

HOW CLOSE ARE WE TO UNDERSTANDING THE SENSE OF BODY OWNERSHIP?

¿Qué tan cerca estamos de entender el
sentido de propiedad del cuerpo?

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ABSTRACT

There has been much discussion about the sense of ownership recently. It is a very controversial topic and even minimal consensus seems hard to achieve. In this paper we attempt to assess the prospects of achieving a better understanding of what is meant by 'sense of body ownership'. In order to do so, we begin by addressing an objection on which the notion itself might depend, coming from the distinction between 'inflationary' and 'deflationary' accounts of the sense of body ownership. Once the path is clear, we will consider some influential ways of approaching the issue, which propose grounding the sense of ownership in the spatiality of bodily sensations, the affective dimension of bodily experience, and in its spatial dimension, among other things. We expect the results of our discussion will allow us to both identify the strongest candidates for an account of the sense of body ownership and to determine the challenges that must be met by competing explanations.

KEYWORDS

Body, ownership, bodily awareness, bodily experience, bodily sensations.

RESUMEN

Recientemente se ha discutido mucho sobre el sentido de propiedad. Se trata de un tema muy controversial, en el que incluso consensos mínimos parecen difíciles de alcanzar. En este artículo intentamos abordar las perspectivas que existen de lograr una mejor comprensión de lo que significa "sentido de propiedad del cuerpo". Para tal fin, empezamos abordando una objeción de la que podría depender la noción misma, derivada de la distinción entre explicaciones 'inflacionarias' y 'deflacionarias' del sentido de propiedad del cuerpo. Una vez se haya despejado el camino, consideraremos algunas aproximaciones reconocidas al asunto, las cuales proponen fundamentar el sentido de propiedad en la espacialidad de las sensaciones corporales, en la dimensión afectiva de la experiencia corporal, en su dimensión espacial, entre otras. Esperamos que los resultados de nuestra discusión nos permitan al mismo tiempo identificar los candidatos más fuertes para explicar el sentido de propiedad del cuerpo y determinar los retos que deben enfrentar las explicaciones en contienda.

PALABRAS CLAVE

Cuerpo, sentido de propiedad, conciencia corporal, experiencia corporal, sensaciones corporales.

Introduction

The “sense of ownership” of one’s body has become an increasingly controversial topic in the literature about bodily awareness in the last twenty years or so. Disagreement begins with the very name of the topic: authors as dissimilar as Bermúdez (2017) and Gallagher (2017a) agree that “‘ownership’ may not be the right term” (p. 147) or that ownership is a metaphor (Bermúdez, 2017, p. 121). It seems reasonable to look at the writings of the theorist who introduced the expression “sense of ownership” in the context of bodily awareness, to determine its metaphorical meaning: Martin (1995) claims that it refers to the appearance that what one is aware of is a *part* of one’s body (p. 269), as when one is aware “that the left hand one feels is one’s own left hand” (p. 283).

As Bermúdez (2017, p. 121) has remarked, however, Martin’s is an essentially mereological conception of ownership. He argues that the existence of illusions of ownership of the entire body makes the mereological conception insufficient. In this regard, Gallagher (2017a, p. 153) has indicated that a conception of ownership as “mineness” can be applied both to body parts and to the body as a whole, but he grants that this conception can also be applied to bodily sensations, actions, thoughts, and experiences in general. As we will argue below, the problem is that while Martin’s conception may be too narrow, Gallagher’s may be too broad.

Bermúdez’s (2017) intuition is that experiencing ownership of a limb involves experiencing it as a part of oneself (pp. 120-121). This view appears advantageous to the extent that it would allow us to substitute the terminology in which my body is “owned” by me, for that in which my body is part of myself. To say that I experience ownership of my body would be a metaphoric way of saying that I experience my body as part of myself. Thus, the sense of body ownership would be a form of self-consciousness. Nevertheless, according to Martin (1995, pp. 283-284), that form of self-consciousness would require the body to be presented to the

subject as themselves, while one's body could be identified simply as the object presented in some way when considering certain experiences. Connecting the sense of ownership to self-consciousness therefore might not be helpful in clarifying the matter after all.

It seems that the only way —if any— of characterizing the sense of body ownership that is acceptable to all parties is still to say that it refers to our awareness of our bodies and body parts as belonging to us (that is, as ours or as our own). Subsequent discussion would involve the specific form of awareness that we are talking about (its nature, source, among others). The main objective of this paper is to ascertain how close are we to (or far from) obtaining a satisfactory understanding of the sense of body ownership, and to try to identify what is required to achieve such an understanding. To that end, we begin by addressing the debate around the 'positive phenomenology' of body ownership, on which the viability of the very notion seems to depend. We will call into question the widely accepted distinction between types of accounts of the sense ownership. We will consider possible ways of explaining the sense of body ownership, attempting to estimate their advantages and weaknesses, and whether some face critical difficulties affecting their plausibility. Finally, we summarize the results of our discussion and determine what the strongest contenders need to do (as well as the chances they have to do it) to move forward our understanding of the matter.

A “Sense” of Body Ownership?

Just as the term “ownership” turns out to be controversial in this debate, so does the term “sense”. As Martin (1995) speaks of a “sense” of ownership, and since it is said that there is a “positive” phenomenology of body ownership (De Vignemont, 2007, p. 430), the question arises of whether that positive phenomenology involves a specific qualitative feel (in the same way a characteristic quale is involved in our experience of pain). A negative answer

to this question (Bermúdez, 2011, 2014, 2017), that is, a denial of a quale of ownership, has been read as meaning that there is nothing experiential about body ownership and that it consists only of judgmental elements (see De Vignemont, 2013). Consequently, this reading has led to a defense on both conceptual and empirical grounds that body ownership is not only experiential but also independent from judgement; in turn, qualia-of-ownership deniers have interpreted the rejection of their position as a defense of the qualitative feel they criticize.

In this section we examine the debate about the “positive” phenomenology of body ownership closely in order to substantiate my reconstruction of it. We will try to show that no one has ever defended that body ownership involves a unique qualitative feel (so that, to some extent, there are no “inflationary” approaches to body ownership), but also that no one has ever maintained that there is nothing experiential about body ownership.

No Determinate “Quale” of Mineness

At the beginning of her 2007 paper, De Vignemont asks the following question: “On which basis do I feel this body as my own?” (p. 427). The question seems aimed at identifying the source of our experience of body ownership, but there is also something in De Vignemont’s wording. In using the term “feel”, she may give the impression of hinting that this is a kind of sensory experience in which one feels one body as one’s own (her question is not just “on which basis do I *experience* my body as my own?”). The assumption that the experience of one’s body as one’s own amounts to a (sensory) *feeling* of ownership, however, might be unwarranted.¹

¹De Vignemont (2013) insists on her phrasing when she describes body ownership as a “felt ‘mineness’ that goes over and above the mere experience of one’s bodily properties” (p. 643). Note also the different way in which Bermúdez (2014, p. 37) asks the question about body ownership: his question asks why it is true that we experience our bodies as our own.

Bermúdez (2011, 2014) has been the main critic of the idea that there is a ‘feeling of ownership’.² He begins by differentiating ‘deflationary’ and ‘inflationary’ perspectives on body ownership. The former claims that the sense of ownership amounts to some facts regarding the way we experience bodily sensations, together with judgments of body ownership. The latter would defend the existence of a specific quale or qualitative feeling of body ownership, which is the source of our experience of our bodies as our own (and whose existence is denied by deflationary views).

Against inflationary approaches to body ownership, Bermúdez (2011) first observes that feelings are usually experienced somewhere, which seems odd to say about body ownership. He acknowledges that it might be a non-localizable feeling (such as the feeling of depression), but counters (p. 165) that it would have to be a feeling with a “suspiciously determinate content” (something like “this part is my own”) which may seem rather like the content of some judgement. That suspicion leads to Bermúdez’s (2011, 2014) central argument against inflationary approaches, derived from Anscombe’s (1957, 1962) criticism of sensations of position.

Something characteristic of our sensuous knowledge is that when we say we know something by means of sensations (“by observation”, in Anscombe’s terms, 1957, p. 13), the sensations at issue are in a certain sense independent from the object or fact they allow us to know. For instance, I know I was sunburnt by means of a characteristic sensation on my skin, but I can also have that sensation without being sunburnt —such as when I have some allergic skin reaction. However, according to Anscombe (1962, pp. 55–56), so-called sensations of limb position or limb motion do not seem to have that independence (“separability”, in Anscombe terms) from the objects or facts we use to describe them. Rather,

² For Bermúdez, unlike ‘feeling’ or ‘sensation’, ‘experience’ (and ‘awareness’) might refer to something non-sensory —as it would be the case with awareness of limb position (see below and Bermúdez, 1998, p. 134).

those sensations seem to be somehow ‘transparent’: when I try to remember or imagine the sensation by means of which I knew my arm was bent, I cannot separate it from the very fact of my arm being bent. As a consequence, it not only seems anomalous to claim that I know my arm was bent by means of the sensation of limb position but also to justify the claim that there is such a sensation. Bermúdez holds that a ‘feeling of ownership’ would not satisfy Anscombe’s separability criterion either —when we try to pinpoint this so-called feeling, we end up describing the fact it allegedly conveys. We therefore have to reach the same conclusion as with ‘sensations of position’, that is, that we have no ground to claim that such feeling exists.

De Vignemont (2013, p. 643) has construed Bermúdez’ rejection of “inflationary” approaches as both denying that there is something experiential in body ownership and committing to a purely judgmental conception.³ De Vignemont’s reply to Bermúdez’s Anscombian argument is twofold: on the one hand, she emphasizes that what Anscombe denies is that these sensations of position play an epistemic role, not their existence; on the other hand, she argues that the Rubber Hand Illusion (RHI) (Botvinick & Cohen, 1998) is an example where an appearance of ownership is separable from the judgement of ownership. If so, the RHI would demonstrate that there is something purely experiential and belief-independent in body ownership.

As Bermúdez (2014, p. 39) observes, postulating something that does not do any explanatory work would be pointless. Parsimony would lead us to deny, as Bermúdez does, the existence of a specific quale of body ownership. Moreover, if de Vignemont takes ‘appearances of ownership’ to be the same as ‘feelings of ownership’, then the second part of her reply would be begging the question: what is at issue is the very fact that we have feelings

³Gallagher (2017a, p. 149) agrees with that reading in saying that Bermúdez denies that there is an inherent, first-order, pre-reflective phenomenology of ownership.

of ownership and, thus, that what RHI subjects undergo should be described in terms of such feelings or otherwise. Finally, as Bermúdez's (p. 41) adds, the failure of independence continues to hold in the RHI because the illusory 'feeling' and the judgement of ownership that would result from it would not be separable.

*The Argument from Disownership and other Arguments
for a Positive Phenomenology of Body Ownership*

To her claim that there are belief-independent illusions of ownership, De Vignemont (2007) adds what can be called 'the argument from disownership'. Drawing from the fact that patients suffering from neuropsychological pathologies such as asomatognosia (Moro, Zampini, & Aglioti, 2004) and somatoparaphrenia (Vallar & Ronchi, 2009) report disownership of their limbs, de Vignemont (2007, p. 429) infers that their bodily experiences either include features indicating alienation or lack features indicating ownership. She goes on to assume (p. 433) that in cases of disownership the sense of ownership is missing and claims that analyzing those cases will allow us to better understand the sense of ownership.

The problem with the argument from disownership is evident: it cannot be assumed that disownership is just the absence of ownership. As Bermúdez (2011, p. 164) points out, "there are all sorts of reasons" for which a patient might report disownership, and we need to consider those reasons before claiming a simple opposition ownership/disownership rather than seeing disownership as an experience involving more complex elements.

To the arguments from disownership and from illusions of ownership, De Vignemont (2007, pp. 431-432) adds three further reasons for a 'positive phenomenology' of ownership. Firstly, she argues that it allows an explanation of the phenomenological difference between one's experience of someone else's hand and one's experience of one's own hand. There are certainly several phenomenological differences between those two experiences: only the latter is proprioceptive or 'from the inside', only the for-

mer is exteroceptive, among others. However, it is unclear that any of those differences require us to speak of body ownership (after all, as we will see below, subjects may experience their bodies ‘from the inside’ without having ownership of them).⁴ Perhaps De Vignemont means that we need body ownership to explain our experience of the other’s hand *as someone else’s* and our experience of our hand *as our own* —but that is not an additional reason for a ‘positive phenomenology’ of ownership, it is not explanatory to say that we experience our hand as our own because we have ownership of it. Secondly, De Vignemont remarks that a positive phenomenology of ownership helps us to explain the following: we are able to non-inferentially compare what someone feels when touched with what one would feel if touched (for instance, when we see someone being tickled), but we do not confuse our sensations (our tickling) with someone else’s, nor feel our sensations in someone else’s body parts. It is unclear why that comparison should lead to such confusion: when it appears to me that I would also feel ticklish if touched in the armpits, I am attributing a token of the tickling-type that is different from the one I imagine I would have. There is no way I could confuse one with the other. Thirdly, De Vignemont asserts that a ‘positive phenomenology’ of ownership allows us to explain the difference between amputees

⁴ Ascertaining all the implications of this possibility goes beyond the reach of this manuscript. The most notable of them has to do with proprioception’s immunity to error through misidentification. Evans (1982) wonders whether one could experience a body other than one’s own ‘from the inside’ —if one could not, proprioception would be immune to error through misidentification (relative to the first-person pronoun). Even though he seems inclined to think that one cannot, it is worth noting that he considers a case where proprioception could fail to be immune to error (p. 221). I will limit myself to the following observation. The claim that there is a sense of body ownership and the claim that proprioception is immune to error through misidentification are different claims, and it is not uncontroversial that they are connected. The latter amounts to the claim that I cannot proprioceptively experience someone else’s body (regardless of how I experience my body), whereas the former has to do with the way subjects experience their body (whether or not it is somehow infallible).

who feel their prostheses as their own body parts and those who do not. However, explaining why this sense of ownership arises in the former amputees and not in the latter seems to require an account in terms of the correspondence between bottom-up and top-down sensorimotor processes—in which this difference is said to lay (Tsakiris & Haggard, 2005)—, which could be in line with a deflationary account of ownership (after all, the sense of ownership would name here a correspondence between body representation and sensory input).

It is unclear that those last three reasons are strong enough to motivate the claim that there is a positive phenomenology of ownership, as is the case with the argument from disownership. Nonetheless, maybe we do not need to enlarge the arsenal of arguments for such positive phenomenology, because we could pinpoint the experiential dimension of body ownership on different grounds.

Neither Inflationists nor Deflationists

Despite the common interpretation of Bermúdez's view, it seems clear that he is acknowledging that there is something experiential regarding body ownership. Remember that he accepts that we experience our bodies as our own—his question is *why* is that so— (Bermúdez, 2014, p.37) and, what is more, he admits that in the RHI one's experience of something belonging to one's body is manipulated (Bermúdez, 2017, p. 120). Thus, in his view, we experience that some things belong to our body (and that experience can be manipulated). For Bermúdez, however, it does not follow that what is manipulated is some feeling or qualia of ownership.⁵ Moreover, to the extent that this experiential element

⁵ The pivot for this claim is the aforementioned difference he sees, in regard to the sensory, between the pair 'feeling'-'sensation', on the one hand, and the pair 'experience'-'awareness', on the other. Given that difference, 'sense' would be something ambiguous between both pairs.

is manipulated in spite of our beliefs and judgments, it can be acknowledged that it is belief-independent.

In this regard, if we are not to read Bermúdez (2011) as being in plain contradiction with his own views (2014, 2017); when he says that body ownership is not “a distinct and phenomenologically salient” dimension of bodily awareness (2011, p. 157) he does not mean that there is not something experiential in body ownership—but that this experiential dimension does not amount to a *quale* of ownership. So, Bermúdez’s view is fully consistent with the following observation: experiencing *x* (being aware of it) does not necessarily mean having an ‘*x*-feeling’ or an ‘*x*-quale’. If so, it would be inaccurate to say that Bermúdez has denied any experiential component in body ownership through his rejection of inflationary accounts.

For her part, De Vignemont (2013) has alternated the formulation of the issue of body ownership in terms of a feeling with another formulation which does not include the feeling terminology:

I am aware that this hand is mine. But is the sense of ownership of my hand manifested to me in a more primitive form than beliefs or judgements? Is there an experience of ownership independent of the judgement of ownership at the doxastic level? (p. 643)

So, and as she seems to use the term ‘feeling’ in a loose, not necessarily sensory way (De Vignemont, 2017, p. 229), it might be uncharitable to view her approach as unavoidably inflationary (that is, as defending the existence of a *quale* or feeling).

How can it be true at the same time that there is an experiential dimension of body ownership and that there is no *quale* of ownership? Our suggestion is that we may need to appeal to the idea that there are aspects of my experience of which we may be aware but that do not belong to the content of experience—as-

pects that could be called ‘structural’—.⁶ Thus, I might be aware of something without an associated quale, and the absence of a quale might not imply that it is not experiential.⁷ The question, of course, is: what structural aspect of bodily experience are we talking about? As will be shown, most of the debate on body ownership amounts to attempts to address that question.

The Structural Aspect of Bodily Experience that Grounds the Sense of Body Ownership

Now that we have provided some support for the claim that what we are referring to as ‘the sense of ownership’ does not need to involve a quale of ownership, we would like to inquire into the structural aspect of experience grounding that sense of body ownership. We will discuss some influential answers to this question, beginning with the one in which the expression ‘sense of ownership’ first appears, and going on to analyze approaches that place the emphasis on experiential aspects as different as affect and spatiality. We will also discuss a further view in which important claims of the previous accounts are put into question. The section ends with the introduction of a dilemma leading to the consideration of a different way of addressing the issue of ownership.

⁶ Anscombe’s argument would not apply to that kind of issue, because it addresses what is known through sensations or feelings (in other words, the content of some experiences). As a structural aspect of experience, the sense of ownership would be neither observational nor non-observational knowledge.

⁷ In a similar vein, Billon (2017) points out that to speak of a “sense” of body ownership merely refers to the fact that we experience our body parts as our own, but that it does not mean that this “sense” involves a “feeling”. Zahavi (forthcoming) makes a related point when he says that what makes part of experience is not always a form of thematic, object-givenness.

The Intrinsic Location of Bodily Experiences

Martin (1995, p. 269) has defended the view that the felt location of bodily sensations is the source of the sense of ownership. In his opinion, together with their intrinsic location, bodily sensations provide us with an awareness of a space where we cannot feel sensations (p. 271) and so of our body as being in a space that extends beyond its limits and encloses it (a “sense of boundedness” as he calls it). Being given as located and being given as falling within one’s apparent boundaries would thus be inseparable aspects of bodily sensation. For that reason, the sense of body ownership (the ‘sense’ we have that the parts where bodily sensations are located belong to my body) is not an additional quality but “already inherent within” (p. 278) bodily sensations.

Martin’s account implies that when a sensation is located, it is located within the apparent limits of one’s body, and, conversely, that no sensation can be located beyond those limits.⁸ He goes on to explain away cases where bodily sensations are purportedly felt beyond one’s body as bodily illusions or hallucinations. As he emphasizes, not all bodily sensations are veridical, which is why the *apparent* locations of bodily sensations don’t need to be within the actual limits of one’s body; thus, some present themselves and certain body parts as having a property they do not have (for instance, their location and that of the relevant limb, as in some examples from Wittgenstein; p. 269), and others present nonexistent objects (such as phantom limb sensations; p. 275). Those cases, therefore, would not jeopardize the thesis that all bodily sensations are located within the apparent limits of one’s body.

In addition to the mereological issue noted earlier, De Vignemont (2013) has argued that Martin’s conception of the sense of

⁸He notes (p. 273) that his account also entails a “sole-object view”, that is, the claim that the only thing of which we are aware through bodily sensations is our body.

ownership is disproved by somatoparaphrenia, because somatoparaphrenic patients can feel sensations in a body part that they deny is their own. This pathology would show that one can have located bodily sensations without experiencing ownership, a possibility that Martin (1995) explicitly denies (p. 270) and that directly falsifies his conception of the sense of body ownership.⁹ More precisely, somatoparaphrenia would demonstrate that feeling sensations located in a body part is not a sufficient condition to experience the relevant body part as one's own.¹⁰

De Vignemont (2013) acknowledges that her argument can be called into question on the grounds that somatoparaphrenic patients are usually delusional: what they have is the delusional belief (instead of the experience) that some of their body parts are not their own. Her answer (p. 649) is that delusional beliefs are an attempt to make sense of abnormal experiences, so that even in that case a denial of ownership would have a corresponding phenomenological source. However, as we remarked earlier, judgements of disownership could have several causes, so the assumption that those judgements are a direct index of the experience of disownership is unwarranted (especially in delusional subjects). At all events, there seem to be other cases of located sensations without body ownership—such as depersonalization (see below)—whereby the empirical challenge for Martin's view would still hold.

According to De Vignemont (2007, p. 435), even though the fact that bodily sensations are ascribed locations on the body is not enough to ground the sense of ownership, the spatial content of

⁹ Note that Martin denies this possibility on the basis that it would imply the existence of a separate quale of ownership. As we have been suggesting, however, it does not follow (it might explain, anyway, Bermúdez, 2011, concern about a quale of ownership).

¹⁰ Note also that Bermúdez (2017, p. 122) agrees that somatoparaphrenia makes experiencing located sensations neither necessary nor sufficient for judgments of ownership.

bodily sensations depends on a spatial representation of the body. Her suggestion is thus that that representation would constitute the source of body ownership (a claim that she calls the “spatial hypothesis”).

Now, given that the distinction is usually made between a body representation for action (the “body schema”) and another for judgment (the “body image”), De Vignemont (2007) asks which could be the source of the sense of body ownership (p. 440). She brings up a variation of the RHI in which the illusion was produced on the basis of hand movements (Tsakiris, Prabhu, & Haggard, 2006). In this setting, when based on purely afferent information (from involuntary movements) the effect was weak, whereas it was stronger when based on both afferent and efferent information. Hence, De Vignemont infers, efferent information (related to the body schema) both contributes to unifying the body as a whole and has an effect on ownership of the body. She also alludes to the fact that the form of disownership reported by deafferented patients was related to their loss of motor control over their limbs. She thus concludes (2007, p. 441) that the sense of ownership would be given by the body schema.¹¹

De Vignemont has recently reviewed that approach as part of her criticisms of “agentive” accounts of ownership (De Vignemont, 2017). She observes (pp. 220-221) that if we experienced as our own the body that is represented in our body schema, then action planning (which is based on the body schema) should be affected when we experience ownership of extraneous parts. In the RHI, however, there is ownership of the fake hand, but action

¹¹ De Vignemont (p. 443) stresses that an account of body ownership must include its implicit first-personal component —it is the experience that this is *my* body—. She holds that this “motor” account explains a couple of traits of the first-personal component, because it represents the body as a subject (or the acting body), rather than the body as an object. However, if her own criticisms of that view are correct (De Vignemont, 2017 and below), representing the acting body would not be sufficient to represent it as one’s own.

planning is not affected. The fake hand is therefore left out of the body schema, but participants report ownership over it. Conversely, tool use seems to affect action planning (so that tools seem to be included in the body schema), but we do not really experience tools as parts of our body. That seems to contradict the claim that the sense of ownership is provided by the body schema; yet, instead of giving up her agentic conception altogether, De Vignemont surmises that it needs to be amended through a refinement of the notion of body schema.

The Affective Dimension of the Body and Bodily Experiences

According to De Vignemont (2017, p. 223), body ownership is invariably connected with a specific kind of action that could be called ‘defensive’ or ‘protective’ (to the point that response to threat has become the main implicit measure of the RHI). She also notes that although we use tools as extensions of our limbs, we also use them to avoid harming our body. Thus, even though the effect of tool use on action planning indicates that they are included in the body schema, there is a kind of action (self-defensive action) directed only to our body parts and not to tools. Thus, it could be argued that as the body has a special significance for the organism’s survival, a specific sensorimotor representation was needed that commands us to protect the body that it represents (p. 231) —it does not necessarily mean that we defend our biological body, but the body that we take we have by virtue of such representation. Accordingly, Ee Vignemont (p. 224) postulates the existence of two kinds of body schema: the working body schema (WBS) and the protective body schema (PBS). The idea is that, whereas tools are included in our WBS, only the body we experience as ours is represented in the PBS.

De Vignemont adds that the significance of the body is experienced by the subject. To defend that claim, she appeals to Akins’ (1996) thesis that perception is “narcissistic”. According to that

thesis, perception specifies the impact on the subject of what is perceived, aiming at securing what is best for it. De Vignemont's (2017) assertion (p. 226) is that the phenomenology of bodily experiences includes that affective, narcissistic dimension—which is also in direct relation to action, because it is what makes us protect our body. Moreover, by comparing it with the feeling of familiarity, she emphasizes that this affective character cannot be reduced to sensory phenomenology.

Her conclusion is that bodily experiences are given in different frames of reference, among which there is the PBS, representing the location of sensations in both a sensorimotor fashion and in terms of their relevance for the organism (De Vignemont, 2017, p. 230). In other words, the affective phenomenology of bodily sensations would be anchored in the PBS that informs (protective) movement and action.

De Vignemont sums up her position in the claim that the source of the sense of bodily ownership is the affective phenomenology coming from the narcissistic dimension of bodily experiences and tied to the PBS (p. 232). Thus, she posits the “bodyguard hypothesis”, according to which the body that we experience as our own is the one represented in the PBS (p. 227). This hypothesis predicts that if one experiences ownership of something, one should react when it is threatened and, conversely, if one feels disownership of something, one should not react when it is threatened. As De Vignemont highlights, in the RHI the strength of the experience of ownership of the fake hand correlates with the reaction to threat (p. 223), and somatoparaphrenic patients do not protectively react when the ‘alien’ hand is threatened (p. 229).

Now, since the function of the PBS is to represent the body that matters for the organism's survival *simpliciter* (not that body *as one's own*), its function does not seem to comprise a first-person component. How is it the source of something with an inherent first-personal component (i.e., the sense of body ownership)? De Vignemont's answer (2017, p. 227) is that the narcissistic dimen-

sion of bodily experiences (anchored in the PBS) has a somewhat implicit reference to the self, to the extent that it is an awareness of their significance *to me*. In other words, the experience of one's body as one's own would consist of the experience that the body has a special affective significance to the subject.

Although some empirical support may be provided for the bodyguard hypothesis, there is a case in which subjects experience ownership but do not protectively react when their body is threatened or when they are in pain. Subjects suffering from pain asymbolia (Berthier, Starkstein, & Leiguarda, 1988) could falsify the bodyguard hypothesis and the claim that the experience of body ownership amounts to the experience that the body has a special affective significance to the subject.¹²

When addressing pain asymbolia, De Vignemont (2017, p. 230; 2018, p. 200) treats it—and cases of amygdala lesion with similar outcomes— as the product of a deficiency in the evaluation of danger. That is, those patients still experience their body as something to protect but misjudge situations in which the body should be protected as harmless. But what are the grounds for claiming that they affectively experience their body? Their behavior is compatible with both the claim that they do not experience their body as something to be protected (although they experience their bodies as their own) and with the claim that they systematically misevaluate threats to their body and pain (while affectively experiencing their body). To put it another way, what makes de Vignemont's treatment of pain asymbolia unsatisfactory is that she needs—but does not offer— some grounds on which to reject the idea that the experience that those subjects have of their bodies as their own does not amount to experiencing their

¹² Pain asymbolia is a condition in which, despite experiencing pain, patients do not display the behavioral or affective reactions usually accompanying pain. It is sometimes said that the pains they experience lack its 'hurtfulness' or 'unpleasantness'.

body as something to protect (a possibility that would prove her account wrong).

The Experienced Spatiality of one's Body

Bermúdez (2017) has recently defended the view that we experience the space of our body in a distinctive way that grounds our judgments of ownership. In other words, what judgments of ownership reflect is the experienced spatiality of the body. He identifies two features of our experience of bodily space that he calls “boundedness” and “connectedness” (p. 126). The first refers to the fact that we experience bodily events within a circumscribed space (corresponding to that occupied by the experienced body), while the second concerns the fact that we locate those bodily events against the background of the body as a whole. He adds that both boundedness and connectedness involve some knowledge of bodily structure, whereby they can only be manipulated within certain limits.

Bermúdez (2017, p. 130) contends that, in order to account for our experience of the space of the body (bounded and connected), we need a frame of reference and a corresponding coordinate system. He first considers the idea that this space could have a frame of reference with three axes (either “Cartesian” or spherical) whose coordinate system would have as its origin the body’s center of mass. However, he discards this possibility on the following grounds: (1) we do not experience any particular body point as the privileged origin of our bodily space (which would involve experiencing every bodily event as being intrinsically close to or far from it), (2) Cartesian or spherical frames only allow for “purely geometrical” (instead of experiential) views on boundedness and on the distinction between bodily space and peripersonal space, and (3) those frames are unable to grasp the fact that body locations are experienced in a relational and holistic fashion (instead of being isolated).

The second option Bermúdez (2017) considers (p. 133) comes from his distinction between the two ways of thinking about bodily location, which he calls A-locations and B-locations (see Bermúdez, 1998, p. 154). Briefly, the frame of reference against which A-locations and B-locations are specified is given by fixed body points (namely, joints), so that we would represent bodily space as a series of cones linked by mechanical joints. Moreover, according to Bermúdez, where the A-locations of bodily experience do justice to boundedness, their B-locations do justice to “connectedness” (p. 137).

Despite sharing doubts about whether experiencing located sensations is a sufficient condition for judgments of ownership, Bermúdez’s account has remarkable points in common with Martin’s. Both can be described as approaches in which the experience of one’s body as one’s own hinges on the spatial content of bodily awareness. Similarly, boundedness (that we experience bodily sensations within the limits of our body) is an essential feature of that spatial content for both of them. Their main difference seems to stem from Bermúdez’s suspicion that boundedness needs to be supplemented with connectedness, that is, that we need a conception of the spatial content of bodily sensations as providing some awareness of the body as an articulated whole. Yet, appraising whether this account makes justice to the experience of body ownership requires us to present and discuss further elements of the debate, which we do below.

Could Body Ownership be Thought-Dependent (Rather than Dependent on a Structural Aspect of Experience)?

The views that we have considered so far admit that we can experience our body as our own without any corresponding thought; to that extent, they could be called “phenomenal accounts”. However, Alsmith (2015) has argued that we can have the experience at issue *if and only if* we somehow think of it as our own. That “cognitive” approach to the sense of body ownership counters

phenomenal accounts, and it does so by challenging one of the main arguments of those accounts.

Alsmith (2015, p. 882) asserts that phenomenal accounts take support from the existence of illusions (such as the RHI) in which subjects report experiencing ownership of parts they do not seem to think of as their own. It is then claimed that, in as much as they do not think of those parts as theirs, their ownership experience is thought-independent. Focusing on the RHI, Alsmith (p. 893) acknowledges that participants have an illusory experience and that they have an experience of ownership but denies that they are one and the same and that the latter is thought-independent. In addition, in his opinion, even if participant experiences of ownership are judgment-independent, judgment-independence is not thought-independence. His contention is that thinking is not restricted to judging and may include intending or imagining. Furthermore, Alsmith argues, imagining may be both spontaneous and unnoticed (p. 892).

Think of someone standing in a demolition site that once was their childhood home. Alsmith claims that in this kind of case people may tend to engage in imaginative perception (spontaneously and without noticing) proportional to the degree of consistency between the content of perception and the content of imagination (2015, p. 892) —if there are some remains, for instance, people might inadvertently imagine the living room or a playground. That would be what happens in the RHI. In Alsmith's view, the RHI would be the effect on the experience of imagining (spontaneously and without noticing) that the rubber hand is one's own hand (facilitated by the experimental setting). What participants report would therefore be thought-dependent. Alsmith's conclusion is thus that in the RHI there would be no illusion of ownership but only a spatial illusion. The illusion would be that the location of the participant's real hand coincided with the location of the rubber hand, whereas the experience that the rubber hand is one's own would be the result of one's imagination.

This is a persuasive way to cast doubt on the claim that RHI provides support to the thought-independence of experiences of body ownership, however, what Alsmith's cognitive account posits goes beyond the thought-independence of the experience of ownership in the RHI. This account holds that thinking of our body as our own is a necessary condition to experience it as such, whenever we experience it as our own. To arrive at that claim, Alsmith would have to specify (or at least provide some indication as to) what kind of thinking process takes place in normal (non-illusory, non-pathological) experiences of body ownership. It is unclear that imagination (either spontaneous or deliberate) is the relevant thinking process here –I am not *imagining* that this is my body. In the absence of a good candidate, doubts may strengthen regarding the postulation of thinking processes as a necessary condition for experiencing body ownership.

Peacocke's Dichotomy

In discussing De Vignemont's (2007) account, Peacocke (2015, p. 174) suggests that theorists attempting to explain the sense of body ownership have a choice to make: either they reductively characterize it as having a source different from the experience of one's body as one's own (and, then, they must dispel doubts as to whether that source is enough to ground the experience at issue) or they claim that the 'source' already "labels various body parts as one's own" (taking for granted the notion of ownership rather than explaining it).

De Vignemont (2017) and Bermúdez (2017) would prefer the former option. Moreover, they emphasize that there is nothing more to the experience of body ownership than the source they propose (i.e., to experience our bodies as our own *amounts to* experiencing them as something to protect, or to the experience of bodily space). There seem to be some approaches that take the latter option, however, that is, taking ownership for granted and

claiming that it is a primitive aspect of experience. As accounts taking the former option can be called “reductive”, let us call those taking the latter option “primitive”. In the following section, we inquire into views that could be considered primitive, attempting to appraise whether they offer a better understanding of the sense of bodily ownership.

The Sense of Body Ownership as Primitive

The “Mark of Mineness”

According to Billon (2017) “the sense of bodily ownership hinges on a phenomenal mark of mineness” (p. 190). To defend his view, Billon focuses on a neuropsychological pathology known as “depersonalization”, which he claims also proves other accounts of the experience of body ownership wrong. Depersonalization is another condition in which patients report disownership, but as those patients are not delusional and show normal rationality (Billon, 2016, p. 370) it could be a more reliable source of insight about disownership than somatoparaphrenia.

Although depersonalized patients do not show sensory alteration, they seem to have an impaired awareness of their bodily sensations, leading to reports of disownership of some of their body parts (Billon, 2017). Depersonalization is not restricted to bodily experience, however. Patients also report feeling as if their mental states were not their own, as if they were not alive or did not exist, and as if some features of reality were absent (see Billon, 2016). They thus report feeling estranged not only from their body but from their actions, thoughts, and themselves. Billon’s conclusion (2016, pp. 374-375) is that the common factor in most descriptions of depersonalization can be described as a lack or impairment of subjective character in patient experiences, which would be the reason why they do not experience their mental states as their own (see also 2017, p. 198). The “mark of mineness” would therefore be the very subjective character of experience (i.e., a mental

state would be “marked” as one’s own in virtue of the subjective character it has).

The Challenges Arising from Depersonalization

Billon (2017) contends that competing accounts of the sense of body ownership should be able to explain depersonalization, and that they face three challenges. He maintains that those accounts are unable to do so.

As noted above, in depersonalization disownership of the body seems to be part of a general disturbance of the experience of one’s mental states as one’s own. According to Billon, that means that explaining depersonalization demands a general account of mental ownership (which constitutes the first challenge). Most competing accounts are only able to explain ownership of one’s body or of one’s bodily sensations, but not of one’s mental states in general.

The second challenge is making predictions about disownership that are met in depersonalization. Most accounts of ownership make predictions that depersonalized patients do not meet, however: that there will be alterations of cognitive, discriminative or motor capacities, abnormalities in the spatial content of sensations, and so on.

Billon (2017, p. 205) acknowledges that some accounts locate the source of the sense of body ownership in aspects of a subject’s experience that are actually altered in depersonalization—so that they meet the first two challenges. The third challenge is to show that those are indeed sources of the sense of ownership and not their result. Taking the example of affective flattening (a characteristic feature of depersonalization), Billon alleges that it could be seen as the result of a patient’s emotional responses lacking normal subjective character rather than the source of the sense of body disownership (so that the source of ownership was affectivity): if the subjective character of fear was impaired, he argues, it might

not seem to one that one is afraid. If so, affective accounts would not meet the third challenge.

Pre-Reflective Ownership and “Experiential Minimalism”

Zahavi (2020) and Gallagher (2017a, 2017b) have defended a view similar to Billon’s, while insisting that the appropriate approach to our experience of body ownership must be rooted in the phenomenological tradition. As in Billon’s account, in their ‘phenomenological view’ the sense of ownership refers to a form of mineness coming from the subjective character and first-personal givenness of first-order experiences (see, for example, Gallagher, 2017a, p. 146). Similarly, it is seen as a mineness of one’s body, but also of one’s movement, action, and experiences.

According to this phenomenological view, the subjective, first-personal character of experience amounts to a pre-reflective form of self-awareness. For instance, Gallagher (2017a, p. 145; 2017b) claims that the subjective character present in everyday, non-pathological experience immediately reveals my experiences as my own and is the most basic part of a minimal self. Similarly, Zahavi (2020) asserts that the subjective and phenomenal character of experience is self-revealing, in the sense that it is an inherent pre-reflective self-consciousness. So, in the phenomenological view, the sense of ownership or mineness would thus be an aspect of the pre-reflective basic self-awareness that the subjective, first-personal character of experience would be.

Problems with Primitivism

Let us first focus on Billon’s challenges. The first and second would prove inherently insufficient “modular” (Billon, 2017, p. 197) approaches to ownership: while depersonalized patients show no modular symptom, the first challenge demands accounting for ownership in general, insofar as alterations of ownership extend beyond bodily experience in depersonalization. Nevertheless,

depersonalization is not the only condition in which we find non-delusional judgements of disownership. As noted by De Vignemont (2007, p. 428), some patients report experiencing disownership towards some of their limbs in asomatognosia. Those patients, however, do not seem to have a global alteration of their experience, and their disownership reports refer only to their body parts. Thus, asomatognosic patients would represent a difficulty for “central” approaches (Billon, 2017, p. 197) analogous to the difficulty that depersonalized patients represent to modular theories (namely, they respectively call into question the proposed extent of the alteration of ownership and disprove key predictions).

As to the third challenge, in discussing the relationship between the affective deficit and the experiential deficit of depersonalized patients which he posits, Billon (2016) acknowledges that there are two options (p. 384-386). The first, as we noted, is that normal subjectivity is required for affective experiences. The second option is to see subjectivity as intrinsically affective and, even though he seems to favor the first option, he does not dismiss the second. A number of reasons could be given in support of the second option: it might allow for a connection with the affective account of body ownership, it would also mean the affective account met the third challenge (Billon, 2017, grants that it meets the first two), the affective account would meet the third challenge without competing with Billon’s account, it fits the views both of theorists inspiring the affective account and of authors in the phenomenological tradition (Akins, 1996; Patočka, 1998), among others. Yet, the issue remains that we have characterized affective accounts as reductive and Billon’s as primitivist. We will attempt to address that issue in the final section of this manuscript.

There is one concern with regard to the phenomenological account that affects its adequacy to explain body ownership. In that account, it is by virtue of the structural feature of their subjective character that all my experiences are given as my own. As Gallagher notes (2017b), rather than being associated with

its content, ownership is associated with the “implicit reflexive” character of experience and, as Zahavi (2020) puts it, mineness is not a ‘thematic’ aspect of experience. A somewhat naive question arises, however: how do I get to experience my body as my own by means of something that presents all my experiences as mine (regardless of whether they are my bodily experiences or my experiences of other objects)? In other words, since all my experiences structurally possess mineness/ownership, it is unclear why some present my body as my own.

One may grant that the subjective character of experience is primitive and that mineness is an aspect of that subjective character, so that my experiences imply me and are given as mentioning me. Nonetheless, it is hard to see how the subjective character of experience could provide a distinction between my own body and any other experienced object.

Indeed, our experience of our body includes unique forms of consciousness, such as those provided by proprioception and kinesthesia. To claim that those experiences differentiate my experience of my body from my experiences of other objects, however, so that they contribute to our sense of body ownership, would be to displace the source of ownership from the subjective character of experiences *as such* to the having of proprioception and kinesthesia.

If we are to account for the experienced ownership of our body rather than for ownership of our experiences, we need something more than a structural aspect of experience that provides ownership of experiences and not of what is experienced. This concern is of major importance for our interpretation of the problem, since we have suggested that a ‘structural’ view of ownership might help to move the debate forward (see above). In the final section, we will attempt to address that concern.

Closing Remarks

In the first part of the paper, we found that the views according to which (1) body ownership involves a quale of ownership, or (2) there is nothing experiential about body ownership, cannot be attributed to any of the theorists accused of having maintained them. Instead, both the advocates of a positive phenomenology of body ownership and those who deny that body ownership involves a specific qualitative feel, seem to share the view that there is an experiential dimension of body ownership—even more, a belief-independent experiential dimension. Rather than feelings or sensory qualia, that dimension could be a structural aspect of experience.

We then discussed some prominent accounts of body ownership, among which De Vignemont's (2017) affective account and Bermúdez's (2017) spatial account stood out. Both can be interpreted as positing structural aspects of bodily experience as the source of the sense of ownership: although having located sensations may not be enough to experience one's body as one's own, Bermúdez makes a persuasive case for the claim that the experienced spatiality of our body could be the source of such experience. For her part, De Vignemont contends that the experience of body ownership amounts to the experience of the affective dimension of one's body, a view that appears consistent with the primitivist approach that sees affect as an intrinsic feature of subjectivity and that explains disownership as the outcome of an altered affective character of experience.

In turn, we determined that the difficulty for the primitivist thesis that alterations of the experience of body ownership must be accounted for as alterations in the subjective character of experience is twofold. On the one hand, it might not be true that whenever there are alterations of the experience of body ownership there are also alterations in the subjective character of experiences (viz. asomatognosia). On the other hand, the subjective character

of experience seems to account for the ownership of experiences and not for the experienced ownership of one's body.

These difficulties might be solved both by emphasizing other structural aspects of experience or dimensions of subjectivity (namely, affect) and by allowing both central (or general) and modular alterations of the affective character of experience. On the one hand, affect may be the dimension of subjectivity that needs to be dwelt on (*i.e.*, subjectivity *as affective*), and arguably alterations in the affective dimension of an experience might blur one's affective relationship to its intentional object. On the other hand, allowing not only central but also modular alterations of the affective character of experience appears to be a conceptual possibility for an affective view—unavailable if one claims that alterations of ownership are due to alterations of the subjective character of experience itself.

Both Bermúdez's and De Vignemont's accounts have their own issues. With regard to de Vignemont's affective account, we found that since the behavior of patients suffering from pain asymbolia is compatible with both the claim that they systematically misevaluate threats to their body (while affectively experiencing it) and with the claim that they do not experience their body as something to be protected (although they experience their bodies as their own), accepting her treatment of pain asymbolia requires some grounds on which to discard the latter claim (whose truth would prove her account wrong).

With regard to Bermúdez's spatial account, it is true that the uniqueness of our experience of the spatiality of our body coincides with the singularity of the sense of ownership, so it is not unreasonable to think that the former might ground one's body ownership experiences (or judgements). However, our suspicion comes from the fact that it is hard to see how that approach could account for the kind of alteration that depersonalized patients have in the experience of ownership of their bodies. As Billon (2017, p. 202, 204) points out, depersonalized patients have nor-

mal spatial bodily awareness, that is, the spatial content of their bodily experiences does not seem disturbed. Since it would be farfetched to deny that body ownership is altered in depersonalization or to claim that such alteration does not problematize the spatial account, Bermúdez would have to show (against the well-established thought that depersonalization is not accompanied by that alteration) that the experienced spatiality of the body is indeed altered in depersonalization.

A further issue has to do with the relationship between De Vignemont's affective account and the approach in which ownership hinges on affect as an intrinsic feature of subjectivity. To begin with, since we characterized the former as reductive (that is, as making experienced ownership of one's body nothing more than experienced affect towards one's body), how could it be consistent with a view in which the sense of ownership is primitive? Yet, the claim that the sense of body ownership is just the experience of the affective dimension of one's body does not seem to contradict the claim that ownership is inseparable from the (primitive, structural) affective-subjective character of experience. Moreover, allowing for the existence of central and modular alterations of the affective character of experience (also within the limits of De Vignemont's view) would make both claims true. That would also allow us to account for the difference between depersonalization and asomatognosia. The consequences of this reading for the primitiveness of the affective-subjectivity approach, remain to be seen.

With the above considerations in mind, the strongest alternatives in the philosophical debate about the sense of body ownership can be narrowed down to the following views: that the experience of body ownership amounts to the experience of the spatiality of our body and that the former amounts to the experience of the affective dimension of one's body. As we argued, whether one account overcomes the other will depend on the ability to demonstrate either that patients suffering from pain asymbolia experience normal body ownership or that the spatial bodily awareness of

depersonalized patients is altered. Arriving at any of those claims demands independently motivated new readings of empirical data (about pain asymbolia and depersonalization, respectively). Until then, both accounts will remain inconclusive.

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