness, indirectly, through studying an aspect of observational awareness: the sense of bodily ownership.

3. The sense of bodily ownership

Much of our understanding of the sense of bodily ownership comes from variants of the rubber hand illusion (RHI) (Botvinick & Cohen, 1998). The RHI involves having a participant sit with their arm resting on the table in front of them, hidden from view by a screen. A realistic rubber hand is placed in front of them and—while the subject attends to the rubber hand—the experimenter strokes both hands simultaneously, with matching paint brushes. After some time, participants generally report that they begin to feel as if the rubber hand belonged to them, or was a part of their body. This experience of the rubber hand as belonging to oneself is thought of as a sense of bodily ownership (SBO)—the same as that which we usually feel over our own bodies. While the classic setup uses a rubber hand, the paradigm has been significantly extended in recent years to include full body illusions using virtual reality technology (Keizer et al., 2016).

What’s important to remember here is that, as Kuhle rightly notes, our knowledge of SBO in the RHI pertains to an observational experience. In all the empirical tests using this paradigm, SBO is measured and explored through having the subject focus on and report how they feel towards the rubber hand.

4. Kuhle’s argument
Now that I have outlined the kinds of experiences discussed in the paper, I will turn to addressing Kuhle’s central argument, which is structured like so:

1) Body scanning meditation increases interoceptive sensitivity
2) Increased interoceptive sensitivity strengthens bodily ownership (as measured by decreased sense of ownership over the rubber hand)
3) Bodily ownership is both an observational and non-observational experience
4) Therefore, meditation affects non-observational bodily awareness

This argument, she claims, supports the possibility of indirectly studying non-observational bodily awareness, via studying meditators (p. 16). I will focus my discussion on the crux of this argument, point 3. Firstly, this point entails that there exists a kind of inattentional SBO. In itself, this is a bold and incredibly interesting claim. As discussed, all we know about the SBO from empirical studies pertains to its observational form, so the existence of a different kind of this experience is a fascinating proposal.

In fact, Kuhle goes further than this, suggesting that the SBO is a fundamentally inattentional experience, one which is only sometimes attended to:

my sense of ownership over my body involves both observational and non-observational awareness. Moreover, it persists even when we stop observing our body. My sense that my body is mine—is me—is always present in my embodied experience of the world. This continued presence relies on a continued, inattentional bodily awareness. When I do decide to turn my attention to my body, I merely add an observational bodily awareness to the already present non-observational bodily awareness of my overall experiential state. (p. 14, my emphasis)

Under this proposal, there is a single kind of SBO which is fundamentally inattentive i.e. it is always present. So, in conducting RHI experiments, we are in fact exploring an inattentive process, which we observe through its less regular attentive form. This is why measures of attentive SBO strength are indicative of inattentive SBO strength, they are the same process (p. 14). Although Kuhle repeats this claim at multiple points throughout the paper, she provides no substantive evidence in support of it. This is problematic—especially given its radical nature and the weight it carries in her argument. The argument Kuhle does offer in support of it begins with a quote from Gallagher:

the sense of ownership ... does not require an explicit or observational consciousness of the body, an ideational, third-person stance in which I take my body as an object. Rather it may depend on a non-observational access ... an access that is most commonly associated with a first-person relationship to myself. In non-observational self-awareness I do not require the mediation of a perception or judgement to recognize myself as myself ... In normal experience, this knowledge is already built into the structure of experience. (Gallagher, 2005, p. 29)

From this she concludes, “In other words, my awareness of my body as subject is what underlies my sense of my body as mine, as myself” (p. 13). I take it that Kuhle is using “awareness of my body as subject” here as a synonym for pre-attentive bodily awareness. So her claim is that the passage from Gallagher supports the argument that pre-attentive
bodily awareness “underlies” SBO. What is meant by “underlying” here isn’t immediately clear. However, she reiterates the claim by saying:

My sense of body-ownership is given in experience as a self-experience—an experience of my bodily self. Such a self-experience stems from a non-observational bodily self-awareness. It is because I experience my body as subject—non-observationally—that I have a sense of bodily self. (p. 13-14)

Given these reiterations, especially the final sentence, I believe the correct interpretation is that pre-reflective bodily awareness is a cause of and necessary condition for (attentive) SBO i.e. that if we did not have pre-reflective bodily awareness, we could not have an SBO.³

Let’s examine the quote from Gallagher, to see if it supports this causal claim. The passage begins with a negative claim:

“the sense of ownership ... does not require an explicit or observational consciousness of the body, an ideational, third-person stance in which I take my body as an object.”

From which Gallagher makes the suggestion:

“Rather it may depend on a non-observational access ... an access that is most commonly associated with a first-person relationship to myself.”

If this suggestion is correct, and it is the case that SBO depends on non-observational access (which, again, I take to be a synonym for pre-attentive bodily awareness), then this would certainly support the claim that pre-attentive bodily awareness is a necessary cause of the SBO. However, this conclusion does not follow from the observation that the SBO doesn’t require “explicit or observational consciousness of the body, an ideational, third-person stance in which I take my body as an object”. Gallagher is making a phenomenological claim: when we do attend to our bodies (or the rubber hand) we immediately have an experience of ownership over it, we don’t need to think, consider or come to any thoughtful conclusion about it; we are simply struck with a raw feeling of mineness.

Yet this phenomenology can be accounted for in other ways, beyond assuming that the experience depends on some aspect of pre-attentive bodily awareness. Consider the possibility that there exists a sub-personal cognitive mechanism constantly monitoring attended sensory input—such as the congruent tactile and visual input in the rubber hand illusion. This mechanism uses this attended sensory input in order to determine whether an object which is also being attended to should be experienced as if it belonged to the agent. The outcome of this mechanism’s calculations determines whether, and how strongly, a subject feels a sense of ownership over an attended to object. While the subject is conscious of the outcome of this mechanism (the SBO), she is not conscious of the cognitive process itself.

If this were the case then we would expect the SBO felt over an object to be immediate. It wouldn’t feel as if we needed to involve any mediation, judgment, third person ideational
stance or anything else of that sort—the raw feeling would simply strike us. Of course, this story does not entail Kuhle’s claim, that pre-attentive bodily awareness is a necessary cause of attentive SBO. In fact, the suggested story does not rely on pre-attentive bodily awareness to play a role whatsoever. All that is needed is an implicit cognitive mechanism that monitors attended sensory stimuli. As such, Gallagher’s observation about what isn’t needed to feel SBO does not entail his suggestion about what might underlie the SBO—a fact which may have prompted him to use such uncertain language in the first place.

The rest of Kuhle’s argument is constituted by the following paragraph:

“...my sense of my body as mine is not something that is solely experienced when I observe my body as an object. Certainly, when I stop perceiving my body it doesn’t disappear from my awareness. I, as the bodily subject of experience, remain. That is precisely because my sense of my body as mine—my sense of body-ownership—is something that is also given in experience non-observationally, or first-personally.” (p. 14)

By this passage I take Kuhle to mean not simply that when I stop perceiving my body it doesn’t disappear from my awareness but rather that an experience of bodily ownership remains, even when we don’t directly attend to our bodies. This stronger reading is supported by the previously quoted passage, where she writes “My sense that my body is mine—is me—is always present in my embodied experience of the world” (p. 14).

So, apart from referencing Gallagher, Kuhle’s other strategy revolves around an argument from introspection. How do we know non-attentive SBO exists? We know because we continue to experience the SBO even when we draw our attention towards other objects in the world. This move is problematic. Arguments from introspection should not be relied on to do such heavy lifting. Even if we put aside the deep philosophical worries about the reliability of introspection (Schwitzgebel, 2008), the fact is different subjects often arise at different introspective results. This is the state of play in arguments regarding thick vs thin views of consciousness—different philosophers simply claim to experience consciousness quite differently (Schwitzgebel, 2007, p. 13; see also: Hochstetter, 2016, p. 3823-3824). The issue of whether a SBO is experienced inattentively is no different—while Kuhle claims it is always present, I personally don’t feel any kind of ongoing experience of ownership over my body while I’m not attending to it. Given the boldness of Kuhle’s claim regarding the relationship between pre-attentive bodily awareness and the SBO and the central role it plays in her argumentative strategy, it should be supported by more than mere introspection.

5. Alternative Routes for Indirect Measurement

While I do not think that questionnaire results from the RHI are any measure of pre-reflective bodily awareness, there may be some routes through which researchers could explore the phenomenon. For example, beyond the classic measures of self-report questionnaire and proprioceptive drift there are whole host of other downstream effects which occur after embodiment of the rubber hand, such as autonomic responses, skin conductance responses and other automatic changes in bodily state (Guterstam, Petkova, & Ehrsson, 2011; Barnsley et al., 2011; Moseley et al., 2008).
Perhaps a theory could be formulated whereby these alternative downstream effects are indicative of a change in pre-reflective bodily awareness. Such a theory would likely begin with a functional characterisation of the cognitive mechanisms which underlie pre-reflective bodily awareness and their specific relationship to the kinds of abnormal sensory input participants are exposed to in the RHI. It would not, however, start from the unsupported assumption that pre-reflective sense of bodily ownership exists and is a necessary cause of attentive SBO.

Another route forward might be to look at well-known psychopathologies that are said to involve deficits in SBO. For example, this has been claimed to be the case in asomatognosia, where patients believe one of their limbs does not belong to them, or the related condition somatoparaphrenia, where patients believe a limb belongs to someone else (Vallar & Ronchi, 2009). Alternatively, there exists an inverse condition (referred to as E+) where patients come to believe someone else’s hand belongs to them (Fossataro et al., 2016; 2017).

What’s different between these delusional subjects and those who experience the rubber hand illusion? One difference is that, unlike RHI participants who only experience the rubber hand as if it belonged to them, these psychopathological patients hold false beliefs about the ownership status of certain body parts. A more important difference, however, is that RHI participants only undergo a momentary change in embodiment experience, specifically as they attend to the rubber hand. These delusional subjects, on the other hand, have ongoing altered embodiment experience. Given that this experience is ongoing, it seems more likely that it persists when attention is directed away from the body. Furthermore, these subjects are more amenable to experimental paradigms designed to measure marginally conscious experience, such as beeper tasks (Schwitzgebel, 2007).

6. Conclusion

Inattentive bodily awareness is a fascinating phenomenon, which has rightly attracted the interest of many great philosophers. I share Kuhle’s desire for understanding more about it through empirical means. Unfortunately, her arguments in favour of the SBO being a fundamentally inattentive process are unconvincing. Consequently, her conclusion that a change in attentive SBO is evidence of a change in inattentive SBO and that we can use this insight to investigate inattentive bodily awareness is unsupported.

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1 How to cash out the experience of ownership is a precarious issue. To start with, there is a distinction to draw between the judgement of ownership (of which subjective questionnaires are a measure) and the experience of ownership. There is some philosophical disagreement regarding the phenomenology of the experience itself, which I don’t wish to
delve into (de Vignemont, 2013; Bermudez, 2015). Herein I interpret Kuhle to be assuming that there is some positive phenomenology of bodily ownership and that the judgments of ownership reported in questionnaires adequately track this experience.

2 There are implicit tests of the rubber hand illusion. For example, asking patients to blindly locate their real hand in external space and measuring how far the located position has ‘drifted’ towards the rubber hand’s location. However, these implicit effects are usually taken to be distinct from the SBO over the rubber hand (Rohde et al., 2011).

3 A weaker interpretation of the “underlying” claim would be that inattentive bodily awareness is one of many contributing factors to SBO. This would allow for the possibility that SBO could exist without pre-attentive awareness. However, this interpretation is less charitable to Kuhle’s argument, so I will put it aside.

4 At-least this is the case for asomatognosia and somatoparaphrenia patients. E+ appears to be a more momentary condition, only occurring under particular circumstances.

5 For that matter, other psychopathologies which involve ongoing, distorted experience of the body may be useful for investigating pre-reflective bodily awareness. For example, anorexia nervosa patients are said to have an ongoing experience of their bodies as oversized (Gadsby, 2017a). Furthermore, it has been suggested that this experience arises from distortion of many of the same body representations said to be involved in SBO cognition (Gadsby, 2017b).
References


