

# FIRST-PERSON PERSPECTIVE AND IMMUNITY TO ERROR THROUGH MISIDENTIFICATION

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Recent discussions of immunity to error through misidentification (IEM) have suggested a number of possible exceptions to a principle meant to apply without exception to specific ways of referring to, or experiencing oneself. As Wittgenstein (1958) first explained it, IEM applies to any use of the first-person pronoun *as subject*. He distinguished use of the first-person pronoun *as subject* from its use *as object*, by examples. On the one hand, ‘as subject’ means any first-person reference I make to myself as an experiencing subject. For example, if I experience a toothache, it would be nonsensical to say ‘Someone has a toothache, is it me?’ On the other hand, ‘as object’ means any reference I make to myself on the basis of an objectifying perception or thought. For example, looking in the mirror and seeing a sunburned arm, I might say ‘I have a sunburn’. It’s possible that I see someone else’s arm in the mirror and mistake it for my own, and in that sense I would seem to be misidentifying myself.

Shoemaker (1968) formalized the idea and termed it ‘immunity to error through misidentification relative to the first person pronoun’.

[T]o say that a statement ‘a is  $\phi$ ’ is subject to error through misidentification relative to the term ‘a’ means that the following is possible: the speaker knows some particular thing to be  $\phi$ , but makes the mistake of asserting ‘a is  $\phi$ ’ because, and only because, he mistakenly thinks that the thing he knows to be  $\phi$  is what ‘a’ refers to” (Shoemaker 1968, p. 7).

IEM is not simply a grammatical principle; it seemingly depends on the kind of experiential access that I have to myself. Shoemaker indicates that in cases of introspection, for example, misidentification is not possible precisely because the subject is not involved in a process of identification. In such cases I do not pick out an object and then ask whether this object fits a set of criteria that would allow it to count as being me. Rather, I have a non-observational introspective access to my experience. Accordingly if I am not trying to identify myself I cannot make an error of misidentification.

Gareth Evans (1982) argued that the immunity principle extends beyond introspection to the kind of access I have to my own body by means of

somatic proprioception.<sup>1</sup> Although it is possible to make a mistake in identifying one's body via sense-perceptual modalities such as vision, it seems questionable whether it would be possible to have a proprioceptive sense of a body other than one's own (Evans, 1982; also see Cassam 1995; 2011). That proprioception is IEM means simply that via proprioception I cannot misidentify my own body. Likewise, it seems possible that passive touch is also IEM since it would be odd to ask: "Someone is being touched, is it I?"

Evans, however, does suggest a thought experiment in which the nervous system of Subject A is connected to the nervous system of Subject B (perhaps by what Ramachandran and Herstein [1999] call a 'neural cable') in such a way that Subject A receives the proprioceptive input from Subject B's body. When Subject B's legs are crossed, Subject A reports that he (Subject A) feels that his (Subject A's) legs are crossed. In this case, it seems, he is mistaken in a way that violates IEM, since, via proprioception, he misidentifies B's legs for his own. I'll discuss this thought experiment later. Questions about IEM can be raised in many other cases that involve passive touch and proprioception, specifically in experiments with robots, rubber hands, and out-of-body experiences. And further questions can be raised about the kind of misidentification that occurs in pathologies such as schizophrenic delusions and Somatoparaphrenia.

In this paper I intend to explore the various cases where IEM seems to fail. I'll begin by looking at cases that seemingly involve failures in self-specific bodily experience – that is, cases in which one misidentifies one's own body-as-subject. Although many of these cases lend support to the idea that there are a number of exceptions to IEM, and that IEM should be considered merely a *de facto* (contingent, rather than absolute or *de jure*) aspect of everyday experience, I'll argue that there is a certain aspect to these experiences that remains self specific and retains the characteristic of IEM. The core feature that remains intact in all of these experiences is first-person perspective. I'll then consider a case of abnormal visual experience which is presented as an exception to this solution and to IEM – the case of DP documented by Zahn et al. (2008).

- 1 I'll treat kinaesthesia (the experience of bodily movement) as a form of proprioception (which is more strictly the sense of posture and limb position). Somatic proprioception can be distinguished from visual proprioception/kinaesthesia. Somatic proprioception is generated by mechanical proprioceptors located, e.g., at body joints, muscle spindles, and sometimes by skin stretch sensations. Visual proprioception, as Gibson 1979 explains, depends on optic flow (in self-movement) and lack of flow (if there is no bodily movement).

## Agency and Ownership

When someone experiences something phenomenologists claim that there is always a sense of “mineness” or ipseity built into the experience. This is sometimes called the sense of ownership, where ownership means not some external relation of *having* something (as in ownership of property), but signifies the intrinsic ‘ownness’ or mineness of experience, the aspect of the experience that makes it subjectively my experience. The sense of ownership, as such, holds not only with regard to experiences of my body or my body parts, e.g., when I reach and grasp something, the sense that it is my arm that is reaching and my hand that is grasping (via kinaesthetic or proprioceptive processes), but also in regard to my experiences of self-movement and action (again via proprioception) – this is not only my arm, but also *my* action.

This sense of ownership also holds with respect to my thinking or stream of consciousness. William James thought ~~that~~ it obvious that: “Every thought is part of a personal consciousness... The universal fact is not ‘feelings and thoughts exist’, but ‘I think’ and ‘I feel,’” and that “to give an accurate account of [this] is the most difficult of philosophic tasks” (1890, I, p. 225). Ownership of the stream of thought is usually put in terms of introspective access. It seems necessarily the case that I can only introspect my own thinking, and that I cannot find myself in the position of asking, “Someone is thinking this, but is it me?” Introspection, however, is often construed as a reflective operation in which I think about my own thinking. To make things more precise, I’m going to adopt the phenomenological view that says that when we consciously think, or perceive, or act, we are pre-reflectively aware that we are doing so, and this pre-reflective awareness is something built into experience itself. On this view I do not need a further reflective introspection to confirm that my thoughts are my own – I do not need access to them in that sense. Rather, what makes my thoughts accessible in reflective introspection is precisely an already operating pre-reflective self-awareness that is part of the concurrent structure of any conscious process.

To further clarify this I’ve elsewhere suggested that pre-reflective self-awareness may involve both a sense of agency and a sense of ownership (Gallagher 2000a).

*Sense of self-agency (SA):* The pre-reflective experience that I am the one who is causing or generating a movement or action or thought process.

*Sense of self-ownership (SO):* The pre-reflective experience that I am the one who is moving or undergoing an experience.

This is a phenomenological distinction that can be easily understood in the experience of involuntary movement. If someone pushes me from behind, I experience the initial movement as something happening to me, as something that I am experiencing, and so have an experience of ownership for the movement. I do not claim that it is someone else who is moving, since I have an immediate multi-modal (kinaesthetic/proprioceptive, vestibular, and visual) sense that I am the one moving. At the same time, however, I can say that I have no experience of self-agency for this movement. I did not cause it; someone else pushed me. So in the case of involuntary movement (as well as in reflex movement) SA and SO come apart. In the case of voluntary action, on the other hand, SA and SO seem tightly fitted and indistinguishable in pre-reflective experience.

The logic of involuntary movement suggests that SA, in a minimal sense of having to do simply with control of bodily movement, may correlate with efferent brain signals (motor commands), since both SA and efferent signals are missing in the case of involuntary movement. SO, on the other hand, may be generated in part by sensory feedback, especially proprioceptive/kinaesthetic reafference generated in the movement itself, or the integration of sensory feedback from different modalities (Tsakiris and Haggard 2005). What is at stake in the claim that proprioception is IEM is the idea that in this kind of experience, whether in the case of involuntary movement or voluntary action, the pre-reflective sense of ownership cannot be wrong, that is, I cannot be wrong with respect to *who* is moving, or standing, or sitting with legs crossed, etc.

This does not mean that proprioception cannot be in error in other respects, however. Proprioception/kinaesthesia provides information about posture, limb position, and how I am moving – and it can be wrong or be misled about these things. Experiments that involve vibrating certain muscles, thereby manipulating proprioception, for example, can lead me to believe that my arm is extended out in front of me when in fact it is not (e.g., Lackner 1988; Longo et al. 2009). The claim about IEM does not extend to the specifics of posture or movement. It pertains only to the question of *whose* body is in question. I might be misled to proprioceptively feel that my legs are crossed when they are not, but IEM states that I cannot be misled about them being *my* legs, or that *I* am the one crossing them.

## Schizophrenia

Following suggestions made by Feinberg (1978) and Frith (1992) about certain schizophrenic experiences (including auditory hallucination, thought insertion, and delusions of control in which subjects report that their body is under the control of other people or things), Campbell (1999) has proposed that such experiences might count as counterexamples to IEM. A schizophrenic patient who suffers thought insertion, for example, might claim that she is not the one who is thinking a particular thought, when in fact she is the one who is thinking the thought. The following example of a schizophrenic's account of her own thought processes illustrates this: 'Thoughts are put into my mind like "Kill God". It's just like my mind working, but it isn't. They come from this chap, Chris. They're his thoughts' (from Frith 1992, p. 66). In such cases the schizophrenic patient misidentifies the source of the thought and seemingly violates the immunity principle.

Whether or not Campbell is correct in his claim that this is a counterexample to IEM (see Gallagher 2000b, and below), his analysis suggests that a scientific explanation of schizophrenic phenomena such as delusions of control might also count as a scientific explanation of how IEM works. Accordingly, Frith's neurocognitive model of the breakdown of self-monitoring in schizophrenia turns out to be a good candidate for explaining IEM. If we can identify which mechanisms fail at the cognitive or neurological level when the schizophrenic patient suffers from delusions of control – that is, when he claims that someone other than him is causing his actions or bodily movements – then we also have a good indication of the mechanisms responsible for (or at least involved in) IEM. This insight links the conceptual arguments of philosophy to the empirical inquiries of neuropsychology and neurophysiology.

To explain delusions of control Frith (1992) appeals to the notions of efference copy and comparator mechanisms involved in motor control (Sperry 1950; Holst and Mittelstaedt 1950). According to more recent versions of this model, a comparator mechanism operates as part of a non-conscious pre-motor or 'forward model' that compares efference copy of motor commands with motor intentions and allows for rapid, automatic error corrections (Wolpert et al. 2000; Frith *et al.* 2000; Georgieff and Jeannerod 1998). Putting this in terms of SA and SO, based on efference copy, the forward comparator process anticipates the sensory feedback from movement and generates SA, while ecological sensory-feedback processes, including proprioception, following on the movement, generate SO. If the forward model fails, or efference

copy is not properly generated, sensory feedback may still produce SO ('I am moving') but SA will be compromised ('I am not causing the movement'), even if the actual movement matches the intended movement (Fig. 1) (see Spence et al. 1997).

It turns out that schizophrenic patients who suffer from delusions of control have problems with the forward, pre-action monitoring of movement, but not with motor control based on a comparison of intended movement and sensory feedback (Frith and Done 1988; Malenka et al. 1982). While control based on sensory feedback is thought to involve the cerebellum (Frith et al. 2000), problems with forward monitoring are consistent with studies of schizophrenia showing abnormal pre-movement brain potentials associated with supplementary motor, premotor and prefrontal cortexes (Singh et al. 1992). Experimental brain-imaging studies suggest involvement of the anterior or posterior insula in generating SA (Farrer and Frith 2002; Farrer et al. 2003).

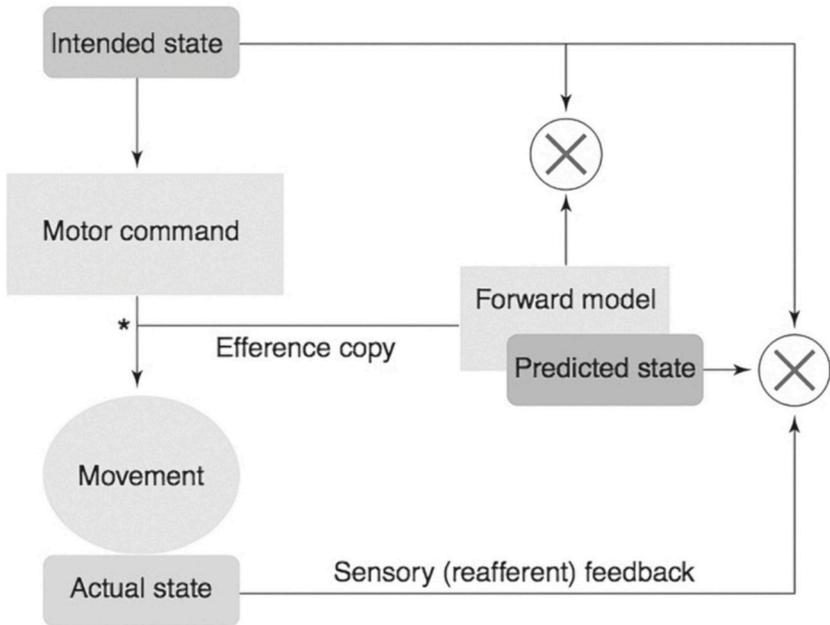


Fig. 1: The forward and feedback comparators. This model represents processes that generate two aspects of the 'minimal self' in normal experience SO and SA. Match at the forward comparator provides a SA; match at the feedback comparator provides SO for movement. From Gallagher (2000a).

On this bottom-up account, problems in precisely these brain areas may therefore result in the lack of SA, characteristic of these kinds of schizophrenic experiences (Gallagher 2007; Hohwy 2004; Gold and Hohwy 2000; Mundale and Gallagher 2008). Such delusions, however, include the additional aspect that the schizophrenic attributes the action to someone else. On a bottom-up account this may be attributed to disruptions in brain processes responsible for differentiating self and other in action (see e.g., Georgieff and Jeannerod 1998). Given such disruptions the subject could actually experience the action as alien – as not generated by him but by someone else. This explanation stays at the level of the pre-reflective experience of self in contrast to a top-down explanation that would look to disruptions at the level of higher-order cognitive (introspective) states and their expressions in narrative (e.g., Graham and Stephens 1994; Stephens and Graham 2000).

Bottom-up approaches thus point to possible neurological explanations of the immediacy involved in the senses of self-ownership, self-agency and IEM. With respect to schizophrenic delusions, however, I have offered the following argument against Campbell's idea that they may represent an exception to IEM (Gallagher 2000b). In the case of action, normally SA and SO are indistinguishable; they both characterize everyday normal action. In the case of delusions of control where the schizophrenic patient claims that he is not the agent of a particular action, SA is not present, but SO is still present, similar to the case of involuntary action. Indeed this is necessarily so for the patient's report to make sense: "*my* body has engaged in an action; *my* body has been moved" – this is his complaint, that he is the one being moved, or being made to act, and that the action is not something he intended. SO is still intact for his body and for his movement, even as the sense of self-agency is not. This is precisely why he feels that this movement or action is *his* concern rather than someone else's; it's not happening to someone else, it's happening to him. His sense of self is *as subject* – he is the one who is experiencing this alien control. So when he reports on his proprioceptive experience, or when he says "*I*" have experienced this alien control, or this alien thought, he is not mistaken about who is experiencing these things; his sense of self remains IEM and is based on his SO.

Even if we accept this solution to delusions of control,<sup>2</sup> however, there

2 Not everyone accepts the analysis proposed here as it pertains to delusions of control or thought insertion. In some cases, however, the disagreement is about the distinction between SA and SO, or the specific definitions of SO, e.g., Billon [in press]; Bortolotti and Broome 2009; Jeannerod and Pacherie 2004. Some authors Billon [in press]; Bortolotti and Broome 2008 mistakenly regard SO, as defined, to be based on the location of the

are a significant number of other pathologies and experiments that seem to challenge IEM in regard to bodily experience. In the following sections I'll discuss a number of such challenges and try to refine this account and identify precisely what aspect of experience delivers IEM.

## IEM and Bodily Experience

Jeannerod and Pacherie (2004), relying on neurological evidence, suggest that, with respect to determining who the agent of the action is, the ways that we come to know this “are not entirely reliable and cannot be a source of identification-free first-person knowledge” (2004, p. 137). On the basis of this they conclude:

In a nutshell, then, the bad news for philosophers is that self-identification is after all a problem. In the domain of action and intention, at least, there is no such thing as immunity to error through misidentification, whether for the self as object (sense of ownership) or for the self as agent (sense of agency). The mechanisms involved in self- and other-attribution may be reasonably reliable in normal circumstances, but are not infallible. (2004, p. 141).

There are a number of issues to be discussed here, including the fact that it may be bad news for non-philosophers as well. First, it's not clear why Jeannerod and Pacherie associate the sense of ownership with the self *as object*. One distinction to be made here is between SO for a body part (I feel this to be my arm) and SO for movement (I am the one moving, even in the case of involuntary movement). The experience of my arm as mine can be based on proprioceptive/kinaesthetic awareness – a pre-reflective sense of arm position or movement – or it may be based on actually seeing that my arm is there in its usual place, attached to my body. In the first case, as Wittgenstein defined it, we have a sense of our body *as subject*; in the second case we have a sense of our body *as object*. I can be mistaken about the second, as when I see an arm in the mirror and mistake it for mine when it is not; in this case IEM is not an issue. But, as we've seen, some philosophers would claim that I can not be mistaken about the first. Jeannerod and Pacherie, however,

experience (i.e., that the experienced thought is “inside” the stream of consciousness, or that the movement is experienced ‘from within’), or on the fact that it can be introspected. Neither location nor introspection, however, is a necessary part of the definition of SO; rather, SO depends on the subject's experience of something that is happening to them, and this experience is pre-reflective. It is not a matter of reflective introspection or of locating experience.

suggest that even if proprioception delivers an awareness of my body (my self) *as subject*, providing a sense of ownership for it, this does not guarantee immunity to error through misidentification. For example, Evans' thought experiment, where A receives B's proprioceptive input, seems to suggest that I can be wrong about whose limbs are whose. Let's take a closer look.

The thought experiment is a difficult case with respect to IEM, since proprioception (or a quasi-proprioception in which I am receiving signals from someone else's body) is involved. In this case I'm not only wrong about the position of my legs, but it also seems I'm wrong about whose legs they are, and that, seemingly violates IEM. For this reason, it has been suggested that in regard to proprioception we have only *de facto* immunity, but not *in-principle* immunity to this kind of misidentification.

Proprioception and passive touch are *de facto* immune to error through misidentification. Although it seems conceivable that one could be hooked up to other bodies in such a way that one had proprioceptive and tactile access to their states as well, in the actual world proprioception and passive touch only carry information about one's own body. (Pacherie and Jean-nerod 2004, p. 117).

Both SA and SO are easily shown to be fallible to the extent that efference and afference processes, including proprioception, are open to experimental manipulation, or neurological disruption.

Consider a number of pathological and experimental cases.

### (1) *Somatoparaphrenia*

Following stroke and damage to the right parietal cortex, a subject claims that her left arm is not *her* arm, but, for example, belongs to her niece. It seems that she misidentifies her body part, and clearly has a problem with SO for that body part. In this case, however, the question of IEM doesn't actually come up, since the subject has no proprioception for the limb. Patients with spared proprioception do not exhibit Somatoparaphrenia (Vallar & Ronchi 2008). Accordingly, the somatoparaphrenic subject's access to the limb is *as object*, and there is no claim made for IEM in such cases; Somatoparaphrenia cannot be considered a violation of IEM.

Katerina Fotopoulou (private communication) at the University of London, reports an interesting case that suggests further complications. Fotopoulou has a post-stroke patient with Somatoparaphrenia. Her left arm (paralyzed and without proprioception or sensation), she claims, belongs to her grand-

daughter. This is her response when she is asked about her arm and made to look at it. But when she is shown her full image in a mirror, and asked about her left arm as it appears in the mirror, she correctly identifies it as her own. When asked about her granddaughter's arm she looks down, directly at her left arm. Whenever she looks directly at her arm, she identifies it as her granddaughter's; whenever she looks at it in the mirror she identifies it as her own.<sup>3</sup>

This case suggests that there may be different kinds of perception of *body-as-object*. The difference might be described as the difference between visual perception of the limb in the experiential canonical positions (as I usually see my limbs without a mirror), and visual perception of the limb in experiential non-canonical positions, which includes impossible limb positions relative to my own body, and perception in the mirror, and which is closer to the way that others perceive my body. Experimental studies show that different brain areas may be responsible for these two different perceptions. Thus one possible explanation is that the area of the parietal cortex damaged by stroke involves (or connects to) an area responsible for registering the experiential canonical limb positions, but not for our perception of non-canonical limb position, or the perception of other's bodies.<sup>4</sup> In neither case, however, is IEM an issue, since both are visual perceptions of the body as-object.

Experiential canonical positions – the positions of my limbs as I usually perceive them – are often associated with the egocentric spatial framework (e.g., Petkova and Ehrsson 2008, emphasize the importance of the egocentric framework in this regard) or first-person perspective (see, e.g., Fotopoulou et al. 2009). On this view, my perception of myself in the mirror would be termed allocentric, or third-person. But I think this latter way of expressing it is misleading since all of my perceptions are ordered in the egocentric spatial framework (that is, they all have a spatial point of origin in my body), even my perception of my image in the mirror, in the sense that the mirror and the image in the mirror are either in front of me, to my right or to my left, etc. The allocentric spatial framework is an abstraction from perceived

- 3 A similar phenomenon of mirror correction has been found to cause immediate recovery from anosognosia for hemiplegia (Fotopoulou et al. 2009).
- 4 Farrer et al 2003 showed differential activation in the inferior part of the parietal lobe, specifically on the right side, for perceived self-movement of limbs in non-canonical positions and in the insula for perception of self-movement in canonical positions in non-pathological subjects, also see Baier & Karnath 2008. Saxe, Jamal, and Powell 2006 found activation in the right extrastriate body area (EBA) in response to images of body parts presented from a non-canonical perspective. Corradi-Dell'acqua et al 2008 have shown activation of the right parieto-temporal-occipital junction during perception of the self as an external object (as in the mirror, or in a video game).

space. If, for example, I visually perceive that object X is to the North of object Y, object X and object Y are still, necessarily located for me in some egocentric framework – X is either to my right or left or in front of me, etc. The egocentric framework applies clearly to the visual, tactile, and olfactory modalities of perception – they all involve a certain direction relative to my body or body part.

This is not the case for proprioception, however. Proprioception does not register in the egocentric framework. The proprioceptive position of my right hand is not relative to my body – it *is* my body's posture; it's not relative to a perceptual point of origin – it is that point of origin (e.g., in the case of haptic perception which involves my right hand touching something else). On the proprioceptive map, and in any experiential canonical position, my left foot isn't closer to me than my right hand (see Gallagher 2003). This may help to explain one difference between seeing my hand in an experiential canonical position and seeing it in the mirror. Seeing my hand in an experiential canonical position normally involves a consistent integration of proprioception in a non-relative, non-egocentric framework (I'll call this the *non-relative bodily framework*) and vision (which operates in the relative, egocentric framework). Seeing my hand in the mirror involves a conflict between these two frameworks; I feel my hand proprioceptively here, but I see it there. In such cases I visually perceive my hand *as object* in egocentric space. To experience oneself *as subject*, in this context, is to experience oneself in the non-relative bodily framework, as the origin of the egocentric spatial framework. I do not, so to speak, make an entrance into this non-relative framework; I *am* it, or I *live* it. The integration of the non-relative bodily framework (the perceptual origin, which involves the complex organization of my body rather than a literal zero point) and the egocentric spatial framework constitutes the first-person perceptual point of view or perspective. This conception of the first-person perspective will help to clarify some of the following cases.

## (2) *Rubber Hand Illusion and Whole Body Displacement*

The idea that IEM is *de facto* (i.e., that IEM is contingent rather than absolute), motivated by Evans' thought experiment about A and B, even if not confirmed by cases of Somatoparaphrenia, does seem to be reinforced by recent empirical experiments on the rubber hand illusion (e.g., Botvinick and Cohen, 1998; Tsakiris and Haggard 2005), and whole body displacement

(in experimental situations, see Lenggenhager et al. 2007; or in out of body experiences, see Blanke and Arzy 2005; Blanke et al. 2002), which also place certain limits on passive touch.

In the rubber hand illusion, you sit at a table with your left hand placed under a cover. A rubber arm-hand is placed on the table in front of you, close to the canonical position of your left hand. Your left hand undergoes passive tactile stimulation (e.g., a brushing of the fingers), and simultaneously you see the similar stimulation of the rubber hand. In short order you start to feel as if the rubber hand is your own, and that is where you feel the stimulation. SO, specifically your sense of body ownership, extends into the rubber hand. Does IEM based on proprioception or passive touch thereby break down in such cases?

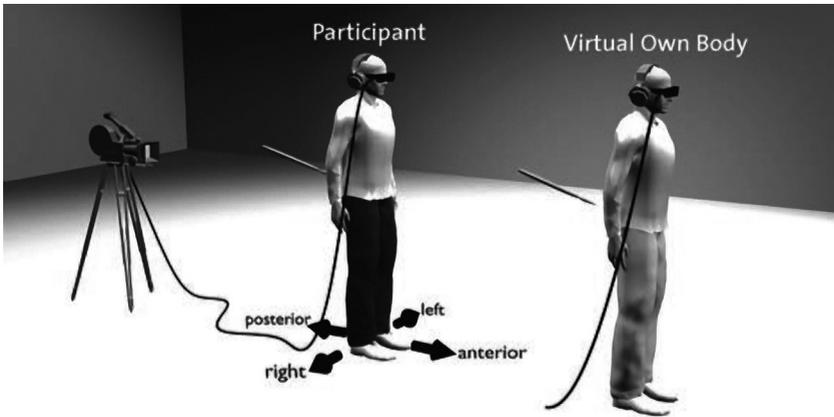


Fig. 2: Blanke's experiments on whole body displacement (from Lenggenhager et al. 2007)

Olaf Blanke's experiments with whole body displacement (Lenggenhager et al. 2007) operate on a similar design. You wear virtual reality goggles and view the live video of your own back, which is being tactilely stimulated. You thus see your own back several feet in front of you being stimulated as you simultaneously feel the tactile sensations on your back. The effect is that you feel yourself to be several feet in front of your actual location, and the feel of the stimulus is displaced to the location of the virtual body. The same effect can be created when a mannequin is substituted in the video and the tactile stroking of your back and the mannequin's back are simultaneous. SO then shifts to the mannequin's body.

To the extent that SO is disrupted or displaced in these experiments, they

seem to challenge IEM. But in both kinds of experiments, notice that visual perception of the body comes to dominate the tactile sensation – SO shifts, along with your tactile experience, to where you *see* the stimulus applied. Close your eyes and the effect disappears. If we assume that SO is the result of intersensory coordination of proprioceptive, vestibular, tactile, and visual signals, in the experiments the tactile/proprioceptive information is remapped onto the visual—the position of one’s own hand, for example, is remapped onto the position of the viewed hand, and the viewed hand feels like one’s own.<sup>5</sup> Vision hijacks proprioception and one might argue that in this case we are referring to or identifying ourselves visually *as object*, in a similar way to the mirror example mentioned by Wittgenstein. And yet one’s immediate proprioceptive sense of where precisely one’s arm is, or where one is being stimulated, is involved, albeit in a distorted way.

One also has to consider the precise situation that the subject is in when she agrees to do the experiment. The subject may in fact alter her perspective from a non-observational one (which may or may not be IEM) to an observational one (which is definitely not, and is not claimed to be IEM). Marcel (2003) in a discussion of Anarchic Hand Syndrome notes that

[T]he pathological condition makes the person an observer of their own action... this suggests that one only has observational knowledge of one’s actions in particular states. In the pathological case, it is due to a restriction caused by removal of normal control. In the non-pathological case(s) [as in the experimental conditions], it is by adoption of a certain attentional attitude, namely, by taking a detached stance in inspecting one’s proprioceptive feedback (2003, p. 87).

Taking an observational or detached stance involves reframing the non-relative proprioceptive bodily perspective so that my body appears as an object in egocentric space. This happens quite easily when our attention is directed towards our body (or body part) rather than towards the task at hand.

On the one hand, to the extent that vision hijacks proprioception, and to the extent that the rubber hand illusion and full body displacement experiments put the subject in an observational stance with regard to the self-as-object, one could argue that the principle of IEM does not apply, and that

5 Mike Martin 1995 proposed that SO is bound to the somatosensory body boundaries—but it seems that the RHI and other phenomena (phantom limb, personal neglect) go against that. Martin’s proposal ignores the effect of vision. As in out-of-body experiences, the “[i]ntegration of proprioception, tactile, and visual information of one’s body fails due to discrepant central representations by the different sensory systems. This may lead to the experience of seeing one’s body in a position that does not coincide with the felt position of one’s body” Blanke & Arzy 2005.

therefore there is no violation of IEM. On the other (probably rubber) hand, if we take proprioception to be the basis of IEM, and my proprioception (hijacked or not) is leading me astray, then it might seem that IEM fails. In the latter case, the strategy suggested by Jeannerod and Pacherie, is to acknowledge the unusual or experimentally induced nature of these phenomena, and argue that IEM is *de facto* (or contingent). Even in this regard it still seems reliable enough for our everyday circumstances. Since in most everyday actions proprioception is not misled, and SA and SO are not dissociated, and indeed are difficult to distinguish, the anchor of our pre-reflective embodied self-awareness is relatively stable.

Before considering another type of experiment, it will be helpful to take a different look at the rubber hand illusion and to see how SA modulates SO and produces a more holistic sense of self. Tsakiris and Haggard (2005) demonstrated that during the rubber hand illusion there is a proprioceptive drift toward the rubber hand. That is, the passively stimulated finger (of one's real hand) was judged to be significantly closer to the location of the rubber hand than it really was. But this effect was localized only for the stimulated finger and not for the whole hand, which suggests a fragmented SO for body parts. Tsakiris and Haggard then hypothesized that a more holistic body (motor) schema, engaged when in action, and thereby involving SA, would contribute to a more coherent or holistic SO. In a further experiment, subjects viewed video of their hands under two conditions: when the subject moves his own index finger, and when the subject's index finger is moved by the experimenter. In the first case of self-generated movement there is SA; in the second, passive movement, no SA. Tsakiris and Haggard show that while the proprioceptive drift in the passive movement is just for the one finger, the drift is for the whole hand in self-generated movement. They conclude that, "The active body is experienced as more coherent and unified than the passive body" (2005b; see Tsakiris, Schütz-Bosbach, and Gallagher 2007). Agency and the corresponding efferent signals involved modulate afferent feedback, and more generally bodily awareness, and thereby modulate the SO for one's actions. In the case of action, SO is integrated into the more holistic body-schematic processes of motor control.

### (3) *The NASA Robot Experience*

We can take this idea one step further and suggest that in instances when we are engaged in action or in doing some task, and are not attending (observa-

tionally) to the body in any explicit way, and when sensory feedback (including proprioception and visual information pertaining to our bodily posture and movement) is attenuated, SO and SA are both holistically integrated and pre-reflectively recessive. Just in such normal cases, when experience of the body is non-observational and pre-reflective, if I happen to be working with certain kinds of equipment, that equipment may be experienced as incorporated into my body schema, and both SO and SA may extend to the equipment.

Cole, Sacks and Waterman (2000) describe their experiences of controlling robotic arms using virtual reality vision and gloves at the NASA Space Center. Every move they made with their hands caused the robots hands to move in the identical way, and they were viewing the robotic hands from a canonical perspective (i.e., they saw the robot's arms where their own arms would be as they manipulated some object). In these circumstances they report that they had an immediate sense that the robot's arms were their own. For the agent who is controlling the robotic arms in this way, SO and SA shifts to things that are not *objectively* part of the agent's body. One might say that the robotic arms become extensions of the agent's body schema – part of the lived and experienced body-as-subject. If I, as agent, then experience the robotic arm as mine do I commit an error of misidentification?

Here there is a double ambiguity that needs to be resolved to gain a clear answer. First, there is the ambiguity between *experiencing* the robotic arm as mine and *identifying* it as mine. Second there is the ambiguity between what is objectively the case in regard to one's body, and the way that the subject lives the body in action. (a) If I am asked to reflectively judge whether I would identify the robotic arm as objectively part of my body, my answer will likely be “no, this robotic arm is not part of my body.” Regardless of my answer, however, IEM is not at stake since IEM applies to neither explicit judgments of identification nor the body-as-object. But (b), as in the case of the NASA robot, I may actually experience the robot's arm as part of my (lived) body. In this case IEM is at stake, since it pertains to the subject of experience. When I say, expressing this experience: “I am [or my arm is] grasping the tool,” when it is actually the robotic arm that is grasping the tool, have I not misidentified myself in a way that violates IEM?

To clarify the difference between (a) and (b), which depends on the distinction between *as object* and *as subject*, consider a different kind of case where vision and visual kinaesthesia, override somatic proprioception and generate a sense of self-movement when there is none. The optic flow and visual kinaesthesia that occur when the train next to mine is moving, when my

train is not moving, can lead to the mistaken experience that I (along with my train) am moving, even though I am not moving. If on this basis I say, “I (rather than the guy in the other train) am moving,” one could argue that I have made a mistake about who is moving, or, alternatively, that I am not mistaken about the person I am referring to (I am clearly referring to myself), I am simply mistaken about moving. In either case, however, there is arguably no violation of the immunity principle, since somatic proprioception is not involved (assuming that I am sitting still and not moving my limbs) and the claim of IEM is for somatic proprioception and not for visual kinaesthesia.

This example of the train helps us to stay on track with the Wittgensteinian distinction between *as subject* and *as object*. (a) On the one hand, if in the case of sitting in a train I say, based on visual kinaesthesia, ‘I am moving’, we could interpret this as a use of the first-person pronoun *as object*, and as an objective claim about my physical state, which is dependent on the state of the train. That is, I am moving if the train is moving. Just as in the mirror case, I am right or wrong about who has the sunburn depending on certain contingencies with regard to the position of the mirror vis a vis myself, so also, whether in the train I am right or wrong about who is moving depends on certain contingencies with regard to what the train is actually doing. If my train is not moving, I am definitely mistaken about who is moving, but not in violation of IEM. (b) On the other hand, and closer to expressing the actual experience, if I said ‘*I feel like I’m moving*’ (which is the basis for my inference that I’m moving) it seems clear that I am not mistaken about *who* is having the experience (the feeling), even if I were not moving. One would not sensibly ask, “Are you sure that it’s *you* who is having this experience?” Returning to the case of the NASA robot, if I say: “I am grasping the tool in my hand,” there are two ways to understand that statement: (a) as a mistaken statement of objective fact where I make an error about whose hand is involved, in which case IEM is not violated since this is a statement about self-as-object. Or (b) as a statement about my experience: “[I feel like] I am grasping the tool in my hand.” But this suggests that the “I” about whom I am talking is indeed myself, even if objectively speaking the hand to which I refer is the robot’s hand. In this case I am not misidentifying myself.

Through all of these examples – the thought experiment about A and B, Somatoparaphrenia, rubber hand illusion, whole body displacement, the NASA robot, the non-moving train – one can still claim for proprioception a *de facto* IEM. For most of our ordinary and everyday experiences and actions, we do have a sense of ownership and a sense of agency that is immune from error through misidentification. Which is to say, our bodily experiences

and our actions are in almost all instances directly and reliably anchored to a pre-reflective sense of self. But, as I'll make clear in the next section, the example of the NASA robot suggests that it is possible to make a stronger claim for IEM.

## First-Person Perspective

We've seen that proprioception may be disrupted or distorted by various pathologies and experiments. Likewise, both SO and SA may disappear or be derailed in various instances and to varying degrees. Can we maintain, however, despite such modulations of experience, even in such cases, IEM is more than a contingent fact? My experience may lack a proprioceptive dimension; it may lack SA, it may lack SO for a certain limb, or it may mistakenly incorporate SO for a limb that really isn't mine. But even when I'm missing SA for an action that I am generating, or experiencing a limb that isn't mine as mine, etc., it's still I who am experiencing (even if I am mistakenly experiencing), and it still seems that I cannot be mistaken about that. It seems that there must be something more basic than proprioception, SA or SO in which to anchor IEM.

Pre-reflective self-consciousness includes a basic self/non-self discrimination. It also includes a basic sense of mineness for whatever experience I have, even if SO for specific body parts or body movements is disrupted. I may lack proprioception for specific parts of my body, I may think that my left hand belongs to someone else (as in Somatoparaphrenia), or my proprioception may be distorted by visual experience, as when I experience the rubber hand as part of my body under certain conditions, or I may even experience my whole body as somehow displaced or alien (in whole body displacement experiments), but in all of these cases I nonetheless have a sense that *I* am experiencing these things. The self-specificity of these experiences is tied to something that survives all of these situations. In regard to bodily experience, what survives (even when proprioception does not) is the non-relative bodily framework that acts as the origin point (or more precisely the complex bodily origin) of the *first-person perspective*, which, in terms of perception and action, is manifested in the integration of the non-relative bodily framework and the egocentric spatial frame of reference.

Indeed, we could say that this first-person perspective is self-specific in a strict sense. Here I follow Legrand and Ruby (2009) in defining self-specificity as (1) exclusive and (2) non-contingent. They argue that

a given self S is constituted by a self-specific component C only if C characterizes S exclusively (i.e., C does not characterize non-S) and noncontingently (i.e., changing or losing C would amount to changing or losing the distinction between S and non-S). (2009: p. 272).

On this definition, as Legrand and Ruby suggest, the first-person perspective that is implicit in all perception is self-specific. The reliability of our bodily self-awareness in this minimal sense is anchored in the non-relative bodily framework that is the point of origin for my first-person perspective on the world. I can never experience anything, even a loss of SA or SO, except from this perspective, since it is pre-reflectively part of the structure of my experience.

On this basis it seems possible to make an even stronger claim about IEM, namely, that even if both SA and SO are disrupted or shifted there is nonetheless something in our self-experience that remains IEM, namely, the embodied, first-person perspective on the world. Indeed, if, as phenomenologists claim, all experience has this pre-reflective structure, then even when I am reflectively aware of myself *as object*, even when I am looking into Wittgenstein's mirror and misidentifying myself *as object*, I am not wrong about who it is that I am misidentifying – I am misidentifying myself. To say it oddly, but precisely: to be able to misidentify myself *as object*, I cannot be misidentifying myself *as subject*.

In this respect, one should not confuse IEM with 'guaranteed self-reference' of the sort argued for by P. F. Strawson (1994). Guaranteed self-reference is tied to the grammatical use of the first-person pronoun. Whoever says 'I' cannot help but refer to himself or herself. Even use of first-person pronoun *as object* cannot be mistaken in this sense. When I look in the mirror and say 'I have a sunburn', I may be wrong about who has a sunburn, but the word 'I' refers to no one other than myself – and that's precisely why my judgment is mistaken.

IEM mirrors guaranteed self-reference, so to speak, but is more basic because it is based on the first-person perspective that allows me to generate first-person *as-subject* statements. IEM is even more pervasive than guaranteed self-reference, since it pertains even to experience that is not expressed using ~~of~~ the first-person pronoun. Rather, it pertains to any experience that involves the first-person perspective – which arguably includes all of my experiences. When I see the sunburned arm in the mirror, and mistakenly say "I am sunburned," not only does the 'I' not refer to anyone other than myself for reasons pertaining to guaranteed self-reference, but it refers to myself as a subject who is more than the speaker since I also occupy the first-person

perspective of the person who sees the arm in the mirror, even as I mistakenly attribute something to myself *as object*. This first-person perspective anchors me unmistakably to myself and underwrites my pre-reflective awareness of myself as subject. I'm not wrong about *who* it is to whom I attribute the sunburn; I attribute it to myself, and it is precisely for that reason that I make a mistake. But that is a mistake about who has the sunburn; it is not a mistake about who is making the (incorrect) attribution, or who is having the experience of looking in the mirror. I am not only the person who is using the first-person pronoun, but also, and more basically, I am the person who is looking in the mirror – I am the *perceiver*, even if I am not the *perceived* in this case. To *be* is clearly more than to be perceived (the self as-object); it is to be the perceiver (the self as-subject), and this is more than being just the speaker who uses the first-person pronoun. I can only identify or misidentify myself-as-object, because I (as the one who perceives, or acts, or judges) can never misidentify myself-as-subject, and in any case where I do identify or misidentify myself-as-object, I am always acting and experiencing, and making the misidentification, as-subject. This goes beyond simple *de facto* IEM.<sup>6</sup>

On this account we should be able to have an answer to Evan's thought experiment which links A's body to B's proprioceptive information. A states that his legs are crossed and supposedly misidentifies himself, since it's really B's legs that are crossed. In this case, however, the claim that A misidentifies himself on the basis of proprioception is based on objective considerations about what constitutes the identity of A's body. That is, objectively speaking, we distinguish between A's body and B's body. But from the first-person perspective, that is, as A experiences it, this distinction doesn't hold. In the non-relative bodily framework, and from A's first-person perspective, the body in question is A's lived body – the body that A experiences proprioceptively, regardless of whether proprioception delivers veridical objective knowledge about bodily position. The lived body, as phenomenologists like Husserl and Merleau-Ponty understand it, can include things like phantom limbs (which one might say are not objectively there), and can incorporate things into its body schema like the blind man's cane or rubber hands or robotic arms,

6 Cassam 1997 suggests that IEM is based on one's *awareness of oneself* (or one's body, e.g., via proprioception) *as perspectival origin*. Bodily self-awareness is "as subject" only if (1) it is an awareness of oneself as perspectival origin (e.g., proprioception) and (2) it is the basis for first-person statements that are IEM. But we've seen that to the extent that this sort of awareness is not reliable, IEM is only *de facto*. In contrast, the claim I'm making is not about my *awareness* of myself as perspectival origin – it's about *being* the perspectival origin of my awareness. Evans 1982, e.g. p. 222 also hints at this more than once, but maintains that IEM depends on mode of access or "ways of gaining knowledge."

which are not objectively part of the body. The body, as experienced or lived from the first-person perspective, can extend into the environment, in a way that the objective body cannot. Objectively it makes sense to say that A's body does not include B's legs. Once we re-engineer A's proprioceptive system to incorporate B's legs (or more generally, B's body), however, then the problem of A saying "my legs are crossed" when the reference is to B's legs, is not a problem of misidentification. A is precisely in a relation to B's legs in which A does *not* have to identify them in order to say they are crossed. And this, as we know from Shoemaker (1984), is just what characterizes IEM. That is, in such cases, we are immune to error through misidentification not because we are so good at identifying ourselves, but because no process of identification is involved.

As far as I know this link between IEM and first-person perspective is seriously challenged in only one instance, in a case that involves anonymous vision, reported by Zahn, Talazko and Ebert (2008). They describe a disorder with selective loss of the sense of self-ownership specifically for visual perception of objects. Notably, the subject (DP, a 23 year old male) has an intact SO in the proprioceptive domain and an intact sense of self-agency. DP's initial complaint was that he had "double visions," the onset of which followed a long overseas flight after a holiday during which he engaged in ocean diving. Examination revealed that he did not literally have double vision, i.e., he did not see objects in double. Rather he described a two-step process involved in seeing.

When looking at or concentrating on a new visual object, he is able to see the object as a single object, but that the way he perceived had markedly changed in a way which he had never experienced before. It appeared to him that he was able to see everything normally but that he did not immediately recognize that he was the one who perceives and that he needed a second step to become aware that he himself was the one who perceives the object. (Zahn et al. 2008, p. 398)

Despite this problem with vision, DP reports no problems with action; his actions feel no different from normal and he is immediately aware that he is acting. SA for actions remains intact, and he needs no second step to identify himself as the agent of his actions. Moreover, even as his visual perception of objects is problematic in the sense just explained, his perception of other people and their movements are normal, as are his social interactions and communications. He shows no schizophrenic signs and has never manifested psychiatric or medical conditions. Imaging studies showed abnormal (hypo-metabolic) functioning in inferior temporal, parieto-occipital and precentral

regions. Standard neuropsychological testing showed nothing abnormal; the researchers excluded attention and executive deficits using reactive cognitive flexibility and divided attention subtests from the Test Battery for Attentional Performance and other tests.

Zahn et al. claim that this case challenges IEM because DP's access to his first-person experience is not direct or non-observational. It seems that DP is sensibly able to ask the Wittgensteinian nonsensical question: "Someone is seeing this object, is it I?" As far as we know, however, in every case where the correct answer is 'yes', DP answers that question in the affirmative. Even if his sense of ownership for vision depends on reflective introspection and he actually has to make a judgment about the identity of the seeing subject, he so far has not made an error of misidentification. The fact that he has to make a judgment at all, however, is an issue. As Shoemaker explains, when we are required to make a judgment of identification we implicitly or explicitly appeal to criteria. One question in DP's case is what criteria he uses to make the correct judgment. That is, why does he answer the question in the affirmative? What aspects of his experience does he consider in order to answer the question? This is not clear from Zahn et al.'s report; and it may not be clear to DP.

Is it possible that just this issue of how the reflective judgment is made could defeat the threat to IEM? Zahn et al. resist this suggestion. If a critic suggests that for DP self-ownership is simply delayed but still intact, Zahn et al. rightly note that DP's reversion to reflective judgment is simply not the way that IEM is supposed to work. For clarity, however, let's set the question of self-ownership aside. As we've seen, the critical factor for IEM is not SO (or SA, or even proprioception), but the first-person perspective. Tim Lane (personal correspondence) makes it clear that this is just what is at stake in the case of DP. Lane suggests that when DP sees an object the seeing is not anchored in the first-person perspective. But this is *not* at all clear. That is, it is not clear that DP's vision is a free-floating, non-positional seeing. If DP's vision of the object is literally the view of no one, this does not mean that it is a view from nowhere; it is of necessity (i.e., it is part of the essence of vision to be) perspectivally situated, and this may be the very thing that allows DP to *judge* it to be *his* view. Indeed, we could easily predict, as Shoemaker would predict regarding DP's introspection, that DP will never make a mistake in this regard since it is never the case that he finds himself having someone else's visual experience.

One might object that perspective may be non-conscious. In cases of non-conscious visual perception, for example, the vision is still determined by

the perspectival orientation of the perceiving mechanism. I'm thinking here not only of masked priming effects, but of the relatively rich information provided by the dorsal visual system for motor control which necessarily includes information about where the object is located vis a vis one's potential reach, for example. Now someone may want to say that if the perspective of DP's vision is non-conscious then it is hardly "first-personal" – perhaps it would be better to say that it is sub-personal. But this is clearly not the case for DP since the vision he describes is conscious vision. DP does not describe a case of blindsight, for example. He does not complain that he does not see. Indeed, to make the kind of judgment he makes about it being *his* vision, the vision must be conscious. To say that his vision is conscious and perspectively situated (i.e., DP consciously sees the object from a certain spatial perspective) implies that there is an embodied perceptual origin, and that the object appears in an egocentric spatial frame of reference. Everything that anyone would want for there to be a first-person perspective is present in DP's vision. That seems to go with the idea that a first-person perspective is built into the very structure of perception.

If it's not a problem with first-person perspective, however, what explains DP's experience? One possibility is that the problem is on the level of reflective introspection or report. There are some instances in which first-order pre-reflective experience remains intact, but reflective processes break down and interfere with the subject's ability to report that first-order experience. Tony Marcel's experiments on the speed and mode of report of visual perceptual experience, for example, shows that a perceiving subject may have a veridical visual perception but may be unable to provide a veridical report of it, or may provide contradictory reports, e.g., that he did see something and simultaneously that he did not see it (Marcel 1993). One mode of reflective report may in fact mask the perception while the other confirms it. Another example is the hyperreflection that sometimes accompanies schizophrenic alien experiences (Sass and Parnas 2003). An overly reflective, and sometimes obsessive attention to aspects of experience that usually remain tacit or recessive introduces a distorted and alien sense for those processes. Indeed, this kind of distortion may be involved in or lead to delusions of control.

Zahn et al. screened DP for schizophrenia and ruled that out. More generally, however, the likelihood that DP's problem is somehow to be located at the level of first-order, first-person perspective is no greater than that it is a problem with reflective processes.<sup>7</sup> His description, which was first ex-

7 One objection to this is that the neuroscientific data suggest problems in perceptual processing rather than reflective judgment. They found abnormalities in the inferior temporal

pressed in terms of double vision, ends up being somewhat neutral between these two possibilities. It is explicated in terms of a two-step process – visual perception plus reflective self-identification. But if it is difficult to conceive of a conscious visual perception lacking a first-person perspective (it's not clear what that would look like, and there is no description provided by DP in Zahn et al.), it is not so difficult to conceive of a reflective process that can interfere with first-order experience to the point that it might seem ambiguous in regard to being the subject's experience, although that same reflection cannot avoid judging (in contrast to the schizophrenic) that it can be no one else's. On this interpretation, although the subject comes to think of the question, "Someone is seeing the object, is it I?" as a sensible one, it's only because his reflective cognition leads him in that direction, and away from the IEM that remains implicit in his first-person perspective, and that, regardless of everything, manifests itself every time he correctly judges that it is indeed his perception.

Another way to look at this is that DP doesn't pick out a selective set of visual object perceptions among a large variety of such experiences that belong perhaps to others or perhaps to himself. Standing next to me, he doesn't pick out my visual experience as a possible candidate for his own. He, quite normally, like the rest of us, finds only his own visual experiences available, characterized already and without exception as experiences from a first-person perspective. That should be the end of the story since we do not normally, in contrast to DP, initiate a reflection to ascertain whether such experiences are our own. What's different in DP's case is that he does initiate a reflection in which he attempts to identify such experiences as his own. The researchers have not ruled out the possibility that the problem is just with the fact that this unnecessary but consistently veridical reflection introduces a second step that masks and then correctly verifies the first-person perspective implicit in his visual object perception.

One final issue may be just as challenging as the case of DP. Is it a com-

and parieto-occipital regions which are crucial areas for visual object and visuo-spatial representation. It's not clear, however, why areas responsible for object representation may be involved in self-specific processes of perspective. Hypometabolism was also found in cerebellar and motor regions, areas involved in predicting the sensory consequences of one's own movements, and necessary for SA in the motor domain, although no problems were found in DP's experience of agency. Zahn et al. rightly note that "a single case can never reveal whether abnormalities in a brain region are sufficient or even necessary to evoke abnormal experiences" [p. 9]. Their study also does not make clear the timing involved in the reflective process described by DP, nor do they discuss any activity in the brain that might correlate to such reflective processes.

plication for this strong claim about IEM that the first-person perspectival source itself can shift? This is said to be what happens in the experiment on body swapping reported by Petkova and Ehrsson (2008). In this experiment the subject wears VR goggles and sees the image projected by a video camera that is worn headtop by another person who is standing facing the subject. The video image, which the subject sees, is a frontal view of the subject himself. When the subject reaches out to shake hands with the other person, the experience is one of shaking hands with himself, notably accompanied by a shift of perspective.

In the present illusions, the visual, tactile, proprioceptive information and the predicted sensory feedback from these modalities during active movements were temporally and spatially congruent in an ego-centric reference frame centred on a new body. Thus, the matching of multisensory and motor signals from the [shifted] first person perspective is sufficient to create a full sense of ownership of one's own entire body. (Petkova and Ehrsson 2008).

Does the fact that the first-person perspectival source can “travel” have implications for the strong claim of IEM?

In some regard the NASA robot experiment is a clear example of this. If, for example, I mistakenly say “I am sitting in front of a table” and I’m wrong about that because I’m actually looking through virtual goggles and I’m seeing the table from the perspective of the robot, am I misidentifying myself? It is clearly I (as the perceiving subject) who am experiencing this. My visual perspective has been technologically shifted (and perhaps has taken my proprioceptive sense with it) – but that perspective is still mine – even if it no longer (objectively) coincides with the canonical perspective of my bodily location – and even if what I experience I experience, as subject, from that shifted perspective. It’s that subject, who I am, and whose experience is in that perspective, to whom the “I” refers.

## Conclusion

Recent objections and challenges to the principle of IEM have been many and frequent. I’ve reviewed a number of them here and have tried to make the strongest case possible for maintaining the principle. I’ve argued that IEM should not be too closely tied to any specific mode of access to self-experience, whether that involves reflective introspection or pre-reflective proprioception. Nor should it be tied too closely to certain aspects of the pre-reflective experience of self, such as the sense of ownership or the sense

of agency. All of these aspects of experience are contingent and will depend on circumstance and/or brain function. I've suggested that the true anchor for IEM is the self-specific first-person perspective that characterizes every experience. This view is clearly challenged by the case of DP and by the possibility of shifting perspectives. I think the jury is still out in regard to the case of DP (we need more evidence), but there is at least one reasonable interpretation that leaves IEM intact even in that case, namely that it is just as likely a problem with reflective introspection as with the first-person perspective of first-order experience. In regard to shifting perspectives, it seems that IEM is rigorous enough to make that journey as well.<sup>8</sup>

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