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Bodily Ownership, Psychological Ownership, and Psychopathology

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Abstract Debates about bodily ownership and psychological ownership have typically proceeded independently of each other. This paper explores the relation between them, with particular reference to how each is illuminated by psychopathology. I propose a general framework for studying ownership that is applicable both to bodily ownership (φ-ownership) and psychological ownership (ψ-ownership). The framework proposes studying ownership by starting with explicit judgments of ownership and then exploring the bases for those judgments. Section 3 discusses John Campbell's account of ψ-ownership in the light of that general framework, emphasizing in particular his fractionation (inspired by schizophrenic delusions) of ψ-ownership into two dissociable components. Section 4 briefly presents an account of φ-ownership that I have developed in more detail elsewhere. Section 5 explores the suggestion, originating with Alexandre Billon, that there needs to be an integrated account of φ-ownership and ψ-ownership because depersonalization disorders typically involve breakdowns of both φ-ownership and ψ-ownership. The argument from depersonalization is not compelling, but Section 6 proposes a different way of reaching the same conclusion. Section 7 shows how reflecting on agency and practical reasoning offers a common thread between the models of φ-ownership and ψ-ownership discussed earlier in the paper.

1 Tools for Studying Ownership

Recent debates about ownership have been fuelled by insights from a range of empirical sources. For discussions of bodily ownership the principal drivers have been the various illusions manipulating where subjects feel sensations and, consequently, their judgments about the extent of their body and what is (or is not) a part of them. In the rubber hand illusion, for example, subjects see a rubber hand being stroked while their own hand (which is out of sight) is synchronously stroked (Botvinivk and Cohen

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1998). It is a robust result that subjects report feeling sensations of touch in the rubber hand and feeling that it is their own hand. In the full body illusion (Lenggenhager et al. 2007) subjects can be brought to identify with a full-body avatar that they see being stroked in front of them, while in the body-swap illusion subjects report a sense of ownership for a mannequin being stroked in the location where they expect their own bodies to be. These experimental paradigms have been hugely influential and are a rich source of insights and data. They offer tools for operationalizing aspects of subjective experience that can then be studied experimentally.

Earlier discussions of bodily ownership were driven much more by the psychopathology of bodily awareness (Bermudez et al. 1995), and psychopathology remains a rich and complementary source for thinking about bodily ownership. Neuropsychologists have identified and studied a number of different disorders in which bodily awareness in general, and ownership in particular, is distorted. Examples include *unilaterial spatial neglect* (where neurologically damaged patients neglect one side of their bodies, and indeed one side of peripersonal and external side) typically the opposite side to the lesion), *somatoparaphrenia* (where patients report disownership of body parts, typically on the contralesional side also) and *alien hand syndrome* (in which brain-damaged subjects report that someone else is moving their hands).

When we shift focus from bodily ownership to ownership of one's thoughts, emotions, and feelings, there is no equivalent to the rubber hand illusion and other illusions of bodily ownership. There are no experimental techniques for manipulating normal subjects' sense that the thoughts they are consciously thinking are their own. So here psychopathology is really the only source of data. Empirically-minded philosophers have paid particular attention to delusions of thought insertion in *schizophrenia* (see, for example, Graham and Stephens 1994; Campbell 1999a, Pacherie et al. 2006). *Cotard's Syndrome* (a rare disease in which patients form the delusional belief that they do not exist, and/or are already dead) has also been studied in this context (Gerrans 2000; Billon 2016), as has the complex of symptoms known as *depersonalization*, in which patients feel varying degrees of detachment and disconnection from their own thoughts, emotions, and bodily states (Billon 2015).

Ownership illusions and psychopathology each have their advantages and disadvantages. As already noted, while they do offer the great advantage of being experimentally tractable, ownership illusions exist only for bodily ownership. Moreover, they suffer from the disadvantage that subjects are typically aware of the illusion even while undergoing it. This is also a characteristic of many visual illusions, but it is potentially more concerning in this context. One reason for being interested in ownership is the light it can shed upon high-level capacities such as self-consciousness. What we are exploring is the role that ownership plays in underwriting awareness of oneself as spatial entity and as a locus of mental and physical agency. This is a matter, broadly speaking, of the functional role of ownership. So an important part of what one is trying to do by looking at disorders of ownership is to make backwards inferences from the functional role of disordered ownership to the functional role of normal ownership. But it is not obvious how to evaluate the functional role of an illusion that is known to be an illusion – there are not too many people who really believe that the rubber hand is their own, for example, and so the illusion of ownership has a limited functional role. Delusions are not like illusions in this respect. Neurospsychological patients suffering from delusions conspicuously grapple with the challenge of integrating their delusional

experience into an overarching cognitive and affective perspective on the world – and, according to one line of thought, how they do this is in many respects continuous with how they integrate non-delusional experience (Davies et al. 2001; Bermudez 2001).

At the same time, though, trying to work backwards from psychopathology to normal functioning brings its own problems. Many of the disorders that seem most illuminating from a theoretical point of view are actually very rare. Cotard's Syndrome is a case in point. There are obvious methodological difficulties in classifying disorders and finding commonalities across patients who often have significant collateral impairments, in addition to the challenges of obtaining clear dissociation data and then making inferences to mental structure (as discussed, for example, in Shallice 1988). And, in the last analysis, much of what is known about psychopathological disorders comes from the reports of severely impaired patients, who are often very hard to understand.

For all these reasons, then, the most promising approach to the complex phenomenon of ownership is likely to be multifactorial and integrative. This paper is intended as a step in that direction. Section 2 proposes a general framework for studying ownership that is applicable both to bodily ownership (which I will term φ-ownership) and psychological ownership (ψ-ownership) – phenomena that have typically been studied independently of each other. The framework proposes studying ownership by starting with explicit judgments of ownership and then exploring the bases for those judgments. Section 3 discusses John Campbell's account of ψ-ownership in the light of that general framework, emphasizing in particular his fractionation (inspired by schizophrenic delusions) of ψ-ownership into two dissociable components. Section 4 briefly presents an account of φ-ownership that I have developed in more detail elsewhere. Section 5 explores the suggestion, originating with Alexandre Billon, that there needs to be an integrated account of φ-ownership and ψ-ownership because depersonalization disorders typically involve breakdowns of both φ-ownership and ψ-ownership. The argument from depersonalization is not compelling, but Section 6 proposes a different way of reaching the same conclusion. Section 7 shows how reflecting on agency and practical reasoning offers a common thread between the models of φ-ownership and ψ-ownership discussed earlier in the paper.

2 A Framework for Thinking about Ownership

The terminology of ownership is widely used but nonetheless rather unclear. This section sets out a basic framework for characterizing the phenomenon of ownership and a general approach to explaining it.

As observed above, discussions of ownership in the empirical and philosophical literatures have pursued two parallel and often unrelated tracks. The first track has focused on bodily ownership, aiming to explicate what it is to take one's body as one's own, including ownership both of the body as a whole and of individual body-parts. The second track has focused on the ownership of conscious thoughts, emotions, and feelings. In the following I will refer to these as φ-ownership and ψ-ownership respectively –

φ-ownership

The phenomenon of taking one's body-parts to be parts of oneself, and (correlatively) of taking one's body to be one's own.

ψ-ownership

The phenomenon of taking one's conscious thoughts, feelings, emotions, and other mental states to be one's own.

The description of ownership in terms of "taking" is deliberately neutral, so as not to prejudge one of the key questions in this area. Many discussions of both kinds of ownership begin with a supposed phenomenological datum, which is that we have (or so it is claimed) a "sense of ownership" for our bodies and for our mental states. Martin, for example, defines the sense of ownership as a "phenomenological quality, that the body part appears to be a part of one's body" (1995, p. 269). But what exactly is this supposed to mean? For some authors, the sense of ownership is a specific feeling of "mineness" that is supposed to be part of the content of introspection and bodily awareness. This feeling of "mineness" is proposed as an explanation of both φ-ownership and ψ-ownership (see Gallagher 2005 and 2017, for example).

Elsewhere I have expressed doubts about both the coherence and the explanatory value of postulating a phenomenology of "mineness" (Bermudez 2011, 2015, 2017b). Be that as it may, it seems unwise to me to characterize the phenomenon of ownership in terms of a qualitative sense of ownership. The basic notion is too unclear and there are too many conflicting intuitions in this area for that to be a secure starting-point. If there is indeed something correctly describable as a sense of ownership then that will emerge as part of the explanation of ownership, rather than as part of the explanandum.

My counter-proposal is that we start instead from explicit judgments of ownership – judgments of the form "That is my hand" or "I am thinking this thought", together with judgments of disownership, such as "That is not my hand", or the more problematic judgments made by patients suffering from delusions of thought insertion. It is plain that we all make judgments of ownership on a regular basis, and often have occasion to make judgments of disownership (at least in the realm of φ-ownership). Moreover, data about φ-ownership and ψ-ownership from experimental studies and from psychopathology typically come in the form of explicit verbal reports.

If we take our starting-point to be judgments of ownership, then the obvious question to ask is – What are those judgments based on? This question in turn has two dimensions. On the one hand it can be taken as asking a descriptive-causal question about the source or origins of those judgments. On the other it can be taken to ask a normative question about the reasons for which those judgments are made. A full account of ownership will incorporate both dimensions – the descriptive-causal, on the one hand, and the reason-giving, on the other. My proposal, then, is that we tackle the problem of explaining ownership through explaining descriptive-causal and reason-giving bases for judgments of ownership.

With this framework in mind the next two sections will outline John Campbell's account of φ-ownership and my own account of ψ-ownership, before turning to the more general question of how φ-ownership and ψ-ownership are related.

3 Campbell on ψ-Ownership

In a series of papers John Campbell has proposed an interesting fractionation in the notion of ψ-ownership (Campbell 1999a, b, 2002). His suggestion, inspired by the project of making sense of delusions of thought insertion in schizophrenics as well by general reflection on the nature of introspection, is that what we tend to think of a unitary phenomenon of ownership really has two components. One strand in what it is to take a thought (or other occurrent mental state) as one's own is that one be able to think of it as one's own – that one be able to ascribe the thought to oneself. This is, I think it is fair to say, the dominant conception of ψ-ownership, its most distinguished proponent being Immanuel Kant who famously wrote in the second edition of the Transcendental Deduction of the Categories that "The 'I think' must be able to accompany all of my representations."[1]

But reflecting on delusions of thought insertion suggests to Campbell that this cannot be all that there is to ownership. Schizophrenic patients suffering from thought insertion report themselves thinking thoughts that are not their own. Taking the reports at face value, the patients seem to be able to ascribe these thoughts to themselves. They do not deny that it is they themselves who are thinking the inserted thoughts (the "I think" does indeed accompany the inserted thoughts, which is why they are a source of such distress). What schizophrenics deny is that those thoughts that they are thinking are their own thoughts. If the possibility of self-ascription were all that there is to ownership then these denials would be completely incoherent, which seems (among other problems) to trivialize a serious and disturbing disorder. So, in Campbell's words –

> At the very least, these reports by patients show that there is some structure in our ordinary notion of the ownership of a thought which we might not otherwise have suspected. The thought inserted into the subject's mind is indeed in some sense his, just because it has been successfully inserted into his mind; it has some special relation to him. He has, for example, some especially direct knowledge of it. On the other hand, there is, the patient insists, a sense in which the thought is not his, a sense in which the thought is some else's, and not just in that someone else originated the thought and communicated it to the subject; there is a sense in which the thought, as it were, remains the property of someone else. (Campbell 1999b, p. 610)

This second strand in the notion of ownership is causal. Part of what it is to take a thought to be one's own is to take oneself to be its author, the person who produced it. This dimension of ownership is missing in delusions of thought insertion. The defining

[1] See the *Critique of Pure Reason* at B13. I have discussed different ways of looking at Kant's unity of apperception in Bermúdez 1994.

feature of schizophrenic patients with thought insertion is being introspectively aware of thoughts of which they do not take themselves to be the author.[2]

Considering this proposal through the lens of the general approach to ownership sketched in the previous section, it seems plausible to interpret Campbell as distinguishing two different types of judgment of ownership –

(1) "I am thinking this thought"
(2) "I am the producer of this thought"

To make a type-(1) judgments is to ascribe a thought to oneself. To make a type-(2) judgment is to claim authorship for that thought. What one might think of as a normal judgment of ownership ("I am thinking this thought" or "This is my thought") typically subsumes both dimensions of ownership.

Given this distinction between these two dimensions of ownership, the next step is to investigate the basis for each of them. In his 1999a Campbell sympathetically discusses Frith's proposed explanation of schizophrenia in terms of a breakdown in normal mechanisms of action-monitoring (Frith 1992). According to influential models of motor control going back to the early nineteenth century, when people perform ordinary (i.e. bodily) actions a copy of the motor instructions (the *efference copy*) feeds into a comparator mechanism. This comparator uses the motor instructions to attenuate sensory and proprioceptive feedback. This is why, for example, the world does not appear to jump to the right every time we move our heads to the left. It is also one of the ways of identifying genuinely self-caused movements. Frith's proposal is that some analog of this process exists at the level of thought, so that some form of cognitive efference copy feeds into a comparator mechanism, which then allows us to identify genuinely self-caused throughts. These genuinely self-caused thoughts are, of course, the ones of which we take ourselves to be the authors. Delusions of thought insertion occur when the efference-copy/comparator mechanism for thoughts breaks down.

Frith's account certainly fits the general model I have proposed. It is an account of the basis for judgments of ψ-ownership (at least – of what I have termed type-(2) judgments of ψ-ownership). What I want to emphasize, though, is that it can at best provide a partial account.[3] As pointed out in Section 2, the notion of a basis has both a causal-descriptive dimension and a reason-giving dimension. Frith's account, located as it is squarely at the subpersonal level, speaks to the first dimension, but not to the second. It tells us about the subpersonal machinery that makes possible judgments of ψ-ownership. But the notion of a reason applies paradigmatically at the level of the person, about which Frith's account is silent.

There is an interesting question as to how we should think about the basis for Campbell's first dimension of ψ-ownership – the self-ascription dimension. I am attracted to the view that Kant's "I think" is, as it were, self-intimating, so that part of what it is to be introspectively aware of a thought is to be capable of ascribing it to oneself, but will not explore that idea further here. The principal conclusion that I want to draw from this discussion of Campbell is that there remains an open question about the reasons for which we typically take ourselves to be the authors of the thoughts that

[2] For a broadly similar distinction see Graham and Stephens 1994.
[3] Frith himself now makes more modest claims for the comparator theory. See Frith 2012.

we are thinking. In the final section of this paper I will suggest an answer to this question.

4 A Model for Thinking about φ-Ownership

In Bermúdez 2017 I propose an account of φ-ownership grounded in earlier work on distinctive features of how the space of the body is experienced (Bermudez 1998, 2005). The account starts from what I take to be two basic features of the phenomenology of bodily awareness. Here is the first –

> **Boundedness**
>
> Bodily events are experienced within the experienced body (a circumscribed body-shaped volume whose boundaries define the limits of the self).[4]

The experienced body has a degree of plasticity over time. At any given moment its boundaries are relatively fixed. But viewed over time it is malleable and capable of adapting to organic bodily growth, to trauma (such as amputation), and to the changing demands of movement and action. The experienced body does not always map cleanly onto the physical body. In some cases, such as prosthetic limbs, the experienced body can extend beyond the bounds of the real body. In other disorders, such as unilateral spatial neglect, portions of the real body fall outside the experienced body.

The second large-scale feature of the phenomenology of bodily awareness I term Connectedness:

> **Connectedness**
>
> The spatial location of a bodily event is experienced relative to the disposition of the body as a whole.

Part of what it is to experience, say, the heel of one's hand on the table is to experience the angle of the wrist and the degree of flexion in the shoulder and the elbow. Whereas Boundedness highlights the role of bodily boundaries in somatic experience, Connectedness highlights the role of limb disposition. The two principles jointly illustrate how individual bodily experiences incorporate an ongoing awareness of the body's limits and moment-to-moment layout. And of course the relation is reciprocal, since individual bodily experiences are an important element in generating that ongoing awareness.

Boundedness and Connectedness each emphasize different aspects of the spatial dimension of bodily experiences. Boundedness emphasizes the relation to the experienced spatial bounds of the body, while Connectedness emphasizes the relation to the body's experienced layout. Since there are not analogs of either in any

[4] Compare Martin 1995, who writes "in having bodily sensations, it appears to one as if whatever one is aware of through having such sensations is a part of one's body" (1995, p. 269). He describes this as a "sense of ownership", but for reasons indicated above I find this terminology unhappy.

exteroceptive sensory modality, there seems to be something very distinctive about how the spatial location of bodily events is experienced.[5]

This distinctiveness does not emerge if we think about how the space of the body is experienced in bodily awareness in the same way as we think about how the space of the external world is experienced in vision and other exteroceptive modalities. When the experienced spatiality of the body is discussed, it is standardly conceptualized in terms of a Cartesian frame with three axes, corresponding to the frontal, saggital, and transverse planes, with the body's center of mass serving as the origin of the coordinate system. This way of thinking about the space of the body, however, cannot do justice either to Boundedness or to Connectedness. There is no sense in which spatial locations that fall within the limits of the body are privileged (as Boundedness requires), and since each point is completely independent of every other there is no way in which it can accommodate Connectedness.

My proposed alternative model distinguishes two aspects of experienced bodily location, which I term A-location and B-location. Both presuppose a general map of the body as a relatively immoveable torso connected by joints to moveable body parts. To experience a bodily event (a pain, say) at a particular A-location is to experience it relative to such a map of the body, without taking into account the body's actual position. For this reason, experienced A-locations can only be experienced within the boundaries of the body.[6] So, A-location corresponds most closely to Boundedness. The B-location of a bodily event is its A-location calibrated relative to the position of the rest of the body. A-location specifies a bodily event within a particular body-part, while B-location fixes the location of that body-part in terms of the angles of the joints that lie between it and the immoveable torso. So, the B-location of the pain in the ball of my foot is its A-location within my foot, supplemented by specifying the angles of the foot relative to the lower leg, and the lower leg relative to the upper leg.

This way of thinking about the spatiality of bodily experience is the key, I suggest, to understanding φ-ownership. The grounding here is both reason-giving and causal-descriptive. From the perspective of subjects' own experience and their reasons for making judgments of ownership, the salient fact is that we experience the space of the body in a manner fundamentally different from how we experience extra-bodily space. This can help explain both judgments of ownership with respect to individual body-parts and judgments about the body as a whole. The body-parts that we take to be our own are the body-parts that fall within the experienced body – the body-parts within which bodily events can be A-located. At the same time the B-location dimension of bodily experience reflects the way in which a constant awareness of the disposition of the body as a whole is a background part of bodily experience, and hence a powerful basis for taking one's body to be one's own.

[5] It is true that visual perception is inherently relational, in that the field of view is centered on the viewer's eyes. But this is not really an analog of Connectedness, because the body is not experienced from a single origin. When we say, for example, that one thing looks nearer than another, this incorporates an implicit self-reference reflecting the origin of the visual point of view. Bodily experience, in contrast, does not allow such spatial comparisons. There is no privileged body-part that counts as "me" for the purposes of describing, say, a pain as further away than an itch.

[6] I am assuming that the general map corresponds to the experienced body, rather than the real body. In this sense it corresponds to what O'Shaughnessy termed the *long-term body-image* (O'Shaugnessy 1995).

From a subpersonal perspective, it is natural to look for a descriptive-causal explanation of φ-ownership in the mechanisms that make possible the experience of A-location and B-location. There is a significant body of work from both neuroscientists and neuropsychologists on which to draw. So, for example, neuropsychological and neuroimaging studies suggest that the right temporal and parietal lobes play an important role in supporting an abstract model of the body.[7] As far as B-location is concerned, there is a rich experimental literature on how limb position is coded for motor coordination and motor control, as well as on different sources of information about joint position.

The principal point that I want to emphasize for present purposes is that this approach ties φ-ownership very closely to the subject's awareness of the body's potentiality for action. From the perspective of action-planning and motor control, the most important variables are joint angles because, to a first approximation, muscles move limbs by changing joint angles. If, as I suggest, bodily events are experienced as having a B-location as well as an A-location, then an awareness of how one's body is configured from an agential point of view is built into the very structure of bodily experience.

5 Depersonalization Disorders and Breakdowns of Ownership

As mentioned earlier, discussions of φ-ownership and ψ-ownership have typically proceeded independently of each other. On the face of it this is puzzling. One of the principal grounds for judgments of ownership is the conscious experience of the body through bodily sensation, proprioception, kinesthesia, and the sense of touch. These experiences put us in touch with our own bodies. They are plainly somatic. At the same time, though, they are also psychological events. As psychological events they are the sort of thing for which the question of ψ-ownership arises. So, φ-ownership and ψ-ownership intersect in potentially interesting ways.

In recent work Alexandre Billon has suggested an even closer connection between φ-ownership and ψ-ownership (Billon 2017). According to Billon, psychopathological disorders such as Cotard's syndrome and depersonalization suggest that we need a single, unified account of the two types of ownership. In Cotard's syndrome patients have a range of nihilistic delusions. They can deny that they exist, for example, or that they are thinking. Cotard's syndrome is complex, not least because it is very rare and the few patients who have been documented present a wide and not always consistent range of symptoms (Young and Leafhead 1996). Billon has argued with some plausibility, however, that there are close connections between Cotard's syndrome and the more common condition of depersonalization (Billon 2016). Patients suffering from depersonalization report a range of highly anomalous experiences that appear closely related to the delusions experienced by Cotard patients. Billon's thesis, in effect, is that Cotard's syndrome is the delusional counterpart of depersonalization, with Cotard patients taking at face value the content of the anomalous experiences characteristic of depersonalization.

[7] See Tsakiris 2011 §6 for a review and further references.

From the perspective of ownership, the relevance of Cotard's syndrome and depersonalization is that they both often involve simultaneous breakdowns in φ-ownership and ψ-ownership. Depersonalization involves experiences both of *desomatization* and of *dementalization*. Patients report themselves as being alienated from their bodies as a whole, from individual body-parts, and from their thoughts and feelings. Here are some representative reports (all taken from Billon 2017):

Desomatization (whole body)

"I do not feel I have a body. When I look down I see my legs and body but it feels as if it was not there. When I move I see the movements as I move, but I am not there with the movements. I am walking up the stairs, I see my legs and hear footsteps and feel the muscles but it feels as if I have no body; I am not there."[8]

Desomatization (individual body-parts)

She did not feel anything, or rather, she did not feel anything as she used to, so she had to touch herself (…) "When I wash myself, she said, my hand is insensitive (…) yesterday when I kissed my daughter, it didn't do me anything, my lips did not feel anything (…) my eyelids [she explained that she used to touch them every mourning] are insensitive (…) It is like a big void in my back, she says, while touching her spine, I do not feel 'my back'." (…) Touching her left side she said: "it is like insensitive".[9]

Dementalization

"I feel pains in my chest, but they seem to belong to someone else, not to me."[10]

According to Billon, the fact that depersonalization disorders and Cotard's syndrome are pathologies of both ψ-ownership and φ-ownership suggest that there should be a unified/single explanation of the two types of ownership. At root, he thinks, there is one basic type of ownership that is compromised in these psychopathological cases.

Billon draws attention to complex and fascinating phenomena that will certainly need to be incorporated into a complete account of ownership. I am skeptical about his overall argument, however. Surely the most that we can conclude from depersonalization and Cotard's syndrome is that there needs to be a unified/single explanation of the simultaneous *breakdown* of ψ-ownership and φ-ownership? It is typically fallacious to conclude from the fact that two cognitive phenomena break down together that they are really two different aspects of a single phenomenon. There could be a simple physiological explanation for the simultaneous breakdown that in no way implies a common capacity that is impaired in each breakdown. So, for example, the two cognitive phenomena might be realized by overlapping neural networks such that damage to

[8] Dugas and Moutier 1911,28, translated in Billon 2017.
[9] Leroy 1901, 520–1, translated in Billon 2017.
[10] Mayer-Gross 2011, 114

the first network interrupts the second. In effect, this is a wiring issue at the subpersonal level, which need not have implications at the personal level.

The history of so-called "Gerstmann syndrome" is instructive. As reported in Shallice 1988, for many years neuropsychologists identified a cluster of deficits associated with left parietal damage as a single clinical entity – including *acalculia* (difficulty in performing arithmetical calculations), *agraphia* (impairment in written communication), *left-right disorientation*, and *finger agnosia*. Shallice argues that these deficits do not seem to form a functional entity, however. To the extent that they cluster, it is due simply to a common anatomical basis.[11] Each of the deficits frequently appears outside of the cluster, and it does not seem possible to make a backwards inference to a single common capacity that is disturbed in all of them.

Billon's claim is essentially an inference to the best explanation – namely that the best explanation of the simultaneous breakdown of φ-ownership and ψ-ownership is an impairment of the "sense of mineness". However, it seems to me that disorders of ownership display a similar pattern to the symptoms in Gerstmann's syndrome. Even if it is the case that φ-ownership and ψ-ownership break down simultaneously in depersonalization, there are plenty of cases where they breakdown independently of each other. In fact we have already considered a number of examples. Unilateral spatial neglect and somatoparaphrenia seem both to present breakdowns in φ-ownership without any compromise in ψ-ownership. In the opposite direction, thought insertion in schizophrenia is an example of a breakdown in ψ-ownership that is not normally accompanied by compromised φ-ownership. So, the psychopathology of depersonalization does not provide compelling reasons to think that there must be a unified account of φ-ownership and ψ-ownership.

6 The Relation between φ-Ownership and ψ-Ownership

Setting the argument from depersonalization aside, however, there are two more general reasons for thinking that accounts of φ-ownership and ψ-ownership must be closely integrated. First, the basic phenomena seem interdependent. As I will bring out in the following, φ-ownership presupposes ψ-ownership and vice versa. Second, from a broadly phenomenological point of view, our awareness of our own bodies and our awareness of our ongoing thoughts, emotions, and feelings are not simply co-conscious. They are part of what Michael Ayers has termed an integrated sensory field – a single, embodied perspective on the world.

Let us begin with the interdependence thesis. I have already hinted at how φ-ownership might be dependent upon ψ-ownership. Probably the most important source for our taking our bodies and body-parts as our own is our conscious bodily experience through somatosensation, proprioception, kinesthesia, and the sense of touch. These interoceptive mechanisms put us in touch with our bodies in a way that we are not in

[11] For a different perspective see Rusconi et al. 2010, who offer a positive account of Gerstmann's syndrome. It is not clear to me, however, that they are clearly distinguishing between a syndrome in the sense of a cluster of symptoms that typically accompany each other, and the richer sense of syndrome in which the cluster of symptoms implicates the breakdown of a single, personal-level cognitive capacity. In fact, the Rusconi et al. hypothesis is that the cortical substrate for Gerstmann's syndrome is a white matter lesion, that disrupts connections between intra-parietal and angular cortex.

touch with non-bodily physical objects. But conscious bodily experiences are, of course, experiences. And as such they are themselves occurrent mental events, which means that the question of ψ-ownership arises for them. I take the body that I experience to be my body precisely because I take the experience that I have of it to be my experience. The same holds, perhaps to a still greater extent, in the case of φ-ownership of individual body-parts.[12] Here too the experience of φ-ownership rests upon sensations and other qualitative events that are ψ-owned. To appreciate the point, consider this question: What would it be like to experience one's body as one's own as a function of feeling sensations in it, but without experiencing those sensations as one's own?

Does this dependence of φ-ownership on ψ-ownership mean that in some sense ψ-ownership is more fundamental than φ-ownership? Unfortunately not, since there is also a dependence in the other direction. Judgments of ψ-ownership take the form "This is *my* thought" or "I am thinking this thought". In these judgments "I" functions, of course, as a referring expression. The referent of "I" is an embodied subject and hence the subject of bodily states that are taken to be the subject's own. So, I claim, ψ-ownership presupposes φ-ownership, in the sense that (for normal embodied subjects) the experience of ownership for one's thoughts and mental states proceeds via the experience of oneself as an embodied subject.[13]

One might wonder, though, whether this argument involves a fallacy of equivocation. After all, the fact that the "I" referred to is an embodied subject does not mean that using the expression "I" involves referring to oneself as an embodied subject.

There are accounts of what it is to use the referring expression "I" with understanding that have the consequence that embodied subjects cannot refer to themselves using "I" without grasping that they are embodied subjects.[14] But there is a more specific reason, not tied to any particular account of self-reference, for thinking that one cannot take oneself to be the subject of occurrent thoughts, emotions, and feelings without taking oneself to be the subject of bodily states. This reason emerges when we consider the phenomenology and the content of perceptual experience.

Starting with the phenomenology of perception, in his magisterial book *Locke* Michael Ayers makes some very salient observations about the multi-modal nature of sensory experience (as a corrective to Locke's theory of sensitive knowledge and his very narrow conception of sensation). He writes –

> There are not, therefore, several sets of apparent directions, auditory, tactual, visual, proprioceptive, vestibular, and perhaps olfactory, which we learn, or are

[12] This dependence of φ-ownership upon ψ-ownership certainly emerges clearly in the model of φ-ownership sketched out in §4, but it seems likely to be implicated in any alternative account. To take just one example, the hypothetical (and to my mind illusory) "feeling of mineness" that some authors have postulated is an occurrent mental state that the subject would need to φ-own. The same point applies, of course, if one thinks (with Zahavi and Kriegel 2015 that the "feeling of mineness" (which they term "for-me-ness") is not an experience itself, but rather an aspect of a core type of experience.

[13] To be clear, the claim is that ψ-ownership presupposes φ-ownership for embodied subjects. Peacocke has argued, in effect, that there is no logical reason why disembodied subjects should not be capable of ψ-ownership (Peacocke 2014). This issue is orthogonal to that considered here, however. There is no reason to think that an account of φ-ownership for embodied subjects would carry over to disembodied subjects, or vice versa.

[14] See, for example, Evans 1982 and Bermudez 2017a.

> innately inspired, to associate or identify with one another. There is one space of which we can be aware in different, but essentially integrated, ways. The five (or more) senses are not distinct inlets for quite disparate, internally unconnected data.[15]

Our sensory perspective on the world (what Locke termed our "sensitive knowledge") comes through what Ayers terms an "integrated sensory field", with the integration coming at the level of content. This is much stronger than the relatively familiar idea that sensory experiences across different modalities are co-conscious, or that perceptual experience is inherently relational and the perceiver's own body is one of the relata. The different sensory modalities are unified by the fact that they collectively represent a single spatial world of three-dimensional objects from a single embodied perspective. For that reason, our experience of our own bodies is integrated into the sensory field in multiple ways.

Our experience of our own bodies structures the experienced space of the non-bodily world in ways that have been brought out in J. J. Gibson's theory of ecological perception. The bodily self is a constant, framing presence in the content of visual perception. One reason is that particular body-parts feature in distinctive, self-specifying ways in vision. Think of the arms obtruding into the visual array from below, or the nose that is the leftmost thing that can be seen by right eye and the rightmost thing that can be seen by the left eye. Moreover, the experience of movement through the world is fixed by the interplay between bodily invariants and the changing pattern of optic flow. And finally, the theory of affordances emphasizes how much the perception of objects can be structured by the perceiver's potential for acting upon them. To take a simple example, we see objects within peripersonal space as being within reach.[16]

Interestingly, the line of thought that we find in Ayers has been significantly extended by Michael Tye (2003). Tye begins with a comparable notion of a unified sensory field: at any given moment, he writes, "there is just one experience here, described in two different ways. This experience represents the sounds, smells, tastes, surfaces, and so on in the world around me in relation to my body, its parts and their boundaries, together with various bodily disturbances. My current experience is closed under conjunction *across the board*."[17] He then takes the idea of a single unified experience still further, to include both emotions and feelings and occurrent thoughts.

Tye argues that the phenomenology of conscious thought is the phenomenology of linguistic, auditory images, while awareness of one's moods and emotions comes via awareness of changes in one's perceptions of oneself and of the world. We are aware of our thoughts through their articulation in inner speech, and aware of our emotions and moods indirectly through the valence of how we experience the world and how we experience our own bodies. Awareness of occurrent thoughts and other mental states, then, are really just further varieties of somato-perceptual experience, which makes them also part of the integrated sensory field (perhaps better termed the integrated somato-sensory-affective-cognitive field!).

[15] Ayers 1991, 186–7
[16] For further discussion see Bermudez 1998 and Essays 1–4 in Bermúdez 2018.
[17] Tye 2003, 76.

This general picture of the phenomenology of introspection explains why one cannot take occurrent thoughts, emotions, and feelings to be one's own without taking oneself to be an embodied subject – and hence further explains the dependence of ψ-ownership on φ-ownership.[18] We cannot (in the normal case) experience ourselves as the owner of our perceptual experiences, thoughts, emotions, and so on, without experiencing ourselves as embodied. And to experience oneself as embodied is to experience oneself as the owner of one's body. So, the dependence between φ-ownership and ψ-ownership goes in both directions. This interdependence gives a prima facie reason for expecting accounts of ψ-ownership and φ-ownership to be integrated with each other. But what form might this integration take? The final section of the paper will propose a deep commonality *at the level of content* across the models of ψ-ownership and φ-ownership described in §3 and §4. The two types of ownership are tied together by the fundamental role that agency and practical reasoning play in each.

7 φ-Ownership and ψ-Ownership: The Common Thread

It seems unrealistic to expect a completely unified account of φ-ownership and ψ-ownership. Yet, as we have seen, the two phenomena are deeply interconnected, and one would expect this interconnection to be reflected in the accounts we give of them. The accounts of φ-ownership and ψ-ownership given in §§3–4 seem on the face of things to be very different. This section will bring out, however, how the common thread of agency ties them together.[19]

As observed at the end of §4, the proposed model of φ-ownership ties the experiential basis for bodily ownership very closely to the subject's awareness of their potentialities for action. What grounds judgments of φ-ownership is the fact that we experience the space of our bodies in the distinctive way that I have tried to capture using the Boundedness and Connectedness principles and the explanatory framework of A-location and B-location. This distinctive way of experiencing our bodies is closely tied to the body's agential capacities. The Boundedness principle, and with it the idea of A-location, incorporates (and contributes to) the subject's ongoing awareness of the limits of the bodily self, and hence the limits of what is directly responsive to the will. The Connectedness principle (and the idea of B-location) builds agential capabilities even more closely into the spatial content of bodily experience, because it specifies bodily locations in terms of variables that are under the subject's direct control (i.e. in terms of the joint angles that specify the orientation of limbs and effectors). On the proposed account, therefore, *the spatial content of bodily awareness incorporates an awareness of the body's agential anatomy.*

[18] The claim here is about the normal case. It is an interesting question (raised by Alexandre Billon) how ψ-ownership would work for someone in a sensory deprivation tank, as envisaged by Anscombe. My hunch (and prediction) is that a lack of ongoing sensory feedback would not change the dependence of ψ-ownership upon φ-ownership. No doubt, things would be very different for someone who had existed for their entire life in a sensory deprivation tank (which, in effect, is the thought experiment proposed by Avicenna – the so-called flying or floating man argument). But since this scenario is so far from the normal case, and since it is unlikely that any prediction made about that case will ever be tested, I am not sure that it helps to speculate about it.
[19] For a different approach to the role of agency in self-awareness see O'Brien 2007.

With this in mind let us turn back to Campbell's account of ψ-ownership, which it will be recalled distinguishes two different and dissociable elements in judgments of ownership – the self-ascription element ("This is my thought") and the authorship element ("I am the producer of this thought"). One question left hanging by Campbell's discussion of the authorship is how we should understand the reasons for which judgments of authorship are made (as opposed to an account, in terms of subpersonal efference copy and comparator mechanisms, of the enabling conditions of such judgments). To answer this question, I propose, we need to look more closely at mental agency.

To begin with a very general thought about ψ-ownership, an important part of what it is to take an occurrent thought as one's own is to take it as something that one can deploy in conscious reasoning. Ownership needs to be understood in terms of the active process of thinking. The comparison with delusions of thought insertion is instructive. Here are two famous and much-discussed reports of thought insertion:

> I look out the window and I think that the garden looks nice and the grass looks cool, but the thoughts of Eamonn Andrews come into my mind. There are no other thoughts there, only his…. He treats my mind like a screen and flashes thoughts onto it like you flash a picture. (Mellor 1970, p. 17)

> I have never read nor heard them; they come unasked; I do not dare to think I am the source but I am happy to know of them without thinking them. They come at any moment like a gift and I do not dare to impart them as if they were my own (Jaspers 1963, p. 123).

In both cases the alienness of the inserted thoughts goes hand in hand with the patient's inability to integrate them into any kind of normal thinking process. Delusional patients are passive recipients of the thoughts, not active thinkers.

Returning to Campbell's distinction between two elements in ψ-ownership, the first element, introspective accessibility, is obviously a necessary condition for conscious deliberation. Only thoughts that we are aware of and that we ascribe to ourselves can occur in conscious reflection. But one of the lessons to be drawn from delusions of thought insertion is that introspective accessibility is not a sufficient condition. Part of the cognitive dissonance experienced by schizophrenic patients with these symptoms is that they experience (and are able to ascribe to themselves) thoughts that they do not know how to integrate with the rest of their cognitive and affective lives. A natural explanation of this cognitive dissonance, and certainly one compatible with Campbell's account, is that only occurrent thoughts that can feature as premises in reasoning are taken to be self-originated.[20] The sense of deep alienation that schizophrenic patients have from the thoughts that they claim to be inserted is tied to the fact that those thoughts resist the type of integration with other thoughts that would be required for the subject to be able to use them in deliberation.

[20] This is also, broadly speaking, compatible with the account of thought insertion proposed by Graham and Stephens (1994), who suggest that schizophrenic patients deny the authorship of thoughts when those thoughts are inexplicable in terms of rest of their beliefs and desires. Their idea is that delusions of thought insertion can sometimes be the best way for the patient to make sense of profoundly anomalous experiences.

The role of agency in ψ-ownership emerges when we think further about this deep connection between authorship and reasoning. Suppose that a judgments of authorship with respect to a particular occurrent mental state is based in large measure on its being available for reasoning. Reasoning can be practical or it can be theoretical, and it should be emphasized that the full range of conscious mental states that are ψ-owned can feature in both types of reasoning – feelings and emotions, for example, can function as quasi-evaluative premises in theoretical reasoning, just as they can feature more directly as motivators in practical reasoning. The connection with agency emerges even whether the reasoning is theoretical, because theoretical reasoning is itself a form of mental action.[21]

But the real common thread between ψ-ownership and φ-ownership comes through practical reasoning. The core cases of practical reasoning issue in bodily action. Practical deliberation is deliberation about what one can do as an embodied subject through directly moving body-parts in basic actions that themselves effect change in the environment. So the body is a background presence in practical deliberation. And it is so in ways that depend upon the very two features of the spatial content of bodily awareness that (I have argued) are integral to φ-ownership.

First, the scope of practical deliberation is delimited by the structural constraints on the body's potential for action that are implicated at the level of A-location. Action planning is informed by a representation of the body that delimits the realm of the possible. What we are capable of moving in basic actions is the experienced body, which also fixes the boundaries of φ-ownership. At the same time (and this is the second point), implementing the results of action planning requires the constantly updated and ongoing awareness of how the body is oriented and how individual body-parts are distributed that comes with B-location spatial content. These are precisely the agency-related factors that I have argued are central to φ-ownership. They give the starting-points for bodily movements and hence for solving the complicated motor control equations of limb trajectory and movement end-point.

Agency, therefore, is the common thread that links φ-ownership and ψ-ownership. There are more general lessons here for how we think about self-awareness. In an often-quoted phrase, Descartes states in the Sixth Meditation that "I am not merely present in my body as a sailor is present in a ship, but [that] I am very closely joined, and as it were intermingled with it, so that I and the body form a unit."[22] The role of agency in φ-ownership and ψ-ownership offers a fresh perspective on the "substantial union" of body and mind. To take one's body as one's own is to be aware of it as directly responsive to the will, as the medium for effecting change in the physical world. To take one's thoughts, emotions, and feelings as one's own is to take them as potential premises in reasoning and deliberation – potential objects of mental actions and potential causes of bodily actions.

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[21] See further the essays in O'Brien and Soteriou 2009.

[22] Descartes, *Meditations on First Philosophy* (AT VII, p. 81), translated by John Cottingham.

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