

INTRODUCTION

Bodily awareness and the body

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The aim of this handbook is to provide a comprehensive overview of philosophical and scientific research concerning human bodily awareness. The handbook contains thirty-three entries organised into seven thematic sections, engaging with a range of recent and abiding issues in philosophy, psychology, neuroscience and computer science. These entries reflect the fact that in roughly the last three decades there has been a vast, renewed interest in the philosophical implications of bodily awareness, as well an explosion of psychological and neuroscientific studies of neural representations of the body.

Much of the work discussed in this handbook shares the common aims of understanding the nature and structure of our awareness of ourselves as bodies and understanding the influence of this awareness on our psychological life more broadly. Indeed, the study of self-consciousness in psychology, psychiatry and neuroscience has been deeply intertwined with the study of how we neurally represent, use and experience our bodies, and how bodily changes and particular kinds of bodily interaction with the world can affect our experience of the world in relation to ourselves. Moreover, these insights are increasingly being exploited by computer scientists and human-computer interaction theorists in the design of new technologies, which in turn provide new possibilities for empirical study, and even re-conception of the nature of the body.

It is perhaps hardly surprising, given such a broad range of work across different disciplines, that the notion of bodily awareness is hardly univocal. There are several different notions of ‘body’ and ‘awareness’ operative in these discussions. So, before summarising the thematic sections of the handbook, we begin by distinguishing some broad readings of each notion, with a view to highlighting some of the general conceptual and theoretical problems associated with bodily awareness.

0.1 ‘Body’

Your body – a human body, we presume – is a physical (or material) object. It is distinctive in its form and complex internal structure, but it is a physical object, nevertheless. Your body is thus a part of the physical world like any other. But even though you can become aware of your body in all the ways you can be aware of other physical objects, perhaps there is no other physical object that you can be aware of in *all* the ways in which you can be aware of your body. You can

take a glance at your hand, catch a whiff your own sweat, hear the crack of your knuckle, feel the resistance of each hand in the other, or taste the blood from a cut in your finger. But perhaps your body is the only physical object that you also be aware of ‘from the inside’. This expression, ‘from the inside’, is commonly used in the philosophical literature to pick out certain distinctive ways in which you experience your body. These are manifest in entirely mundane events: feeling your legs crossed, feeling pressure in your feet as you stand, feeling pressure in your abdomen after eating, feeling fatigue in your muscles after an extended period of activity, or feeling pain in your back after an extended period of inactivity.

But is it only your own body that you can experience from the inside? There are multiple forms of this question. One form raises the possibility of experiencing events occurring to or within what are (by some criterion) non-bodily objects, but in just the same manner as you might experience events occurring to or within your body. For instance, is it right, as Lotze (1888) suggests, that as you write or draw, you experience a feeling of pressure, not just in your hand, but *at the tip of your pencil*? And with recent rapid advances in immersive virtual reality, might each of us be able to experience a variety of virtual bodies in just the same way as we experience our human body? Another form of the question raises perhaps more fanciful possibilities: can you be aware of another human body from the inside? This is a long-standing trope of science fiction. For instance, central to the plot of *Strange Days* is a device that can be worn to record the (sometimes distressingly painful) experience of one person from the inside and replay that experience for another. This is a (wireless) variant of what are sometimes called ‘cross-wire’ cases: imagined cases in which your somatosensory system can be causally connected to another human body such that it gives rise to the very same experience as would be the case were it caused by your nervous system within your own body.

But perhaps all that these cases show is that there are experiences which are *similar* to our experience of our bodies from the inside, but not sufficiently similar to count as experience of our bodies from the inside. For instance, as compelling as cross-wire cases are as props for imagination in science fiction, such cases are less convincing as devices for thinking through the conceptual implications of bodily awareness. For, as Lea Salje (2017) argues, they do not give good reasons for thinking that such experiences are just the same in all the relevant respects, rather than, *e.g.*, a means of being aware of a human body in ways that would be *different* from your experience of your own body. Or, even if we assume that your experience would be just the same in all the relevant respects, this may be simply because the mechanism generates an experience of *your* body from the inside by unusual means.

Whether or not it is true that you cannot experience any other physical object than your body from the inside, the human body is a physical object that has a special status for each of us. For each of us feels ‘peculiarly attached’ to a particular body, as P.F. Strawson (1959/2003: 93) put it (with a fair degree of understatement). And even Descartes, famous for raising the conceptual possibility that you are separable from your body, was also keen to recognise a range of experiences in which you feel ‘intermingled with’ your body (Descartes, 1642/1984: 56). Indeed, he introduced a metaphor that you might use to intuitively distinguish your experience of your body through seeing, smelling, tasting, or hearing it, or even feeling its touch, from your experience of your body from the inside. With respect to all the former ways you have of experiencing your body, Descartes suggests, you are in a position similar to that of a sailor experiencing events on his ship. Failing serious injury, this is manifestly not the position you are in with respect to your own body when you experience it in any of the ways picked out by the term ‘from the inside’.

A major complication of the very idea of the human body as a physical object is that most of our encounters with such objects are encounters with *human beings* – living creatures with

the capacity to perceive, think and act. Characterising human beings simply as physical objects can arguably obscure not only the fact that they are alive, but also that they are psychological subjects (McDowell, 1983; Cockburn, 1990). Moreover, a conception of the human body as simply a physical object may have the implication (for some) that it does not have any psychological properties, that it is not the body itself which perceives, thinks and acts. It is at least not obvious how the body, conceived as something essentially non-psychological, can form an integral part of our psychology (as many of the entries of this handbook will claim it does).

There are very different ways in which one might go about resolving tensions such as these. For instance, one approach would be to understand the role of the body itself as indirect in a certain respect, as mediated by representations of the body. On such an approach, it is not the body itself that figures in our psychological life, rather it is the body as represented in our brains that does so (de Vignemont, 2018). In an extreme form such an approach might yield an explanatory dualism – what one might call, following Grush (2003), a neo-Cartesian explanatory framework – making the body itself essentially irrelevant to psychological explanations (Alsmith and de Vignemont, 2012). Just as internal representations may ‘stand in’ for the worldly objects and events you experience and think about and act upon, so internal representations of the body may ‘stand in’ for the body you experience, think about and act with. However, an explanation of the mind in terms of representations does not require a picture of the mind as fundamentally separate from that which is represented. Consequently, even if body representations play an essential role in explanations of bodily awareness, the explanatory role of the actual body may be indispensable (Alsmith, 2019).

A contrasting approach would be to conceive of the human body as the form of a psychological subject. For instance, on a phenomenological conception of the body (and indeed, the mind), the body’s role in conscious experience is fundamental (Gallagher, 2005). Such an approach might emphasise your experience of your body from the inside, as discussed above. It might also emphasise that your body itself sets the possibilities and limitations of your experience in a way that no ordinary object does. It is not simply that you experience the world through and with your body – you experience the world *from* your bodily perspective, inextricably shaped by the ways in which your body’s structure and dynamics constrain that perspective (Husserl, 1952/1989, 1973/1997; Drummond, 1979). It would be consistent with these observations to conceive of your body as not just a special kind of object, but rather as what you are as a subject of experience. On this conception, your experience of your body from the inside is not simply a kind of privileged access that is contingent upon a nervous system being embedded within a particular physical object. Experience of your body from the inside is rather the most basic form of your experience of yourself, the most basic form of self-consciousness. Against this background, to the extent that your body is conceived as a physical object – either by yourself, by someone else, or in some theoretical context – there may be a failure to capture its true psychological significance (Merleau-Ponty, 1945/2002; Sartre, 1943/1992).

But there is another conception of the human body which takes its psychological significance to be bound up with its nature as a physical object. This approach is associated heavily with an Oxonian tradition that begins with Strawson’s (1966) discussion of Kant’s First Critique, the themes of which were the inspiration for two influential edited collections in the early 1990s (Eilan et al., 1993; Bermúdez et al., 1995). Proponents of this approach also appeal to the range of ways in which the body constrains our perspective or point of view on the world (Bermúdez, 1998). But they emphasise that to have such a perspective requires rudimentary spatiotemporal awareness (and perhaps causal understanding) that is only available in virtue of our bodily nature (Evans, 1982; Campbell, 1994). The central idea is that your capacity to be aware of yourself as a subject is inextricably linked to your capacity to be aware of an objective world. Moreover,

these two capacities are interanimating. Your ability to perceive objects as parts of an objectively existing world arises concomitantly with your awareness of yourself as an object within that world, as a spatiotemporal entity amongst others. On this approach, an awareness of yourself as a physical object, something that has a traceable spatiotemporal history, is precisely what is required for you to identify certain events as your own experiences, and to be aware of yourself as the very same subject of a diverse range of experiences (Cassam, 1997).

0.2 ‘Awareness’

Awareness is one of the most general terms in our mental vocabulary. We have many *ways* of being aware. We have at least as many ways of being aware as we have modes of sensory perception; often when you perceive something through your senses, you become aware of it (as you are surely aware of these words, for instance). As noted above, you can of course be aware of parts of your body in all the ways in which you might perceive any physical object. But is your awareness of your body *from the inside* a form of perceptual awareness? Following early work by Armstrong (1962) and Pitcher (1970), there have been several defences of the view that bodily sensations, such as feelings of pain and pressure, are in fact perceptual experiences of bodily events. Matters of controversy have concerned whether the events we experience in bodily sensations are genuinely mind-independent (Vesey, 1961; Armstrong, 1964) and, more recently, whether their feel could be accounted for solely in terms of how they represent the body (Tye, 1995a; Block, 2005) – see Aydede (2009) for critical discussion on both these counts. But even leaving these disputed issues aside, awareness of the body from the inside is unusual in several further respects.

Consider an orthodoxy in thinking about sensory perceptual experience: sensory experience is sense-specific; it decomposes into unimodal experiences generated by sensory systems with dedicated sensory receptors, visual, auditory and olfactory receptors. Recent work has argued forcibly that this orthodoxy is both conceptually and empirically inadequate (O’Callaghan, 2019; Briscoe, 2016; Briscoe, 2017). If anything, the case with respect to bodily awareness is even stronger. The sheer variety of the sensory receptors involved in your awareness of your body from the inside, and the variety of ways in which you are aware of your body, seems deeply in tension with the notion that there is a specific ‘body sense’ (Eilan et al., 1995).

A brief list of the relevant sensory receptors includes: cutaneous receptors embedded within your skin; as well as, to use Sherrington’s (1906) influential terminology, ‘proprioceptive’ receptors embedded within your muscles, joint capsules, tendons, and skin; ‘interoceptive’ receptors embedded within your glands and viscera; as well as several structures dedicated to tracking the relation between your body and the gravitational field within the otoliths of your inner ear (Lenggenhager and Lopez, 2015) and perhaps even within the kidneys and the vascular system (Mittelstaedt, 1996; Vaitl et al., 2002).

These sensory receptors enable a broad range of ways in which you can be aware of your body ‘from the inside’. There is your awareness of the position and movement of your body parts, which, e.g., Bermúdez (1998) calls somatic proprioception (developing Sherrington’s terminology). Sometimes awareness of the movement of our body parts is separately referred to as kinaesthesia (Goodwin et al., 1972). And in the phenomenological tradition, the term is sometimes reserved to capture your awareness of the *potential* of your body’s movements (Husserl, 1952/1989). What all these have in common is that they have relatively determinate spatial content. As Armstrong (1962) notes, it is this determinacy of spatial content which some forms of bodily awareness lack, in particular those he calls bodily feelings. And here Armstrong is pointing to what Ryle (1951) referred to as ‘general conditions’ we undergo when we are

hungry, tired, or in moods such as being anxious, *etc.* There is some overlap in phenomenological quality between these and the slightly more spatially determinate visceral feelings associated with visceral states and activities, such as feeling your stomach or lungs reaching capacity, or feeling an increase in your heartrate – enough that they all fall under the umbrella of the term interoception (Tsakiris and De Preester, 2018).

There is also an overlap in affective quality between episodes of interoception (in this broad sense) and some of the more spatially determinate ways you can be aware of your body when experiencing pleasant sensations, such as orgasms, or painful sensations, such headaches. These latter, painful sensations, have been much discussed in the recent history of philosophy, but largely in an instrumental fashion, as a means of talking about a vivid form of conscious experience – and, moreover, largely without much sensitivity to psychological and neuroscientific detail (Hardcastle, 1997). When Armstrong and others (e.g., Pitcher, 1970) argued that pain is a form of perceptual awareness of your body, that view was rather more controversial than it is today. However, perhaps less controversial was Armstrong's (1962) characterisation of sensations of pressure and vibration we become aware of when objects impinge the body's surface as forms of perceptual awareness of your body. Armstrong referred to these as transitive sensations, distinguishing them from, e.g., pains, which he called intransitive sensations, because the latter, unlike the former, seem to represent some object beyond themselves, namely that which impinges the body's surface.

This raises a further peculiarity of bodily awareness: it is a form of awareness on which arguably many other forms depend. It is well-established that proprioceptive and vestibular information play crucial roles in multisensory integration of spatial information (Howard and Templeton, 1966). This fits well with a persistent theme in the phenomenological tradition, that our all perceptual awareness of the world is dependent upon our awareness of our bodies (Husserl, 1973/1997; Merleau-Ponty, 1945/2002). But the case is most obvious in awareness of the world through touch. For instance, as you perceive a book you hold in your hands, you may be tactually aware of the texture of its surfaces, its weight, its solidity. According to a long tradition of theorising about touch – stretching at least as far back as the Ancients in Western philosophy (Sedley, 2018) – your tactual awareness of these properties of the book depend upon a more direct awareness of parts of your body, an awareness of how they are affected by their contact with the book as you hold it. This has sometimes be described as the 'duality' of touch, or as Katz (1925/1989) puts it, the 'bipolar' quality of touch, consisting in both your experience of the object you touch and an experience of how your body is affected by its contact with that object. Indeed, one way of characterising the kind of bodily awareness involved in touch is that you cannot be aware of your body in these ways – feeling pressure and resistance in your hand and arm as you hold the book – without also thus being aware of the corresponding properties of the object you touch – the book's solidity and weight (Richardson, 2013).

One set of issues here concern whether *being conscious* is essential to awareness, such that you cannot be aware without being consciously aware, or whether being consciously aware is just one of the forms that awareness can take. For some, questions concerning the nature of our bodily awareness, and corresponding questions about its roles in our psychological life, are naturally framed as questions about how bodily information is encoded. It might be claimed that, whilst such information could be the content of a conscious experience of the body, this is not required for it to shape conscious experience of other objects. For instance, Fulkerson (2014), claims that in many cases of tactual experience, you are aware of your body in only the limited sense that you might *potentially* experience your body in its relation to the object you perceive.

However, this may be seen as a failure to recognise the way in which the body usually figures in your conscious life. Certainly, it is the exception, rather than the rule, that your

body is an object of your attention. Moreover, when it is, this is usually as a consequence of disfunction (Leder, 1990). But that is consistent with the possibility that your awareness of your body in its ordinary functioning is a form of conscious experience that is ‘attentively recessive’ (O’Shaughnessy, 1995), ‘non-observational’ (Gallagher, 2003), or ‘pre-reflective’ (Legrand, 2006; Sartre, 1943/1992), to use some of the (not quite equivalent) phrases one finds (used in various ways) in the literature.

What all these phrases have in common is that they suggest that there are ways in which you are aware of our body – indeed, perhaps fundamental ways in which you are aware of your body – that might systematically elude introspection. This makes it especially difficult to settle substantive debates about the phenomenology of bodily awareness (Alsmith, 2012; Schwitzgebel, 2007). For instance, a matter of considerable recent debate is whether the fact that the body you are aware of from the inside is your own body somehow shows up in your experience. One way of stating the issue is whether there is a distinctive experience of bodily ownership over and above all the ways in which you experience your body from the inside. Is there a distinction to be drawn within the range of bodily experiences you might have, such that some of these present your body as your own and some do not?

If there is such a distinction to be drawn, then an obvious theoretical role for an (albeit elusive) experience of bodily ownership would be to ground your disposition to judge that you do indeed have a body and that the body you experience from the inside is your own. By contrast, on what M.G.F. Martin (1995: 273) refers to as a sole-object view, *any* awareness you have of a body from the inside can *only* be of your *own* body. If that is correct, then the idea of an elusive, yet distinctive experience of bodily ownership over and above your awareness of your body from the inside is simply a superfluous theoretical invention. As Bermúdez (2011: 166) puts it, there are ‘facts about the phenomenology of bodily awareness (about position sense, movement sense, and interoception) and there are judgments of ownership, but there is no additional feeling of ownership’. Given the elusive nature of bodily awareness, such a dispute can hardly be settled by introspection, especially as it may be hard to distinguish any putative experience of bodily ownership from a corresponding judgement of ownership. Indeed, on some views, experiences of bodily ownership may occur only when one is engaged in some mental activity which involves thinking of a body as one’s own (Alsmith, 2015). Accordingly, much of the contemporary debate in this area has involved review of empirical phenomena which seem best explained by appeal to a distinctive experience of bodily ownership (see especially, de Vignemont, 2013, 2018).

0.3 The handbook

We turn now to an overview of the seven sections of the handbook. We begin with a slightly more extensive discussion of the first section, on Epistemology and Metaphysics, to show how deeply issues concerning bodily awareness are intertwined with abiding philosophical issues concerning knowledge and reality, using a famous argument of G.E. Moore’s as a vehicle for this purpose. For the second section, on Historical Approaches, we attempt to make fruitful connections between the recent history of the science of bodily awareness and the longer history of the subject, stretching back to the Ancients, through early modern philosophy and twentieth-century phenomenology and neurology.

For the remainder of the sections, we largely let the contributions speak for themselves, providing only a little context before running through a brief description of each entry. Contributions to the third section, on Body Representations, focus on theoretical issues and empirical work relevant to understanding the nature, function and structure of mental