



Review article

Explaining the felt location of bodily sensations through body representations



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ABSTRACT

Why are bodily sensations felt on specific body parts? This paper discusses the view according to which we need body representations to account for the felt location of bodily sensations. My aim will be to consider whether or not some claims linked with that view are substantiated (namely, that all of our grasp of the spatiality of our bodies must come from bodily sensations, that the representation of the body can determine bodily sensations surmounting sensory input, that the content of body representations cannot be action-oriented). To do this, I first introduce and assess Brian O'Shaughnessy's seminal version of the representationalist approach to bodily sensations. Next, I will inquire into a purported objection to any version of the approach, showing its inadequacy. Finally, I will concentrate on Frédérique de Vignemont's variant of the representationalist view, trying to pin down a few of her assertions. My conclusion will be that the scope and strength of the representationalist position in regard to the aforementioned claims is different from what it is usually thought to be.

1. Introduction: The problem of the location of bodily sensations

If we are bitten by a mosquito, then we feel not just the characteristic itch but we are also able to tell the place of the itching. So, together with their intrinsic qualitative aspect, bodily sensations apparently bring with them a spatial aspect.¹ But, are bodily sensations literally located on the body parts in which they are felt? It seems that they are not: sensations are psychological entities, and to that extent they must take place in the brain. What, then, explains the fact that despite being in the brain, bodily sensations seem to us to be located on specific body parts?

An answer that may come immediately to mind is that the felt location of bodily sensation is the place of its cause. However, some physical events on certain body parts may cause bodily sensations that are felt somewhere else, which are described as *referred sensations* (O'Shaughnessy, 1980). Other attempts at a definition of the felt location of bodily sensations can be equally discarded: the place where we believe (or are inclined to believe) the cause of the sensation is, the place in objective physical space in which the

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¹ Sensation is sometimes defined as the process in which a sensory receptor is stimulated, making the brain to interpret it as sound, image, odor, taste, pain, among other qualities, whereas perception is consequently defined the process of making sense of the information coming from sensation (see Mather, 2016). In this sense, it is thought that without perception sensation would be raw feeling (Russell, 1912), and perception without sensation would be impossible (see O'Shaughnessy, 1980). However, in this paper I employ de Vignemont's (2017, 2016a, 2018) characterization of bodily sensations as items endowed with both qualitative character and spatial content (typically related to spatial properties of the stimulus and the sensation's location on the body). To that extent, bodily sensations (sometimes also called, bodily experiences) go beyond the mere qualitative and phenomenal character customarily ascribed to sensations, including a certain "aboutness" (that is, conveying information about body parts or body areas) but without being labeled as perceptions (perhaps insofar as what they present is not a discrete perceptual object).

relevant body part is, the place in the biological body where it seems to be, and so on (see O’Shaughnessy, 1980, p. 222 et seq., and Armstrong, 1962, p. 85 et seq.)

Difficulty to define the felt location of bodily sensation may lead one to the thought that the problem is assuming that bodily sensations have an inherent spatial component. It could be said that bodily sensations exclusively have a qualitative aspect and that this qualitative aspect is different depending on the stimulated body part. Alternatively, one could contend that the location of bodily sensations should be specified in terms of motor abilities; that is, as the place we *know how* to reach when a body part is stimulated. However, against the first suggestion, we find that there can be a difference in the felt location of sensations that are qualitatively indistinguishable. Against the second suggestion, neuropsychological cases have shown that it is possible to know how to get to the location of the stimulation in the absence of any sensation whatsoever, such as numbsense patients (de Vignemont, 2010, 2018).

In this paper I want to delve into a different way to explain why bodily sensations seem to us to be located on specific body parts, which might be called the *representationalist approach*. According to this approach, the specification of the location of bodily sensations involves the existence of a certain spatial representation of the body. Brian O’Shaughnessy (1980, 1989, 1995) can be considered to be the first prominent advocate of such view, which he calls *the body-image hypothesis*. However, my focus will be Frédérique de Vignemont’s *body-map theory* (de Vignemont and Massin, 2015, de Vignemont, 2018), probably the most recent version of the representationalist approach and a refinement of O’Shaughnessy’s *body-image hypothesis*. I will argue that, despite being essentially right, the representationalist approach (both in O’Shaughnessy’s and in de Vignemont’s version) has not really established some of its claims and it still has a few key points to clarify. Therefore, the actual scope and strength of the representationalist approach is different than has previously been thought.

I will proceed in three steps. In the first step, I will illustrate how O’Shaughnessy (1980, 1995) argues for his body-image hypothesis, with the aim of making clear what he achieves to demonstrate (particularly as regards an idea coming from Elizabeth Anscombe, 1957, 1962). In the second step, I will consider an alleged objection to any version of the representationalist approach: that a representation of the whole body is not necessary and that a bunch of local representations are enough for the task. The third step will consist of an analysis of the two main lines of argument that de Vignemont uses to motivate the body-map theory. I intend to address some obscure elements in de Vignemont’s first argument, and to show that the scope of her second argument is more limited than it might seem.

2. The ‘body-image’

O’Shaughnessy’s explanation of the spatiality of bodily sensations depends on the notion of a body-image (1980, 1989, 1995): he contends that an awareness of the body together with some awareness of its general spatial traits is a necessary condition of the appearance of a bodily sensation on the body. He then claims that this second awareness amounts to the possession of a kind of ‘internal picture’ of the body, the *body image*. The body image (or, sometimes, long-term body image) is a general sense of the body endowed with spatial content (1995, pp. 184, 188). In his view, bodily sensations can only appear on a body that is so internalized: they appear “*first and foremost (...) onto the body-image; and thence, and only secondly, albeit immediately, onto the body itself*” (1980, p. 211). In this regard, he asserts that the content of proprioceptive awareness at a given moment is caused by the conjunction of somatosensory information and the body image.

The way O’Shaughnessy (1980, 1995) argues for the body image as an account of the spatiality of bodily sensations can be seen as an argument to the best explanation where other candidates have been proved to be inadequate. Let us think, for example, that instead of a body image it is the body itself that explains the spatial content of bodily sensations. According to O’Shaughnessy (1995), the *explanandum* requires an *explanans* already spatially endowed, and the body itself meets this requirement. However, if the *explanans* is the body itself, then we can only explain the spatial content of *veridical* bodily sensations but manifestly not that of phantom limb sensations. This might illuminate his reply that what we need to explain the spatial content of proprioception is a representation causally intervening between the body itself and individual bodily sensations with their spatial regularity (and capable of explaining this spatial regularity by its possession of spatial content).

O’Shaughnessy (1995) considers another option: bodily sensations themselves are endowed with spatial content. It could be said that they bring to awareness their own shape, which in turn maps that of the body, thus explaining the spatial content of proprioception. But, as Bermúdez (1998) has also argued, in order to possess their spatiality, bodily sensations require a frame of reference. O’Shaughnessy surmises that “*the spatial properties of bodily sensations cannot be the epistemological foundation of the spatial content of proprioception*” (1995, p. 191). In being represented as spatially endowed, bodily sensations presuppose a representation of a spatial frame of reference, of something already endowed with spatial content.

A third alternative is a sort of three-dimensional image generated by sensory inputs, which he calls I_{3D} . Among other characteristics, I_{3D} constantly mutates as the body moves and its content determines our immediate knowledge of our body. As an additional feature, the posture of the moment would have a direct cerebral effect in the current I_{3D} , so this knowledge could be had independently of the existence of a sensation. This third feature is particularly relevant for the purposes of our discussion, insofar as it is the hallmark of Anscombe’s conception of how non-observational knowledge is acquired (Anscombe, 1957, 1962).

O’Shaughnessy (1995) notes that this would be an *anaesthetic* knowledge of the body, not proprioceptive experience—which he characterizes as feeling the body. Indeed, the deliverances of I_{3D} could not be considered bodily sensations, but this does not prove that this kind of immediate anaesthetic knowledge of the body is impossible. In fact, the line of argument O’Shaughnessy uses to reject any role for such knowledge is not tenable: that without bodily sensations the will would not have access to the body. As a matter of empirical fact, we know that the bodily will can have its immediate object in the absence of any proprioceptive experience (as in deafferentation; see Gallagher and Cole, 1995). Bodily sensation cannot be the only way for the will to have access to the body.

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