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## A View from Nowhere: The Zero Perspective View of Bodily Awareness

Krisztina Orbán

### RESUMEN

Muestro aquí que la conciencia del cuerpo es una forma primitiva de autoconciencia, puesto que sirve de salvaguarda al sujeto respecto de errores que surgen de la discriminación y seguimiento. Para ello, argumento que en la percepción interna no hay un origen aparente; no está centrada en la localización espacial. Me concentro en mostrar que la conciencia corporal tiene una estructura espacial radicalmente diferente de la percepción externa (como la visión), lo que yo llamo *estructura de perspectiva cero*. El contenido espacial de la percepción interna está en correspondencia biunívoca con la imagen del cuerpo y tal correspondencia no tolera una perspectiva espacial. Esta es la razón por la que la conciencia corporal está libre de errores de discriminación y de seguimiento.

PALABRAS CLAVE: *conciencia corporal; egocentricidad; perspectiva; percepción espacial; autoconciencia; epistemología de la autoconciencia.*

### ABSTRACT

I show that bodily awareness is a primitive form of self-awareness, because it safeguards the subject from errors arising from discrimination and tracking. To this end, I argue that in internal perception there is no apparent origin; it is not centred on any spatial location. I focus on showing that bodily awareness has a radically different spatial structure from external perception (like vision). I call this a *Zero Perspective structure*. Spatial content in internal perception is mapped onto the body image and such a mapping does not tolerate a spatial perspective. This is the reason why bodily awareness is free from discrimination and tracking errors.

KEYWORDS: *Bodily awareness; Egocentricity; Perspective; Spatial perception; Self-awareness; Epistemology of Self-awareness.*

## I. INTRODUCTION

Does bodily awareness play an essential role in how the subject knows about herself? I will argue that bodily awareness – as a form of internal perception – has a different spatial structure in experience than in

external perception (vision, audition, etc.). We experience our own body as a special object with a distinct spatial structure. This suggests that bodily awareness might provide a form of primitive self-awareness distinguishing oneself, in experience, from other objects. Bodily awareness precedes full-blown self-awareness both developmentally and phylogenetically; it does not require self-consciousness.

There is a puzzle about self-awareness. It seems that when I act – e.g., when I walk – I know which object is my body without the possibility of mistake. I know which object I intend to move. Contrast a case when I try to move my bike. I need to discriminate it from other objects and recognise it as my bike. We are endowed with the capacity to discriminate an object from other objects which enables us to individuate and identify objects in the world. But one may make discrimination mistakes. In this case, the object may not be my bike. Surprisingly, when I walk, none of these mistakes are possible; I know which one is my body – that body I can walk with – without the possibility of mistake. *There is a way of knowing* about one's body from the inside which does not allow the possibility of trying to move the wrong object. Similarly, when one feels pain, one need not discriminate who is in pain or recognise the subject who is in pain. Experiencing pain does not allow discrimination mistakes related to who is in pain. Consequently, based on feeling pain, a subject cannot be mistaken about who is in pain – or who should take a painkiller.<sup>1</sup> How can I be aware of myself without the possibility of being aware of the wrong object? This is *the Error-Freedom Puzzle*. If bodily awareness is a primitive form of self-awareness, as I suggest, then it can provide the object which the subject is in an error-free manner.

It is *not* the case that whenever I am aware of my own body I cannot make a mistake about whose body it is. When I supposedly look at my hand it may turn out to be someone else's hand. Error-Freedom only applies to some ways of being aware of my body but not all such ways. The contrast with my bike is that there is no way to perceive my bike where the possibility that it is not my bike is excluded because of the way I am aware of my bike.

Let me note that my discussion concerns neither immunity to error through misidentification (IEM) nor guaranteed right reference (GRR). When I self-ascribe being in pain based on feeling from the inside then I cannot misidentify who is in pain, so my self-ascription on this basis is immune. GRR is a double guarantee: a self-ascription cannot lack reference and the subject cannot use 'I' for the wrong object. IEM and GRR

are features of self-ascriptions. My focus in this paper is on what makes both of these features of self-ascriptions possible *at the level of experience*.

To say that some feature is an aspect of experience, is not to say that it must be so because it is a feature of self-ascribing that experience. For example, before one is self-conscious and able to self-ascribe pain, one is already able to experience pain. It is important to note that Error-Freedom is *not* about self-ascription, but about the structure of experiencing one's own body in a certain way, from the inside.

Bodily awareness, as I use it, is an internal way of directly knowing one's own body. It includes proprioception and kinaesthesia (a direct way of knowing<sup>2</sup> the posture and movement of one's own body parts from the inside), nociception (pain), interoception (perception of one's visceral states, e.g. hunger, thirst, or one's heartbeat) among other aspects. Bodily awareness is contrasted with external perceptual faculties like vision, audition or touch, which are radically different. The latter provide direct knowledge about many objects, in contrast with bodily awareness which only provides one object, one's body.

The outline of the paper is the following. I argue for the claim that (1) bodily awareness and external perception have a different spatial structure. Due to this (2) bodily awareness provides epistemological advantages over being aware of one's body externally. I then observe that (3) these advantages are the mark of the kind of self-awareness underpinning the use of 'I' due to answering the Error-Freedom Puzzle. I conclude that (4) bodily awareness is a very good candidate for providing a basic form of primitive self-awareness where the subject knows about the object which she is without the possibility of mistake.

## II. FRAMES OF REFERENCE

Any discussion of spatial perception and its structure should begin with characterising frames of reference. An egocentric frame of reference is centred on a part of the subject's body [Klatzky (1998), Levinson (1996), Bermúdez (1998)], while allocentric frames of reference are centred on other objects. The brain employs allocentric frames of reference based on task demands, for example, when one has to decide how to grab a particular object (power grip/precision grip; from the top/from the bottom of the object). The grip will be decided relative to the object so it has to employ an allocentric frame of reference centred on the object.

Klatzky characterises a frame of reference as follows:

A reference frame is a means of representing the locations of entities in space. In an egocentric reference frame, locations are represented with respect to the particular perspective of a perceiver, whereas an allocentric reference frame locates points within a framework external to the holder of the representation and is independent of his or her position [Klatzky (1998), pp. 1-2].

Any frame of reference, egocentric or allocentric, is characterised by a coordinate system (e.g. Cartesian or Polar) and any such system requires an origin [Klatzky (1998), pp. 1-3]. This requirement concerning the origin is called the:

*Origin Requirement (OR):*

A frame of reference requires at least one origin.

In egocentric and allocentric reference frames locations are characterised by providing their distance in a certain direction from a single origin at a time [Klatzky (1998)].

A spatial representation is egocentric or allocentric, where these are supposed to be exclusive and exhaustive [Klatzky (1998)]. This has important consequences for understanding bodily awareness. Intuitively, bodily awareness should be egocentric because it has immediate consequences for action [Campbell (1994)] and its frames of reference can only be centred on the subject [Klatzky (1998), Levinson (1996)]. An allocentric frame of reference is centred on an external object. The space of bodily awareness only allows the subject to be acquainted with her own body, but no external objects. It has a sole-object character [Martin (1995), Bermúdez (1998)]. So, the frame of reference for bodily awareness cannot be centred on an external body; it cannot be allocentric. If it cannot be allocentric then it has to be egocentric according to Klatzky.

#### *Egocentric Frames of Reference*

An egocentric frame of reference consists of a special coordinate system with at least three axes and an origin centred on a point in the subject's body which is the intersection of the three axes. One of the axes is "an intrinsic axis of orientation that is imposed by the [subject's] physical configuration" [Klatzky (1998, p. 5)]. Egocentric frames of reference utilise axes derived from asymmetries of the body (e.g. left/right).

An egocentric reference frame can be centred on the trunk, head, hand, or other parts of the body. In cases of navigation the reference frame has a heading axis given by where the subject is heading. The origin of an egocentric system changes with the movement of the subject in the direction of heading. But as we have seen it must be centred on an origin, a single origin in the subject's body.

Consequently, the egocentric frame of reference relies on the natural asymmetries of the body beside being centred on a body part; the egocentric frame of reference requires a representation of one's own body.

What would a unique egocentric origin look like? An example of an origin is the 'Cyclopean eye' [Julesz (1971)]. In binocular vision, when one sees something it seems to be from a unified monocular origin and not from the locations of the two eyes and it is computed from an origin halfway between the two eyes [except for a few cases; Ono and Saqib (2015)]. It is as if one sees from a Cyclopean eye situated between one's two biological eyes, typically. The employment of the monocular Cyclopean eye, both computationally and phenomenologically speaking, seems to be an accurate description of vision for core cases (for healthy subjects) [Ono et al. (2002), Ono and Saqib (2015)]. But the computational and the phenomenological origin need not coincide.

One may be able to be aware of the origin but this is not necessary. There are computations which are not available to consciousness. Computationally speaking, there are finger, trunk, or hand etc. centred frames of reference, but the subject is not aware of most of them [Levinson (1996)]. As this shows there are two ways to understand egocentricity: a more unified phenomenological experience-based way and a less unified computational model-based way.

The phenomenological notion of frame of reference only applies to the content of conscious perceptual experience. The computational notion only provides a model for understanding perceptual information processing (e.g. saccadic movement and compensation), but it is often – illicitly – used to describe the structure of perceptual awareness at the phenomenological level of explanation.

### III. BODILY AWARENESS

Here I only concentrate on the internal foundation of bodily awareness, what we know from the inside and how we experience space from the inside. Bodily awareness, in this sense, includes proprioception,

kinaesthesia, sense of temperature, sense of balance [Lenggenhager and Lopez (2015)], interoception and nociception. Proprioception is a perceptual modality that provides the subject with a sense of the position of her body parts relative to one another from the inside. Kinaesthetic sense provides awareness of the movement of the subject's body. Interoception [Craig (2002)] provides awareness of thirst, hunger, one's heart-beat, and the need to micturate. Nociception is a damage detecting sense; the subject perceives the damage by way of feeling pain in a particular location [Melzack and Wall (1983)].

External perception enables the subject to know of objects in the world including herself and represent the spatial relation between objects and herself. Faculties of external perception are the five senses, classically conceived: vision, audition, touch, taste, and smell. External modalities are multiple object faculties: more than one object can be perceived by them, not only the subject. In contrast, internal perceptual faculties include all the channels of information which provide awareness of the subject's body from the inside: bodily awareness.

Bodily awareness is integrated with self-relevant content gained through external perceptual modalities [de Vignemont (2014)]. Yet one is free to pay attention to internal or external sources of bodily awareness relying on an attentional shift. When a content is self-relevant for a subject then the subject's behaviour displays an understanding that the content concerns the subject itself (e.g. feeling hunger triggers eating or feeling an itch triggers scratching itself). These registrations of self-relevance do not require self-consciousness.

Let us bring what we have learnt about egocentric perspective to bear on understanding the structure of the space perception in external and bodily awareness. It is often assumed that external and internal perception *share a common spatial structure* in terms of their spatial content being organised in an egocentric frame of reference [Klatzky (1998)]. If this is the case, then in bodily awareness there should be an origin or a phenomenological counterpart of origin: a perspective. I want to challenge this.

### III.1 *Differences in the Internal and External Spatial Experience*

Is the spatial structure of bodily awareness and external experience different? Martin (1995) distinguished bodily awareness (experiencing space from the inside) and external perception (experiencing space from the outside in, e.g., vision) by structural differences manifest in their phenomenology. Only a single object, the subject, can be known from the inside while multiple objects can be known through external senses.

In other words, bodily awareness has a *sole-object character*. This is a phenomenological characterisation; it seems to be as of a unique object. The question arises as to what makes it a sole-object experience. What is the difference between experiencing my body from the inside and from the outside?

To answer these questions, another aspect of the difference was noted by Bermúdez (1998), who argued that there is no single egocentric origin for bodily awareness, but multiple origins. According to him, bodily awareness is plausibly thought to be egocentric, centred on an origin in the subject's body. But it cannot be centred on a single origin. He argued that bodily awareness has to have more than one origin, which is provided by adjacent hinges or joints of the body (e.g. elbow, knee, wrist) [Bermúdez (1998), pp. 155-156].<sup>3</sup>

Some theorists read Bermúdez as proposing the No Origin view, according to which no origin can be found in bodily awareness. But Bermúdez writes:

Since it emerged earlier that it would not be right to take a single fixed point as an origin, it follows that we must look for a set of fixed, or at least relatively fixed, points in terms of which we can fix the *A* location [location relative to given point on the body] and *B* location [relative to other body parts] of a given bodily event [Bermúdez (1998), p. 156].

Consequently, Bermúdez offers:

*A. The Multiple Origin view*

In bodily awareness, there is more than one location on the subject's body which functions as an origin of an egocentric frame of reference.

I will take a different approach towards understanding their structural difference. I will argue that bodily awareness has a *zero (spatial) perspective* structure. This view denies that bodily awareness has one or more origins at the phenomenological level of explanation.

III.2 *The No Origin View*

There are two ways to deny OR for bodily awareness; either there is more than one origin as Bermúdez argued or there is no origin as I propose.

### B. *The No Origin View*

In bodily awareness, there is no location on the subject's body which could function as the origin of an egocentric frame of reference.

Therefore, we have two models: the No Origin and the Multiple Origin view. How can we decide which one is correct?

In favour of the Multiple Origin view, some say that whenever there is a frame of reference it is required that there has to be at least one origin [Klatzky (1998)]. Yet it is not clear what would provide the origin in bodily awareness. This supports the No Origin view. So far, considerations in favour of the two views are balanced.

Even if at the computational level OR is perfectly sound and is empirically and mathematically well supported from geometrical considerations about coordinate systems [Klatzky (1998)], OR may *not* hold at the phenomenological level. Generally, there are doubts that constraints on the computational understanding of frames of reference must also apply to a phenomenological understanding of frames of reference.

Whatever the phenomenological counterpart of origin has to be, it should be something which is in principle available to the subject or it would not be phenomenological. Consequently, if we are to settle a phenomenological question concerning a kind of awareness then we should find the phenomenological counterpart of the notion of origin, something which one can be aware of.

## IV. SPATIAL PERSPECTIVE

The notion of spatial perspective captures something significant in the phenomenology of spatial perception – what is available to the subject when she is aware of a scene from a point of view. The notion of a *viewpoint* is the phenomenological counterpart of the notion of *an origin* of a frame of reference. A spatial perspective on an object/event/scene requires a viewpoint and presents objects in a certain direction from the subject relative to the viewpoint. This accounts for the fact that change of the spatial perspective on an object occurs when a change of the viewpoint from where the scene is observed occurs.

A spatial perspective is a way things appear to the subject from a certain viewpoint from where a subject perceives an object. Looking at a tree while climbing it or sitting under it presents very different perspectives on the tree, because I am looking at it from different viewpoints.

What changes when I change my location in space is the viewpoint and this changes my spatial perspective on the tree. In contrast, think of an afterimage, it typically appears at the same place independently of whether I have moved. I cannot change my spatial perspective on an afterimage; its position is independent from my movements in space. In the real world, physical objects appear from a spatial perspective to the subject, including the subject when she sees, hears or touches herself.

*A spatial perspective* is a way an object/event/fact appears to the subject from a certain viewpoint from where the object/event/fact is perceived (in a specific perceptual modality).

The viewpoint is the apparent location from where something is perceived. So, it is a phenomenological and not a computational notion like origin. The viewpoint may be dependent on the perceptual modality. Haptic or tactual or visual or auditory viewpoints may differ from each other. I may hear or see the same event from different perspectives. When I hear something from behind at the same time as I see the same event in a mirror in front of me, the perspective on the same event is different because the visual and auditory viewpoints are different. In a sense, there is a spatial perspective because one perceives something externally.

Spatial perspective was introduced for understanding how the perceived scenario changes depending on (1) bodily movements of the perceiver and (2) changes in the environment [e.g. Evans (1982), Ismael (2009), and Peacocke (2012)]. The spatial perspective on an object only changes when the observer's viewpoint changes (changing the direction of gaze may be sufficient) or the object's location changes relative to the subject.<sup>4</sup> Thus, to take an example, turning one's head changes the viewpoint. Spatial perspective is not merely a phenomenological notion but it is a geometric relation between the subject and the perceived object.

To elucidate what a spatial perspective is, I will turn to describe three conditions on spatial perspective.

### *Directionality*

Perceiving an object presents the object in a certain direction from the subject. We may observe that a spatial perspective enables the subject to perceive an object in a certain direction from a viewpoint. One can hear something approaching from the back. One is *able* to find the compost in the garden only by relying on her nose; this can be done with a functioning nose. Sometimes one may not know where the sound comes

from, but typically when something like a lion produces a threatening noise we turn to the correct direction.

*Directionality Constraint on Spatial Perspective:*

The subject's spatial perspective on an object requires that the object is perceived in a certain direction from the viewpoint.

*Shiftability*

A change of viewpoint is a change of spatial perspective. When a subject looks at something, she sees it from a viewpoint from where the scene seems to appear. But she could have seen it from another viewpoint which would change the spatial perspective.

Spatial perspectives have been discussed in the literature in terms of perspectival sensitivity [Peacocke (1983)] or perspectival connectedness [Siegel (2010), Campbell (1994)]. That discussion focuses on how changes of the subject's spatial perspective shape spatial perception. The issue here is the subject's ability to re-identify objects and track them even when the subject changes her own location in space and the object under observation looks different. To make sense of these counterfactual possibilities the subject has to be endowed with some kind of understanding of the shift of spatial perspective or the ability to predict the consequences of such shifts in a wide range of cases (Evans 1982). These require an understanding of having and changing spatial perspectives [Peacocke (1983), Campbell (1994), Noë (2004), Schellenberg (2007)]. Let me call this feature *shiftability*. Shiftability is a necessary feature of spatial perspective. The notion of spatial perspective is introduced in order to capture the counterfactual dependence of how an object would look from different perspectives.

A constraint should be introduced:

*Shiftability Constraint on Spatial perspective:*

A spatial perspective shifts when the subject changes her viewpoint relative to the object or the perceived object moves relative to the subject. A shift in spatial perspective, at least in counterfactual situations, should be possible.

A spatial perspective need only be in principle shiftable. It may be that it is not shiftable for a period of time or for a particular object because of some obstacles (e.g. impenetrable objects prevent one from moving around; or only a keyhole is available).

To understand what it means to shift the perspective, we have to look at a contrast where the spatial perspective is un-shiftable. An example of an un-shiftable perspective on something is seeming to hear a ring tone in the ear. It is precisely this un-shiftable viewpoint that provides a reason to think that the information provided is relevant to knowing about my hearing system and not about the external world. The experience lacks the perspectival structure because its viewpoint is not shiftable.

The notion of spatial perspective is introduced to explain how the subject is still able to keep track, re-identify and recognise objects in the face of changes of perspective. Thus, if it were not shiftable it would not serve its explanatory purpose.

#### *Awareness*

The notion of a spatial perspective is introduced to capture differences between spatial perspectives which the subject, in principle, can be aware of. Not all movements of my eye will change my spatial perspective. The only changes counting as changes of spatial perspective are those which the subject, at least in principle, can be directly aware of. The perceptual capacities of a healthy subject include the power to shift her spatial perspective from one spatial perspective to another one. Accordingly, let me introduce the following condition.

#### *Awareness Constraint on Spatial Perspective:*

The changes of spatial perspective should be available to the subject in principle (unless there is some obstacle preventing it) so that in some cases the subject may be in a position to shift her spatial perspective at will.

We may imagine a subject who cannot change her spatial perspective at will. One cannot act with her body unless she changes her spatial perspective at least in one perceptual modality. For instance, think of a paralysed subject, her viewpoint will change when objects are moving around her.

## V. ZERO PERSPECTIVE

It is often said that all cases of spatial perception require a spatial perspective. A lake looks different from a high viewpoint than from a position on the shore. To understand what enables us to track external objects and apparent changes of objects due to perspectival change we have to acknowledge that there is a shiftable spatial perspective on ob-

jects. A shiftable spatial perspective is required for perceiving objects located in space relative to the location of the subject [Siegel (2010) and Peacocke (1983)]. We are creatures which can act and navigate. The mere possibility of navigation and action requires some kind of shift of spatial perspective. This suggests that being perspectival should be considered a mandatory feature of spatial perception; call this its *spatially perspectival structure*. Perception is assumed to have a spatially perspectival structure. Is this true of all kinds of perception including bodily awareness? I will argue that only external perception is spatially perspectival.

### V.1 *Arguments for the Zero Perspective View*

Let me first motivate the idea that bodily awareness lacks perspectival structure. Think of feeling a stomach ache or an itch in one's shoulder. Is there any way that the spatial perspective from which you feel it could be changed? Does it make sense to ask where one feels the pain or the itch from? In bodily awareness there are sensational objects, like pains and itches. They seem to be located in a particular part of the body and not in a certain direction from a viewpoint. The viewpoint relative to the sensation cannot be changed because there is no viewpoint or, if there were one, it would not be shiftable relative to its object. There is no spatial perspective in bodily awareness because there is no viewpoint. I will call such a structure a *zero-perspective structure*.

I can now argue for the zero (spatial) perspective characterisation of bodily awareness. More precisely, I will argue from shiftable and directionality for the Zero Perspective view on bodily awareness.

### V.2 *Argument from the Lack of Shiftability*

I may see an object – e.g., a house – from different viewpoints in space and the object will look different. I cannot perceive my pain or my itch from different viewpoints from the inside.<sup>5</sup> These sensations cannot look different because of the possibility of shifting the apparent location from where they seem to be perceived and thus they cannot undergo perspectival changes. The locations of these sensations are given by mapping them onto the body image, as I will argue in section 5.4. The mapping happens at the subpersonal level and only its result is available to consciousness [de Vignemont (2010)].

I may shift my attention from one foot of mine to my other foot, but this would not be a shift of viewpoint. The pain was initially in the foreground of my attention and I can alter this by trying not to attend to the relevant leg where the pain is. I may allocate attentional resources,

but this is a change in where the focus of my attention is, and not a change in the spatial viewpoint (where I perceive the pain from). Accordingly, in bodily awareness one cannot choose or change the viewpoint from where one perceives pain, vestibular sensations, hunger, or thirst because there is no viewpoint.<sup>6</sup> This is the reason why it cannot be shifted. Remember that for a spatial perspective, a shiftable viewpoint is required, so in bodily awareness there cannot be a spatial perspective. This provides us with the first reason to accept the Zero Perspective view on bodily awareness.

### *V.3 Argument from Spatial Direction*

In external perception, the perceptual object can be in different directions from the viewpoint (phenomenological counterpart of origin) from where it is perceived, but this is not the case for bodily awareness. Let me concentrate on bodily sensations, like pain, itch, numbness, or even the feeling of warmth in one location. If the structure of spatial perception in bodily awareness were the same as external perception, then we should find directionality in bodily awareness. There can be different directions for a subject from where something (an object or an event) is perceived via external perception. However, when one perceives pain via nociception, one does not perceive the bodily property as being instantiated in a certain direction from a viewpoint. In such a case one is simply aware of some bodily property and its location in the body. A sensation is perceived *to be somewhere* in the body it is *not* perceived *from somewhere* in the body. What makes this possible is the representation of one's own body: the body image.

### *V.4 Body Image*

My focus here is only on the relation between bodily awareness and the body image. What is the body image? The subject is typically aware of the location of her limbs and their relation to each other from the inside.<sup>7</sup> The body image is the conscious model of the body [O'Shaughnessy (1980), de Vignemont (2010), Wong (2016)] which provides a representation of the body parts relative to each other. The body image is distinguished from the body schema:

The body schema consists in sensorimotor representations of the body that guide actions. The body image groups all the other representations about the body that are not used for action, whether they are perceptual, conceptual or emotional [de Vignemont (2010), p. 670].

Generally, when one perceives something from the inside, it is mapped onto the body image. The body image provides a spatial layout of the body. The body image is the conscious model of the body, which is why I have suggested that located sensations one is conscious of are mapped onto the body image instead of the body schema, which is unconscious. If someone prefers to use the body schema for mapping the location of sensation, this would not affect my argument for a Zero Perspective view.

If we accept de Vignemont's idea that the body schema is dynamic and is for action, the mapping may depend on whether one is engaged in action. Even if the body schema and body image might provide different location information for a body part/sensation this will only be a conflict in how to map the location onto the relevant body model. The sole-object character of the mapping and its zero-perspective structure is unaffected.

When one perceives a sensation (from the inside), the location of the sensation is provided by the location on the body image. As I will argue below, this mapping does not tolerate a spatial perspective because it does not tolerate a viewpoint. Consequently, bodily awareness is spatial, but mediated by the body image. This accounts for the structural difference between internal and external perception alongside explaining why sensational objects are not defined directionally from a viewpoint.

This zero-perspective structure may be the key for a subject to perceive the object that she is as a distinct object, different from all other objects. What excludes the possibility of spatial perspective in bodily awareness?

#### V.5 *Why Is It the Case that Mapping the Location of the Sensation onto the Body Image Cannot Tolerate Spatial Perspective?*

I suggest that for egocentric perception to be centred on an origin in the body part, this body part would have to be provided by the body image. Now if the body image were in turn centred on a body part (if it is to be egocentric), it would require another body image. The body image cannot be centred on itself so this would require yet another body image and we would be off on an infinite regress [Campbell (1994)].

The body image cannot tolerate a spatial perspective while egocentricity requires the body image. The function of spatial perspective is to present the location of the object in body-relative terms, but mapping the location of the bodily sensation onto the body image *already* defines the location of sensation in body-relative terms. In bodily awareness, the location of the sensation is mapped to a location on the body image.

Consequently, there is no need for a spatial perspective to get the location of the sensation in body-relative terms since it is already given in such terms.

*The Sole-object Character of Bodily Awareness and the Internal Architecture*

Martin (1995) proposed that bodily awareness has a sole-object character. The sole object character captures a phenomenological significance of the content gained through bodily awareness: for the subject, it seems that the subject receives information only about *x* through bodily awareness. The information seems to be only accessible to the subject in this way through internal information channels.<sup>8</sup>

The mapping idea supports Martin's claim. The suggestion that the location of the sensation in bodily awareness is provided by mapping the location of the sensation to the body image by registering the location of the relevant sensor in the relevant body part explains why the experience (if everything goes well) will be an experience of the subject about herself (being in pain/having an itch and so on).

This phenomenological character, I suggest, is underpinned by a structural property: the internality of the architecture.<sup>9</sup> Through internal information channels only *x* gains information of only *x*. Call whatever ensures this *the internality of the architecture*. When a computer shows that it is out of battery the architecture of the information channel is an internal architecture.

The internal architecture is necessary for making an information channel internal.<sup>10</sup> The architecture of the information channel, its internality, is necessarily such that it guarantees that the receiver and the object the content concerns has to be the same.<sup>11</sup> We have to add the internality of the architecture as a requirement on making an information channel internal. For this reason, at the personal level, internal perceptual modalities are such that through them only the subject can gain content only of the subject due to the structure of the information processing pathway. So, in order to play its proper function, an internal channel has to have an internal architecture.

Sometimes we make mistakes because something looks like something else from a different spatial perspective. This suggests that there is a special advantage in having a different structure of spatial perception from the inside. I propose that the zero-(spatial) perspective structure, which requires the sole-object characteristic and an internal architecture of bodily awareness, explains epistemological advantages of bodily awareness-based self-awareness. In particular, I will suggest that the zero-

spatial perspective structure of bodily awareness may play a role in explaining why a basic primitive self-awareness based on bodily awareness cannot tolerate certain kinds of mistakes which other kinds of perception allow. I turn to showing the epistemological advantages of bodily awareness.

## VI. SOME EPISTEMIC ADVANTAGES OF BODILY AWARENESS

Martin (1995) distinguished bodily awareness and external perception by structural differences manifest in their phenomenology. As he emphasises, phenomenology alone cannot ensure that the content has to concern the subject. However, what ensures this is the zero-perspective structure of bodily awareness, which originates from the mapping of the felt location onto the body image. This structure is possible because bodily awareness has an internal structure of information processing (only  $x$  processes information about only  $x$ ). The internal structure of information processing guarantees that the content has to concern the subject (if it concerns anybody).

There are several kinds of mistake possible in case of external perception of one's own body which are excluded in bodily awareness. I will introduce these features in turn. The first kind of mistake is a failure in perceptually discriminating the object from the background or singling it out from many objects.

### *Discrimination Mistakes*

Perceiving an object requires discriminating the object [Shoemaker (1996), Schellenberg (2016), O'Callaghan (2018)]. To perceive an object,  $o$ , (i) one has to discriminate it from a background (unless the object occupies the complete perceptual field) (ii) one has to discriminate it from other perceivable objects which are visible at the time (if there is any). To perceive an object one has to be able to discriminate it from the background and from other objects; this alone allows mistakes. Without discriminating the object, one cannot detect the object as an individual entity. So, having the capacity to discriminate an object is considered to be necessary for perception.

Discrimination mistakes come in many forms:

- (a) one may not discriminate an object from its background,
- (b) one may take one perceived object to be two objects, or
- (c) two perceived objects to be one object, and

- (d) one may misrecognise a perceived object as another object based on a recognitional capacity.

Kripke (1979) discussed such (b-c) cases. There are perceptual versions of discrimination mistakes (a-d) when the discrimination of an object is possible but is not successful, for example:

1. One may only see a coral reef with exciting colours when there is a stonefish (a fish which looks exactly like a colourful coral reef) blending in.
2. One may be looking at two trees while seeing them as one single tree.
3. A baby penguin may misrecognise an adult as her mother when she is not.

External perception allows for the possibility of discrimination mistakes. The reason why discriminating and singling out the object can go wrong is that external perceptual faculties are multiple object faculties which allow that the viewpoint may be changed. When the viewpoint cannot be changed on a single object then mistakes cannot happen.

#### *Discrimination-Freedom in Bodily Awareness*

Bodily awareness has a zero-perspective structure. The zero-perspective structure is only possible because of the sole-object character of bodily awareness. Spatial perspective enables the subject to understand the spatial relation between herself and other objects in the world. However, if there is only one perceivable object through bodily awareness, and this is the subject herself, then only internal spatial relations are possible (between the parts of this object: trunk, limbs and head, etc.). Spatial perspective is not needed because the subject need not settle where she is relative to the perceived object.

Discrimination errors are ruled out by the zero-perspective structure and the sole-object character of bodily awareness. Primitive self-awareness based on bodily awareness only presents one with her own body and its parts, but *nothing else*. Whatever way the location of a sensation is mapped onto the body image it can *only be* mapped to one or to another part of one's own body. Thus, because of the zero-perspective structure, there cannot be a background and a foreground (discrimination mistake (a)). One need not recognise the object one perceives from the inside because there is no alternative. Thus, recognition mistakes for

the perceived object, the subject, are not possible (case (d)). Only body parts can be mis-mapped.<sup>12</sup> Due to the sole-object character of bodily awareness, one cannot take two objects to be herself or herself to be two objects ((b)-(c)). Consequently, bodily awareness does not allow discrimination mistakes because it lacks spatial perspective and locations are mapped to the body image. So there is nothing from which one's body has to be discriminated. I turn to the second mistake.

### *Tracking Mistakes*

When we attribute properties to objects the objects may move in space or the perceiver may change her spatial perspective in space or something may even occlude the object one perceives. Tracking objects is essential for our ability to attribute perceptual properties to objects. It requires a spatial perspective which can be changed relative to the object in question and opens the possibility of error. Let me consider an example:

4. One may seem to follow Pele whilst failing to track him in a soccer game.

When one uses a referring expression to an object which one perceives, one may lose track of the object. Whenever one has to perceptually track that object through external perception, tracking mistakes are possible.

### *Tracking-Freedom*

Peacocke (2013) asked how tracking-freedom is possible for knowing about ourselves while tracking other objects allows such mistakes. Experimental results show that in a scene where several visual objects are moving and may occlude each other, a subject is typically able to visually track up to four moving objects [Pylyshyn (2007)]. When one externally perceives an object then the object may move relative to the viewpoint of the perceiver, or the perceiver may change her viewpoint, or an object may occlude the target object of perception. Across these cases, the subject has the capacity to track the target object. However, tracking mistakes are possible and they come from different sources. They happen due to the fact that an object may be perceived from different spatial perspectives because of the movement of the object or the subject. Without perceiving an object from different spatial perspectives tracking mistakes are only possible if there is more than one object. But neither of these are possibilities within bodily awareness. Thus bodily awareness is free from tracking-errors.

## VII. BODILY AWARENESS AS A BASIC FORM OF SELF-AWARENESS

Bodily awareness is free from discrimination mistakes and tracking errors. Similarly, discrimination mistakes and tracking errors cannot happen in self-awareness underpinning the use of 'I'. It is plausible that one cannot use 'I' for the wrong object or fail to discriminate oneself from something else or a background. The subject cannot use 'I' for something which is not an object or more than one object. This may well be a mark of the use of 'I' because it solves the Error-Freedom Puzzle. For these reasons, I propose that bodily self-awareness with a similar structure is a good candidate to be a predecessor of full-blown self-awareness and thereby the use of 'I'.

There is a long debate about whether bodily awareness is self-awareness [e.g. Cassam (1997) and Martin (1995)]. My aim is in some way different. I am trying to show that bodily awareness is a plausible candidate to provide primitive but not full-blown self-awareness (or is a precursor to it). This primitive self-awareness is perception and action-based.<sup>13</sup>

One knows about herself through bodily awareness and one only needs to develop the capacity to use 'I' for this object. Here is my tentative proposal for how primitive self-consciousness plays a role in the development of the capacity for first person reference. Before one is self-conscious one may experience an itch in one's shoulder and scratch it; the behaviour displays understanding of the self-relevance of the information. Developmentally, a subject starts with eating when she is hungry based on interoception, which is part of bodily awareness. At the next stage this turns into concrete bodily self-ascriptions (I am hungry) when 'I' is used for the object known from the inside. Subjects then start to understand that one uses 'I' for oneself (for the object one knows from the inside); this requires sensitivity to perspective taking, understanding that the perspective of others is different from one's perspective [Ricard et al., (1999), Smyth (1995)]. Finally, the subject may develop further complex capacities to understand the working of the mind – what is called by psychologists a 'theory of mind' – which enables her to move to more abstract descriptions (I think that ...) as she matures into an adult.

## VIII. BASIC PRIMITIVE SELF-AWARENESS SOLVES THE PUZZLES OF SELF-AWARENESS

To recall the puzzle we started with, if I suppose that I can only perceive myself from a spatial perspective from where other objects may

be perceived, I can never be sure which body is mine. If so, whenever I supposedly perceive myself, this awareness will require recognition of *this body as me* (two modes of presentation of the same object) which could be incorrect. However, when I act, I seem to act with my body without the possibility of trying to act with the wrong body. How can I be aware of myself without the possibility of being aware of the wrong object? I called this the Error-Freedom Puzzle.<sup>14</sup>

Acknowledging bodily awareness as a form of self-awareness solves the Error-Freedom Puzzle. Self-awareness grounds the differentiation of the self from other objects in the world. The structure of bodily awareness (zero-perspective, made possible by an internal architecture) offers a solution to the Error-Freedom Puzzle by explaining what rules out certain kinds of errors.

Bodily awareness provides an awareness of the body where the subject cannot be wrong that what she perceives is she herself. I have shown that external and internal space are perceived very differently. I propose that 'I' is used for the body which one knows through bodily awareness, the object one knows about without spatial perspective, identification, discrimination and tracking. Thus, when one perceives oneself from the inside through bodily awareness the relevant mistakes are not possible. Bodily awareness does not require an identity presupposition (that object is me) or a discrimination of oneself from other objects. This solves the Error-Freedom Puzzle.

I do not suppose that bodily awareness is necessary for developing self-consciousness, even if stereotypically this has to be the case. (A stereotypical table has some legs, but there could be a table without legs, a table might be hung from the ceiling.) Alternative developmental trajectories for self-consciousness are possible. I propose that whatever way the subject knows about herself, fundamentally, it should have a zero-spatial perspective. This marks the subject as different from objects around her for which one *has to have* a spatial perspective to have direct knowledge about.

Consequently, bodily awareness is a good candidate to be a form of primitive self-awareness. Due to its epistemological advantages, it provides a developmentally sound solution to the Error-Freedom puzzle.

## IX. CONCLUSION

There are internal – bodily awareness – and external ways of knowing of myself. Are these ways of knowing of myself equally good? I argued that bodily awareness has precedence over external perception of

oneself by providing a basic experiential form of self-awareness which is different from full-blown self-awareness. To this end I distinguished the perceptual structure of internal and external spatial perception. I argued for the Zero Spatial Perspective view on bodily awareness. *A spatial perspective* is a way things appear to the subject from a certain spatial viewpoint. A requirement on spatial perspective is that it can be shifted (even voluntarily) to another spatial perspective in the same modality and objects and events perceived in certain direction from it. I argued from the absence of shiftability and directionality to the conclusion that bodily awareness has a zero-perspective structure.

In bodily awareness, a sensation is mapped onto the body image and this explains why it cannot have spatial perspective, but has a zero-perspective structure. Mapping a location onto the body image is such that it does not tolerate a spatial perspective. I presented this structure as part of the explanation of why bodily awareness is free from discrimination and tracking mistakes – in comparison to external perception of oneself.

The zero-(spatial) perspective structure, which requires the sole-object characteristic and an internal architecture of bodily awareness, explains epistemological advantages of bodily awareness-based self-awareness. Uses of 'I' have certain marks; they are free from certain kinds of mistakes compared to uses of other terms. Bodily awareness is free from the same kinds of mistake and this makes bodily awareness a good candidate to be a basic form of self-awareness underpinning the uses of 'I'. Due to its epistemological advantages, bodily awareness provides a developmentally sound solution to the Error-Freedom puzzle. Such a form of primitive self-awareness may be constitutive in understanding the first-person phenomenon even if it developmentally precedes self-consciousness.

*Philosophisches Seminar  
CIN Philosophy of Neuroscience Group  
Eberhard Karls Universität Tübingen  
Bursagasse 1, 72070 Tübingen, Germany  
E-mail: orbankrisztina@gmail.com*

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## NOTES

<sup>1</sup> This is true on the assumption that the subject is neurologically normal. The mechanism enabling the registration of the self-relevance of the information may break down e.g., in some forms of schizophrenia.

<sup>2</sup> From feeling a sharp pain in my abdomen, I may infer that I have a kidney stone. But note that this kind of pain, at best, provides only indirect knowledge of the kidney stone.

<sup>3</sup> “For any two objects that are visually perceived, it makes obvious sense to ask both of the following questions: (a) Which of these two objects is farther away? (b) Do these objects lie in the same direction? [...] Neither of these questions makes sense, however, with respect to proprioception” [Bermúdez (1998), p. 153].

<sup>4</sup> For the sake of simplicity, we may add that the point of view differentiates in three dimensions: front/back, up/down and left/right. If the divide between up/down or left/right changes above the discrimination threshold of the subject, then it will be a different viewpoint. Similarly, the viewpoint has a directionality. For vision, it will be where one is heading and a cone built around it: the receptive field. In vision, there is a sudden drop of sensitivity where peripheral vision ends and this is captured by the cone metaphor. This is the best model only for vision. For touch, the points of contact with the object and the origin from where the contact points are computed matters [Klatzky (2003)]. Thus, the same object may be touched from different directions, from different viewpoints.

<sup>5</sup> My discussion only concerns sensations which have a felt location in the body, not cases like dizziness.

<sup>6</sup> Experiencing hunger or thirst could have a spatial component (in the stomach or throat), but this is not necessary. The idea will be that whenever one has a direct error-free knowledge of oneself this will *not* be from a spatial perspective.

<sup>7</sup> O’Shaughnessy (1980) introduced the short-term body image precisely for this.

<sup>8</sup> Similar ideas can be found in O’Brien (2007), Recanati (2007), Evans (1982), and Frege (1956).

<sup>9</sup> Peacocke’s notion of ‘subject-reflexivity’ of mental event is a way of characterising the self-reflexive structure of the content [Peacocke (2014), pp. 12-13]. The notions of ‘private/first person access’, ‘sole-object character’, ‘reflexive structure’ characterise different dimensions of this complex structural feature: only  $x$  receives information about only  $x$ .

<sup>10</sup> This applies to rewiring cases, such as rewired proprioception or rewired nociception, which on my picture are neither internal nor forms of bodily awareness. In an internal information channel (hence IC) there is only one can-

didate to be known; the subject has no means to recognise more than one object, or recognise which one from many objects is perceived. Rewiring requires a system which enables the subject to know which object she knows about and this individuation/recognition system would turn an internal IC into an external IC of multiple objects.

<sup>11</sup> Perry describes the reflexive/circumstantial structure of information processing. For an x-ray of a tooth, the relevant kind of visual mark “on the x-ray shows that the tooth which *the x-ray itself* was exposed has a cavity” [Perry (2002), p. 175]. This reflexivity captures some part of how reflexivity could be part of the structure of the information processing. The x-ray cannot be about anything else but the tooth it was exposed to. Recanati (2007) suggests that the subject is not in the content of internal perception, but is a presupposition supplied by the fact that the information was acquired through an internal channel.

<sup>12</sup> See footnote 1 for the enabling conditions of this capacity.

<sup>13</sup> There are other multiple layered theories of self-awareness. Rochat (2003) distinguishes 5 stages of self-consciousness, relying on Gallup’s self-awareness test.

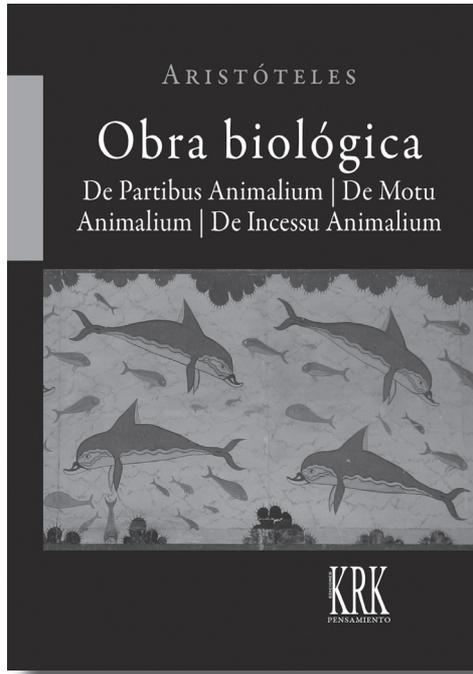
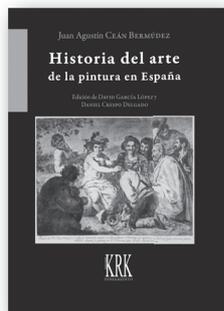
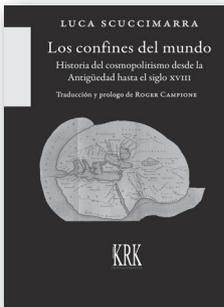
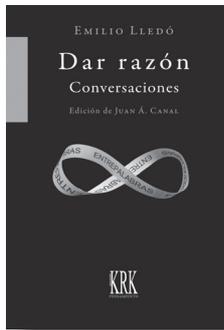
<sup>14</sup> There is a second puzzle concerning self-awareness. Whenever I know about myself from a perspective I have to presuppose that *this object*, which I am acquainted with, *is not me*. In this case ‘me’ in the presupposition *this object is me* again requires an identification presupposition. This will lead to an *Infinite Regress*. So it seems I have to know about the object which is myself without presupposing that *this object is me*. In the case of bodily awareness either there is no identification presupposition (there is a first-person mode of presentation of the object, my body) or if there is a presupposition then it cannot go wrong. In the second case, it cannot be true that this object (known through proprioception) is not me given that the judgement is based on an internal information channel (like proprioception). Thus bodily awareness stops the regress Shoemaker (1968) p. 561, discussed an infinite regress regarding immunity to error through misidentification and self-knowledge; my version concerns primitive self-awareness.

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**KRK**

PEDIDOS  
correo@krkediciones.com  
www.krkediciones.com