

Mental Activity & the Sense of Ownership

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Published online: 4 November 2014
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Abstract I introduce and defend the notion of a cognitive account of the sense of ownership. A cognitive account of the sense of ownership holds that one experiences something as one's own only if one thinks of something as one's own. By contrast, a phenomenal account of the sense of ownership holds that one can experience something as one's own without thinking about anything as one's own. I argue that we have no reason to favour phenomenal accounts over cognitive accounts, that cognitive accounts are plausible given that much of our mental activity has unnoticed effects on our mental life, and that certain illusory experiences of body ownership sometimes described as thought-independent may be best explained as imaginative perceptual experiences.

1 Introduction

A phenomenal account of the sense of ownership holds that one can experience states, properties and processes as one's own without thinking about anything as one's own. Discussion of the sense of ownership has been dominated by phenomenal accounts; the aim of this paper is to introduce and defend an alternative kind of account: a cognitive account. A cognitive account of the sense of ownership holds that one experiences something as one's own only if one thinks of something as one's own. This paper argues that we have no reason to favour phenomenal accounts over cognitive accounts, that cognitive accounts are plausible given that much of our mental activity has unnoticed effects on our mental life, and that certain illusory experiences of body ownership sometimes described as thought-independent may be best explained as imaginative perceptual experiences.

Phenomenal accounts of the sense of ownership take a variety of forms. I describe these in section 1. Phenomenal accounts differ according to what is held to be self-attributed in experiences of ownership. But they converge on the claim that such experiences are thought-independent. In section 2, I introduce the notion of a cognitive account of a sense of ownership. A cognitive account holds that if one self-attributes any of the variety of things that proponents of the phenomenal account suggest that we

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do, one must be engaged in the relevant kind of mental activity, namely thinking of something as one's own.

Sections 3 to 5 respond to an empirically based objection to cognitive accounts. The objection, stated more fully in section 3, is that in multisensory body illusions, such as the rubber hand illusion (RHI), subjects report illusory experiences of ownership for a hand which we have no reason to believe that they think of as their own. They are reporting how they experience a rubber hand, which they know is not their own. They are not reporting how they think about the rubber hand, for that is irrelevant. The RHI and related studies would therefore suggest that experiences of body ownership are thought-independent and thus that the basic assumption of a cognitive account is false.

I argue for an alternative account: these subjects are sincerely reporting on phenomenal events that are partially dependent upon spontaneously imagining that the rubber hand is their own. In section 4, I argue that, perhaps in contrast to mental action, the effects of our spontaneous mental activity on our experience is often unnoticed. Drawing on a series of observations by Kendall Walton, I argue that spontaneous imagining is a form of spontaneous mental activity that exemplifies this characteristic. In section 5, I argue that by appealing to spontaneous imagining, a cognitive account can provide an explanation of reports of experiences of ownership that is superior to the standard explanations offered by phenomenal accounts.

1.1 What is the Sense of Ownership?

The notion of a sense of ownership has been extensively appealed to in recent philosophy of mind. Appeals differ with respect to the scope of the self-attribution involved. Some claim, for instance, that we have a sense of ownership for our bodies and that this is a contingent property of bodily experience: perceptual experience of a body can represent that body as one's own, but not all such experiences do so (de Vignemont, 2007). Appealing to the notion of a sense of body ownership is thus required to account for the difference between experiences that do and experiences that do not represent a body part as one's own (de Vignemont, 2011, 2013).

Others have a more liberal view of the sense of ownership. They see it as a more pervasive property of the subjective structure of every kind of conscious experience. Shaun Gallagher, for instance, introduces the notion in drawing a contrast with the sense of agency.¹ To adapt his example slightly: Say I am a child, and a stronger child takes my wrist and starts hitting me in the face with my hand, while saying, 'Stop hitting yourself!'. In such a case, it might be thought that we have no sense of agency for the movements involved as they are involuntary, but that nevertheless the notion of a sense of ownership would be required as part of an adequate description of the experience of involuntary movement. On this view, we ought to delineate a phenomenal property that is absent in such a case, a sense of agency, from a phenomenal property that is nevertheless present, a sense of ownership for the movements involved

¹ Although many of the issues here are parallel to those concerning the existence of a sense of agency (cf. the discussion of non-doxastic agentive self-awareness in Bayne and Pacherie (2007)), my focus here will be on the sense of ownership.

(Gallagher, 2000, p. 16).² And for a liberal, such as Gallagher, the very same contrast might be drawn in the experience of other forms of activity, not merely bodily activity such as movement, but mental activity such as thinking.

In schizophrenic symptoms of delusions of control or thought insertion, the sense of ownership is retained in some form, but the sense of agency is missing. The schizophrenic who suffers from these delusions will claim that his body is moving but that someone else is causing the movement; or that there are thoughts in his mind, but that someone else is putting them there. (Gallagher & Zahavi, 2008, p. 160)

It is a short way from here to a maximally liberal conception, according to which the notion of a sense of ownership has an even broader scope of application than the self-attribution of one's body parts, movements and thoughts. On a maximally liberal conception, the sense of ownership is that which remains invariant amongst the variation across modes of conscious experience.

Although the various modes of givenness (perceptual, imaginative, recollective, etc.) differ in their experiential properties, they also share certain features. One common feature is the quality of mineness, that is, the fact that the experiences are characterized by a first-personal givenness that immediately reveals them as one's own. (Zahavi, 2005, p. 124)

Despite their differences, these uses of the notion of a 'sense of ownership' are similar to the extent that they are intended to pick out a phenomenal property that is independent of mental acts of self-attribution. Thus, de Vignemont insists: "My body is manifested to me in a more primitive form than beliefs or judgements. It is manifested in the form of feelings of ownership" (de Vignemont, 2011, pp. 83–84). More explicitly, Gallagher and Zahavi describe the 'senses' of ownership and agency as first-order phenomenal experiences, saying that "the higher-order, conceptually informed attributions of ownership or agency may depend on this first-order experience of ownership or agency" (Gallagher & Zahavi, 2008, p. 161). And what is meant by the claim that the sense of ownership is a first-order experience is surely that when I, for instance, am "aware of an occurrent pain, perception, or thought from the first-person perspective, the experience in question is given immediately, noninferentially and noncritically as mine" (Zahavi, 2005, p. 124). Hence, the common idea amongst all phenomenal accounts (indeed, that which defines them as phenomenal accounts) is that there is a way in which we might experience things as our own which is independent of the ways in which we might think of those things as our own.

² Hence the purpose of the distinction between the senses of agency and ownership here is to delineate the sense of agency (rather than ownership) as a distinctive experiential phenomenon and highlight the methodological difficulties in studying it (Gallagher & Zahavi, 2008, pp. 158–169). But it is perhaps due to the association (or rather the contrast) with bodily action, that Gallagher's distinction has been influential in areas where the more specific notion of body ownership would be more appropriate (see e.g. Haggard et al. 2006; Tsakiris, 2010; Tsakiris & Haggard, 2005a).

In sum, phenomenal accounts of the sense of ownership, claim that:

1. There is a phenomenal property *O* in virtue of which a subject experiences something as its own.
2. *O* does not necessarily require a subject to think about anything as its own.
3. But we need not endorse 2, if 3 is plausible:
4. *O* necessarily requires a subject to think about something as its own.

A cognitive account of the sense of ownership affirms claim 3 and thus denies claim 2. It denies that there can be experiences of ownership that occur in independence of an individual thinking about something as her own. To think about something as one's own is to apply the concept of ownership in thought. To apply the concept of ownership in thought is to think about something – e.g., in belief, judgement, desire, intention, recollection, or imagination – in a manner that is sensitive to the distinction between something being one's own, someone else's or no-one's.³

A cognitive account neither affirms nor denies claim 1; it is not committed to the existence of experiences of ownership *per se*. In this respect a cognitive account is consistent with the possibility that, in the final analysis, experiences of ownership may not hold a place in our ontology. Nevertheless, if it is true that we can and do experience bodily and mental events, properties, states and processes as our own, a cognitive account holds that we do so only when we are thinking of something as our own.

My main aim in introducing the very idea of a cognitive account is to persuade the reader that a cognitive account is a plausible alternative to a phenomenal account of any given phenomenon to be described as an experience of ownership. This aim is worthwhile because phenomenal accounts seem to have, so to speak, hijacked the conceptual space in thinking about the nature of experiences of ownership. To my knowledge there are no accounts of experiences of ownership that are both consistent with their existence (i.e., consistent with claim 1 being true) and also deny the central claim shared by phenomenal accounts (namely claim 2). This is unfortunate, as without such accounts to hand it is difficult to assess the grounds that we have for accepting the descriptions of experiences of ownership asserted by proponents of phenomenal accounts.

1.2 When do we have a Sense of Ownership?

You might ask: when do we have a sense of ownership, according to a cognitive account? I answer: less often than according to a phenomenal account. Cognitive accounts are more parsimonious than phenomenal accounts. Cognitive accounts are premised on the undeniable fact that we can and do think about bodies, thoughts, experiences etc. as our own. But what is often claimed by proponents of phenomenal accounts is that we should distinguish these various instances of self-attributive thought from the sense of ownership as an experiential phenomenon. Consequently, a

³ As my intentions here is to state the commitments of a cognitive account in highly general manner, I do not further specify the structure of self-attributive thought. However, one account that I find attractive postulates for any self-attributive thought a contrast set of things that are not attributed. Thus thinking about something as one's own is singling out something as one's own, by being in a frame of mind in which one distinguishes that which is one's own from some set of things that are someone else's or no-one's at all.

phenomenal account posits more possible instantiations of *O*. It claims that *O* is a property of more experiences than a cognitive account does. On a phenomenal account, non-pathological subjects experience their own bodies, their own thoughts, their own experiences *etc.*, and they also experience these as their own. That is, whatever phenomenal properties these experiences have, they *also* have the phenomenal property *O*. On a cognitive account, non-pathological subjects experience their own bodies, their own thoughts, their own experiences *etc.* But unless they are in a frame of mind to think of these things as their own, then these experiences lack the phenomenal property *O*; they do not experience these things as their own, if they do not think of them as their own.

To flesh this out a little consider a few examples tailored to distinguishing a cognitive account from a maximally liberal phenomenal account.

- (a) I see a drop of blood on a white rose.
- (b) I remember my experience of seeing the bloodied rose.
- (c) I judge that my experience is best described as being of something surreal but beautiful.
- (d) I wonder whether my experience could be exactly the same as another's.

Both a cognitive account and a maximally liberal phenomenal account can accept, with certain qualifications, that cases (b) – (d) describe cases in which I may have a sense of ownership for my experience. The accounts differ with respect to case (a). According to a maximally liberal phenomenal account, the details of case (a), barring the unusual, are sufficient to assert that I experience my visual experience of a bloodied rose as my own. By contrast, a cognitive account requires that there be, in addition, something of the kind of thinking that is involved in cases (b) – (d), in which I am thinking of my experience as my own. I think of my experience as my own, when I wonder whether anyone might have the same aesthetic experience as I do (d), or I evaluate my experience as being a certain way (c), or I simply remember my experience (b).

Before moving on to consider cases tailored to a more conservative conception of the sense of ownership, two additional comments are worth making. Firstly, it ought to be admitted that a cognitive account requires that the subject be engaged in some form of higher-order thinking in order to possess a sense of ownership for that which she is thinking about. But this does not commit a cognitive account to a higher-order theory of consciousness, or indeed self-consciousness (Rosenthal, 2004, 2005). A cognitive account does not require that there be a higher-order state in order for a state to be conscious; nor does it deny that there can be forms of self-consciousness that do not require higher-order states. All it denies is that there can be an experience of ownership that occurs in independence from a thought that singles out something as one's own.

Secondly, it might be objected that all that is meant by a sense of ownership on a maximally liberal conception is that there are ways of experiencing one's own experience that do not require a higher-order state. This is fine, no one wants to get bogged down in terminological disputes. But what should be clear is that a cognitive account denies that when one experiences one's own experience one thereby experiences one's experience *as one's own*. Indeed, it would be wrong to motivate the additional instances of *O* posited by a phenomenal account by noting the fact that in self-conscious

experience, the body or experience that one experiences is one's own (cf. Gallagher, 2000, p. 16; Gallagher & Zahavi, 2008, p. 160; Zahavi, 2005, p. 124). This would be to fail to mark a distinction between the fact of ownership and the experience of ownership. Consider, by way of analogy, that it is possible that other worlds exist than our own. These are other worlds that we could experience were matters different. Despite this possibility, it is nevertheless true that the world that we experience is our own. But it does not follow from the fact that the world that we experience is our own that we experience the world as our own. Likewise, in self-conscious experience we may experience something that is our own; it does not follow from this fact that what we experience is experienced as our own.

The foregoing remarks are enough to support the claim that a cognitive conception of the sense of ownership is a plausible alternative to a phenomenal conception. Although thus far I have been discussing phenomenal conceptions in the round, for the remainder of this paper the focus will be on a more conservative conception of the sense of ownership as a phenomenal property of bodily experience. The reason for doing this is that it is possible to formulate an empirically based objection to all cognitive accounts based on a certain description of experiences of body ownership provided by a particular conservative account. Before moving on to that objection, consider briefly some examples tailored to distinguishing a cognitive account from a conservative phenomenal account:

- (e) I feel the pressure of my fingers in my palm as I clench my hand into a fist.
- (f) I am looking at pictures of hands; I see one that I judge to be mine.
- (g) I awake after surgery and I form the conscious intention to move my right hand.
- (h) I am practicing a part in a play and I imagine that a deformed hand (a stage prop) is my own.

Again, both a cognitive account and a conservative phenomenal account can accept that cases (f) – (h), with certain qualifications, describe cases in which I may have a sense of ownership for a particular body part. The two accounts differ with respect to case (e). According to the phenomenal account, the details of the scenario (barring the unusual) are sufficient to infer that I experience a hand as my own. By contrast, a cognitive account requires that there be, in addition, something of the kind of thinking involved in cases (f) – (h). To experience a hand as my own I must be in a state that involves thinking about something as my own, such as when I see a hand that I judge to be mine (f), or I consciously intend to move my hand (g), or I imagine that I have a deformed hand (h).

1.3 An Empirically Based Objection to Cognitive Accounts

One way of positively motivating a cognitive account would be to endorse a sole-object model of bodily experience (Bermúdez, 2011; Evans, 1982; Martin, 1995). To endorse a sole-object model of bodily experience is to deny that there is more than one possible object of genuinely bodily experience. More positively, it is to claim that necessarily one experiences one's own body when one experiences a body in certain 'normal' ways. These ways include somatic proprioception and somatosensation, and arguably (in sighted subjects) sight of particular parts of a body from a perspective within the

head of that body (de Vignemont, [forthcoming](#)). When one experiences a body in one of these ways, one is necessarily aware of a single object of that kind or one of its parts. If this is right, then it is vacuous to describe one's bodily experience as being as of one's own body, for one could not have such an experience that was not also an experience of one's body. If one feels cold feet in the normal way, the feet that one feels are one's own. If one sees two sides of a nose very nearby as one normally does, the nose that one sees is one's own. In neither case, nor any similar case, does one's experience have the phenomenal property *O*, such that one experiences the relevant body part as one's own.

I suspect that the sole-object model as formulated may be too strong, however it is a useful background for the particular conservative phenomenal account of the sense of ownership that I will discuss, developed by Frédérique de Vignemont. De Vignemont denies the sole object model. She claims that bodily experiences can either present one's own body or a variety of other kinds of object and that there is a division within the class of bodily experience, call it *b*, such that certain of the objects of those experiences are treated as one's own (de Vignemont, [2007](#), pp. 430–431; [2011](#), p. 83). A sole-object account can simply reject the premise that bodily experiences present a variety of other kinds of object than one's body. But it must still offer an explanation of why it is that we treat our bodies differently from other objects. De Vignemont claims that the best explanation must posit *O* as a thought-independent property of some *b* experiences, call them *b₁*, and not others, *b₂*. When a subject undergoes an instance of *b₁* “there is something it is like [for that subject] to experience parts of one's body as one's own, some kind of non-conceptual intuitive awareness of ownership” (de Vignemont, [2013](#), p. 650). In short, she proposes a phenomenal conception of the experience of body ownership to explain the proposed division.

We can add the necessary claims to our scheme as follows:

1. There is a phenomenal property *O* in virtue of which a subject experiences something as its own.
 - a. *b* experiences are either *O* (*b₁*) or *not-O* (*b₂*).
 - b. *b₁* experiences do not necessarily require a subject to think about anything as its own.

If claim 1.2 is true, then we can conclude:

2. *O* does not necessarily require a subject to think about anything as its own.

And if that argument is sound, we must deny claim 3.

3. *O* necessarily requires a subject to think about something as its own.

Thus, reasons for believing claim 1.2 are reasons for denying cognitive accounts in general. Although I ultimately think we must deny the claim, reasons for believing it are to be found in de Vignemont's account of the rubber-hand illusion (RHI).

First, a description of the illusion itself: In the RHI, participants are required to observe a rubber hand being touched whilst their own obscured hand is touched. Participants observe, for instance, a paintbrush tapping a rubber hand on its finger at location L_1 ; simultaneously they feel the touch of a paintbrush on a finger and that they feel to be at a distinct location L_2 . After a brief period, many participants report feeling as if the rubber hand were their own. Other typical measures of the illusion include a measure of the extent to which participants mislocalize their hand in the direction of the rubber hand (known as 'proprioceptive drift', see Botvinick & Cohen, 1998; Tsakiris & Haggard, 2005b) and a measure of the extent to which they exhibit a physiological threat response to a sudden, typically violent action towards the location of the rubber hand (known as a 'skin conductance response', see Armel & Ramachandran, 2003; Ehrsson et al. 2007).

The various modalities of the participants' response certainly suggest that they undergo an illusion of some kind. Moreover their reports of feeling as if the rubber hand were their own in particular suggest that the illusory experience they undergo is an experience of body ownership. Still, we need to do a little work to focus the case in the appropriate manner.⁴ For although the relevant questionnaire items are often described as picking out 'perceptual effects', nothing in the reports of the participants themselves directly suggests that their experience is thought-independent. Indeed, in the original study, participants were reported saying, for example, "I found myself looking at the dummy hand thinking it was actually my own" (Botvinick & Cohen, 1998, p. 756, third column). Nevertheless, de Vignemont draws attention to certain persuasive details of the case:

Of special interest for us here is the fact that participants can feel as if the rubber hand were their own hand while they are clearly aware that this is a rubber hand that is stroked in front of them. It then seems that the content of their experience can be at odds with the content of their ownership judgement (e.g. 'It feels like my hand, but I do not believe it's my hand'). (de Vignemont, 2013, p. 645)

This is certainly persuasive in so far as it indicates that the content of the participants' experiences ought to be seen as independent from a certain way of thinking, namely judging. Though even if it is right to say that the subjects do not judge that the rubber hand is their own, this does not mean that their experience of it is thought-independent. Sometimes thinking about something is judging something, but certainly not always. Nevertheless, the burden of proof seems to be on the shoulders of a proponent of a cognitive account. There are solid grounds for a distinction between the participants' likely judgement concerning the rubber hand and their experience of the rubber hand. Moreover, there is clearly a perceptual illusion that is measurable by

⁴ I leave aside the issue of whether the participants' experience is properly described as bodily experience. One might worry on this count that the illusion results at the very least from a combination of somatosensory input and visual input. But this is not something that should concern us too much here. For the purposes of this discussion, we can stipulate that both cognitive and phenomenal accounts assume a multimodal conception of bodily experiences according to which certain visual experiences of the body from a head-centred perspective are partially constitutive of certain bodily experience (for discussion, see de Vignemont, forthcoming).

the degree of proprioceptive drift and skin conductance response. All this makes it hard to see why what the participant thinks about the rubber hand would be relevant to their experience of it.

I think that there is a plausible response for a proponent of a cognitive account. It builds on several claims about the nature of thinking as a mental activity, none of which I believe are controversial, but some of which could do with some detailed exposition. Before I get to that, though, it is worth making a few initial clarificatory remarks. First, it ought to be recognised that the ‘thinking’ involved in thinking of something as one’s own, is not restricted to judging that something is one’s own; thinking of something as one’s own can occur in any of the variety of forms that thinking can take. As illustrated by cases (f) – (h), it can occur not only when judging, but also when intending or imagining. It is the latter form of thinking that is most plausibly occurring in scenarios in which subjects report experiences of a rubber hand as their own. They do not judge it to be their own, nevertheless they come to imagine that the rubber hand they are watching being stroked is their own hand, and their report simply imports the content of their imagining. This suggests that in a certain respect the reports are incomplete, or elliptical, as they do not include reference to the subject’s imagining. But it would be a misunderstanding to see the reports as wholly inaccurate or even insincere on this basis. When a participant responds affirmatively to a questionnaire item such as ‘I felt as if the rubber hand were my hand’, this may be an accurate description as far as the participant can tell (or as far as an accurate description is possible). It may nevertheless be true that the participant’s experience is a consequence of them coming to think in a certain way about the rubber hand. It would only be insincere of a participant to respond affirmatively to such a statement if they had *noticed* that their report is a consequence of them thinking in that way; and to do that they ought to have noticed their thinking as it occurred. But as I aim to show in the following sections, we ought to reject the idea that one’s thinking need always be noticed. In particular, we ought to reject it where the imagination is concerned.

1.4 Mental Activity and Imagination

Sometimes one does things without noticing what one is doing. This is often true when moving one’s body intentionally. A strikingly robust experimental finding is that individuals will correct for a deviation introduced into a movement they perform, thereby ensuring the action they intend nevertheless achieves its goal, but will not report such corrections in their movement (Fournier et al., 1998; Kannape *et al.*, 2010; Knoblich & Kircher, 2004). Individuals are able to compensate for a bias introduced, but give no indication of having noticed doing so, suggesting that whilst they are trying to perform the task, e.g., of drawing a line straight ahead, their actual activity, specifically their corrective movement, in fact goes unnoticed. This is one of many instances in which we may be engaged in a particular activity without noticing what we are doing. This is also true for things done where movement is irrelevant. Such activity, mental activity, thinking, can have significant effects on a subject’s mental life, but yet go unnoticed. Correspondingly, a central claim of this section is this:

- (i). One need not always notice one’s thinking.

When thinking *qua* mental activity counts as action (and why) is a vexed issue that we need not resolve here (Soteriou, 2009).⁵ However, where thinking is thought of as a mental action, claim (i) might seem to be incompatible with the thesis that mental actions are known to the agent by means of a form of action awareness. The most adamant proponent of this thesis is arguably Peacocke:

The distinctive way in which a subject comes to know of his own mental actions is by taking an apparent action awareness at face value. You judge that it will rain. When so judging, you have an apparent action awareness of your judging that it will rain. It seems to you that you are judging that it will rain. By taking this awareness at face value, you come to know that you judge that it will rain. (Peacocke, 2009, p. 193)

It may well be that an agent's knowledge of mental action is distinctive in so far as it is based upon apparent (i.e. conscious) awareness of mental action. But one should not confuse this with the claim that one notices one's thinking whenever one thinks. Firstly, what one is consciously aware of and what one notices may not be the same. Indeed, it is commonly accepted that conscious experiences of action are typically attentively recessive (O'Shaughnessy, 1980/2008; Peacocke, 2006). As such, where one's awareness of mental action is conscious, it need not be because the action itself is being attended to and thus noticed. Secondly, it does not follow from the dependency of knowledge of mental action on awareness of mental action that we are always aware of mental action. What follows, rather, is that if we do something without being aware of doing so, then we do not know what it is that we are doing. This seems to be just the right consequence, regardless of one's view on mental action. In any case, it leaves unscathed the claim that one need not always notice what one is doing when one is thinking.

Now, for an example of unnoticed thinking, consider what Velleman has us suppose that he does without noticing in the following example:

Suppose that I have a long-anticipated meeting with an old friend for the purpose of resolving some minor difference; but that as we talk, his offhand comments provoke me to raise my voice in progressively sharper replies, until we part in anger. Later reflection leads me to realize that accumulated grievances had crystallized in my mind, during the weeks before our meeting, into a resolution to sever our friendship over the matter at hand, and that this resolution is what gave the hurtful edge to my remarks. (Velleman, 1992, p. 464)

⁵ In order to minimise controversy, I use the term activity to pick out a kind of process that need not be identical to action. Often when one speaks of something being done, what is done is (perhaps only implicitly) thought of as intentional, or as the product or an instance of someone's trying (see e.g., Hornsby (2012, 2013)). Certainly, we do things when we act; to act is in part to engage in some form of activity. But we need not consider all activities to be actions – consider that of volcanoes; and indeed, not all human activities are actions of the kind that philosophers of action are most directly concerned with – consider that of the human digestive system. Hence, I reserve the term action to a narrow usage, though nothing turns on whether some of the events that are a part of what I would refer to as an activity can also be described as actions in a broader usage (see, e.g., Mele, 2009, p. 20).

Velleman's aim here is to show that there can be actions that do not involve full exercise of one's agential capacity. But the example also serves to illustrate claim (i). For whether or not what is done is an action, one of the reasons why it is surely not a full-blooded action is that Velleman, the agent, does not know what he is mentally doing as it is happening. And this is just because he does notice the relevant processes of mental activity as they unfold (Velleman, 1992, p. 471). Beliefs and desires of his were formed, a decision of his is made, but he only notices what he had come to desire and decided to do after he had done the action that they lead to. At the time, he did not notice the contribution of his thinking to what he did, because he did not notice he was thinking about the matter in that way.

Claim (i) is exemplified by a certain way of thinking, namely imagining. This point needs to be handled with a little care, as deliberate imagining cannot but be noticed. For instance, if I deliberately imagined that the walls of my home were a certain colour, it would be inaccurate to say that I did not thereby notice what I was doing. But imagining is not always deliberate: "Often we just find ourselves imagining certain things [...] Like breathing imagination can be *deliberate* or *spontaneous*" (Walton, 1990, p. 14). There are various ways in which these two forms of imagination can be contrasted. The most straightforward is that spontaneous imagining typically exemplifies claim (i), whereas deliberate imagining does not.⁶ For instance, as a case where spontaneous and deliberate imagining have the same contents, say that I imagine that a stage prop of a deformed hand is my own (case (h) from section 3 above). As I give my performance after weeks of practice, my imagining that I have a deformed hand may be a natural part of the pretending involved in the performance, but my imagining is spontaneous, rather than the deliberate exercise it was in rehearsal.

Spontaneous imagining often occurs in cases of imaginative perceptual experience.⁷ These are cases in which one's imagination and one's perception jointly contribute to one's experience. Examples include cases in which one's experience of a scene is affected by one's imagining an absent object, or an object in a different location – a part of the bare wall is seen as just the right spot for a clock; the sofa is seen as better placed under the window, rather than by the door (Grush, 2004, p. 390). But imaginative perception is not limited to these cases. Take for instance, my use of a deformed fake hand as a stage prop in my performance. This one of many cases in which people use "artificial prompters or alter natural ones in order to direct the imaginings of others in predetermined ways" (Walton, 1990, p.23). Just as I adorn a false hand in my performance to foster the audience's imaginative perception of a poor man with hideously deformed appendage, "snowmen, dolls or toy trucks are designed by their makers to induce those who see or use them to imagine men, babies and trucks of certain sorts." (ibid.).

⁶ Walton actually uses the term 'non-occurrent imagining' for imagining that is not the focus of attention; 'spontaneous imagining' is the term he uses for cases of imagining passively. However, the distinction between cases in which one passively imagines attentively and cases in which one passively imagines non-attentively is not necessary for my purposes. Thus I use the label spontaneous imagining in a manner that is slightly different from Walton, but I draw on those of his observations concerning spontaneous imagining that serve to elucidate the character of passively imagining non-attentively.

⁷ Others use the term 'make-perceive' (Briscoe, 2008) or 'superstitious perception' (Gosselin & Schyns, 2003).

Perhaps in these cases one might notice that one's imagining contributes one's experience, or perhaps one might only notice that one was imagining soon after, or upon reflection. All we need note for present purposes is that in some cases of imaginative perception, it is plausible that the contribution of imagination goes unnoticed. In these cases, the imagining may best be described as spontaneous rather than deliberate. Certainly, it is plausible that there would be a difference in the experience. As Walton observes, "imagining spontaneously can be more fun, more exciting than doing so deliberately [...] a more "vivid" or realistic experience [...] more like actually perceiving or otherwise interacting with the real world" (Walton, 1990, p. 14). This similarity to the experience of actually perceiving motivates the thought that spontaneous imagining is modulated by perception to a greater degree than deliberate imagining: "The relevant general principle is that evidence of the falsity of the [imagined] proposition imposed forcefully on one's consciousness makes it difficult to [spontaneously] imagine that the proposition is true" (Walton, 1990, p. 15). In fact, the converse principle may be more useful, namely that the privation of evidence of the falsity of the imagined proposition makes it easier to spontaneously imagine that the proposition is true. More simply and more generally, the degree of spontaneity in imaginative perception may linearly correlate with the degree of consistency between the content of perception and the content of imagination.

1.5 Imaginative Experiences of Body Ownership

We now have the resources required for an explanation of experiences of ownership in the RHI in terms of a cognitive conception of the sense ownership. Let me first briefly summarise what needs to be explained.

The RHI is a multisensory stimulation paradigm that involves visual observation of a tapping movement on rubber hand at location L_1 and synchronised or asynchronised tactual stimulation of the observer's obscured finger placed at a distinct location L_2 . Where the stimulation is synchronous, after a sufficient induction period many participants respond affirmatively to questionnaire items such as 'I felt as if the rubber hand were my hand' (Botvinick & Cohen, 1998) or '...it seemed like the rubber hand belonged to me' or '...it seemed like the rubber hand was my hand' (Longo et al. 2008). In order to respond to the argument presented in section 3, a cognitive account needs to offer an explanation of these reports of experiences of body ownership in the RHI, according to which those experiences are thought-dependent.

There are behavioural responses to explain as well. For instance, Botvinick and Cohen (1998) found that appropriately induced subjects exhibit a 'proprioceptive drift'. When asked to reidentify the location of their hand or finger, they place it closer to the location of the visually observed tapping or stroking (Tsakiris & Haggard, 2005b). Arnel and Ramachandran (2003) also found a greatly heightened affective response in induced subjects when the rubber hand was stabbed or twisted after a sufficient induction period (see also Ehrsson et al., 2007). In order to respond adequately, the account also needs to offer sensible explanations of these behavioural reports.

The explanation is that these participants are imaginatively perceiving a rubber hand as their own. They are watching a rubber hand being stroked at L_1 , they are feeling a hand being stroked at L_2 and they are imagining that the rubber hand that they see at L_1 is their own hand. The participant is engaged in a form of propositional imagining,

imagining *that* the rubber hand is their own. This is not to claim that the participant's propositional imagining 'penetrates' their visual processing (Pylyshyn, 1999). That is a theoretical possibility, but nothing claimed here rules out the alternative interpretation according to which propositional imagination conceptually elaborates upon a non-conceptual visual process (see also Currie & Ravenscroft, 2002, p. 29). It is imagining that the rubber hand is their own that leads participants to report experiencing it as their own by responding affirmatively to the relevant questionnaire items. But this imagining is itself facilitated by the consistency between the content of the imagining and the content of perception. The perceptual presence of the rubber hand being stroked in just the manner as the stroking that they feel is eminently consistent with the proposition that they have a rubber hand. As a consequence, the experimental setup fosters the participant spontaneously imagining that the rubber hand is their own. Later, the participant is thus likely to report experiencing the rubber hand as if it were their own hand. And there is no reason to think that this response is insincere. For a comparison: when watching a performance of the Tempest I neither intend nor try to imagine that the actor I see onstage is the mighty wizard Prospero; indeed, I might never have heard of either the actor, the character or the play. But if the performance is compelling then I am naturally caught up in the imaginative project. Similarly, a compelling experimental setup might facilitate a participant in engaging a fictional scenario in which she imagines that she has a rubber hand.

The behavioural responses in fact need not be explained in terms of experiences of ownership. They can be explained in purely perceptual terms that do not require positing an experience of ownership. Proprioceptive drift occurs when seeing a (rubber) hand being stroked at L_1 , and feeling a hand being synchronously stroked at L_2 causes participants to misperceive the location of the hand they feel being stroked. This misperception is revealed when a participant is asked to reidentify the location of their hand. Such an explanation is bolstered by the fact that proprioceptive drift data is known to dissociate from questionnaire reports of experiences of ownership (Rohde et al. 2011; Serino et al., 2013). A purely perceptual explanation of the skin conductance response would be that seeing a rubber hand being stroked at L_1 , and feeling a hand being synchronously stroked at L_2 affects a change in the representation of the space surrounding the participant's hand. Space surrounding the body is sometimes referred to as 'peripersonal space' (Fogassi et al., 1996). Through the course of multisensory stimulation the participant's hand-centred peripersonal spatial representation is extended to include the location of the rubber hand (Makin et al. 2008). One of the functions of peripersonal spatial representations is that they can elicit appropriate defensive movements in response to potentially dangerous nearby events (Cooke & Graziano, 2003). The affective response exhibited by participants in the RHI is a consequence of a perceived threat, itself a consequence of an extension of hand-centred peripersonal representation through synchronous multisensory stimulation.

These purely perceptual explanations of the behavioural effects motivate a denial of the claim that the experiences of ownership reported by participants in the RHI are themselves reports of an illusion of ownership. Certainly the behavioural effects demonstrate that an illusion is produced by the multisensory stimulation. But the illusion is a spatial illusion, one that need not involve an illusory experience of ownership. It involves at most a misperception of the location of one's hand and a misperception of a threat to one's hand. It does not involve an experience of a rubber

hand as being one's own, or an experience of a threat to one's rubber hand. Those experiences, if had by participants, are a product of their imagination.

In this regard, consider a study by (Guterstam et al. 2013). Instead of watching strokes on a rubber hand, subjects watched a paintbrush move through empty space. In conditions where seen and felt paintbrush movements were spatiotemporally congruent, participants were disposed to misidentify the location of their hands as closer to the observed region and reacted affectively to stabbing movements within that region (ibid., p. 13). Many of them also responded affirmatively to the statement 'it felt as if my right hand were located on the table where I saw the brush moving, as if I had an 'invisible hand' (ibid., p. 3). Accordingly, the authors describe the scenario as one in which subjects experience an 'invisible hand illusion'. But here it is all the more obvious that the experience of ownership cannot be an illusory experience. What is experienced as owned is invisible; one cannot misperceive something that is by definition not perceptible. However, given the explanation of the RHI offered above in terms of a cognitive conception of the sense of ownership, we can have ready explanations of what is in fact illusory about the scenario, namely the location of the participants hand and the perception of a threat to that hand. And more importantly, we have an explanation of the participants' reports that does not violate common sense, namely that the participants come to imagine that they had an invisible hand.

2 Conclusion

We have no reason to favour phenomenal accounts over cognitive accounts. Cognitive accounts are plausible given that much of our mental activity has unnoticed effects on our mental life. Certain illusory experiences of body ownership sometimes described as thought-independent may be best explained as imaginative perceptual experiences.

In section 1, I described various forms of a phenomenal account of the sense of ownership can take. Phenomenal accounts differ according to that which is held to be self-attributed in experiences of ownership, but they are all nevertheless phenomenal accounts in so far as they all claim that such experiences are thought-independent. In section 2, I introduced the notion of a cognitive account of a sense of ownership, which holds that in order to experience something as one's own one must be engaged in the relevant kind of mental activity, namely thinking of something as one's own.

Sections 3 to 5 developed and responded to an empirically based objection to cognitive accounts stemming from an argument in favour of a conservative phenomenal account stated in section 3. The key premise of the argument is motivated by the assertion that in multisensory body illusions, such as the rubber hand illusion (RHI), subjects report illusory experiences of ownership for a hand that they do not think of as their own. In section 4, I laid the ground for an alternative account, which I provided in section 5: these subjects are sincerely reporting on phenomenal events that are partially dependent upon spontaneously imagining that the rubber hand is their own. In section 4, I argued for the claim that often mental activity goes unnoticed and that *a fortiori* the effects of our spontaneous mental activity on our experience is often unnoticed. By drawing on Kendall Walton's discussion of the nature of imagination at the beginning of his *Mimesis as Make-believe*, I argued that spontaneous imagining is a form of spontaneous mental activity that is an often unnoticed contributor to imaginative

perceptual experiences. In section 5, I argued that by appealing to spontaneous imagining, a cognitive account can provide an explanation of reports of experiences of ownership that is not only consistent and empirically adequate, it also allows the natural accommodation of the otherwise commonsense violating idea of experiencing ownership for an invisible hand.

Phenomenal accounts of the sense of ownership have dominated recent work on the sense of ownership without sufficient warrant. My hope is that this paper goes some way towards changing that situation, thereby enabling us to understand the disputed phenomena with a greater precision than we would otherwise.

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