Embodiment and Subjectivity – The Origins of Bodily Self-Awareness

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
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2014

Abstract

What is the role of the body in our conscious mental life? How does the body shape our sense of self? In what follows, I explore how our sense of self involves a sense of bodily self. I explore how we are aware of our bodies in our everyday being in the world, and I frame my approach using a phenomenological distinction between the body as subject and the body as object. I consider the sensory modalities by which we are aware of our body as the subject of experience – proprioception (the sensory modality responsible for providing information about body posture, limb location, and movement) and interoception (the sensory modality responsible for providing afferent information about visceral organs, bodily temperature, pain, body chemistry, etc.) – and I develop a model of how to understand these senses in relation to our typical bodily self-awareness. In doing so, I argue for the need to enrich our account of perception to include a particular form of bodily perception – bodily-self perception.
I close by looking at the consequences of my view for understanding a specific, and much studied form of bodily experience: the sense of body-ownership. I argue that our current interpretations of cases such as the rubber hand illusion and virtual whole body illusions fail to take into account the distinction between our awareness of the body as subject and our awareness of the body as object. As a result of this failure, these illusions have been taken to show that our sense of self as bodily might not be entirely reliant on our own body. I show how this interpretation is false, and why a consideration of our interoceptive awareness of the body as subject is crucial for properly understanding just what these cases really show in regards to our sense of self as bodily.
Acknowledgments

I am truly blessed to have had two great mentors guide me along my philosophical path, and to them I owe an incredible amount of gratitude. My first, who also became my supervisor, is Evan Thompson. I first encountered Evan as an undergraduate at York University, and it is in his philosophy of mind course (my first in this area) that my passion for issues surrounding consciousness was ignited. I am thankful for his undying support and guidance throughout these many years, without them I would not have found my way to where I am now. The second person that I am honored and blessed to count as my mentor is Mohan Matthen, to whom I simply cannot express how much I owe. Mohan’s belief and trust in me, as well as his critical engagement with my work, strong words of encouragement, and never-ending support have helped me grow as a scholar in ways that I am still uncovering.

Of course, I could not have developed the ideas in this manuscript or become the scholar that I am today if it weren’t for the stellar community of thinkers that I’ve had the great fortune of interacting with. There are simply too many to name all here, but in particular I want to thank Dominic Alford-Duguid, Andrew Brook, Matthew Fulkerson, Matt Habermehl, Aaron Henry, Thomas Metzinger, William Seager, Sean Smith, and Dave Suarez — you all have a hand in writing this thesis and I thank you for it.

Lastly, I could not have even begun or completed a project of this magnitude if it weren’t for the love, support, and encouragement of my incredible family and friends. It is to my parents, Diane Desjardins and Berthold Kühle — who always told me to do what I love — my brother, Jaisen Kühle — who pushed me to always work harder — and my amazing friends, Sareh Pouryousefi and Diana Heney— who kept me grounded and sane throughout the entire process — that I owe the most love and thanks.
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Chapter 1: Embodiment & Subjectivity

1. Introduction

I am a thinking, feeling, experiencing being with a sense of self. I am an embodied being: I experience myself as a body — my body — that is located in space; I experience the world by my bodily involvement with it. In some respects these seem like two distinct aspects of my being: I am a thinking, mental being, and I am also a physical, bodily being. Yet, in many other respects these seem not to be distinct at all: I sense myself as essentially embodied. That is, I do not use my body to navigate the world in the same way a sea captain controls a ship to navigate the ocean. Rather, my relationship to my body, and my experience of my embodiment are far more complex. How, then, should we explain the fact that our sense of self is a sense of being embodied? Understanding our embodiment — what constitutes the sense of being embodied and how this relates to our sense of self — is a difficult issue. However, it is an issue that has much value in being explored because understanding our embodiment will lead to a deeper understanding of the self, “[f]or if the self is that which perceives, acts, and thinks, and perceiving, acting, and thinking must be understood in bodily terms, then the metaphysical lesson is obvious: the self is, first and foremost, an embodied self.”

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1 This analogy comes from Descartes’ sixth meditation, see Descartes: Selected Philosophical Writings, trans. by J. Cottingham, R. Stoothoff, & D. Murdoch (Cambridge: Cambridge University Press: 1988), 116.

the exploration into our sense of embodied self by considering our bodily awareness from our experiential perspective.

In his paper, “The Embodied Self”, Quassim Cassam sets out three main areas of investigation one must consider in order to provide a complete account of our embodiment. The first is metaphysical. Here one must answer the question: what is the relation between a person and his or her body? We might want to argue that a person is something of an entirely different nature from the body and that they are, thus, two distinct things, as Descartes argued. We might want to argue, conversely, that a person and his or her body are one and the same thing, thus taking a materialist approach. Or, we might want to give an account that sits somewhere in between these two extremes. To be sure, this area of inquiry is of importance, but not one that I will concern myself with in this project.

The second area of investigation is epistemological. Here one asks: what, if anything, is special about the knowledge we have of our own bodies? Take, for example, a pain in my finger. Although I may be wrong about whether or not the hammer is what caused the pain, I cannot be wrong about the feeling of pain, and about my being the subject of this painful experience. There is, what some have argued\(^3\), an immunity to error with regards to certain knowledge I have on the basis of my bodily awareness. What is at issue, then, is how I can know myself to be immune in

\(\text{\footnotesize\(^3\) See Gareth Evans, }\textit{Varieties of Reference}\text{(Oxford: Oxford University Press, 1982), and Quassim Cassam, }\textit{Self and World}\text{(Oxford: Oxford University Press, 1997).}\)
this way with respect to certain bodily states? Once again, these epistemological concerns are not part of my project here.

What is of interest is the phenomenological area of investigation. The concern here is to answer the following question: how exactly is each of us aware of his or her body from within? On the face of it, we each enjoy a special connection to our own body, and this is most obviously exhibited in the fact that we can feel certain parts of it in a way that others cannot — the fact that we can feel our body from the inside. But what is it about this connection that affords us this particular kind of awareness, a bodily self-awareness? How exactly do we come to be aware of our body in this manner? Perhaps it is a perceptual awareness. If it is perceptual in kind, then one possible implication is that we perceive our body in the same way that we perceive other things in the world, namely, as an intentional object. Yet, there seems to be a way in which we experience our body not as an intentional object, but as the subject of our experience. I do not lose touch with my body the way I do with worldly objects that I am no longer aware of. My body is always there for me, with me, as me. So, how exactly am I aware of my body: is it as an object, a subject, or both?

My interest in this thesis, then, is to explore our bodily awareness in order to gain an understanding of how our sense of self might be constituted by a sense of being an embodied self. Specifically, I am interested in the question of how our body presents itself experientially. To be clear I will not concern myself with all areas of investigation just described. Rather, I will focus exclusively on the last area mentioned: that is, I will concern myself solely with the phenomenological issues concerning embodiment.
2. **Varieties of body awareness**

We are aware of our body in many ways throughout our daily life. We are aware of itches, tickles, sore feet, grumblings in our stomach, whether we are sitting, standing, laughing, or frowning. Our body seems always to be a part, in some manner, of our overall awareness of the world. Yet, it remains unclear what exactly constitutes this bodily awareness. Although the fact that we are aware of our body is obvious, providing an account of this awareness is not obvious at all. The body presents itself in many ways, and so we might describe our bodily awareness as revealing multiple bodily appearances.

For example, I am aware of my body as *mine*: this body is *my* body, *my* forearm is burning. In this respect, my bodily awareness involves a sense of body-ownership. I am also aware of my volitional influence on my body: this body *engages* and *acts* in the world, e.g. I am *running*. In this respect my bodily awareness involves a sense of agency. I also take my body as an object in the world, with particular features and characteristics: my body as *big* or *small*, *short* or *tall*. My bodily awareness in this respect involves a body image. But there is another, unique element to my bodily awareness that is often overlooked: my body is also given to me as *subjective*.

My awareness, in this respect, is of a bodily subject of experience. That is, my body is not merely that *with* which I experience the world — in the way that, say, a pair of glasses I wear is an object with which I experience the world — but rather my body is that *through* which I experience the world — unlike with my glasses which I can remove and nonetheless continue to
experience the world, my body is not something I can remove — it is always present in my experiential consciousness. Indeed, it is the only means through which I can experience the world. Insofar, then, as my body is subjective, my bodily awareness is a kind of self-awareness: it is an awareness of my self as bodily.

3. The Project

My interest in this project is to consider this particular, and poorly explored form of bodily awareness — bodily self-awareness. My goal is to account for how the body is experienced as the subject of experience, that is, how bodily awareness constitutes the sense of being a bodily self. In what follows, I provide an account of what bodily self-awareness is and how it arises. Insofar as my concern is with how we experience our body, my project is driven by two phenomenological questions: First, what is it by virtue of which we enjoy an awareness of the body as subject? Second, what kind of awareness is our awareness of the body in this manner, i.e., perceptual, non-perceptual?

The reason I take on the project of answering the first question is because bodily awareness as it pertains to the body as subject has not been adequately explored by those theorists concerned with issues of embodiment, as we will shortly see. For the most part, those working on issues of embodiment have focused mainly on exteroceptive perception as constituted by sensorimotor integration — the body as actively engaged in the world and our awareness of it in this capacity — or our sense of ownership over our body, or the relationship between body image and body
schema. To be clear, I take no issue with the work that has been done on these aspects of bodily awareness. Surely each of these is an important element of our bodily experience. However, by focusing on bodily awareness as it relates to agency, ownership, and so on, there has been a lack of consideration of another, important element of bodily awareness: bodily awareness as self-awareness. When I engage in the world, say by walking up a set of stairs, I experience myself-as-bodily. I do not manipulate an object, namely the body, to make my way up the stairs; rather, I walk up the stairs. Our bodily awareness is, in my view, foremost an awareness of the body as the subject of experience. As such, I take it that to understand fully the many other facets of our bodily awareness, we must first understand how our body is given as subjective. That is precisely why my aim is to explain how our typical bodily awareness is an awareness of the body as subject.

The second question of concern is to explain what kind of awareness our typical bodily self-awareness is. For this, I must consider whether bodily self-awareness is perceptual or non-perceptual. For many theorists working on issues of embodiment, there is no issue: bodily awareness is a perceptual form of awareness. However, as we will see, if perception is defined as an attentional relation that holds between a perceiver and an object, and if there is reason to believe that our bodily awareness involves an awareness of the body as subject, then such a view of perception cannot account for our bodily self-awareness. In other words, if our concern is with

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4 For my purposes here I take ‘body image’ to refer to a conscious representation of the body and ‘body schema’ to refer to an unconscious representation of the body, although it must be noted that there remains disagreement about how to distinguish between body representations and about how many such representations there are.

5 I will show in the next chapter why perception, as typically understood, is taken to require such an attentional relation.
the body as subject, then our awareness of our body in this manner cannot be accounted for via a model of perception that defines perception as directed only to objects. We must consider, then, whether our awareness of the body as subject is perhaps non-perceptual or whether we might want to expand our view of what counts as perceptual in order to allow for a perceptual awareness of the body as subject.

In what follows, then, my project is two-pronged: first, I provide an understanding of how typical bodily awareness involves an awareness of the body as subject. My focus will be to consider the body’s experience of itself from within, and I will do this by considering the sensory modalities of the inner body — proprioception and interoception. Second, I give an account of the kind of awareness our typical bodily awareness is. I show how bodily awareness is a form of perception, but not one that involves an attentional relation to an object. I argue instead for the need to expand our conception of perception and I propose a distinct form of perception that I term bodily self-perception.

My argument will be as follows:

1- Bodily awareness involves an awareness of the body as subject.

2- We are aware of our body as subject via proprioceptive bodily self-perception.

3- We are aware of our body as subject via interoceptive bodily self-perception.

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6 I will describe these sensory modalities in greater detail in chapters 2 and 3, respectively.

7 I will explain in greater detail what bodily-self perception is in chapter 2.
Therefore, our bodily awareness is constituted, at least in part, by a proprioceptive and interoceptive awareness of the body as subject given by bodily-self perception. In sum, I will show how proprioceptive and interoceptive bodily self-perception serve to generate our awareness of the body as subject, i.e., our bodily self-awareness. First, however, let me further elucidate what I mean by bodily self-awareness by way of an example.

4. **Awareness of the Body as Subject — A Primer**

Consider the following case: I am out on the cliffs of the Niagara escarpment, rock climbing with friends. I am about halfway up a route that I have not done before and it is challenging. I have one more move to make before reaching the next clip where I will place the rope into a piece of security. I am comfortable for now, but need to figure out how to make this next move. I need to reach up with my hand. Is that a decent hold up there to my right? Can I reach that? Maybe, but I know *instinctively* that I would need to move my right foot up a little to make the reach. Where could I plant my right foot? I scan the rock face. I see a nice foothold, but I cannot step to it immediately because my weight is currently on my right foot. I need to shift my body weight. I cannot just shift it over, however, because my left hand is too close to my left foot, and the balance will not work out — I can *sense* this. I need to move my left hand. I scan the rock face above and around my left hand. I find something, and then very carefully move my left hand to a pocket in the rock. I then shift the weight to my left foot, position my right foot, and shift the weight back onto the right foot to step up and reach my right hand to the handhold I first found. Now I can use my left hand to grab the rope that hangs down from my harness and clip it into the carabiner set into the rock. I fumble and the rope slips from my hand. I try again, and continue to struggle. I suddenly feel the fatigue in my right forearm. I tell myself to hurry and clip the rope,
and I can then take a rest and shake out the burn in my forearm. I begin losing my grip, and realize that I am going to fall. I need to let go of the rope length that I pulled up so that my belayer can take up the slack before I fall. “Falling” I yell down just seconds before my grip gives out. I fall, weightless and nervous, 5, 10, 12 feet before the previous clip catches me and my entire body weight suddenly sinks into the harness. As I swing in the open air along the rock face, I take a rest and shake out those burning forearms.

I have always loved climbing because of the intricate bodily awareness involved. As you are climbing, it seems as though you are simultaneously highly aware and yet unaware of your body. On the one hand, I attend to particular parts of my body as I climb the rock face. For example, I became directly aware of the burning and fatigue in my right forearm right before I lost my grip and fell. On the other hand, I do not attend to every aspect of my body while climbing even though virtually every aspect of my body is involved. When I try to slip the rope into the clip, I do not attend to my feet, their position, or the tension that I am using to keep them balanced on the footholds. When I am scanning the rock face for the next handhold, I am not directly aware of myself keeping my body balanced and in place. Yet each of these aspects to my embodied activity is a part of my overall experience. In other words, every part of my body is present for me as the subject of experience when climbing, even those aspects that I do not attend to.

I argue that my awareness of my body is comprised of more than what is provided by attention. To be sure, this is a contentious position. There has been a long-standing disagreement about whether our conscious experience includes anything more than what is attended to. As Eric
Schwitzgebel explains in his paper “Do You Have Constant Tactile Experience of Your Feet in Your Shoes? Or Is Experience Limited to What’s in Attention?,” there are two views of experience: a rich view and a thin view. On the rich view, experience involves what is at the center of attention, as well as what is unattended at the periphery and background feelings. On the thin view, experience involves only what lies within attention, and it is therefore limited. Although, thus far, the debate as to which of these views is correct is unresolved — there are compelling intuitive appeals for either view, and current empirical evidence can be interpreted to support either view — let me attempt to further motivate my endorsement of the rich view for bodily awareness by way of an example.

One of the main problems faced by proponents of the rich view is the need to explain how we can know that we experience more than what we attend to. One way to do this is to consider what a certain experience would be like if it were to occur with one less sensory modality. Consider the following example: I am sitting on a park bench, totally immersed in reading a novel. My attention is entirely taken up by my reading of this book, and I, thus, do not attend to any ambient noises or sounds from my environment (birds tweeting, children playing, cars driving past, etc.). If I were suddenly stopped by someone and asked if I had just heard that robin’s song, I would likely respond that I did not, as I was focused entirely on my book. Now, would it be correct to say, based on this response, that the robin’s song, and all the other sounds for that matter, were not part of my conscious experience in the moment just prior to my being queried? I do not think so. I hold this position because if I were congenitally deaf and sitting on a

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park bench, completely immersed in reading a novel, my conscious experience would be radically different than in the previous case. Although my response to a sudden query about hearing the robin’s song would be the same as in the hearing case — I would respond by saying that I did not hear the robin’s song — the hearing experience that I would deny having in the deaf case is entirely different than the hearing experience that I would deny having in the hearing case. The difference, I take it, is this: in the hearing case, I did ‘hear’ various sounds — they were registered by my auditory system and properly processed by my brain — although I might not have noticed them, whereas in the deaf case, I truly did not ‘hear’ anything at all — there was no processing of any auditory stimuli. Moreover, if I were stopped and asked, in the hearing case, whether there were any sounds or ambient noise around me while I was reading, I would very likely be able to report that there were, and even vaguely describe them⁹. In short, if we simply compare the overall experiences in each of the hearing and deaf cases, it seems quite clear that my experience of being fully attentionally immersed in reading a book on a park bench is vastly different in the hearing case because my experience would include all the ambient sounds and noises that are not attended to.

I propose that the same interpretation of our conscious experience applies in the case of bodily awareness. Even though I may be attending to something out in the world, say I am thinking about how to make my next move up the rock face, it is not the case that I come to experience myself, in that moment of deep thought, as non-embodied — I do not stop experiencing my body

as a living organism, breathing, heart pounding, etc. Rather, I propose that I remain aware of my body inattentionally. My body remains experientially present, and this fact is something that an activity like rock climbing highlights. In addition, climbing highlights another interesting aspect of our bodily experience: the effect that subtle things such as tension, breath, balance, and nervousness, i.e., background feelings, have on our overall experience. All of these background feelings, as we will see in chapter three, play a large role in shaping our experience of our self as bodily.

I take the bodily experience and the bodily awareness that one has while climbing to be analogous to the bodily experience and bodily awareness that one has in everyday life; it is just perhaps better highlighted while doing something like climbing. Although in such cases I am engaging in a specific activity, my bodily awareness is not merely of doing the activity. Rather, there is a sense in which I am aware of my body as my self, the very subject engaging in the various movements of climbing. What such cases bring to light is that bodily awareness involves an awareness of the body as subject, which is distinct from an awareness of the body as object. This awareness of the body as subject is indeed difficult to account for because, as we will see, it requires finding new ways to study our bodily awareness. Nonetheless, we must provide an account of our bodily self-awareness if we are to understand our sense of embodiment and its relation to our sense of self.
5. **Bodily Awareness — Current Research**

There has been quite a bit of research recently seeking to give an account of the many facets of our bodily awareness, and much of this research has been very fruitful. Most of it has focused on our awareness of the body as it presents itself as object in experiential consciousness. Very few, however, have sought to account for our bodily *self*-awareness, and of those, most have attended to how the body gives itself as an agent in the world. As a result, their work does not account for our awareness of the body as the very subject of experiential consciousness. This lacuna in the research is precisely what I aim to fill with the account I develop here. To be sure, I am not the only thinker to want to account for our awareness of the body as subject. Dorothée Legrand, for example, has also been concerned with our awareness of the body as such. However, whereas her focus has been to consider exteroception in relation to our bodily self-awareness, in my account I will focus on interoception and proprioception. First, however, let me further substantiate my contention that there is indeed a lacuna in the current research.

### 5.1. **Accounting for the Body as Object**

One of the most obvious aspects of our embodiment is a sense of ownership we have over our body. I do not just have a body, but I have this body, *my* body. Furthermore, the sense of ownership I have over my body is a very strong one: it is deeply traumatic to lose a part of one’s body and it is often described as losing a part of oneself. Our sense of body-ownership has a lot to do with the fact that our body is the only one that we can feel ‘from the inside.’ That is, we have a special relationship to our body that we do not have with any other body.
This sense of ownership has been a point of interest for many researchers concerned with accounting for our bodily experience and our sense of bodily self. The main strategy employed to explain the bodily basis for our sense of body-ownership has been to measure how and when we begin to lose a sense of ownership over our body. The current hypothesis is that by looking at cases where one loses a sense of body-ownership we can decipher precisely where the bodily basis lies for our sense of ‘myness’ over our body. Although there are no cases where a subject loses his/her sense of ownership over their entire body, there have been cases of partial body-ownership loss and body-ownership extension that have granted insights into our bodily experience. The cases of most interest have been the rubber hand illusion, out-of-body experiences, somatoparaphrenia, deafferentation, and phantom limb syndrome. The rubber hand illusion and induced out of body experiences are both cases of laboratory-induced body-ownership illusions. In the former case, one experiences ownership over a rubber hand; in the latter case, one experiences being located at a different spatial location from that of one’s physical body. Somatoparaphrenia, deafferentation, and phantom limb syndrome are all naturally occurring cases of body-ownership delusion or loss resulting from brain/body trauma. These cases respectively involve feeling as though a part of your body is not yours, losing a sense of your body’s position in space, and feeling an amputated limb to be present.

The research based on these cases has been interpreted as showing that the sense of ownership that shapes our bodily awareness, and that, on the face of it, seems to ground our sense of self in

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10 Chapter 4 will be devoted to evaluating the current research on body-ownership and showing how it might be adapted to garner insight on bodily self-awareness. Therefore, I will only give it a short consideration here.
our embodiment, is malleable. Indeed, this research creates a problem: what it purports to show — that my sense of this body being my body is not as reliable as I think — is at odds with my everyday bodily experience — that I have never failed to experience this body as my body. To be sure, this research has been very useful in understanding an important feature of our bodily awareness. However, what must be pointed out is that the work on body ownership considers our awareness of the body as awareness of the body as an intentional object of perception. When we speak of the sense we have of our body being ours, we are alluding to an awareness that involves an identification of an object, namely the body, with ourselves. In other words, my sense of body ownership is a sense I have of this body — this physical object I perceive — being my body — my self. Insofar as the research on body-ownership goes, then, it does not address the distinctive awareness of our body as subject, and so it leaves unexplained an important feature of our bodily experience.

5.2. Accounting for the Body as Subject

There are, however, some thinkers who have sought to explore our awareness of the body as subject. These thinkers are influenced by the Phenomenological tradition and its exploration of consciousness. This is one reason why they acknowledge the important distinction between an

11 Although it might provide insight into our bodily self-awareness as I propose in chapter 4.


awareness of the body as subject and as object, for this distinction is central to the Phenomenological literature on body awareness, especially in the writings of Husserl and Merleau-Ponty. The position of these recent theorists is that one of the fundamental characteristics of our bodily self-awareness is our sense of agency — we are aware of ourselves as bodily agents in the world. Thus, bodily self-awareness is best looked at as an awareness of the body embedded in action and perception. Their approach is to explore the body as subject insofar as it relates to our agency in the world and argue that we have an awareness of the body as ‘subject-agent’. Although these thinkers have sought to account for the oft-neglected bodily self-awareness, their views have shortcomings, too, as we will see.

One of the most carefully developed accounts of our bodily awareness as subject-agents is that of Dorothée Legrand. She first makes a distinction between the opaque body and the invisible body. The opaque body is defined as the body one looks at — it is the body taken as the object of attention. The invisible body is defined as the body one looks through but that is not itself experienced. She then claims that “[n]ormal bodily experience usually lies between the ‘opaque body’ and the ‘invisible body’.” In other words, normal bodily experience involves a body that is experienced, but not one that is directly perceived as an object — it is the experience of the

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body as subject. Such a form of bodily experience is pre-reflective\textsuperscript{16} — it involves the body given first-personally in our experiential consciousness. The body we experience pre-reflectively, and that lies between the opaque and the invisible body, Legrand calls the \textit{performative} body.

The performative body is the body as it is lived through in our interactions with the world — it is the body as involved in skillful action. Importantly, on this account we experience the performative body pre-reflectively as the \textit{subject-agent}. What characterizes such a bodily experience? A sense of presence. Presence is the sense of being in the environment as a subject-agent. So, when I am climbing, I am bodily present in the moment, and my bodily awareness is of my body as it is involved in skillful action; it is an awareness of my body as subject-agent. Thus, according to this view, my bodily self-awareness when climbing is an awareness of my performative body — the body’s presence as subject-agent. The question now becomes: how might we understand presence and our pre-reflective bodily self-awareness in a naturalistic manner? Our sense of presence, it is argued, is brought about by properly integrated proprioceptive and exteroceptive (especially visual) information. To see how this integration takes place, we must consider the role played by the body schema.

\textsuperscript{16} The Phenomenological account of consciousness holds that in every experiential moment we find a duality involving an object-givenness and a subject-givenness. That is, in every phenomenally conscious moment, there is the awareness of an object as given by being intentionally directed towards the object, and a self-awareness which is experiential consciousness as given to itself first-personally, i.e. as subject. The self-awareness involved in phenomenal consciousness does not result from a higher-order or reflective state, but instead is part of the structure of experience. The Phenomenological account is a one-level account of phenomenal consciousness. So, it is said that in our being aware of the object we are intentionally directed towards, we are also pre-reflectively aware of our self as well. When Legrand speaks of the body as subject that we experience pre-reflectively, then, she means the body that is given first-personally in our moment-to-moment experiential consciousness. For further discussion of the phenomenological one-level account of consciousness, see Dan Zahavi, \textit{Subjectivity and Selfhood: Investigating the First-Person Perspective} (Cambridge: MIT Press, 2005).
Shaun Gallagher defines the body schema as “a system of sensory-motor processes [vestibular and proprioceptive] that constantly regulate posture and movement — processes that function without reflective awareness or the necessity of perceptual monitoring.”\(^1\) The body schema is not reducible to a perception of the body. Rather, it “operate[s] below the level of self-referential intentionality. It involves a set of tacit performances — preconscious, subpersonal processes that play a dynamic role in governing posture and movement.”\(^2\) For Gallagher, the body schema operates in an almost automatic manner.

Although Legrand agrees with this definition for the most part, she argues that the body schema cannot always lie at the pre-conscious and subpersonal level if we are to explain pre-reflective bodily self-awareness. Although the body schema, as defined by Gallagher, seems to capture all the elements required to bring about the sense of presence discussed above — the key characteristic of our experience of the performative body — it is better defined as the sometimes conscious *implicit* processing of somatosensory information that can be used for sensory-motor interactions. Understood in this manner, the body schema can be used to explain how the body is *in the world* because it is what allows the subject-agent to interact with its environment.

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In sum, accounting for pre-reflective bodily self-awareness, i.e., the fundamental form of self-consciousness, requires that we account for how self-relative information — information about the world in relation to our body — arises, and how this relates to our worldly interactions. Our pre-reflective bodily awareness is an awareness of the body as subject-agent, and so it cannot rely on information that is solely about the self/body, i.e., self-specific information. Rather, it relies on the integration of self-relative sensory-motor information as represented in the body schema.

This subject-agent view exemplifies the approach taken by those willing to consider the body as subject — looking at the body as agentive being in the world. Insofar as it has broadened our view of embodiment, it is an important view. Where it falls short, however, is in not properly accounting for the more passive aspect to our awareness of the body as subject. To be clear, I agree with the distinction between the opaque body and the invisible body drawn above, and I take it that there is a pre-reflective experience of the body. However, I disagree with the view that pre-reflective bodily self-awareness is best, or even fully, explained as of a *performative* body; that is as a subject-*agent*. We are not continuously involved in skillful action — our body is not at every instant a performative body. I contend that there is more involved in our bodily self-awareness than can be explained by looking to the body as subject-agent. Furthermore, as I will show, our bodily self-awareness does not rely only on self-relative information involving the external world, i.e., information about our self/body *in relation* to the world.
The body is not just located in the external environment, but is *itself* an environment. There is a complex inner milieu within the body that must be maintained (e.g. body temperature, hormonal balance, etc.). And although our interactions with the external world are important for our bodily self-awareness for the reasons we just considered, we must look at how our experience of the body as subject arises from the body *itself* and from *its* environment. To put the point another way, to be an agent requires being a subject, and my concern is with how the body gives itself as a subject and not just as a subject-agent. In what follows, then, I shift the focus away from exteroceptive and proprioceptive perceptual interaction with the outside world, and focus instead on how we experience our body from within.

Let me return to the climbing case to further my point. There is a clear sense in which I am aware that it is my body on the rock face. There is also a clear sense in which I am aware that I am the bodily agent engaging in the activity of climbing. Yet, there is also a sense in which I am aware of *my self* as bodily in the experiential moment. The research on our sense of body ownership and our sense of bodily agency does not account for this particular aspect of my bodily awareness. Body ownership focuses on what allows me to identify my body as mine, as such it still relies on my awareness of my body as an object. Bodily agency, on the other hand, can include my awareness of my body as subject, but only insofar as this awareness arises from my active involvement in the world. Neither of these aspects of my bodily awareness brings to light the basic sense of self, of subjectivity, that my bodily awareness also includes. Put differently, aside from the association one can make to bring about a sense of body ownership, and without considering worldly interactions associated with my agentive involvement in the world, there is a sense that I have of *my being* bodily — of my *bodily self*. To be sure, my
volitional engagement with the world is fundamental to my sense of bodily self. However, there is a sense of bodily self that arises not from my identification with my body, nor from my ability to engage in the world — there is a sense of bodily self that arises merely from being a living body, i.e., a body with an inner environment. This sense of bodily self is what remains to be explored, and it is precisely the element of bodily awareness that I aim to give an account of here.

Having clarified the gap in the current research and thus motivated the need to account for this gap, I turn now to consider the nature of this awareness and how determining it turns out to be more difficult than expected.

6. Perception

As I stated at the outset, for many thinkers working on embodiment, bodily awareness is taken to be a kind of perceptual awareness. However, such a view of bodily awareness will not accommodate awareness of the body as subject so long as perception is commonly understood as a relation that holds between a perceiver and an object. In other words, if bodily awareness is perceptual in this sense, then it can only involve object awareness, and thus will not be useful as an account of our awareness of the body as subject. Let us take a brief detour into the phenomenology of experiential consciousness to gain a better understanding of why this is so.

According to a Phenomenological understanding of consciousness, any account that sees consciousness as only involving object consciousness fails to explain the subjectivity of
consciousness. That is because consciousness involves more than what it is directed towards. When I experience something, say eating a piece of chocolate, there is indeed an object of my experience, i.e., the chocolate. However, my experience involves more than just the chocolate: it also involves a subject, namely, myself. I am eating chocolate. As Dan Zahavi explains, “although my attention is on the object, the experience itself remains conscious, not in the sense that I am aware of it [in the sense of being intentionally directed towards it], but in the sense that there is something it is like to be in that state.”

According to Zahavi and the Phenomenological tradition more generally, the mine-ness that constitutes our conscious experience cannot be successfully accounted for by views that see awareness as only object-awareness. “The experiential me-ness in question is not a quality like bitter or bright, black or orange that varies with the intentional object experienced.” Rather, the first personal givenness of experience is best accounted for by a pre-reflective self-awareness. Indeed, the contention is that the experiential dimension of for-me-ness is pre-reflective self-awareness. Moreover, the pre-reflective self-awareness of experience is simply given in the having of the experience. Phenomenologists describe this ‘given-ness’ as ‘lived through’ — “intentional experience is lived through (erlebt), but does not appear in an objectified manner. Experience is conscious of itself without being the intentional object of consciousness.”

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19 Zahavi, Subjectivity and Selfhood: Investigating the First-Person Perspective, 43.


The Phenomenological account, then, is a one-level account: “every positional consciousness of an object is at the same time a non-positional consciousness of itself.”22 “[O]ne perceives the perceptual object, but one experiences, literally ‘lives through’ the intentional act […], it is […] pre-reflectively self-given.”23 By pre-reflective, here, we mean that it is given prior to taking a reflective stance on the experience. At this point, one might ask: why must it be given pre-reflectively? Because when a mental act or experience is reflectively given, it means that the act or experience is taken as the object of the intentional gaze. For Phenomenologists, however, before any act or experience can be reflected upon, it must first be lived through — it must first be given pre-reflectively. That is because the pre-reflective self-givenness of the intentional act is what renders it a conscious act. What makes an experience conscious is not a higher-order state, but an intransitive, pre-reflective self-awareness. Only once a mental act has been pre-reflectively given, and thereby rendered conscious, can one then subsequently take a reflective stance on the act. To be clear, pre-reflective self-awareness is not an added quality to experience; rather it is an implicit, first-order awareness that constitutes the mode of being of experience.

The first-personal givenness of consciousness to itself is what phenomenologists also describe as the reflexivity of consciousness. “[E]very positional consciousness of an object is at the same

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23 Zahavi, Subjectivity and Selfhood: Investigating the First-Person Perspective, 41.
time a non-positional consciousness of itself.” As Zahavi explains, for an experience to be intentional is for it to be given to a subject. The subject of an experience is not only the origin of the intentional gaze but also that for which what the intentional gaze is directed towards is given. Yet, the subject of experience is also the very consciousness of which the experience is a part. Therein lies the reflexivity of consciousness: without moving into a reflective objectification, the intentionality of experience implies the first-personal self-givenness of consciousness to itself as the subject of the intentional act. This reflexive structure also explains why every experience seems to be endowed with a first-personal phenomenal feel, a mine-ness. For an experience to have such a feel, there must be a subjectivity involved, and this subjectivity stems from consciousness’ pre-reflective self-awareness of itself as the subject of intentionality.

In sum, then, “[a]ll of this suggests that first-person experience presents me with an immediate and non-observational access to myself, and that […] (phenomenal) consciousness consequently entails a (minimal) form of self-awareness. To put it differently, unless a mental process is pre-reflectively self-conscious there will be nothing it is like to undergo the process and it therefore cannot be a phenomenally conscious process.”

What does this account of consciousness have to do with whether bodily self-awareness is perceptual in nature? As mentioned at the outset, I am a conscious, embodied being and my

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consciousness is a bodily consciousness — it involves an awareness of my body, but also an awareness of my being bodily. Furthermore, as I have argued, my awareness of my body is both as object and as subject — I enjoy a bodily self-awareness. According to the Phenomenological account just described, my self-awareness is pre-reflective, and thus non-observational. Accordingly, my bodily self-awareness is also pre-reflective, and non-observational. Given that object perception involves a subject holding an observational/intentional/positional relation to an object, my bodily self-awareness, then, cannot be object perceptual in nature. Does this imply, however, that the alternative account is correct; namely, that bodily self-awareness is non-perceptual? I argue that it does not.

Gallagher agrees with the Phenomenological account of the structure of consciousness, and grants that insofar as the first-person quality of my experience is founded on its being embodied, then it presents me with an immediate and non-observational access to my self as bodily. In other words, my embodied experience of the world involves a non-observational bodily self-awareness. He goes on to argue that my bodily self-awareness, then, must be non-perceptual. Perception, in short, is positional, thetic, observational, and involves attending to an object as an object. If perception involves an observational relation to an object, then the form of bodily self-awareness that is entailed by our phenomenal embodied consciousness cannot be perceptual. It cannot be perceptual because perception involves an object-directedness; it involves taking a position with respect to an object. However, our bodily self-awareness does not involve taking a

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26 I will argue for this point at much greater length in chapter 2.
position on the body; rather, I have an immediate and non-observational access to my body. Therefore, Gallagher concludes, bodily self-awareness must be non-perceptual.

I take Gallagher’s position to be right in many respects. However, I do not think him correct to conclude that our bodily self-awareness must be non-perceptual. I hold this view because I reject the underlying assumption that perception is necessarily observational and object-directed. Perception is typically thought of by appealing to vision. Perhaps, as a result, “[i]t is part of the ordinary conception of perception that its objects are mind-independent, public objects.”27 As Burge puts it: “our perceptual experience represents or is about objects, properties, and relations that are objective.”28 Although this is the intuitive account of perception, there are varying theories of perception currently under discussion that tease out the particularities of the perceptual experience differently: sense-datum theory, adverbialist theory, intentionalist theory, etc. What remains the same among all theories of perception that are standardly held, however, is that perception involves a givenness of what is perceived as object. “Perception can only confront what is presently given: in this sense, it seems that you can only see or hear or touch what is there.”29 We typically take what is there, presently given, to be objective. But, what if there is more than one way for something to be given in perception?

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Indeed, if the above-mentioned account is the only account of perception that can be given, then Gallagher is right to conclude that bodily self-awareness must be non-perceptual because it is non-observational. However, as I will show in chapter 2, the account of perception commonly described is not exhaustive. I argue that the view of perception as necessarily object-directed is too narrow, and that we must broaden our account of perception to consider other possible forms of perceptual awareness. Perhaps, in certain instances, something can be given in a manner other than as an object to which we relate.

As Merleau-Ponty explains, the body is always present. I can move away from objects in the world, but I cannot move away from my body. The body remains as a constant presence in my experiential life. My body is that by which I have a perspective on the world, that by which I am a subject experiencing a world. Yet, it is also something that I am aware of. The body is that which gazes at an object. It is that which is directed towards things, but its presence in our experience is not only as an object. As we saw above, in the Phenomenological tradition there is a distinction made between two modes of givenness for experiential consciousness — object-givenness and subject-givenness — and every experiential moment involves both forms of givenness. I want to explore the possibility of perception also having this duality and involving both a relation to something as object-given as well as subject-given. When we experience an object, I contend, the body is given as the subject of experience. The body is not what I am perceiving, it is what I am. It is that through which I am perceiving. To be sure, I can direct my intentional gaze onto my body; my body can be given as object to me. However, even in this case, my body always remains given as subject. This leads to the question: how can we account for the nature of our bodily awareness?
I propose that there is a form of perception that is non-observational, does not involve an attentional relation between a perceiver and an object, and is therefore non-positional. If there is sufficient reason to grant that there is such a form of perception, then Gallagher’s conclusion that non-observational bodily self-awareness must be non-perceptual does not follow. Indeed, I will show that there is good reason to count bodily self-awareness as perceptual, but of a different kind than commonly described.

Before I reveal the plan for this project, let me briefly address an objection that is sometimes put forward against the idea that, as Merleau-Ponty expressed it, the body is always present for me in experience\(^\text{30}\). The refrigerator light illusion is often taken to show that we are naive in thinking that we enjoy a continuous awareness of our body in our everyday life. This is the illusion to which one might fall prey in thinking that the refrigerator light is always on because whenever one opens the door one sees the light. The objection, then, is that we naively, and mistakenly, think that we have a continuous awareness of our body, e.g. of my hair on the back on my neck, because whenever I turn my attention to the sensations on my neck I can feel my hair.

I grant that if the basis on which one claims that we have a continuous awareness of the body is that whenever we turn our attention to the body it is there, then indeed such a basis does not necessarily warrant the conclusion that the body is always present for me in my experience. All it

\(^{30}\) It is also a criticism made against the rich view of consciousness, i.e., that we experience more than what we attend to.
warrants is the claim that the body happens to be there whenever I turn my attention to it. However, I take it that there is another, stronger reason for believing that our body is continuously present in our experiential lives. I take it that the body is always present because it gives itself subjectively. As we saw in the Phenomenological account of experiential consciousness, so long as one is conscious, and thus enjoying a first-personalness to one’s experiential life, then the subject is always experientially present in a pre-reflective manner. That is, phenomenal consciousness requires a pre-reflective self-awareness. In our case, the subject of consciousness is an embodied subject. As I will show, our embodied sense of self stems from our bodily self-awareness, i.e. our awareness of the body given as subject. Thus, the body given as subject, i.e., pre-reflectively, is always present in experience. Insofar as our awareness of our body as object goes, then, indeed it is not always there — the refrigerator light illusion makes its point. However, it addresses only one manner in which we are aware of our body. Insofar as we have bodily self-awareness, i.e., of our body as subject, the refrigerator light illusion does not apply. The body as subject is present in experiential consciousness because there is always a self or subject of experience in experiential consciousness — and in our case we are embodied subjects of experience.

7. **A New Direction**

Let me close this chapter by re-considering the two questions driving my project. First, how are we typically aware of our body? It is indeed a multi-faceted awareness, but one aspect in particular interests me: the body as subject. Given that current investigations of body-ownership and the body as-agent are unsatisfactory, in what follows, I focus solely on giving an account of our neglected bodily self-awareness. The second driving question is: what kind of awareness is
our typical everyday bodily awareness? As I briefly mentioned, for many theorists, bodily awareness is perceptual. For certain contemporary phenomenologists, it is non-perceptual. I argue that the phenomenologists are right to hold that pre-reflective bodily self-awareness cannot be a form of object perception, and yet wrong to claim that it must therefore be a non-perceptual form of awareness. I contend that what is needed instead is an expansion of our current conception of perception. I offer an account of how we might be perceptually aware of the subjective body, and I call this form of perception bodily-self perception.

In answering my two driving questions, I will focus my attention on the sensory modalities of proprioception and interoception. My reason for this is that insofar as my concern is to determine whether and how the body gives itself as subject I must consider what underlies our experience of our body. Our experiences are shaped by our many sensory modalities, and so to explore how we experience our body as subject will necessitate exploring the sensory modalities by which we experience our body. Of the five exteroceptive sensory modalities of vision, touch, smell, taste, and hearing, and the two somatosensory modalities of proprioception and interoception, only the latter two are strictly and continuously concerned with the body. That is, vision is concerned with visual objects in that it is designed to process whatever visual stimulus it encounters. The object that lies at the origin of the visual stimuli can vary greatly. I can visually perceive a cup on the table, or the table, or even my hand holding the cup. A similar account can be given for the other four exteroceptive sensory modalities. The two somatosensory modalities of proprioception and interoception, however, differ from the exteroceptive senses in one crucial respect: proprioception and interoception have been identified as the only sensory modalities that have to
do strictly with the body, and the stimuli they are responsible for processing always stem from the same origin — one’s own body.

My overall goal in this project, then, is to show the following:

1- Bodily awareness involves an awareness of the body as subject.

2- We are aware of our body as subject via proprioceptive bodily-self perception.\textsuperscript{31}

3- We are aware of our body as subject via interoceptive bodily-self perception

4- Therefore, our bodily awareness is constituted, at least in part, by a proprioceptive and interoceptive awareness of the body as subject given by bodily-self perception.

In this first chapter, I motivated my claim that in our typical everyday life we enjoy a bodily awareness that cannot be properly accounted for by looking at issues of agency or ownership. I then motivated the need to account for our awareness of the body as subject by expanding on our current conception of perception as object perception.

In the second chapter I focus on the sensory modality of proprioception, and I argue that we enjoy a proprioceptive bodily-self perception that gives us an awareness of our body as subject. To make this argument, I first consider the standard view of perception and show how it fails to account for the way in which we are proprioceptively aware of our bodies in our typical

\textsuperscript{31} I will explain in greater detail what bodily-self perception is in chapter 2.
everyday involvement with the world. I then reject the suggestion that our proprioceptive awareness should be understood as non-perceptual and offer instead my enriched view of perception, which allows for a proper account of our typical proprioceptive awareness. I then set out in more detail what exactly bodily-self perception is, and lay out its fundamental characteristics.

In the third chapter, I continue my phenomenological exploration of our bodily self-awareness by extending my discussion of bodily-self perception to another sensory modality: interoception. Specifically, I argue that we typically enjoy a perceptual interoceptive awareness of our body as subject of the kind found with proprioception, i.e., bodily-self perception. I make my case using phenomenological analyses of typical everyday instances of interoceptive experience. More specifically, I appeal to certain examples of visceral awareness, as well as to the connection between emotion, interoception, and our emotionally valenced conscious mental lives. I end by proposing that both proprioception and interoception constitute, at least in part, the subjectivity of consciousness by virtue of affording us an awareness of the body as subject, via bodily-self perception.

In the fourth, and final chapter, I consider an important outcome of my view. If my account is correct, then it offers new insight into our interpretation of certain body illusion cases. That is, according to my view, the standard interpretations of the rubber hand illusion and virtual body
illusions\textsuperscript{32} are incorrect. Specifically, these illusions do not show any loss of bodily self-awareness. Indeed, as per my account, one cannot lose awareness of one’s body as subject so long as one is conscious and bodily-self perceiving one’s body through proprioception and/or interoception. Instead, I argue that we must interpret the results of such cases as showing that subjects might lose awareness of their body as object, but remain aware of their body as subject. I go on to address a criticism that my view faces with regard to methodology — how we could study our bodily self-awareness if it is an awareness that cannot involve observation of the body — by suggesting a new method of inquiry based on recent findings on body illusions, interoceptive sensitivity, and body scanning meditation.

\textsuperscript{32} Both the rubber hand illusion and the virtual body illusion are instances of so-called body-ownership illusions, and they are taken to show how easily one’s body-representations can change to include a sense of ownership over a rubber hand. I will consider each of these in greater detail in chapter 4.
Chapter 2: Bodily Self-Awareness — Proprioception

As was just explained in chapter 1, to understand our sense of self as bodily we must give an account of our bodily self-awareness, and for this task, we need to look at how the body experiences itself as lived through, i.e., as subject. In this chapter, I argue that one crucial way the body experiences itself in this manner is via the sense of proprioception. More precisely, I argue that, in proprioception, we enjoy a form of awareness of our bodies in our typical everyday involvement with the world that differs from how we perceive objects in the world — we perceive our bodies subjectively, and this is what, in part, constitutes our sense of bodily self. I will also argue that proprioception plays an important role in generating the egocentric spatial framework\(^1\) against which all perceptual experience is given. In this way, proprioception is also involved in constituting the first-personal perspective of experience\(^2\).

In what follows, I first explain in more detail the sensory modality of proprioception and then present an analysis of the role that proprioception plays in a typical instance of everyday interaction with the world. To do so, I explore what are typically taken to be the criteria for an event to count as perceptual (and alternatively as non-perceptual). I consider and reject in turn

\(^1\) I will say more about the egocentric spatial framework in what follows, but briefly stated here it refers to the spatial framework of the bodily perceiver. That is, the framework onto which all exteroceptive perceptions are mapped and integrated.

\(^2\) I do not contend that proprioception alone constitutes the egocentric spatial framework and the first-person perspective of experience. As I will argue in the next chapter, I believe that interoception plays a key role in constituting these as well and I am open to the possibility of other sensory modalities playing some role, too.
two opposing interpretations of proprioception’s role in our everyday bodily being in the world, as well as a view that suggests that we should interpret our typical proprioceptive awareness as non-perceptual. I argue that what we need is a broader understanding of perception, that is, an understanding of perception that allows perceptual awareness to have forms other than object perception. As I argue, although our typical proprioceptive awareness is perceptual, it does not belong to the kind of perception defined by the object perception model. Instead, I propose an account of perception that moves beyond the object perception paradigm and serves to explain our typical awareness of our bodies — subjective awareness.

1. **Proprioception**

Broadly speaking, proprioception is understood as the sensory modality concerned with the position of one’s body, its posture, and its movement in space. Long before Sherrington introduced the term ‘proprioception’ in 1906³, there was discussion of a “sense of movement” and a “muscle sense.” Since Sherrington’s classification of exteroception, interoception, and proprioception, the latter has been defined specifically to refer to our vestibular sense (sense of orientation and balance)⁴, our kinesthetic sense (sense of movement), and our sense of position, posture, and stance. Proprioception involves information gathered from receptors in the inner ear, as well as muscular, tendon, and articular sources. In short, any information having to do with the musculo-skeletal aspects of the body in relation to its spatial layout and movement is considered to be within the domain of proprioception. In general, there is a distinction made

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⁴ There is a growing push to distinguish the vestibular system as its own sensory modality. However, for my purposes I will continue to include it with proprioception as this will not affect the view I am proposing.
between proprioceptive information and proprioceptive awareness: proprioceptive information is understood as the subpersonal and nonconscious information transmitted from the various proprioceptive sense receptors to the brain, and proprioceptive awareness, although not exactly agreed upon, is taken to involve the conscious awareness\(^5\) of the body as given by proprioception.

One issue of interest for some\(^6\) has been to determine the nature of our proprioceptive awareness of our body. There are those who argue that our proprioceptive awareness is a form of object perception, and others who argue that this awareness it is not perceptual at all. One of my goals in this chapter is to answer the following questions: is proprioceptive awareness a form of perception? If it is, what kind of perceptual awareness is it?

2. **Study Case**

Before considering the different ways these questions can be answered, let me first briefly set out the position that I aim to defend by way of an example. It is important to note, however, that because my concern is to determine how we are *typically* aware of our body, the example to follow is intended to reflect an instance of everyday bodily being in the world.

Consider the following situation: I take a book from my bookshelf, and hold it in my right hand. This situation appears to be a fairly typical experiential involvement with my environment: there

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\(^5\) What exactly is meant here by conscious awareness is complex and will be discussed further in later sections.

\(^6\) In what follows we will discuss the views of O'Shaughnessy, Bermúdez, and Gallagher.
are many objects that I interact with in this way, and that I hold in my hand throughout the day. Now, what can this example tell us about the typical way in which I am proprioceptively aware of my body, and more specifically my hand, in such situations? Is my proprioceptive awareness of my hand in a typical everyday experience of holding a book perceptual or non-perceptual? If perceptual, is it a case of object perception?

According to the view I defend, in this case I am perceptually aware of my hand, but not of my hand as an object. The perceptual awareness that characterizes this instance is not object perception, but another kind of perception. I experience my hand, but not as an object of perception alongside the book. When I hold a book in my hand, I am typically said to perceive the book via my haptic sensory modality: I perceive the book because I am touching it and this sensory experience gives me an awareness of the book as an object that my body interacts with. My hand, however, is experientially diaphanous in this example; that is, I experience the book through my hand, and so my hand is part of my experience of the book. However, my hand is not present in my experience as the book is. Rather, I experience my hand as subject in my perceptual experience of the book. In other words, I experience the book objectively — as an object that I hold in my hand — but I experience my hand subjectively — not as an object along with the book, but as that through which my body interacts with the book. Indeed, I could shift my attention to my hand and thereby take it as an object of perception. I could very well choose to take an observer’s stance with regards to my hand and perceive the position of my fingers, and the force I am exerting to hold the book in a certain position, etc. But in the example given, this is not what occurs. In the example given of a typical everyday involvement with the world where
I hold a book in my hand, I claim that I perceive the book as an object, and I perceive my body — my hand — as subject.\footnote{Although in this example I discuss my awareness of my hand in my experience of holding a book, it is important to note that what I mean by this is that my awareness of my hand is not distinct from my awareness of my body. Rather, I am aware of my body as subject through my hand holding a book.}

In short, I argue that not all perception is object perception and my goal in the following is to show the need to enrich our understanding of the different forms that perception can take. Although the more commonly considered exteroceptive sensory modalities of vision, touch, smell, taste, and hearing typically take the form of object perception, the awareness that we have of our bodies in our everyday involvement in the world does not take this form. I propose that, in the case of our typical everyday awareness of our bodies, we make use of a unique kind of perception, which I call \textit{bodily-self perception}. Before I elaborate the characteristics of this form of perception, I must first motivate the need to expand our conception of perceptual awareness.

To do so I will first evaluate the more common understanding of the example described above. According to this understanding, we perceive our hand as an object. I will consider, and reject two such accounts of our typical everyday proprioceptive awareness, those of O’Shaughnessy and Bermúdez. Next, I will consider and reject another suggested account of our typical everyday bodily awareness, that of Gallagher who argues that our awareness is of a non-perceptual kind. As I will show, appeals to either object-perceptual or to non-perceptual awareness fail to properly account for the kind of bodily awareness we enjoy in our daily lives. Before I can make clearer why I think these theorists are mistaken, and thus provide support for
my own view, I must elucidate in more detail what exactly is commonly meant by perception — the object perception model. By virtue of what does something count as perceptual, and alternatively, fail to count as perceptual according to this paradigmatic model?

3. **Criteria of Perception**

For many thinkers involved in the debate over the nature of proprioceptive awareness, Shoemaker’s account of object perception is taken to provide the defining guide to the fundamental features of perception. In the first of his “Self-knowledge and ‘Inner Sense’” lectures, Shoemaker begins by distinguishing object perception from broad perception. The former, he explains, is based on “cases of perception […] in which one or more particular things are objects of the perception,”\(^8\) where by ‘objects’ he means particular things, and not facts or states of affairs. The latter involves “cases of perception in which there are no objects in this sense — in which the only ‘objects’ are facts or states of affairs.”\(^9\) He then goes on to list the basic defining features of object perception.

For Shoemaker, there are four main distinctive features of object perception: fact/object awareness, intrinsic properties perception, object identification and tracking, and object as focus of attention. The first feature reflects that although perception provides an awareness of facts, it does so by first providing an awareness of objects. So, to become perceptually aware that my water bottle is to the left of my coffee cup, I must be aware of my water bottle and of my coffee

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cup as objects. I could be aware of the relation between the two only by virtue of being aware of the relata.

This leads to the second feature: that the perception of an object involves the perception of its intrinsic, non-relational properties. To be able to perceive that my water bottle is to the left of my coffee cup, I must not only perceive the water bottle itself and the coffee cup itself, but must do so based on the intrinsic properties of these objects, properties that are given by the objects. One could not perceive these objects at all, or their relation, if they did not “present themselves as having intrinsic, nonrelational properties.”

The third feature is that in the perception of an object, sense perception must afford some form of identification information about the object such that the object can not only be distinguished from other objects of perception, but also be tracked through time and be re-identified. In order to claim that I am perceiving the water bottle, I must be able to track it through time, and this necessarily requires me to obtain some information about the bottle that enables me to identify it as a distinct object (i.e., as distinct from other objects I may also be perceiving). I need not identify it as a ‘water bottle’, but I must distinguish it from other objects of that perception by way of information that is unique to that object.

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The fourth feature is that “[o]bjects of perception are potential objects of attention.”11 By this Shoemaker means that one can shift one’s attention from one object to another object within the same perceptual moment. So, as I look at my desktop, I am said to perceive many things: the top of my desk, my water bottle, my coffee cup, my notepad, my pen, etc. These are all objects of my perception. However, they cannot all be what I am attending to at the same time. I may be focused on my notepad, and then shift my attention to my coffee cup. When this shift occurs, it does not bring with it a new perception, but simply a shift of attention between objects within the same perceptual experience. Although he discusses other features, these four are the ones that he considers to be central to object perception.

Shoemaker’s view provides a good place to begin. However, it stems primarily from a consideration of what makes vision count as a form of perception. The criteria by which vision counts as a form of perception, though, do not necessarily directly translate to other sensory modalities. For many thinkers involved in the debate over the nature of proprioceptive awareness, Shoemaker’s model has been the paradigm for defining perception, and has been the basis upon which they have mounted their arguments. However, in order to avoid working with an understanding of object perception that could be considered too vision-centric, I will broaden the object perception model so that it can apply to any sensory modality that exhibits the characteristics of such a form of perception. This, in turn, will allow me to evaluate properly our typical everyday proprioceptive awareness to determine whether it exhibits the general characteristics of object perception.

Before re-evaluating the features of Shoemaker’s model, I must clarify my target of explanation. In the complex discussion about what perception is, different issues are involved, three of which I distinguish here: First is the issue of determining what the *nature of the perceptual relation* is, regardless of how it is that we perceive and what it is that we perceive. Second is the issue of what different *types of perceptual relations* there are. This is the issue of determining the specific ways in which we enter into a perceptual relation with our environment. Third is the issue of what the different *objects of perception* are and how we come to distinguish these objects. Although all three issues are closely connected, my concern is specifically with the first issue and whether our typical proprioceptive awareness involves a relation of the object-perceptual kind. In other words, it is my contention that we must first determine where typical proprioceptive awareness stands in regards to the first issue before there is any need to look at where it stands in regards to the second and third issues. To be clear, then, in what follows I am attempting only to isolate the features relevant to determining what constitutes a relation of the object-perceptual kind, setting aside how these features might affect the second and third issues. With this clarification in hand, let me proceed to broaden Shoemaker’s model.

At the outset, Shoemaker makes a distinction between *object perception*, where one or more particular things are objects of perception, and *broad perception*, where the ‘objects’ are not particular things but rather facts or states of affairs. In both types of perception one relates to something *as an object*. So, perceiving something involves taking what is perceived, in the first moment, as separate from the perceiver — as not something that is simply in the mind of the
perceiver. Perception involves a perceiver relating to an object in a particular way (via vision, touch, etc.). The object can then come to be associated in all sorts of ways — to another object (e.g., the pen and the paper), or to the perceiver himself (e.g., the leg is mine). However, first and foremost, in object perception a perceiver relates to an object, *as an object*. For example, Max hears a melody. Here, Max is the subject; hearing is the relation that Max enters into; and the melody is the object that Max enters into this relation with. When Max hears the melody, he relates to the melody as something other than himself, i.e., as an object. At the core, object perception involves a subject, i.e., a perceiver, entering into a relation, i.e., vision, touch, smell, etc., with something that is given as distinct, i.e. as an object, that the subject relates to. Regardless of *what* the object of perception is and/or how one relates to the object, the fundamental structure of object perception remains the same. This explanation of the perceptual relation in object perception may, at first glance, appear trivial. Obviously object perception is a relation between a perceiver and a perceived, i.e., a subject and an object. What needs to be elucidated, is how the relation to an object *holds*. For this matter, let us look at each of Shoemaker’s features in turn to see which, if any, can illuminate the issue.

Shoemaker’s first defining feature is not immediately very informative. He simply states that object perception, first and foremost, involves an object. That is, before any associations or identification of relations can be made between two objects, one must first perceive the objects that are to become associated or related in themselves. This does not explain how the relation to an object holds.
Next is the feature that when we perceive an object we perceive its intrinsic and non-relational properties. This feature holds more evidently in the case of vision; however, when considering other sensory modalities such as hearing or gustation, it is not so immediately applicable. What would be the intrinsic and non-relational properties of an object of gustation? Determining whether and how this feature holds for all forms of sense perception would require first clarifying what are the intrinsic properties of the various kinds of objects we perceive, and then looking at which sensory modality relates to which of these properties, how, and why. But these questions relate to the issues of perception that I have set aside. So this feature will not be informative to my target of explanation, which is how the relation to an object holds in object perception.

Another feature of object perception is that whatever is perceived in this way can be attended to. What seems to underlie this feature is a view of attention as having a foreground/background structure. That is, when we perceive a scene involving multiple items, we are able to focus only on a few select items at a time. Only a few items are in the foreground of attention, and the rest remain in the background. However, if the items of a scene are given as objects of perception, then even if some of them remain in the background, they are nonetheless available to be brought to the foreground, i.e., one can shift one’s focus of attention onto these items because they are objects of perception. Therefore, whatever is an object of perception will have the potential to be an object onto which attention is focused. Setting aside the question of whether or not this view of attention is accurate, the issue still remains of how something becomes an object of perception. This attention feature comes into play once a perceptual relation has been established between a subject and an object, but does not explain how something comes to be perceived.
One might argue against the basic understanding of the function of attention in perception that I propose and claim instead that attention is not something that is exercised once a perception has occurred, but rather is what constitutes perception. So, under such a view, the relation between a subject and an object such as to constitute perception is an attentional relation. However, even under this understanding, we must explain what such an attentional relation is, and that is what I aim to uncover as well, whether we call it an attentional relation or a perceptual relation.

The third feature Shoemaker proposes seems to address the question best and to uncover what describes the fundamental nature of object perception. I will call this the discerning feature. It is that object perception involves distinguishing an object, tracking the object, and re-identifying the object as the same object throughout a perceptual experience. So, if I see a chair, then I am distinguishing a certain object in my environment from other possible objects, and I am tracking this object throughout my ‘seeing’ experience. In order to successfully track the object, i.e., ‘see the chair’, I must track the same object; I must re-identify the object. The issue of what it is by virtue of which a perceiver makes the distinction is another issue. However, at a minimum, object perception involves discerning something and this is what constitutes the perceptual relation of a subject to an object. To be sure, Shoemaker elucidated this feature from a consideration of visual perception. And, although the boundaries by which we distinguish an object of perception become less clear when we consider perception in non-visual sensory modalities, nonetheless, it seems that we are able to distinguish, track, and re-identify what we perceive in other sensory modalities as well, at least in a minimal manner. I take it, then, that a
perceptual relation holds between a subject and an object when discernment occurs, because
discernment is the process by which an object comes to be perceptually related to a subject. So, I
may not know how it is that I am perceiving, nor exactly what it is that I am perceiving, but I am
able to tell that I am perceiving something because there is something that I discern through
time. I take this to be the case in all instances of object perception.

It must be noted at this point that one could argue that the discernment process can occur
unconsciously, and thus there can be unconscious perception. Although this may be a plausible
argument, I want to re-iterate that my target of explanation is our bodily awareness in our typical
everyday interactions with the world. Consequently, my concern is to evaluate, in part, whether
our typical proprioceptive awareness is a form of conscious perception. My concern is: am I
typically proprioceptively aware of my body by consciously perceiving the proprioceptive
aspects of my body? To begin uncovering the answer to this question, let me re-consider the
example of holding the book in my hand.

4. Proprioceptive Awareness — Perceptual or Not?

4.1. My View — Preliminary Account

I take a book from a bookshelf and hold it in my hand. In that moment, as I hold the book in my
hand, I feel the book (its shape, weight, etc.). I distinguish the book as an object. Say, for
example, that in addition to having the book in my hand I also had a golf ball in my hand
alongside it (it may be a very small book such that both of these items could fit into one hand). I
would distinguish the book from the golf ball by discriminating between the different features
belonging to each. The book is rectangular whereas the golf ball is spherical. The golf ball has small indentations along its surface whereas the book is smooth of surface. In short, when holding both of these objects in my hand, there would be a discernment of each as its own thing. Further, the discernment, which is done based on a discrimination of features, would allow for the continued tracking of these two items by way of identifying them as distinct objects based on their specific features. As a result of this process, I am said to ‘perceive’ the book and the golf ball in my hand. Now, the same story can be given for the example we began with. When I hold a book in my hand, I distinguish it as an object by certain features that, in turn, allow me to track and identify the object through time. In holding the book in my hand, then, I have a perceptual experience of the book. As an object in the world I haptically discern the book with my right hand. The interesting question now becomes: Do I discern my hand in the same way? I argue that I do not; my hand is not perceived as an object alongside the book in this experience.

I make this claim for the following reasons. First, in this instance I do not simultaneously discern the book and my hand. To discern one is to not discern the other because when my attention focuses on the book, and I then distinguish, track, and identify the book, my hand recedes from my attention. In fact, to perceive my hand I must stop perceiving the book because I am able to discern the book only through my hand. My hand is how I perceive the book, it is not also itself something that I perceive as an object alongside the book. In my experience of holding the book, the book is quite clearly given as an object in the environment that I relate to. When I consider my experience phenomenologically, I can identify what is perceived (the book) and how I perceive it (as an object in the world). My hand, however, is not involved in the experience in the same way. Although my hand is not part of the perceptual objects that I am conscious of, I
nonetheless take it that my hand is within my conscious awareness in that moment: my hand is still experienced. I am not perceptually aware of my hand in the same way that I am perceptually aware of the book it holds; rather, I am perceptually aware of my hand as that through which the book is held. My hand is experienced subjectively as what relates to the book. I call the form of perception that characterizes my subjective experience of my hand bodily-self perception.

As an embodied being in the world, my body is that by which I engage and perceive the world. I cannot set my hand aside, nor can I come to acquire it at some point in the way that I do the book. I can come to perceive my hand as an object and can also come to stop perceiving my hand as an object, but in so doing my hand does not disappear from my awareness. My hand, and my body as a whole, are present for me in my awareness of the world. I can stop perceiving, and thereby being aware of the book, but the same cannot be said about my hand. When I use my hand to touch something else in the future, it does not surprise me, nor do I have to first re-acquire it within my perceptual awareness in order to then touch a new object. It is always there for me. So in the case under consideration, I contend that my awareness of the book is of the object perception kind, and that my awareness of my hand is of the bodily-self perception kind, because my hand (and body) is typically experientially given to me as subject and is therefore typically present as my bodily self. To further motivate the need to enrich our understanding of perception to include bodily-self perception, I will now consider and reject two accounts that argue that our bodily awareness is a form of object perception.

4.2. Perceptual — O’Shaughnessy’s View
Brian O’Shaughnessy takes proprioception to be a form of perception. Although he does not explicitly specify object perception, it is clear from his discussion of perception that he takes it to be a relation of the kind discussed in the object perception model. In this section, then, I will take perception to be synonymous with object perception. He makes his argument on the basis of typical cases of instrumental action. O’Shaughnessy take instrumental action to be intentional manipulative action. His primary example of such a type of action is playing a stroke in tennis. To play a stroke in tennis, one must intentionally move one’s arm and racket to meet and return the oncoming tennis ball. Although the case of holding a book is not as complex as the case of playing a stroke in tennis, O’Shaughnessy’s argument applies to both instances. He argues that in such instances, not only is proprioception involved in a perceptual manner, but it is required to be involved in this way for the action to be possible.

First, he distinguishes what he calls introspective proprioception — in which one shifts one’s focus onto a particular aspect of the body (say, the position of the arm) and uses proprioception to gain information about that particular bodily aspect. Second, he clarifies that if perception is best understood as an “experience, of the type attending, whose content is caused nondeviantly by its object, and it can form the basis of an inference to the existence of its object,” then it is clear that introspective proprioception is a form of perception. But, this is not the type of proprioception that is at issue. What is of concern is to understand how proprioception functions in our daily worldly interactions, in which proprioception is not typically introspective, and more specifically, to understand how proprioception functions in instrumental action.

O’Shaughnessy grants that if perception involves a noticing, in which the object of perception makes attentional demands, then it seems that proprioception typically is not perceptual; we do not find that our body is “a rival object of awareness as we actively engage with our surroundings.” Furthermore, if perception involves items coming into attention, and at any instant we have only so much attention available, then if proprioception is a form of perception, it must make attentional demands. Yet, if that is so, then when we engage in intentional manipulative action, proprioception should be a discordant and distracting item competing for attention along with the other items involved in the action. However, we do not typically have such experiences; that is, we do not typically find ourselves distracted by proprioception. So far, so good. However, O’Shaughnessy takes it that holding such a non-perceptual view might lead one to conclude that proprioception plays no role in instrumental action; a conclusion that he does not support. How, then, is proprioception involved in instrumental action?

O’Shaughnessy argues that the proprioceptive awareness involved is perceptual, only not in a manner such as to disrupt attention. At first this claim may seem at odds with his previous claim regarding proprioception not being a discordant and distracting item competing for attention. But there is no such conflict, because he takes it that if an act is intentional under a proprioceptive description, then in the act a small measure of attention can be left for proprioception. This small measure of attention would not lead to any discord or distraction but would suffice to explain

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13 O’Shaughnessy, “Proprioception and the Body Image,” 175.
how proprioception plays a part in instrumental action. We can confirm this small measure of attention by appealing to short-term memory or knowledge. If one has a short-term memory or knowledge of X, then X must have occupied attention at a particular time. So, if one has a short-term memory or knowledge of the proprioceptive bodily phenomena involved in an instrumental action, then this proprioceptive awareness must have occupied some part of attention during the execution of the instrumental action.

O’Shaughnessy explains his view by analyzing an example of hitting a volley in tennis. After hitting a volley, we can usually recall, among other things, the movement of the arm made in the act. Thus, if I have a short-term memory of my arm movement, then my arm movement occupied my attention at some time during the act. Going back to his initial definition of perception as involving items coming into attention, one must conclude that the proprioceptive awareness in the instrumental action is perceptual: “Since, immediately after playing such a tennis stroke, one will surely have some sort of short-term memory and knowledge of one’s own arm movement, and in fact would usually be prepared to place bets on the matter if challenged, we may reasonably conclude that arm movement was proprioceptively perceived at the time.”¹⁴ In sum, according to O’Shaughnessy, proprioceptive awareness is to some extent perceptually involved in our typical everyday interactions with the environment.

### 4.3. Criticisms of O'Shaughnessy’s View

¹⁴ O’Shaughnessy, “Proprioception and the Body Image,” 180 (my emphasis).
Although at first glance O’Shaughnessy’s view may appear intuitively appealing, when one looks more closely, problems arise. First, O’Shaughnessy’s focus is to elaborate the role of proprioceptive awareness in regards to only certain types of instrumental action, e.g., hitting a volley in tennis. However, not all actions are instrumental in the way he discusses. He himself concedes: “[n]onetheless, other examples of intentional manipulation of the environment exist in which the role of proprioception is more problematic. These are the cases in which the natural epistemological and attentive recessiveness of the bodily means increases to such an extent that they become *invisible to the agent*. Special activities like knacks (whistling) and skills (darts) are examples.”\(^\text{15}\) He then goes on to say: “But despite the relevance of these phenomena to the problem under discussion, which is the existence, content, and role of proprioceptive attending in the course of physical acts of manipulation, I will for the moment set these cases to one side.”\(^\text{16}\)

The issue here is that it is not clear why we would want to set these cases to one side. As mentioned, what is of interest is our sense of embodiment — our immediate sense of self as embodied beings. These fully immersed activities such as knacks and skills, which O’Shaughnessy sets aside, are far better suited to help us uncover how it is that our body is proprioceptively given in our daily interactions with the world, because they best reflect our *typical bodily interaction* with the environment. A view that does not account for such activities, then, is not one that explains how we are proprioceptively bodily self-aware.

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\(^{15}\) O’Shaughnessy, “Proprioception and the Body Image,” 180 (my emphasis).

\(^{16}\) O’Shaughnessy, “Proprioception and the Body Image,” 180.
This brings us to another issue: how should we account for the fact that proprioceptive awareness seems most typically to be attentionally recessive? Recall that O’Shaughnessy first claims that in order to be able to recollect something, one must have been aware of it in the act. He goes on to define this awareness as a perceptual awareness. So, for me to have a short-term memory or knowledge of hitting a volley in tennis, I must have perceived my arm at some point at the time of the action. The problem with this account is that it assumes that all perception is of the object-perceptual kind, that is, it implies that to be aware of something is to perceive it as an object. Thus, if I have a short-term memory or knowledge of hitting a tennis volley, it is because I was at some point aware of, and hence perceiving, my arm as an object in the experience. The problem here is twofold: first, this need not be the case, and second, it does not best explain the kind of awareness I had of my arm in hitting the volley.

My ability to recall something does not entail that what is recalled was attended to in the perceptual moment. I can be aware of something without having focused any attention towards it in the experiential moment. This is precisely the point that Ned Block makes in distinguishing between phenomenal consciousness and cognitive access. There is evidence to show that what we are aware of outstrips what we are attending to. If that is the case, then O’Shaughnessy’s argument — that because we can recall our bodily position or movement, and give a proprioceptive description of our body’s involvement in instrumental action, therefore our body must have been perceived and attended to as an object at the moment of action — fails.

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17 It might also turn out not to be the case that I am recalling anything at all, but merely constructing a story about how I accomplished an action based on my knowledge of how such actions are usually done.

18 Block, “Consciousness, accessibility, and the mesh between psychology and neuroscience.”
can recall my body’s involvement in a previous instrumental action because I was aware of my body at the time. But this does not necessarily entail that I was attending to, and thereby *perceiving* my body as an object. As I will argue, one can be aware of something without its being the object of a perceptual act — awareness need not always involve object perception.

In sum, I agree that object perception is a type of experience that involves attention. I also agree that our instrumental actions seem to involve proprioceptive awareness of some kind. Nevertheless, proprioceptive awareness need not be of the object-perceptual kind. There may be other forms of perception that better account for the proprioceptive awareness involved in our typical instrumental action, as I will show.

### 4.4. Perceptual — Bermúdez’s View

We now turn to another perceptual account of proprioception. In *The Paradox of Self-Consciousness*, Bermúdez argues that by virtue of providing perceptions of bodily properties, proprioception is a form of object perception. He relies on Shoemaker’s model of object perception, and more specifically, on what he takes to be the three central constraints of the model: the identification constraint, the multiple object constraint, and the object constraint. The identification constraint is the discernment feature I described in section 3 above. The object constraint is the fact/object awareness feature I described in the same section. The multiple objects constraint holds that “[o]rdinary modes of perception admit of our perceiving,
successively or simultaneously, a multiplicity of different objects.”\textsuperscript{19} Bermúdez argues that proprioception meets all three of these constraints and thereby counts as a proper form of object perception.

Bermúdez takes somatic information systems to be responsible for providing two types of information: information about the body and the environment, and information solely about the body. Both types of information can be given consciously and unconsciously. The information that comes to be conscious does so in either of two ways: mediate or immediately. Mediate conscious proprioception involves a sensation of certain bodily states that then constitutes an experience. For example, I experience pain because I feel pain — I have a pain sensation that constitutes the experience of pain. Alternatively, immediate conscious proprioception does not involve a sensation. Rather, we simply experience the bodily state. For example, there is no sensation involved in being aware of the position of my right arm. I do not feel the position of my arm in the same way I feel pains, tickles, itches, etc., rather I am simply aware of its position. For Bermúdez, what is at issue is conscious proprioception, both mediate and immediate. More specifically, his task is to show that mediate and immediate forms of conscious proprioception meet the object, identification, and multiple objects constraints required for a form of awareness to count as a form of object perception. He argues that when I am aware of the position of my right arm it is because I am perceiving my arm as an object.

Bermúdez contends that to understand how conscious proprioception meets the object constraint one must first understand how it meets the identification and multiple objects constraints. That is, he takes it that by showing that conscious proprioception involves discernment — distinguishing an object, tracking the object, and re-identifying the object as the same — and perceiving multiple objects — successively or simultaneously perceiving many different objects — he will have necessarily shown it to meet the object constraint, because in order to meet the identification and multiple object constraints, conscious proprioception must involve an object. His first order of business, then, is to show that proprioception is about more than just the body because it involves information from our various senses in relation to the body, and therefore meets the multiple object constraint. For this he appeals to cross-modal integration, and argues as follows: when having a sense perception of picking up an apple, say, we not only perceive it visually, but also haptically. Our experience of picking up the apple is not fragmented into separate modalities — we do not experience separate apples, one visually and one haptically. If this were the case, then reaching for the apple and bringing it to our mouth successfully would be very difficult because to do so would require the integration of visual, tactile, and kinaesthetic information. Rather, our experience of the apple is integrated and involves information from many sense modalities, including information about joint and limb position as well as kinaesthetic information. It seems wrong, according to Bermúdez, to hold that each sensory modality has its own type of object in the world. Indeed, there is ever more evidence strongly suggesting that “what we experience in sense perception is a presentation of the world that integrates information from all modalities.”

20 Bermúdez, The Paradox of Self-Consciousness, 141.
This integration across sensory modalities indicates that there is a common structure and coding of sensory information systems. Bermúdez argues that for all sensory information to be integrated into one comprehensive experience it must be given against a so-called egocentric framework\textsuperscript{21}. That is, all the information about picking up the apple must be given as occurring to and stemming from one and the same agent/body. As Bermúdez explains, “[s]ense perception generally involves localizing what is perceived within an egocentric frame of reference centered on the perceiver’s body, [and] the possibility of action depends both on correct information about the location of objects relative to body-centered axes and on correct information about the location and movement of body-parts.”\textsuperscript{22} This type of information about the body is given by proprioception; that is, proprioception gives information about the body from within the context of an overall perceptual field\textsuperscript{23}.

Thus, according to Bermúdez, if sense perception is always of a perceptual field which involves cross-modal integration, and proprioception is crucial for this integration, then proprioception does meet the multiple objects constraint by virtue of the fact that the perceptual field admits of a range of objects. Recall that the multiple objects constraint holds that ordinary modes of perception allow for the perception, successively or simultaneously, of multiple objects.

\textsuperscript{21} The egocentric spatial framework is the framework wherein what is perceived is represented as located in relation to the perceiver. As such, this framework involves the body — its position and layout.

\textsuperscript{22} Bermúdez, The Paradox of Self-Consciousness, 142.

\textsuperscript{23} Although O’Shaughnessy does not explicitly mention it, I believe that something like this is what he wants to refer to when he states that proprioception is a part of our everyday perceptual actions.
Proprioception involves information about more than just the body because it involves information about how the various senses are related to and function as part of the complete body, and this stems from its playing a crucial role in the integration of multiple objects in the perceptual field. As such, proprioception meets the multiple object constraint.

Having shown that proprioception meets the multiple objects constraint, he goes on to argue that it also meets the identification constraint by successfully tracking an object — the body — through time. For Bermúdez, the identification constraint is at heart a tracking constraint — to identify an object of perception one must be able to track the object. However, to track an object, implicitly involves the possibility of losing track of the object. In other words, if it is not possible for one to lose track of the object, then there is no tracking. As a result, the identification constraint would not be met because there would be no identification involved, given that there would be no tracking involved (either successfully or unsuccessfully). To show, then, that conscious proprioception fulfills the identification constraint, Bermúdez shows that it is possible to lose track of one’s body, either in part or in whole, over time, which implies that there is indeed tracking of the body prior to the loss. To show this to be the case, he appeals to the example of walking home on autopilot.

Consider the following: you walk up the steps to your front porch and suddenly realize that the last thing you can recall is locking your office door on your way home earlier that evening. You have no memory at all of your walk home. You, clearly, successfully accomplished the task of walking home from work. Yet you cannot recall which route you took, what lined the streets, or
even whether you passed others on your way. In this case, Bermúdez argues, we face a situation where proprioception has lost its object. To be sure, you were walking home, the proprioceptive systems functioned correctly at a nonconscious level — this is what allowed you to find your way home without tripping or falling. However, at the level of conscious proprioception, during your walk you lost track of the object, i.e., the body. Bermúdez’s reason for drawing this conclusion is quite simple: “[t]he best reason for describing these as cases of losing track of what one’s body is doing is the feeling of surprise that comes when one notices what has been going on.”

From this analysis, he concludes that in the case of walking home on autopilot the person proprioceptively loses track of the body. Moreover, given that it is possible to proprioceptively lose track of your body, we are warranted to hold that in situations where you are fully aware of yourself walking home, you are indeed tracking your body via conscious proprioception. Thus, according to Bermúdez, conscious proprioception does meet the identification constraint for perception. Furthermore, this conclusion seems intuitively appealing given that “[i]f the phenomenology of sense perception is indeed integrated rather than fragmented, then the body will appear as one object among the range of objects that appear in the integrated sensory field.”

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24 Bermúdez, _The Paradox of Self-Consciousness_, 144.

In sum, Bermúdez contends that conscious proprioception meets the multiple objects constraint because it allows for the perception, simultaneously or successively, of multiple objects, and it also meets the identification constraint because it involves identification information which enables the “tracking” of the body over time. By virtue of meeting these two constraints, it, then, fulfills the object constraint of providing an awareness of an object in a sense experience because it is “critically responsible for the body appearing as a distinctive object in the integrated sensory field.” So, for Bermúdez, conscious proprioception must be considered a form of object perception.

4.5. Criticisms of Bermúdez’s View

Although Bermúdez presents an interesting position, particularly in his discussion of the role of proprioception in providing the egocentric spatial framework, there are a number of problems with his argument, the first of which being how he defines proprioception. In *The Paradox of Self-Consciousness*[^27], Bermúdez defines somatic proprioception as involving the following types of information:

1- information about pressure, temperature, and friction from receptors on the skin and beneath its surface.

2- information about the relation of body segments from receptors in the joints, some sensitive to static position, some to movement.

3- vestibular information about balance and posture.


[^27]: See section 6.1 of chapter 6.
4- information about bodily dispositions and volume obtained from skin stretch.
5- nutritional and homeostatic information received from receptors in the internal organs.
6- information about muscular fatigue.
7- information about bodily disturbances derived from nociceptors.

This definition of proprioception is simply incorrect. In fact, Bermúdez conflates three different sensory modalities in his definition. From the preceding list, 1 is more appropriately tied to the sense of touch; 5, 6, and 7 are considered to be part of the interoceptive sensory system; and, 4 could be considered either a form of touch or a form of interoception depending on what this information involves (bodily disposition and skin stretch at the periphery of the body or within the depths of the body, say). The only proper forms of proprioceptive information are 2 and 3. It is important to flag this problematic definition because it is crucial that our target of explanation be clearly and correctly specified, otherwise we cannot be sure what our analyses are said to uncover. By conflating three distinct sensory modalities in the definition of proprioception, Bermúdez sets himself an incorrect target of explanation, and runs the risk of improperly accounting for conscious proprioception. Nevertheless, although Bermúdez fails to correctly define proprioception, he appears to rely mainly on cases involving information of types 2 and 3 to develop his argument for proprioception being a form of perception (except for the cases of pain he appeals to). Therefore, the definitional issue may not be problematic for the view he defends.
Far more problematic is his understanding of bodily experience and bodily awareness. There are three main issues with his account, the first of which is his argument for conscious proprioception meeting the multiple objects constraint. He is correct that our multi-modal experience of the world must involve a sensory integration that relies on an egocentric bodily spatial framework. Indeed, the subject of experience, i.e., the agent interacting with the world, is the sourcepoint of sensory perception, and so there needs to be an integration of sensory information reliant on the bodily spatial framework of the agent. In short, all the sensory information must come together against the framework of one body. Moreover, the framework of the body is in large part generated by proprioception. However, the fact that proprioception plays a role in constituting the egocentric spatial framework onto which multiple sensory inputs (from objects in the world) get integrated does not entail that proprioception meets the multiple objects constraint. Proprioception constitutes the framework onto which objects are given, but it does not, in so doing, give the body as an object onto this framework as well. Furthermore, as we will see in further detail when considering Gallagher’s view, what plays the constituting role in the egocentric spatial framework is proprioceptive information, not conscious proprioceptive awareness. Hence, the relationship between proprioception and the egocentric spatial framework does not serve to show that proprioception meets the multiple object constraint.

The second problem with Bermúdez’ account is his defense of proprioception meeting the identification constraint. I grant that the identification constraint is at heart a tracking constraint and it therefore requires the possibility of losing track of the object in question. However, I do not see how his example shows that conscious proprioception meets this constraint. Bermúdez claims that the proper way to understand the case of walking home on autopilot is as
exemplifying an instance of proprioceptively losing track of one’s body. Indeed, insofar as you do not discern your body the entire way home, you lose track of it, i.e., you stop perceiving your body as an object. However, this does not mean, as Bermúdez suggests, that only unconscious proprioception was at play. This is a very odd claim indeed. It seems, at the very least, intuitively obvious that in the process of walking home one does not lose consciousness altogether and become a zombie. Presumably, then, while walking home there is some type of bodily experience that continues to occur. One way to explain this experience is to grant that you continue to have an awareness of your body, i.e., you continue to proprioceptively perceive your body, just not by means of object perception. The view that I propose accounts for the bodily self-awareness that is involved in such a case. In the case of walking home on autopilot, I suggest that the person’s proprioceptive awareness of their body as they walk home is an instance of bodily-self perception, and this explains their successful accomplishment of the task, even though they may be attending to something else.

The third problem with Bermúdez’s account is that it simply does not fit with the phenomenology of our lived bodily experience. He claims that “[i]f the phenomenology of sense perception is indeed integrated rather than fragmented, then the body will appear as one object among the range of objects that appear in the integrated sensory field.”28 Yet, in our everyday lives, our body is not one object among the many objects that appear in the integrated sensory field. Rather, our body, when not the object of attention, is diaphanous and inattentionally present in our awareness.

28 Bermúdez, The Paradox of Self-Consciousness, 145.
We can conclude from these considerations, then, that object perception does not properly account for the kind of awareness we have of our body. That is, our everyday proprioceptive awareness simply is not of the object-perceptual kind. Perhaps, then, as Gallagher argues, it is of a non-perceptual kind. I now consider this alternative account and show how it too fails to properly explain our target of inquiry. As will become clear, the only way to explain our typical proprioceptive awareness is to expand our view of perception beyond object perception and consider a form of perception related specifically to our subjective awareness of our body.

4.6. Non-Perceptual — Gallagher’s View

Gallagher argues that proprioception provides a non-perceptual awareness of our body’s spatiality, and in so doing is importantly involved in structuring the first-person perspective from which all experience occurs. His argument is twofold: first, if perception involves distinguishing an object such that one can identify the object and thereby track it through time (discernment constraint), then there is a case to be made for proprioceptive awareness, in its most typical form, not falling under the category of perception. Second, if perception is necessarily perspectival, and what gives perception its perspectivalness is in large part proprioception, then whatever structures this perspectivalness cannot itself be perceptual, on pain of leading to an infinite regress. From these considerations, he concludes that proprioceptive awareness, in its most typical form, is best understood as a non-perceptual and non-perspectival form of awareness.
Let us begin by looking at his first argument in more detail. Reconsider the example of holding the book in my hand. If proprioceptive awareness were a form of perception, Gallagher argues, then as I held the book and haptically discerned it, I would also somehow need to discern my hand at the periphery of my perceptual field — I would have to discern both the book and my hand. However, if I discern what is at the periphery of my attention, i.e., my hand, then I no longer discern what is at the focus, i.e., the book. I shift the focus of my attention from one object to another. If we consider the phenomenology of the experience, it seems we either focus on and track the book, or we focus on and track our hand. Gallagher takes it from the phenomenology, then, that we do not keep track of both at the same time. Furthermore, when I discern my hand, I focus on my body and it becomes an instance of taking the body as object. However, in typical everyday instances of holding a book, we do not usually focus our attention on our hand; our attention is typically focused on the book.

This phenomenological description is akin to my analysis of the case study at the outset of the chapter. However, where Gallagher and I differ is in the conclusion we draw from our analyses. He claims that when I track the book, my hand recedes into my background awareness and is *no longer perceived*. He also holds that my hand does not disappear from the experience altogether — I am able to hold and thereby touch the book only *through* my hand, and through my proprioceptive awareness of my hand and body. So my hand is necessarily involved in perceiving the book. However, Gallagher contends, my hand’s involvement in my perceptual experience of the book is as that *through* which I experience the book — as the very subject of experience. My proprioceptive awareness is an integral part of my successfully engaging in and with the world, but typically not such as to present my body as an object of perception. Gallagher
concludes, then, that in its most typical form, my proprioceptive awareness is best understood as a non-perceptual awareness — it’s an awareness of my body as I live through it.

Gallagher next argues for the importance of proprioception to the very structure of perception. Perception is characterized by being perspectival. That is, whenever I perceive something (using any of my standard senses), what I perceive is always given from my embodied perspective on the world. It is structured by and given against an egocentric bodily spatial framework. The egocentric spatial framework is generally understood to be a body-centered framework that allows for a differential spatial order in the perceptual sense modalities.29 Our perceptual experiences are not only multi-modal, but are multi-modally integrated. This multi-modal integration involves many different objects being structured against one spatial framework. That is, our typical perceptual experience always occurs from a body and to a body: it is perspectival, it occurs from a point of view. This perspectivalness, Gallagher argues, is given by the egocentric spatial framework because our perceptual experience is integrated and structured by it.

The egocentric spatial framework plays a fundamental role in perception and our perceptual experiences of the world. What, then, constitutes this framework? One of the proposals is proprioception. Proprioception constitutes the egocentric spatial framework because it is the sensory modality responsible for providing information regarding the body’s structure and

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29 To be clear, I acknowledge that there could be more than one egocentric spatial framework, and that these could differ structurally. However, these subtleties are not relevant for my purposes here. For this reason, I will speak of only ‘the’ egocentric spatial framework in general terms.
spatial layout. The egocentric spatial framework is a body-centered spatial framework, and so proprioception plays a role in shaping this framework.

There is, however, a regress worry: if perception is given against a bodily spatial framework, and what generates this framework is a form of perceptual awareness, then the awareness too will need to be given against a bodily spatial framework. That is because all perception is perspectival and therefore must be given against such a framework. As a result, if proprioception is perceptual, then it must be given against an egocentric spatial framework^{30}. Yet, proprioception is also suggested to be what generates this framework. Herein lies the regress: if perception requires a perspective, then this perspective cannot in turn be given by something perceptual — proprioception cannot be both perceptual and what generates perspectivalness. How could something perspectival generate perspectivalness? The solution, Gallagher suggests, is that there must be a form of non-perspectival, non-perceptual bodily awareness that generates the bodily spatial framework.

The need for such a non-perceptual form of bodily awareness is also echoed by O’Shaughnessy and Bermúdez. As Bermúdez states:

“[H]ow is this information about the location and orientation of the body acquired? There seem to be two possibilities. The information could be gained sense-perceptually (for example, by looking at oneself in a mirror) or it could be gained non-sense-perceptually. It is here that the regress looms. If information about the location and orientation of the body is acquired sense-perceptually, then, as has already been granted, it needs to be mapped onto information about

^{30} This point is made by O’Shaughnessy, Bermúdez, and Gallagher.
the location and orientation of the body. The same question reappears: how is this information acquired?"31

At some point, it is claimed32, what grounds the egocentric spatial framework must be acquired non-perceptually. This leads Gallagher to conclude, however, that if the egocentric spatial framework is constituted by proprioception, then, proprioception is non-perceptual and thereby non-perspectival. Proprioception, then, can also be said to generate the first-person point-of-view.

4.7. Criticism of Gallagher’s View

Although I appreciate Gallagher’s attempt to describe our typical proprioceptive awareness as something other than object perception, and I agree with his reasons for arguing against the view that proprioceptive awareness is a form of object perception, I disagree with the conclusions he draws from his two arguments. As I will now show, both of his arguments fail because they rest on the assumption that all perception is object perception and, thus, perspectival.

My main concern regarding his first argument can be put in the form of the following question: does perception necessarily involve discernment? If all perception necessarily involves discernment, then Gallagher’s first argument holds. But Gallagher gives no independent argument to establish that all perception involves this constraint. Instead, he relies on Shoemaker’s object-perception model to make his case, and Shoemaker makes clear that his


32 This is a claim that O’Shaughnessy, Bermúdez, and Gallagher all agree to.
model specifies the constraints for object perception. Indeed, Shoemaker even begins his description of the object-perception model by distinguishing two types of perception, broad and object, and then specifies that his concern is with only the latter. So the discernment constraint is perhaps necessarily involved in object perception, but it is an altogether different matter to show that it is necessary for every kind of perception. Gallagher’s first argument, then, merely shows that our typical proprioceptive awareness fails to count as a form of object perception because it fails to meet the discernment constraint. However, he does not successfully show that our typical proprioceptive awareness is best understood as a non-perceptual awareness. In fact, failing to count as a form of object perception simply leaves open the possibility of a form of perception that does not involve a discernment constraint.

Furthermore, his conclusion that proprioceptive awareness is non-perceptual makes it very difficult to understand how, as he claims, my ‘hand recedes into the background awareness and is no longer perceived,’ and yet ‘my hand is necessarily involved in perceiving the book.’ What could the relation between a non-perceptual awareness and a perceptual experience of an object be? Put another way, how should we understand an experience of our body as relying on a particular sensory modality that is non-perceptual? Intuitively, experiences of bodily states based on the senses are perceptual experiences, and so my experience of my body via proprioception seems, intuitively, to be a perceptual experience. Gallagher’s view leaves undetermined some explanatorily difficult terrain.
Regarding his second argument, I wonder whether perception needs to be perspectival. Gallagher gives a very interesting account of the role proprioception plays in generating the egocentric spatial framework and thereby the first-person perspective of our typical perceptual experience of the world. I agree with his claim that proprioception is importantly involved in the egocentric spatial framework, and with his conclusion that what constitutes the egocentric spatial framework cannot be perspectival or it will lead to a regress. However, I do not see how these points lead to the further conclusion that proprioception is non-perceptual and non-perspectival unless one assumes that all perception is perspectival in the way described by the egocentric spatial framework. That is, insofar as there is a perceptual relation between a subject and an object, then this perceptual relation must be perspectival. However, must all instances of perception involve a relation between a subject and an object? I think not, and this assumption is precisely what I have been questioning throughout this chapter. As I will explain in section 5 below, I take it that the minimal condition for an experience to be perceptual is that it involve a sensory modality by way of which a relation is established between a perceiver and a perceived. This, however, does not necessarily involve a relation between a subject and an object. If this is correct, then it is not necessarily the case that all perception requires a perspective. Indeed, all that can be said is that object perception requires a perspective, in which case Gallagher’s second argument shows only that what is required to generate the egocentric spatial framework cannot itself be a form of object perception. So proprioception, then, is not typically a form of object perception, and is non-perspectival. However, this conclusion does not support the further claim Gallagher makes that proprioception is non-perceptual.

4.8. Where We Stand
At this point, let us take stock of the positions taken in this debate. Object perception is characterized by three main features:

1. **Discernment** - To perceive an object is to distinguish it from other objects, identify it and track it through time.

2. **Egocentric spatial framework** - The perception of objects is perspectival and requires an integration of multi-modal stimuli onto a bodily spatial framework to constitute this perspective.

3. **Attention** - To perceive an object is to attend to an object.

For O’Shaughnessy and Bermúdez, the goal was to show that our typical proprioceptive awareness is a form of object perception. As I have argued, they fail to show that our proprioceptive awareness meets the constraints of object perception. Gallagher, on the other hand, argued that by failing to meet the constraints of object perception, proprioceptive awareness is non-perceptual. However, his view fails to consider the possibility that not all perception is object perception and that a non-object perceptual account of proprioceptive awareness might be more parsimonious in relation to the phenomenological analyses of our typical everyday bodily being in the world. Indeed, I take the most common but erroneous assumption behind the discussion of proprioceptive awareness to be that all perception exhibits the characteristics of object perception, and therefore must involve discernment, egocentric spatial framework, and attention. As I have shown, this assumption leads in two equally unappealing directions: either proprioceptive awareness is object perceptual or proprioceptive awareness is non-perceptual. To resolve these issues, we must reject this assumption. Instead, we must enrich our understanding of perception and show how perception need not only be thought
of in terms of object perception. I suggest a form of perception that can better account for our typical proprioceptive awareness: *bodily-self perception*.

5. **A Richer Account of Perception — Bodily-Self Perception**

As I have stated, my view offers a model for a different kind of perception from object perception but that is nonetheless a form of perception insofar as it involves a sensory modality by way of which a relation is established between a perceiver and a perceived. In the case of bodily-self perception, what is perceived need not be perceived ‘as an object’. That is, perception need not involve a positional relation wherein a subject takes a perspective on an object. So, what is bodily-self perception? It is the manner in which we are aware of our body subjectively. It does not involve objects to which one is directed and in turn perceives. Rather, it is a perception of the body as the self and of the self as bodily. That is, bodily-self perception allows for an experience of our body as that *through* which we interact in the world (as subject) rather than as that *with* which we interact in the world (as object). It is to perceive the body as the subject of object-directed experience. To better articulate this form of perception, let me elucidate some of its characteristics. Bodily-self perception, I propose, is characterized by the following three features:

1. **Attentional seclusion**
2. **Non-Perspectivalness**
3. **Ever-presence**
Attentional seclusion. Before I can elucidate this feature of bodily-self perception, I must first clarify the attention feature of object perception. Much confusion arises from Shoemaker’s claim that for object perception one only needs that objects be potentially attended to. Specifically, one can interpret the term ‘potential’ in a few ways. First, we can construe the term very broadly: absolutely anything that can come to be attended to at some point in time meets the attention constraint of object perception. This construal seems uninformative, for it does not shed light on what object perception is or how we can know that we are engaging in object perception. Further, it is far too broad a construal because it no longer serves as a constraint on what counts as an object of object perception. Another, more charitable understanding of the term takes it to be couched in the view that attention involves a foreground/background structure. Under this construal, the potential objects of attention are all those objects that lie in the background of attention. So I am said to attend to what is given in the foreground, and I can potentially attend to anything in the background. Object perception, then, I understand to involve both the foreground and background of attention.

Bodily-self perception, on the other hand, is attentionally secluded. That is, what is perceived in bodily-self perception is neither in the foreground nor in the background of attention — it is not attended to at all. There is simply a self-givenness of the perceived as the perceiver whereby both are the self/subject. To bodily-self perceive my body is to bodily-self perceive myself. I do not ordinarily or typically perceive an object, the body, and then identify it as myself; rather, the body ordinarily gives itself as subject in bodily-self perception. The body is immediately experienced as myself.
Non-Perspectival. There is no point-of-view in bodily-self perception — it is non-perspectival. It is non-perspectival, in part, because it does not involve a subject/object relation, but is only of the subject. Because it does not involve a relation between a subject and an object, there is no object onto which a perspective is taken. To be given subjectively is to be given as that which takes a perspective, and therefore not as that which has a perspective taken on it (as is the case with an object). By virtue of being non-perspectival, it is an awareness of that which constitutes the egocentric spatial framework, which, in turn, generates a perspective for other forms of perception (i.e. object perception). Bodily-self perception, however, itself does not involve a framework. It is a manner of perceiving the very subjectivity of the body.

Ever-Presence. My body is always present as subject for me so long as I am conscious. As Merleau-Ponty so nicely put it: “an object is an object only in so far as it can be moved away from me, and ultimately disappear from my field of vision. Its presence is such that it entails a possible absence. Now the permanence of my own body is entirely different in kind: […] [i]ts permanence is not a permanence in the world, but a permanence on my part.” Experiential consciousness involves the body, i.e., being bodily in the world. There is an ever-present bodily self-awareness in our experiential lives. As I have shown, bodily-self perception is how we experience our body as subject. As a result, bodily-self perception must be ever-present in experiential consciousness. So long as there is bodily self-awareness, then there is bodily-self perception.

Bodily-self perception, then, differs from object perception in that it does not involve a relation between a subject and an object, it does not involve discernment (distinguishing, identifying, and tracking an object), and it does not rely on an egocentric spatial framework the way that object perception does. Furthermore, if we grant my discussion of attention above, bodily-self perception does not involve attention in the same way that object perception does, that is, it does not require attention at all. Bodily-self perception is attentionally secluded, non-perspectival, and ever present.

Given its characteristics, bodily-self perception is restricted insofar as how it comes about. From our considerations thus far, bodily-self perception cannot come about from any of the exteroceptive senses. These, by virtue of being externally directed, will always bring about object perception. Instead, we must consider other ways in which we experience our bodies. Proprioception seems an obvious candidate for bodily-self perception. In the everyday proprioceptive awareness that we have discussed throughout this chapter, it seems clear that what we have is a bodily-self perception (attentionally secluded, non-perspectival, and ever present perceptual experience) of our body posture and limb position.

Reconsider the case study with which we began: holding a book in our hand. The phenomenological analysis of the case yielded the following description: I perceive the book because I am touching it and this sensory experience gives me an awareness of the book as an object with which my body interacts. My hand, however, is experientially diaphanous in this
example. When I consider my experience phenomenologically, I can identify what is perceived (the book) and how I perceived it (as an object in the world). My hand, however, is not involved in the experience in the same way. That is, I experience the book through my holding of it, through my hand, but my hand is not given as an object that my body interacts with the way the book is. Nonetheless, my hand is still experienced. I experience my hand subjectively in my perceptual experience of the book. Indeed, I could shift my attention to my hand and take it as an object of perception. But, in the example given, this is not what occurs. When looking at the different accounts of the kind of awareness we have of our hand in this instance, only my account of bodily-self perception clearly captures the features of this awareness. In this case, I am aware of my hand: as attentionally secluded — because I am not attending to my hand in any way, that is to say my hand is neither in the foreground or background of attention, it is attentionally recessive — as non-perspectival — because there is no perspective that I take on my hand in my awareness of it — and as ever-present — because my hand, and body, are always present to me as that through which I engage in the world. I cannot be said to perceive the book in a similar manner. Only one’s own body can be perceived via bodily-self perception. Typical proprioceptive awareness, I conclude, is a form of bodily-self perception because it reflects the features of bodily-self perception. This view explains the special kind of awareness we enjoy of ourselves as embodied beings and begins to explain how our sense of self as bodily might come about.

6. **Bodily Perception — The Way Forward**

We began this chapter by considering the paradigm view of perception: object perception. We then considered two ways of accounting for the everyday proprioceptive awareness that we enjoy
in our bodily being in the world. On one account, our typical proprioceptive awareness was argued to be a form of object perception. On the other account, typical proprioceptive awareness was found to be non-perceptual. Both of these accounts failed. What was needed was a richer view of perception that allows for more than simply object perception. I suggested such a view, namely bodily-self perception. I then argued that our typical proprioceptive awareness was a form of bodily-self perception. My view accounts for what O’Shaughnessy identified as proprioceptive awareness typically seeming attentionally recessive. It also accounts for the intuition that we typically must be aware of our bodies in some way to successfully act. And it accounts for how proprioception might constitute the egocentric spatial framework. It does all this without having to hold that my body is an object among other objects I perceive, and without appealing to a very unintuitive non-perceptual form of awareness.

Bodily-self perception, however, may involve more than merely proprioceptive awareness. I suggest that there are two sensory modalities that allow for bodily-self perception: proprioception and interoception. My reasoning is as follows: first, these are the only sensory modalities that are strictly of our own body; and second, they are the only sensory modalities that are of the inner body. As I will show in the next chapter, our typical interoceptive awareness is also best viewed as a form of bodily-self perception. Moreover, an analysis of our typical interoceptive awareness will yield a much richer picture of bodily-self perception.
Chapter 3: Bodily Self-Awareness — Interoception

In the first chapter, I focused on clarifying the distinction between our awareness of the body as object and our awareness of the body as subject. In the previous chapter, I showed that the object perception model fails to account for bodily self-awareness, and I then motivated the need to expand our understanding of perception in order to account for this form of awareness. I posited an enriched account of perception called bodily-self perception, and I positioned my account in the debate over proprioceptive awareness. As I mentioned at the closing of the previous chapter, however, proprioception is not the only sensory modality that contributes to our bodily self-awareness. As I will now argue, interoception also plays a crucial role, one perhaps more important than proprioception, in our awareness of the body as subject.

My task in this chapter is to consider my explanatory targets again from a fresh perspective: how we experience our body and what the nature of our awareness of our body is in relation to interoception. My goals are threefold: first, I argue that our experiential consciousness includes interoceptive bodily self-awareness; second, I argue that this self-awareness exhibits the characteristics of bodily-self perception that were discussed earlier; third, I argue that interoception is crucial to our sense of self as bodily, indeed is even more important than proprioceptive awareness.
I begin by reviewing the neurophysiological substrates of interoception. I then provide examples to clarify how the distinction between our awareness of the body as object and of the body as subject applies to interoception. Next, I briefly discuss interoceptive awareness in light of the account of object perception I presented in chapter 2, and I elaborate on the enriched view I proposed. Finally, I turn my attention to the strongest support for interoception being a form of bodily self-awareness — the emotions — and show how they best serve to support the view that interoception is fundamental to our experience of our bodily self.

1. **Interoception**

Unlike proprioception, interoception has only begun to gain notice in the philosophical community. Much of the interest in this sensory modality has come from those studying emotions. In the scientific and medical communities, however, interoception has long been considered of importance, and there are references to the inner body that date back as far as the early 19th century. At that time, Ivan Sechanov referred to certain bodily sensations as “dim feelings,” “faint sensations,” and an “obscure muscular sense” at the border of consciousness.\(^1\) Around the same time, Claude Bernard used the concept of a ‘milieu intérieur’ to describe the “identifiable set of physiological parameters that defined the normal internal state of the organism.”\(^2\) Later, this normal internal state came to be known as the homeostatic state of the body. Although today we have come to understand that maintaining homeostasis does not, in fact, involve holding the body in a static state, there are nonetheless certain parameters that the

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body must maintain in order to survive: “[h]omeostasis […] is a dynamic and ongoing process comprising many integrated mechanisms that maintain an optimal balance in the physiological condition of the body, for the purpose of survival. In mammals, these include autonomic, neuroendocrine, and behavioral mechanisms.”³ To maintain those parameters, the body needs continuous and up-to-date information from its inner environment. This feedback, which is required for homeostasis, is thought to be provided by what 100 years ago Sherrington called interoception: the “sensory-perceptual processes for events occurring inside the body.”⁴

Interoception, in short, is the overall sense of the physiological condition of the body.⁵ It is the sensory system responsible for providing afferent information about, among other things, the visceral organs, bodily temperature, pain, body chemistry, etc. It comprises various types of receptor, each specific to one kind of stimuli; there are chemoreceptors (chemical stimuli), nociceptors (pain stimuli), mechanoreceptors (pressure stimuli), thermoreceptors (temperature stimuli), visceroreceptors (visceral organ stimuli), to name a few. Some areas of the internal milieu are more densely populated by such receptors than others, and some specific areas have more than one type of receptor responsible for them — for example the stomach has visceroreceptors, thermoreceptors, nociceptors, etc.

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⁴ Cameron, *Visceral Sensory Neuroscience: Interoception*, 3.

In primates, there is a direct sensory pathway (lamina I) that provides the primary interoceptive representation of the physiological condition of the entire body. This thalamocortical pathway represents the afferent inputs from both the sympathetic and parasympathetic nerves. Interoceptive information is first gathered in the spinal cord and lower brainstem regions before it converges in higher brainstem regions. It is in these higher brainstem regions that the interoceptive information is topographically mapped. Finally, these neural maps are represented in insular cortex, and the somatosensory cortices I and II. Where along this pathway our interoceptive awareness arises, however, is still an issue of contention. Some theorists, such as Craig, believe that interoceptive awareness is based in higher levels of processing, whereas others, such as Damasio take it to stem from earlier areas of the pathways. As we will see, this debate has consequences for how we might account for the difference in our interoceptive bodily awareness as object versus as subject.

For Craig, the extension into the insular cortex is what underlies “the distinct, affective bodily feelings that we can perceive, such as cool, warm, itch, first (prick) pain, second (burning) pain, muscle burn, joint ache, visceral fullness, flush illness, nausea, cramps, hunger, thirst, and the special visceral sensation of taste.”⁶ He holds that there is a growing amount of evidence⁷ showing that the insular cortex contains the substrates for interoceptive processing and awareness. More specifically, he argues that the primary interoceptive representation first occurs in posterior insular cortex, and is subsequently re-represented in anterior insular cortex where

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⁷ See Craig, Critchley, etc.
these re-representations provide the basis for all the subjective feelings from the body and emotional awareness — at the very least of homeostatic emotions. The evidence shows a posterior to anterior progression of the interoceptive representations, which in turn he takes to reflect a progression from unconscious processing of the interoceptive state of the body to a conscious awareness of our interoceptive body. Craig takes it to have been confirmed that the anterior insular cortex, and in particular the right anterior insular cortex, is crucial for the subjective awareness of the inner body. Indeed, he suggest the following working hypothesis for interoceptive awareness: “[r]ecursive meta-representations of homeostatic feelings allow the brain to distinguish the inner world from the outer world. Most strikingly, degrees of conscious awareness are related to successive upgrades in the self-representational maps.”

Damasio, on the other hand, disagrees with the view that interoceptive awareness arises in insular cortex. To be sure, that particular brain region plays some role in our conscious awareness of the internal states of the body. Where the issue of contention lies, however, is in whether the insular cortex is the basis for our interoceptive awareness, as Craig suggests. Damasio argues that although “[c]ontemporary neuroscience has identified the insula as the main cortical target for signals from the interoceptive system, and functional neuroimaging studies consistently implicate the human insula in both interoceptive and emotional feelings[,] …

8 Homeostatic emotions, as opposed to the most commonly understood primary (fear, anger, etc.) and secondary (anxiety, nervousness, etc.) emotions, are a distinct kind of emotions having to do with the feelings and associated behavioral motivations surrounding the maintaining of homeostasis. I will discuss these in further detail in section 4 of this chapter.


10 A.D. Craig, “Human feelings: why are some more aware than others?” Trends in Cognitive Sciences 8, no. 6 (2004): 239.
[s]everal findings suggest that this hypothesis is problematic.”11 First, given that many areas of the upper brainstem are mandatory relay stations for the processing of interoceptive information and that these areas have been shown to produce complex representations of bodily states, they should not be discounted from playing a role as the basis of our interoceptive awareness. Second, evidence shows that children born without a cerebral cortex (of which the insula is a part) nonetheless exhibit behaviors compatible with feeling states — mental experiences that accompany changes in bodily states as represented in areas associated with interoception. Third, patients with bilateral insula damage show no signs of their bodily or emotional feelings being disrupted or abolished. Indeed, “feelings seem to dominate the mental landscape of patients with bilateral insular damage.”12 As a result, Damasio contends that “[t]hese observations do not support the view of the insula as a necessary substrate for feeling states. […] Together, these findings indicate a key role of the human brainstem in triggering and supporting emotion and feeling. Normal human feelings do not require the insula, although they consistently engage this region.”13 Rather, Damasio suggests, the insula appears to play a modulatory role in the processing of bodily state representations.

One reason why this debate over where the basis for our interoceptive awareness lies is important is because it has important consequences for our understanding of the evolutionary development of consciousness. If Damasio is correct, and interoceptive awareness originates in

12 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 147.
13 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 147.
the brainstem — a phylogenetically older brain region than the cerebral cortex, which has been associated with virtually every aspect of our cognitive mental lives — then it implies that interoceptive awareness was the first form of consciousness to arise in biological evolution. Indeed, as Damasio suggests, “[t]he advent of feelings was simultaneously the advent of the mind. Early organisms capable of feeling were, for the first time in evolution and unlike all other life forms, aware of some aspects of their own existence. Feelings paved the way for the establishment of higher levels of cognition and consciousness, culminating in the modern human mind.”14 15 Whether or not this contention is correct, it nonetheless seems clear that interoceptive awareness is a key aspect of our conscious mental lives.

It is certainly the case, however, that many of the afferent signals sent to the brain by the multitude of interoceptive receptors never reach consciousness. Most of the time, the body is able to regulate itself without the need for conscious awareness or control. This seems intuitive given that if we were to be attentively aware of every signal that the internal milieu sent to the brain about the states, needs, changes, etc. of the body, then our entire conscious lives would be taken up by the need to regulate all these signals. And even then, we would likely not be capable of consciously managing all the signals relevant to successfully achieving homeostasis. It is important, therefore, to make a distinction between interoceptive information and interoceptive awareness. This distinction mirrors the one made in the previous chapter between proprioceptive information and proprioceptive awareness: interoceptive information is the subpersonal and

14 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 150.

15 Although far more could be said about this claim, for my purposes here, which is merely to give a basic account of interoception, I will set this discussion aside.
nonconscious information transmitted about the physiological condition of the entire body, and interoceptive awareness involves the conscious awareness of the body as given by interoception.

Thankfully, much of the maintenance of homeostasis is done subconsciously and automatically. However, there are certain instances when afferent information about the milieu intérieur does reach consciousness. Often, this is when there is a need that must be met via some conscious action the subject must engage in. For example, interoceptive signals sent to the brain from the viscera of, say, the bladder may need to reach consciousness in order for the subject to act in a manner so as to regulate the distended organ. One proposal for why homeostatic needs reach consciousness is that doing so facilitates “learning of the conditions responsible for homeostatic imbalances and of their respective corrections, as well as anticipation of future adverse or favourable conditions.”16 In short, involving consciousness might allow for an added level of regulative behavior that would not be available at the level of mere interoceptive information processing. The viscerosensory system, therefore, involves more than simply maintaining homeostasis, although that is what it is most often associated with. It is also largely associated with motivation and behavior. Moreover, there are instances of interoceptive signals reaching consciousness not because they require action, but simply as a result of specific goings on within the body. For example, we can be aware of a rumbling in our stomach after having had a meal — a rumbling that does not require any action on our part but that we are simply aware of. In short,

16 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 143.
“interoception [comprises the] sensory perceptual processes for events occurring inside the body, including visceral perception (i.e., conscious awareness of visceral function).”\(^{17}\)

Thus, the internal body communicates with the brain in many ways and for many reasons, and this often involves consciousness. But why is this so? That is, why are certain bodily signals associated with consciousness at all? These questions point to a certain kind of explanatory gap that arises in these discussions, one that Evan Thompson refers to as the body-body problem:

“The body-body problem is a non-Cartesian way of recasting the explanatory gap between the conscious mind and the physical body. […] [I]n the body-body problem, the gap is no longer between two radically different ontologies (“mental” and “physical”) but between two types within one typology of embodiment. […] [It] concerns the relation between one’s body as one subjectively lives it and one’s body as an organism in the world.”\(^{18}\)

Any exploration of why certain aspects of the physical body are associated with our consciousness of them will require that one tackle the body-body problem. However, my concern here is not to explain why certain aspects of our internal milieu are associated with consciousness, but rather with what specific ways we are interoceptively conscious of our inner body. What is at issue here, then, is the same as what was at issue with proprioception: first, are we interoceptively aware of our body as subject, and second, is our interoceptive awareness a form of perception? Explaining how certain aspects of the body become part of our conscious awareness is not my target. As such, my concern is not with the body-body problem, so I will set it aside here.

\(^{17}\) Cameron, *Visceral Sensory Neurosciences: Interoception*, 3, my emphasis.

2. **Interoceptive Awareness — the Body as Object**

It seems clear that we often perceive our inner body, e.g., we are able to discriminate internal regions from one another, and track internal states. That is, although we are not always aware of our internal organs, and are perhaps never aware of some of them, it is nonetheless undeniable that we are, at times, perceptually aware of at least some of them. “While it has long been the given wisdom that, with the exception of pain, one generally cannot feel the functions of one’s visceral organs, the bulk of the data does not support a conclusion this conservative.”\(^{19}\) As I will now consider, we experience not only our inner body, but we do so even when there is no homeostatic need.

Take, for example, the experience of having a full stomach after eating a large meal, or the movement of a hot beverage down your throat. In these cases, you experience a bodily state of affairs. These states of affairs comprise multiple sensations, e.g. pressure, distention, warmth, and so on. All of these sensations, and their associated states of affairs stem from our interoceptive system. I contend that our experience of these states of affairs is perceptual in kind. More specifically, I take these to be cases of an awareness of the inner body as object — cases of object perception. I make this claim for the following reasons: in these instances, we experience the characteristics of object perception, namely discernment, perspectivalness, and attention.

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\(^{19}\) Thompson, *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*, 145.
First, a clear object or state of affairs is involved, i.e., full stomach, warm beverage moving down our throat, etc. Second, a distinction is made between the object of focus and other objects involved in the experience, i.e., stomach, upper chest/throat, etc. The states of affairs are identified and tracked through time via their associated sensations, e.g. fullness, distention, temperature, etc. Third, a perspective is taken in the experience, i.e. it is framed by the egocentric spatial framework.

To be sure, at first glance this might appear to be a contentious claim given that, intuitively, we do not typically experience, say, the position of our arm in relation to a particular perspectivally stable point of origin on/in our body. In addition, the egocentric spatial framework, as we saw in the last chapter, was shown to play a role in our exteroceptive perceptual experience, not in our bodily awareness. However, to say that an experience is perspectival does not imply that the point of origin for the perspective need be a particular, unchangeable location that can be identified only on an external spatial plane. Rather, to take a perspective merely means to experience something as located somewhere in relation to the subject of experience.

In a case of exteroceptive perception, the subject of experience is characterized by the body as a whole located in the world. However, in the case of our awareness of the body as object, the subject of experience is characterized by the many aspects of the body represented in a 3-D\textsuperscript{20} egocentric spatial framework constituted by proprioception \textit{and} interoception. In other words,

\footnote{I qualify the egocentric spatial framework as three-dimensional because it involves the entire, three-dimensional, body, i.e., the inner visceral environment as well as the musculo-skeletal layout.}
these sensory modalities not only provide the spatial framework for our exteroceptive perceptual experience, but they also provide the inner bodily framework on which we rely when we object-perceive aspects of our body. So, in the case of object-perceiving the position of my arm, my arm is the object and the rest of my body is that in relation to which it is given and I thereby perceive it as an object. In order for my arm to be given in this relational manner, the perception is structured by my 3-D egocentric spatial framework. I thereby experience the location of my arm from a point of view, i.e., from the perspective afforded by the rest of my body in relation to my arm. The subject, in such a case, is my body as given by proprioception and interoception, and with it I perceive my arm as on the left of and above, say, my waist. Returning to the case of a full stomach, then, although the state of affairs is experienced as a series of sensations in my body, I nonetheless feel my stomach as located with respect to other elements of my body, and I thus take a point of view in my object-perception of its state.

Lastly, the bodily sensations are attended to — when I sit back in my chair after eating a large meal and realize just how full my stomach is, in that moment, my attention is turned to my stomach and the state it is in, i.e. its distention, pressure, etc. In sum, the cases described reflect instances where there is an object-perceptual experience of an aspect of my milieu intérieur. These examples, however, are cases where homeostasis has been disrupted — the temperature of the esophagus has moved beyond its normal boundaries, and the size of the stomach has stretched beyond its normal size. One might contend that these are unique instances that require special consideration. Yet, it is not just in cases of disrupted homeostasis that one can come to perceive one’s inner environment as object. We can also object-perceive our internal organs even
when there is nothing wrong or nothing that requires action. Indeed, we often voluntarily turn our attention to an aspect of our visceral body to perceive it.

Research done on the basis of results from Pavlovian-style conditioning studies shows that, within the realm of interoception and with the use of biofeedback or verbal reinforcement, a subject can be conditioned to become directly aware of, and even control the function of certain aspects of their visceral environment. The most familiar example of visceral perception and training through biofeedback can be seen in the training of small children to become aware of certain visceral needs, e.g., when potty training. In these cases, the child relies on his ability to directly perceive the changing state of a visceral organ, both to increase the specificity of its awareness, and to learn to control that organ.

There is also evidence to suggest that typically non-conscious visceral information can be made consciously available. Research suggests that one important difference between patients with irritable bowel syndrome and normal subjects is that the former are more aware of, and thereby attentive to, certain parts of their digestive systems, and that this increased awareness relates to an overall heightened sensitivity to the workings of their entire digestive system\(^{21}\). Incredibly, research by Weiss and Engel (1971) “demonstrated in eight patients with premature ventricular contractions (PVCs) that all eight could learn some heart rate control, and five reduced PVC frequency.”\(^{22}\) For one subject, the ability to better control the premature ventricular contractions


\(^{22}\) Cameron, *Visceral Sensory Neuroscience: Interoception*, 192.
was associated with an awareness of its occurrence, and in another, an awareness of the decrease of premature ventricular contractions came with conditioning. In sum, “it appears that non-conscious visceral afferent impulses can be made conscious with verbal reinforcement or feedback. Visceral sensation was described as at the ‘borderline’ of conscious, but that learning can improve awareness. The apparent (at least relative) silence of visceral sensations in one’s consciousness does not imply silence in affecting behavior (or thought processes.)”

The key point to take away from these examples is that there are various clear instances of our being perceptually aware of our internal body where an aspect of our visceral world becomes the object of perception, and that this awareness is entirely dependent on interoception. In all these cases of interoceptive object perception, we discern an aspect of our inner milieu, pay attention to it, and have a perspective on it. I contend, however, that this manner of perceiving our visceral body is not the only, or typical, way we are aware of our inner milieu. I propose that our ability to condition ourselves to become perceptually aware of our interoceptive body as object implies another, more primitive bodily self-awareness. I propose that in our everyday involvement in the world, typically we are not aware of our interoceptive body as an object, but rather as oneself, i.e., via bodily-self perception. In other words, typically we are interoceptively aware of the body as subject. To make my case for these proposals, I now consider what I take to be fairly usual instances of interoceptive awareness in our everyday experiential lives and offer a phenomenological analysis of the kind of awareness that these instances involve.

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23 Cameron, “Interoception: the inside story — a model for psychosomatic processes,” 700. In the next chapter I will review another example of increasing one’s awareness of the inner body through the practice of body scanning meditation.
3. **Interoceptive Awareness — the Body as Subject**

In the previous chapter, I argued, based on phenomenological grounds, that there was a distinct form of perceptual *proprioceptive* awareness — bodily-self perception. What I now wish to consider is whether the same argument can be made, on similar phenomenological grounds, for a bodily-self perceptual *interoceptive* awareness. I contend that, in typical cases, our interoceptive awareness fails to meet the constraints of object perception, and instead appears to better meet those of bodily-self perception.

Consider the following example: I am playing softball on a particularly hot and humid day. As I stand out in the field, at the ready to make a play, I am aware of the heat, and that my bodily temperature is accordingly high. Yet, in that moment, as I focus on the player stepping up to the plate to bat, I do not attend directly to the warmth of my body; rather, I focus on the player, his position, my position, as I wait in anticipation of him hitting the ball. Although I could turn my attention to my bodily temperature and thereby render it the object of my perception, in that moment, my attention is on the player stepping up to bat. That is, in that moment, I am not tracking my body temperature as I track the player; instead, when I focus on the player, the warmth of my body recedes from the focus of my attention. Although I may not be discerning and attending to my body temperature when focusing on the player at bat, this is not to say that I am not aware of it. Indeed, I am aware of my bodily temperature, but in a manner altogether different from that of the batter.
To help clarify my point, consider the similar case of double sensations that Merleau-Ponty describes in *The Phenomenology of Perception*: 

“when I touch my right hand with my left, my right hand, as an object, has the strange property of being able to feel too. We have just seen that the two hands are never simultaneously in the relationship of touched and touching to each other. When I press my two hands together, it is not a matter of two sensations felt together as one perceives two objects placed side by side, but of an ambiguous set-up in which both hands can alternate the rôles of ‘touching’ and being ‘touched’.”

When one hand touches the other, I can focus on the touching hand, or on the hand being touched. That is, I can touch my right hand (with my left hand), or I can touch my left hand (with my right hand). When I touch my right hand, I object-perceive my right hand — I discern, attend, and have a point of view on it. My left hand, however, in *that very moment* becomes experientially diaphanous. I object-perceive my right hand *through* my left, however I do not discern, attend, and hold a point of view on my left hand *as I use it* to touch my right hand. My left hand is that which is *touching*. Phenomenologically, I cannot be said to simultaneously focus my attention on both hands. In that moment, I may have the impression that I am attending to both hands, but this impression is an illusion brought about by the rapid shifting of attention between the two hands. If you look at the experience more closely and in an isolated instant, the structure of perceptual experience reveals that only one hand is attended to at one time. When I shift my focus to one hand, the other hand recedes into the background. This does not mean that the hand which recedes from my attention also disappears from my awareness altogether. To be

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sure, I am still aware of both hands. That is, I still have a perceptual experience involving both hands — one is touching and the other is touched.

Similarly in the softball case, it is not because I do not attend to my body temperature that I am not aware of it. Instead, when considering the phenomenology of that moment, the best explanation is that my body temperature has simply receded into the background of my awareness, as it were. As such, in that moment, as I am focused on the batter, my awareness of my body temperature is not something I am aware of as object — I do not distinguish my body temperature as an object or state of affairs, and I do not track my body temperature through time as a distinct object or state of affairs. Yet, I am nonetheless aware of my body temperature — it would be wrong to say that I am unaware, or unconscious of my feeling warm. If it were not as warm outside, then surely my experience would be different, at least insofar as my body temperature goes. Indeed, I contend that the correct phenomenological account of this case is that I am interoceptively aware of my body as subject via my awareness of my body temperature, among other things. In fact, as I will explore further below, my overall experience of the moment is contextualized by this feeling.

I propose that although I am inattentively, or pre-attentively aware of my body temperature, it nonetheless contributes to my experience of the world. Many visceral sensations are not only

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25 Perhaps only by my body temperature causing me to feel irritable or impatient, or even sluggish. As we will see shortly, there is an important connection between interoception and emotions that allows for a more robust explanation of the phenomenology of this moment.
sensory, but also associated with an affective and motivational aspect.\textsuperscript{26} In the softball case, it is quite likely that my body temperature is felt as unpleasant and that this affects my experience in the moment. Moreover, my experience is likely affected by far more than simply my bodily temperature. I could be mistaken about what exactly the main factor contributing to my bodily state is in that instance—maybe I had an early lunch and am now hungry which causes me to feel an emptiness in my stomach, and perhaps the heat and humidity are causing me to feel a little light-headed and tired. Nonetheless, in the moment, I may not (and often do not) realize all of this; that is, I am not attentively aware of all these varying physiological factors, nor, perhaps, could I even fully distinguish them from one another. In the moment, I attend to the batter stepping up to the plate to bat. Nevertheless, all these bodily states are part of my experience of the world at that time\textsuperscript{27} — at the very least insofar as they affect how the world is given to me by adding an affective tone to what I am experiencing. Based on phenomenological analyses, I propose that the role these various states play in my experiential consciousness is not as perceptual objects, but rather as part of my interoceptive bodily self-awareness. In playing this role, they are given to me as subject— as myself\textsuperscript{28}.

As I will show, there are many aspects of the interoceptive body that we are aware of in this manner. If we recall the examples of visceral conditioning mentioned above, “[v]isceral

\textsuperscript{26} Craig, “How do you feel? Interoception: the sense of the physiological condition of the body,” 656.

\textsuperscript{27} Some might counter that it only seems like they are all experientially present because whenever you shift your attention to them they are there. For a reply to this, see my discussion of the refrigerator light illusion in chapter 1, section 6.

\textsuperscript{28} In section 4, I will discuss in more detail the connection between interoception and the sense of self.
sensation was described as at the ‘borderline’ of consciousness, but that learning can improve awareness.”  

29 That is, through training one is able to bring attention to certain aspects of one’s internal milieu that were unattended prior to training. Now, I hypothesize that for something to lie at ‘the borderline’ of consciousness, and to have an effect on behavior and thought, and yet to be such that it can, through conditioning, be brought to the forefront of consciousness so as to be directly attended to, implies that, prior to conditioning, it lay not at the level of unconsciousness, but rather at another level — that of pre-attentive awareness as subject30. Indeed, in the following chapter I will consider recent evidence from research on meditation and interoceptive awareness that strongly supports this hypothesis.

Interestingly, neuroscientific data also suggest that we are conscious of inner visceral states to varying degrees, and as mentioned earlier, many hypothesize that “[r]ecursive meta-representations of homeostatic feelings allow the brain to distinguish the inner world from the outer world [, and] [m]ost strikingly, degrees of conscious awareness are related to successive upgrades in the self-representational maps.”31 This hypothesis, and the evidence for it, offers support for the view that we can be aware of our inner states without discerning or attending to them. As successive upgrades in the self-representation occur, we become increasingly aware of our inner body. I take this to suggest that awareness moves from being a pre-attentive interoceptive awareness of the body as subject, to one that allows for an interoceptive awareness

29 Cameron, “Interoception: the inside story — a model for psychosomatic processes,” 700, my emphasis.

30 Recall that awareness as object involves attention. Thus, a pre-attentive awareness must involve something given as subject.

31 Craig, “Human feelings: why are some more aware than others?” 239.
of the body as object. That is, we can have interoceptive awareness of the body as subject and as object, however we likely first experience the former before our awareness allows for the latter.

All of this, however, is still speculative. In the next chapter, I will examine additional evidence that supports these hypotheses. At a minimum, though, I take it that there is sufficient phenomenological evidence to support the distinction between interoceptive awareness of the body as object versus as subject. Let me return to consider, then, how the accounts of perception I considered in the previous chapter can illuminate the nature of our interoceptive awareness of the body as subject.

4. **Object perception versus Bodily-Self Perception**

I argued in the previous chapter for the need to expand our understanding of what counts as perception because of the failure of object perception to account for our proprioceptive awareness of the body as subject. Here I will show how this need to expand our view of perception is further motivated by considerations of interoceptive awareness.

As discussed, object perception, broadly construed, involves the following three characteristics: discernment, perspectivalness, and attention. Discernment involves the object of perception being distinguished from other objects, identified and tracked through time as the same object. Perspectivalness involves the egocentric spatial framework and structures our experience of an object from a particular point of view. That is, object perception requires the integration of multi-modal information onto a bodily spatial framework that is constitutive of its experiential
perspectivalness. The attention characteristic simply reflects that in object perception to perceive an object is to attend to an object, whether this involves the object being in the foreground or background of attentional awareness. As I showed in chapter 2, when it comes to accounting for the proprioceptive awareness we have of our body in our everyday experiential lives — the body as subject — the object perception account fails. We do not typically experience our bodily posture, limb position, etc., as objects in our experiential lives. In addition, I showed that going the route of arguing for a non-perceptual bodily self-awareness also fails. As I argued, there are further options to either object perceptual or non-perceptual bodily self-awareness, and there are good reasons for thinking that bodily self-awareness is perceptual. In the end, I showed the need to expand our understanding of what might count as perception and proposed what I called bodily-self perception.

On my account, bodily-self perception is characterized by the following three features: attentional seclusion, non-perspectivalness, and ever-presence. Attention is typically understood to involve a relation between a subject and an object\(^\text{32}\) — a relation whereby the subject is directed towards a particular object(s) and experiences this object(s) in either the foreground or background of attentional awareness. Bodily-self perception, however, does not involve such a relation. When we are aware of our body via proprioception and interoception in our everyday experience of the world, we do not attend to our body, i.e., we do not direct our mental gaze to

\(^{32}\) The nature of attention and its relation to perceptual experience is a topic of considerable current interest. However, this issue is not of concern to me here. For my purposes it is enough to use the basic and common understanding of attention as involving “the selective directedness of our mental lives.” Christopher Mole, "Attention", in The Stanford Encyclopedia of Philosophy, ed. Edward N. Zalta (Fall 2013 Edition), http://plato.stanford.edu/archives/fall2013/entries/attention/. Thus understood, attention involves a directedness by a subject towards a particular object or state of affairs.
our body and select it as that towards which we shift our attentional awareness. As we have seen, we do not experience our body as an object in our typical everyday awareness. Rather, we experience our body as subject — we experience it as that by which we perceive and we do not take a position/perspective on it — and thereby we are not directed towards it in an attentive, object-perceptual way. In other words, what is perceived also presents itself as the perceiver — the very subject of experience. In fact, in my everyday experience of the world, I simply do not need to direct my attention to my body in order to be aware of its presence. My body is there for me in my experiential awareness as the very subject, the experiencer. As such, bodily-self perception does not involve attention, and is thereby said to be attentionally secluded. When I anxiously await the arrival of a dear friend at the airport, the anxiety and excitement that I experience while standing and watching travellers come through the arrivals gate are not experienced as anything other than myself. That is, it would be nonsensical for me, upon reflection, to ask ‘there was anxiety and excitement in my experience just then, but who was experiencing those?’ Rather, in my experience of anxiety and excitement, I am, in effect, experiencing myself as anxious and excited.

Moreover, given that bodily-self perception does not involve an object towards which a subject is directed, but instead a subject that experiences itself as subject, there is no point of view to be had. In object perception, one directs one’s attention to an object perceived via one of the sensory modalities. For example, when I see the apple on my desk, my visual gaze is directed towards the apple on the desk, and as a result I perceive the object as located at a certain spatial location in relation to me — at the center of the desk in relation to me sitting at the side of the desk. My body affords me this spatial point of origin in the world from which I perceive objects,
i.e., my body affords me a point of view. As we considered in chapter 2, object perception is characterized by being perspectivally given — it always occurs from a body and to a body. Our experiential perspective is anchored to the body in the sense that objects that are perceived ‘as objects’ are given spatially in reference to the body. So, our sense perception of the world “is spatially organized by an implicit reference to our bodily position.”

Our perception of our body as subject, however, is not the same. We do not experience our body as given spatially in reference to itself in our typical bodily self-awareness. We can experience a part of our body in spatial reference to another part of our body — to be sure I can experience my arm in relation to my torso or leg when I look at my arm. But, when we speak of our experience of our body as a whole — the overall sense of embodiment that characterizes our phenomenal consciousness — this experience is not anchored in relation to our body such that we experience it from a perspective. Put another way, our bodily self-awareness is non-perspectival, in the sense that it is that by which we have a perspective on the world, and so, it does not appear as an object within that perspective. Bodily-self perception, then, by virtue of being only of the body and reliant on sensory modalities that can only concern themselves of the body, and by virtue of being attentionally secluded, is non-perspectival. We do not take a perspectival stance, i.e., a point of view, on our body when we bodily-self perceive it via proprioception and interoception.

33 The egocentric spatial framework is definitely not the only framework at play in perception. Broadly speaking, there is a distinction made between egocentric and allocentric frameworks in discussions of perception: “[e]xceptions notwithstanding, there is general understanding that 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 independent of his or her position.” Roberta L. Klatzky, “Allocentric and egocentric spatial representations: Definitions, distinctions, and interconnections,” in Spatial cognition - An interdisciplinary approach to representation and processing of spatial knowledge (Lecture Notes in Artificial Intelligence 1404), eds. Christian Freksa, Christopher Habel, and Karl F. Wender, (Berlin: Springer-Verlag, 1998), 2.

Lastly, bodily-self perception is characterized as ever present. Recall the following point made in chapter 1: it is the case with virtually every thing or object that I experience that I can stop experiencing it. For example, I can either continue to hold the pen in my hand, or I can simply stop holding the pen in my hand and, say, put it away in my desk. If I do the latter, the pen disappears from my perceptual and experiential field. The same, however, cannot be said for my body. I cannot step away from my body. My body, so long as I am phenomenally conscious, is there for me in my experience in some way. “On the one hand, an unfelt feeling or sensation makes no sense, but the observation that we are not always aware that we have a certain feeling or sensation is quite evident.”35 We have a relationship to our body that we do not share with anything else in the world — our body is ever present to us. Further, its ever-presence does not stem from an awareness of it as object — clearly I can stop attending to my body. Rather, its ever presence lies in its always being there as the subject of experience, as the perceiver of the world. As a result, if bodily-self perception is the manner in which we come to be aware of our body as subject, and our awareness of the body in this manner is ever-present, then so too is bodily-self perception ever present.

In sum, our awareness of the body as subject stems from our attentionally secluded, non-perspectival, and ever present perception of the body as bodily-self. Having thus provided an explanation for two of my targets — our interoceptive awareness is of both the body as object

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and the body as subject, and the nature of this awareness is of the bodily-self perception kind — let me now bolster my position by considering the strongest and clearest example of our interoceptive awareness of the body as subject — the emotions.

5. **Interoceptive Awareness of the Body as Subject — the Emotions**

Emotions have been an area of particular interest for those concerned with the study of interoception and the sense of self. Our sense of self is clearly and inextricably tied in large part to our emotional mental lives. If I am always angry and irritable, I will have a very different sense of self than if I were mostly happy and patient. My sense of who I am as a subject in the world is given in large part by my emotional experience. Interestingly, our emotions are deeply tied to our interoceptive systems. As we will see, since the proposals made by James and Lange that the feeling aspect of an emotion is constituted by changes in our inner, interoceptive body, scientists have looked very closely at the role of interoception in emotion and have found strong evidence in support of certain aspects of the James-Lange theory. As a result of the ever-increasing evidence showing the correlation between interoception and emotions, in combination with the strong ties between emotions and the sense of self, it appears that interoception, and more specifically interoceptive awareness, might be a crucial locus of our sense of bodily self. “If an emotion is defined as a motivation and a concurrent characteristic feeling […] then identifying the part of the brain that provides the image of that subjective feeling […] can show us how we are aware of ourselves.”

Furthermore, given the prevalence and diversity of emotional experiences that we enjoy, as well as the connection between emotions and behavior,

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36 Craig, “Human feelings: why are some more aware that others?”, 239.
emotions have become the main area of inquiry for those scientists seeking to explore interoceptive awareness. For these reasons, I now turn to a consideration of emotions to further support my view that we have an interoceptive awareness of the body as subject and that this occurs via bodily-self perception.

It has been generally agreed that there are two main categories of emotions: primary and secondary. Primary emotions include happiness, sadness, fear, anger, surprise, and disgust. Secondary emotions include embarrassment, jealousy, guilt, and pride. Recently, however, A.D. Craig has suggested that there is a third category of emotions, which he calls homeostatic emotions. In short, homeostatic emotions are afferent states that produce a feeling that is associated with a motivation for behavior. Examples of such emotions are temperature sensations, itch, pain, hunger and thirst, muscle ache, visceral urgency, etc. Given the diversity of what counts as an emotion, it seems clear that in our everyday experiential lives, we continuously feel some form of emotion or other, and possibly more than one emotion at a time. For example, in this very moment, although I may not feel any of the secondary emotions, I certainly seem to feel at least one of the primary emotions, namely happiness, and a number of homeostatic emotions as well, namely itch, thirst, and muscle ache. Surely, I may not always know how to classify what I feel. However, it seems safe to say that I typically always feel something, no matter how dim. Moreover, as Craig suggests “emotions are not simply occasional

37 See Damasio, Craig, Critchley, etc.

events, but rather are ongoing and continuous.” Our emotions are always present, affecting our conscious and experiential lives. The question that arises, then, is: how are our emotions present?

If one looks up the word ‘emotion’ in a medical dictionary, one will find it defined in three ways: first, an emotion is the affective aspect of consciousness; second, an emotion is a state of feeling; third, an emotion is a conscious mental reaction subjectively experienced as strong feeling usually directed toward a specific object and typically accompanied by physiological and behavioral changes in the body. The third definition reflects the standard view that an emotion comprises three different elements: a behavioral component, a cognitive component, and a subjective feeling component. To clarify each of these, consider the following example: as I walk along the street, there suddenly appears a large, aggressive dog in front of me. It is barking, and seems to be at the ready to attack. At the moment that I perceive this animal, I freeze and gasp, I realize that I am in danger, and I feel fear. My freezing and gasping, in this instance, are taken to comprise the behavioral component of the emotional state. My realization that I am in danger forms the cognitive component. Finally, my feeling of fear makes up the subjective feeling component of the moment. Although all three elements play an important role in the complete


40 Merriam-Webster’s Medical Dictionary, online, URL: http://www2.merriam-webster.com/cgi-bin/mwmedsamp?va=sample.

41 As we will see shortly, Damasio has come to re-define an emotion as an action program which can, or not, be accompanied by a feeling. However, for my purposes at this point, which are merely to give an introduction to this area of inquiry, we can set this aside.

42 My description of the situation follows no particular order.
experience of the emotion, it is the behavioral and subjective feeling aspects that have been linked to the interoceptive system.

William James was among the first to propose the theory holding that the subjective feeling aspect of an emotion is given by muscular and visceral signals of the interoceptive body. Carl Lange, around the same time, proposed a similar view wherein he argued that vasomotor changes were the cause of our feeling of emotions. Given the temporal proximity between these proposed accounts, the view that the felt aspect of emotions stems from the interoceptive system has come to be known as the James-Lange theory of emotions. Going back to the previous example of my encounter with the dog, according to the James-Lange theory, my feeling of fear stems from the multitude of biological changes that occur within my body — my fear is the sum of my body releasing adrenaline into my bloodstream, my heart beating faster, my body temperature rising, my palms becoming sweaty, etc. These bodily state changes are what constitute the feeling aspect of an emotion.

To make this view clearer, consider a contrasting view. Prior to the James-Lange theory, the standard explanation for an emotional state took a more cognitive approach: I see the dog, I let out a cry, and I then ascertain my fear. The feeling of fear, under such a cognitivist view, is something that comes after the perception of the dog and the bodily reaction of letting out a cry — it is considered to be a cognitive event. Such an account of the experience, however, is the

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wrong way of looking at the situation according to James and Lange. According to their view, the feeling of fear does not come after the other aspects of the emotion are experienced — the feeling of fear is what is manifested within the body. Put another way, if the bodily manifestation of sweaty palms and racing heart are the result of a cognitive evaluation whereby you deem seeing the aggressive dog worthy of being yelled at, then you would not really feel the anger. “[I]f we fancy some strong emotion, and then try to abstract from our consciousness of all the feelings of its bodily symptoms, we find we have nothing left behind, no ‘mind-stuff’ out of which the emotion can be constituted […].”44 What distinguishes emotions from cognitive states is that the latter do not involve a feeling component, only the former do. So, in the example above, there is nothing left of the feeling of fear once you have taken out the various bodily state changes resulting from seeing the dog. That is not to say there is no cognitive element to emotion, but rather that this element is distinct from the feeling of an emotion. In short, the feeling of fear is just the feeling of the combined bodily states comprising the adrenaline in your bloodstream, the racing of your heart, the rising temperature of your body, etc. As James states: “My theory […] is that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur IS the emotion.”45 The feeling of emotions, then, is not cognitive but sensory, and in large part, interoceptive.

The James-Lange view has not gone without criticism, and many have been opposed to its strong association between the feeling of an emotion and bodily states. It has been objected that

44 James, *Principles of Psychology, Vol. 2*, 451

45 Cameron, “Interoception: the inside story — a model for psychosomatic processes,” 698.
emotions must involve a judgment — they involve rationality that is not explained by the mere perception of bodily changes. To be sure, that is certainly an important point. However, we must remain clear on which aspect of an emotional experience we are seeking to explain. The James-Lange theory is not necessarily at odds with the view that emotions involve rationality. To claim that the feeling of an emotion is the result of certain bodily state changes is not to discount a cognitive element to emotions. Rather, it shows that the cognitive element does not exhaust all the aspects of an emotion because it is not felt. The need to distinguish between the felt and the cognitive aspects of emotions is further supported by evidence that one can feel an emotion without involving any judgment or cognitive element at all. As J. Prinz points out,

“There is also anatomical evidence that emotions can be elicited via pathways from early visual structures, such as the pulvinar and superior colliculus, to the amygdala which instructs other structures to perturb the body (Ledoux, 1996; Morris et al. 1999). These pathways trigger an emotional bodily response without the mediation of any kind of judgment. The relevant perceptual centers don’t even support categorical object recognition, much less sophisticated appraisal, and the amygdala pairs inputs with somatic responses by association, not by assessment. One could try to argue that the bodily states induced by this pathway would not qualify as emotions unless we supplemented them with appraisal judgments, but this would be gratuitous. The said bodily changes feel like emotions, and they do not require appraisals to occur.”

In short, insofar as my concern is with how we experience our body as subject the fact that there is strong evidence to support the relation between the feeling of emotions and changes in bodily states shows that the criticisms against James and Lange relating to the rationality of emotions

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do not concern me. As O.G. Cameron puts it, “without afferent sensory input from the body, no complete emotional experience could exist because the feeling part would be missing.”

Although James and Lange were the first, they certainly are not the only ones to defend the view that interoception underlies the feeling of emotions. Many contemporary scientists, such as Damasio and Craig, continue to confirm the connection between interoception and emotions.

Damasio’s account of emotions is in fact a modern day version of the James-Lange view. According to Damasio, however, emotions are a type of action program triggered by changes in interoceptive neural maps. An action program is defined as a “set of innate, programmed physiological actions aimed at addressing the detected changes and thereby maintaining or restoring homeostatic balance.”

There are two kinds of action programs: drives — aimed at satisfying basic needs, e.g. thirst, hunger, exploration and play, etc. — and emotions — such as disgust, fear, anger, sadness, joy, shame, etc. So, for example, when seeing the aggressive dog, both drives and emotions would be triggered, thereby causing increased heart and respiratory rates, secretion of cortisol and adrenaline, analgesia, a change in facial muscles to form the expression of fear, and an increased focus of attention on the perceived threat, i.e., the aggressive dog. The fear I experience when seeing the dog, however, is neither a drive nor an emotion on his account. Rather, the fear is the feeling associated with the triggered action program. For Damasio, we must distinguish feelings from emotions. “Feelings are mental experiences that

48 Cameron, Visceral Sensory Neuroscience: Interoception, 276.

49 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 144.
accompany a change in body state,"\textsuperscript{50} however, emotions and drives are action programs that can be either conscious or non-conscious. Interestingly, research has shown that the same cortical regions are activated for interoceptive awareness and emotional experience. This finding lends empirical support to the view that the subjective feeling element associated with an emotion is constituted by bodily state changes.

As mentioned by Prinz above, there are specific neural pathways and cortical regions that have been suggested as the locus of interoceptive and emotional awareness. A number of neuroanatomical studies have found evidence to support the view that the subjective feeling of emotions is based on neural representations of the physiological state of the body.\textsuperscript{51} One such study, Critchley et al.’s 2004, showed that a particular cortical region strongly associated with interoceptive awareness, the right anterior insula (rAI), is also associated with emotional awareness. Indeed, they showed that both the rAI and the anterior cingulate cortex (ACC), which was previously associated with motivation for behavior and a sense of agency, were active during emotional experience. In particular, their study confirmed that the rAI is key for explicit subjective awareness involving interoceptive awareness and emotionality. These findings, in turn, support Craig’s suggestion that there are homeostatic emotions which involve a distinct sensation stemming from the interoceptive pathways which is represented in rAI, as well as an affective motivation originating in the ACC. As mentioned, the basic interoceptive feelings associated with homeostatic emotions are temperature, itch, visceral distention, muscle ache,

\textsuperscript{50} Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 144.

\textsuperscript{51} See Damasio and Carvalho, Critchley, Craig, Seth, etc.
hunger, thirst, ‘air hunger’, and sensual touch. Craig’s view is that the sensation, or interoceptive feeling, involves a distinct tone (pleasant or unpleasant), and thus brings with it a motivation for behavior towards the homeostatic need from which the sensation originated. In other words, when the body is unable to maintain homeostasis on its own, it gives rise to a homeostatic emotion so as to engender behavior that will lead to the required regulation. Setting aside how one might want to categorize emotions, the significance of Critchley et al.’s findings is that they support the proposal that “individual differences in emotional awareness are predicted to be directly related to differences in the capacity for interoceptive feelings.”

At this point, however, one might point out that the Critchley et al. study, and Craig’s interpretation of its findings, are concerned with attentive interoceptive awareness — the kind of awareness involved in discriminative subjective judgments of interoceptive feelings. Yet, this kind of interoceptive awareness — of the inner body as object — is not the target of explanation I set myself in this chapter. Rather, my concern has been to account for pre-attentive interoceptive awareness — awareness of the inner body as subject. What, then, does the evidence suggest about this form of bodily self-awareness? Quite a bit, if we consider it in light of Damasio’s account of the neural pathways that give rise to interoceptive awareness.

Re-consider the neuroanatomical account I described in section 1 of this chapter. Damasio argues that interoceptive awareness arises in areas that are developmentally prior to the insular cortex.

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52 Craig, “Human feelings: why are some more aware than others?”, 240.
Indeed, he provides evidence for the view that interoceptive awareness stems from the brainstem, although it does at times engage rAI. “Indeed, the available evidence indicates that phylogenetically recent sectors of the nervous system, such as the cerebral cortex, contribute to but are not essential for the emergence of feelings, which are likely to arise instead from older regions such as the brainstem.” He takes the evidence to suggest that interoceptive awareness was the first form of consciousness to arise in humans, and indeed might give us insight into low levels of mind and consciousness in non-humans. Although Craig’s and Damasio’s accounts of the biological underpinnings of interoceptive and emotional awareness have commonly been found to be at odds with each other, I think they are in fact complementary if we consider them in light of the distinction between awareness of the body as object versus awareness of the body as subject, and how this distinction reflects the structure of experiential consciousness, as discussed in chapter 1.

The Phenomenological account holds that consciousness involves more than merely object consciousness — it also involves subjectivity. As Zahavi explains, “although my attention is on the object, the experience itself remains conscious,” and Sartre holds that, “every positional consciousness of an object is at the same time a non-positional consciousness of itself.” In short, on this account there must be a subjectivity to consciousness if there is to be object consciousness. Accordingly, our awareness of the body as object involves an awareness of the

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53 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 143.
54 Zahavi, *Subjectivity and Selfhood: Investigating the First-Person Perspective*, 43, my emphasis.
body as subject, but not vice versa. Put another way, our awareness of our body as subject is required for any awareness of the body as object. That is because to be aware of our body as an object, we must be able to object-perceive our body — discern, attend to, and take a perspective on our body. To discern our body, we must be able to distinguish it from other possible objects of perception, track it as the same object through time, and thus identify it as the same object. In order for me to identify my body as not only the same object through time, i.e., the same body, but also as my body, i.e., the same bodily self, I must be able to identify the features of my body that make it mine. “In order to identify [a body] as oneself, one has to identify certain features and already know that these features characterize oneself.”56 In other words, what characterizes the body as ‘me’ already has to be known. To be sure, the knowledge of which features characterize oneself might rely on further identification, however, “[t]he supposition that every item of self-knowledge rests on identification […] leads to an infinite regress.”57 At some point, my awareness of my body as myself cannot rely on identification. “The point here is that identification of objects cannot ground consciousness of the self-as-subject: intentional aspects of consciousness cannot ground its subjective aspects.”58

Indeed, it is the other way around. The reason I am able to identify my body as myself when I observe it is because I am aware of it as subject in my experiential consciousness. Recall the


Phenomenological account of consciousness: “[i]nsofar as conscious experiences are characterized by a subjective ‘feel’, i.e., a certain ‘what it is like’ to have them, they also come together with a minimal form of self-consciousness.” Accordingly, our awareness of the body as subject grounds our awareness of it as object. As Legrand similarly argues, “pre-reflective self-consciousness is the necessary ground to which other forms of self-consciousness are anchored, i.e., the subjective first-person perspective anchors the experience of intentional objects (the self-as-intentional-object included).” Bodily self-awareness (as subject) anchors bodily awareness (as object). Without an awareness of the body as subject, there will be no awareness of the body as object. For these reasons, then, I claim that awareness of the body as subject is prior to an awareness of the body as object, and by prior to I do not necessarily mean in a temporal manner, but at the very least in a phenomenological manner.

I see this account of bodily self-awareness falling very nicely in line with both Damasio’s and Craig’s views of the neurological underpinnings of interoception and emotions. As I interpret it, Craig’s account, based in part on the work by Critchley et al., concerns interoceptive awareness of the body as object, whereas Damasio’s account concerns interoceptive awareness of the body as subject. Damasio’s argument for the phylogenetically earlier brain regions being the locus of interoceptive awareness make perfect sense if our awareness of the body as subject is prior to, and allows for, our awareness of the body as object. Indeed, I contend that using the as object/as subject distinction allows us to better understand Damasio’s account and reconcile the seemingly


60 Legrand, “Pre-reflective self-as-subject from experiential perspectives,” 586.
contradictory empirical evidence showing different brain regions as the locus of interoceptive awareness.

The rAI and the ACC are the brain regions associated with attentive interoceptive awareness of the body as object, and the brainstem is associated with pre-attentive interoceptive awareness of the body as subject. Seen in this light, “it is reasonable to advance the idea that feelings, which are only accessible to the organism in which they occur, provide a subjective experiential window into the processes of life regulation.” The combined evidence, then, gives us reason to view the experience of emotions as playing a role in both our awareness of the interoceptive body as object and as subject. That is, when attending to our feelings, we are aware of our body as object and as subject, and when not attending to our body but to other experiential objects, then we are aware of our body as subject insofar as our feelings affect our experiential awareness.

Let me give an account of how this is so by reconsidering the softball case. I stand at the ready on third base on a hot and humid day. My attention is directed towards the batter as I await the start of the next play. Let us assume that my body temperature is rising but not yet at a problematic level. In such a scenario, I contend that I experience the heat and my rising body temperature, but that in the moment described I do not attend to them. Why do I contend that I experience my body temperature if I do not attend to it? Because my rising body temperature

61 Damasio and Carvalho, “The nature of feelings: evolutionary and neurobiological origins,” 143.
lends an affective tone (pleasantness or unpleasantness) to my experience, which I am not attentively aware of, because the rising body temperature has not yet reached a critical point. In other words, I am aware of my body temperature insofar as its affective tone influences my overall experience, however, I am not attentively aware of it — my body temperature is not something I pay attention to as I focus on the batter. Given the characteristics of object perception and bodily-self perception — attentional and pre-attentional, respectively — it would appear that the best account of my experience in this case is that I am bodily-self perceiving my body temperature. In other words, I am aware of my body as subject insofar as my body temperature colors my overall experience with an unpleasantness. Surely, if my body temperature continues to rise I may be forced to shift my attention to it and behave accordingly to ensure appropriate thermoregulation. But in the moment described, that is not the case. In the moment described, my awareness is bodily-self perceptual, and I am therefore interoceptively bodily self-aware.

My critic might ask: why claim that there is an inattentional affective tone to my awareness in this moment? That is, why not just say that until the point is reached at which an attentional awareness is required to cause thermoregulative behavior, my body temperature is simply not something I am aware of and thus remains unconscious? My response is that the phenomenological analysis of the experience does not support this proposal. If my non-critical, rising bodily temperature were simply unconsciously perceived, then my experience of the batter would be no different if it were cold out and my body temperature were cool but not decreased to a critical point. Yet, that is not the case. To be sure, if it were cold out, then my experience of standing on third base at the ready to make a play and attending to the batter stepping up to home
plate would be different from the way it is in the case initially described. I happen to enjoy the cold and am very uncomfortable in hot climates. Thus, my overall experience on a hot and humid day is typically unpleasant as a result of my rising body temperature, but pleasant on a cooler day when my body temperature is decreased. Indeed, the evidence suggests that when we become attentionally aware of our body temperature it is because we must take action to restore thermoregulation. However, the scientific and phenomenological evidence also suggests that there is a form of awareness that lies between attentive awareness and nonconscious awareness. There is an awareness of the rising body temperature via its affective tone — there is an increasing unpleasantness in my experience, an unpleasantness in my overall awareness of standing at the ready on third base attending to the batter.

As Craig explains, “[t]he affect (i.e. pleasantness or unpleasantness) we feel with an innocuous thermal cutaneous stimulus is the perceptual correlate of thermoregulatory motivation. Think of the discomfort you feel in a room that is too warm or too chilly for energy-efficient thermoneutrality: if you remain in that room, the discomfort grows until it becomes an intractable motivation.” Of note here is the element of growth — the sensation of being too warm or too cold increases. Being slightly too warm or too cold often is not an issue, and it is thus not something we really notice or attend to. Yet here is the key point: we often do not attend to our emotional/feeling states, yet they are not unconscious. Rather, our emotional/feeling states are experienced in large part through the affective tone brought to our experiential awareness.

62 See my discussion of Block in chapter 2, section 4.3 for one example.

63 Craig, “A new view of pain as a homeostatic emotion,” 304, my emphasis.
With every experience of an emotion/feeling comes an affective tone — emotions are always felt as pleasant or unpleasant. One cannot feel an emotion without the associated changes in bodily states. To experience an emotion is to experience a valenced and motivationally-laden bodily state. Insofar as our experience is valenced, then, we are aware of our emotions/feelings — we are bodily self-aware. Given the relation between our emotional experience and interoceptive awareness, then, I propose that our awareness of such an affective tone is, in effect, an interoceptive bodily self-awareness. As I will now show, the nature of this interoceptive awareness of the body as subject is perceptual and reflects all three characteristics of bodily-self perception.

Re-consider the example of encountering an aggressive dog given above. When I see the aggressive dog, and feel fear, my overall experience is of fear in the face of seeing this dog. I attend to the dog, I discern the dog, and I perceive the dog from a point of view. In short, I perceive the dog via object perception. My fear, however, is not experienced in the same way. That is, my fear is not an object of perception in that moment, along with the dog. My fear is a large part of my experience — I am afraid and feel this fear very strongly. However, my fear is pre-attentive, non-perspectival, and reflects the ever presence of my body.

First, my fear is pre-attentive because it is given as a part of who I am (as subject) in that moment — I am afraid. I do not take it as an object alongside the dog. Indeed, there is no

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64 This may have to do with interoception’s key role being the maintenance of homeostasis.
question as to who is afraid. Rather, my fear is the manner in which I take the dog as an object — the dog is experienced through my fear, as scary. Next, my experience of fear is non-perspectival. I do not take a position on my fear; indeed it does not make sense to speak of holding a point of view on one’s fear in the moment of experience. Rather, my fear pervades me, it fills my entire body, my entire self. Lastly, if my fear is but my heart racing, adrenaline pumping, palms sweating, etc., as has been argued, then my experience of fear involves an experience of my body as a dynamic and continuous entity. Of course I can focus on the pounding of my heart and the sweatiness of my palms, and thus perceive these bodily states as I perceive the dog — via object perception. However, to do so requires a clear shift in attention — a shift in the perceptual manner that I experience the fear. Typically, however, in the moment when I perceive the dog, my fear is certainly a part of my experience, but not in the same manner as the dog is. My fear affects my perception of the dog as object, i.e. the dog is experienced as scary. In other words, I experience the dog through my feeling of fear, and in so doing my experience involves an awareness of my body as subject — indeed, an interoceptive bodily self-awareness.

Moreover, we need not consider only the case of fear, a primary emotion, as characteristic of such an interoceptive awareness. Indeed, the same case can be made for secondary or homeostatic emotions as well. We often claim to be unaware of feeling anxious or tense. We go about our business and behave in certain ways that may betray our background emotional states to others, and yet it is not always obvious to ourselves that we are in those states and behave in ways that reflect these. However, our anxiety or tension is clearly part of our subjective experience of the world, at least insofar as they paint our experience of the world with a sense of
unease, unpleasantness, etc. Consider this analogy to further clarify what I mean. Just as looking through Kant’s rose-tinted glasses renders everything pink-ish, and you do not typically notice/attend to the glasses when you look through them, similarly you experience the world through your emotional/feeling states, and these color your experience with an affective tone. Yet, you typically do not attend to these — they simply occur.

For example, my experience of a small child throwing a tantrum will very likely differ depending on the mood I am in: if I am tense and stressed, then I will have a far more unpleasant experience of the child’s behavior than if I am calm and happy, and the child’s behavior is not felt to be as irritating. In both cases, the child’s behavior is the same, but my experience of it differs based on my emotional state. There is also evidence from work on facial feedback\(^65\) that shows we are not always directly aware of our background emotional states, but that these affect how we experience the world. It seems that “mere change in facial musculature seems sufficient for an emotional response, even when we do not realize we are making emotional expressions.”\(^66\)

In sum, then, it appears that our various and varying emotional states are in large part given by our ever changing bodily states, and that these are not always directly attended to. Yet, they nonetheless play a part in shaping our subjective experience of the world — arguably a very large part if we grant that our conscious mental life is perpetually valenced in some way. I feel

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calm, angry, or anxious, and I do not necessarily come to be aware of this by attending to my calmness, anger, or anxiety. Rather, I am calm, angry, or anxious. The very subject that experiences the world does so through calmness, anger, or anxiety. In other words, I experience the world by being happy, fearful, calm, stressed, etc. In this regard, then, I contend that we are aware of our interoceptive body as subject via bodily-self perception.

6. Conclusion

When we try to consider what it is that we are aware of when we are aware of our body (as a whole), it seems to involve more than what exteroception and proprioception alone have to say about our bodies. That is, the awareness of our body that exteroception provides is of a physical thing in the world, and this awareness is always contextualized by the external world. I see my body in the external world, i.e. surrounded by other objects, I touch my body within the same external world context, etc. But, my overall bodily awareness is not exhausted by what my exteroceptive senses provide precisely because there is more to my awareness of my body than what I directly perceptually experience of it in the world.

Alternatively, the awareness of our body that proprioception provides is also not able to account for all aspects of our bodily awareness. It provides an ‘internal’ awareness insofar as it allows for an awareness of our bodily position and movement without relying on our exteroceptive senses, and it does this via both object perception and bodily-self perception. So we can know that we are sitting, or that our arm is raised, or that our foot is moving by feeling it from the inside, and we can also have a sense of our body’s position and movement as given pre-attentively and non-
perspectively. However, the information proprioception provides is spatial, and moreover, given in relation to action in the external world. In other words, I am aware, from the inside, of my body insofar as it is positioned in the external world, and capable of moving in the external world (even though the awareness need not involve the external world). Nevertheless, proprioception does not account for all the aspects of my bodily self-awareness.

My bodily self-awareness involves more than my body as it relates to the world. As J. Smith describes, bodily awareness is an “awareness of the position, orientation, movement and size of our limbs, our sense of balance, bodily sensations (pains, tickles), pressure, or temperature.”67 Moreover, as D. Legrand explains, one of the difficulties in explaining our bodily self-awareness lies in accounting for “the bodily ‘thickness’ of the experience of the world.”68 That is, our bodily self-awareness is not just of the body that allows us to be positioned and move in the world, and that gives rise to the subject as agent in the world. Our bodily self-awareness is also about the body as subject with a world of its own within the boundaries of flesh and skeleton.

In other words, there is a way in which I feel my body as having an inner working world that is separate and distinct from the world external to it. Further, I am very strongly aware that certain things in the external environment affect my internal bodily environment, and that these are separate environments working together. My bodily self-awareness always includes an


68 Legrand, “Pre-reflective self-consciousness: On being bodily in the world,” 505, my emphasis.
awareness of this inner environment — it involves an awareness that this milieu intérieur ‘fills’ my being. As Merleau-Ponty states, “I observe external objects with my body, I handle them, examine them, walk around them, but my body itself is a thing which I do not observe [in the act of object perceiving].”

When I feel someone’s hand on my back, for instance, I feel it as located in a different place on my body than if one were to touch my stomach. This is obvious. But, there is more involved in the feeling of these hands at different locations than their mere location relative to my body’s spatial/skeletal layout. In my feeling of the person’s hand on my back, there is an implicit sense that although they could move their hand up or down, left or right, they could not move their hand forward (towards my chest). Put another way, in experiencing a hand on my back and my own hand on my stomach, I am implicitly aware that it is impossible for the other’s hand to move forward and mine to move backward such as to allow the two to meet somewhere in the middle. This implicit awareness does not stem only from the fact that both hands would meet resistance from skin, bone and muscle. It is an awareness of far more that would provide resistance — namely the whole inner world of my interoceptive body. In this way, my implicit spatial bodily framework involves more than just body posture and limb position, but also a thickness/depth that fills in what is framed by proprioception.

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69 Merleau-Ponty, *Phenomenology of Perception*, 104.
Interoception, as I have sought to show throughout this chapter, is an integral aspect of our bodily awareness, and especially of our bodily self-awareness. As a result, considerations of our interoceptive awareness must be included in any discussion looking to explain the various elements of our sense of bodily self. More precisely, discussions of our sense of agency, and especially our sense of body-ownership, must take note of the influence of our interoceptive awareness. Unfortunately, as we will now see in the next chapter, this has not been done, and thus much of the work that seeks to explain our sense of body-ownership fails to properly account for interoception’s role in this sense of our bodily self.
Chapter 4: Interoception — The Forgotten Sense Modality

As I stated at the very outset of my project, my concern has been with how the body gives itself experientially. I distinguished between two ways in which we are aware of our body: as subject and as object. I then sought to answer two particular questions regarding how we experience our body as subject: first, in virtue of what do we have an awareness of the body in this manner? And second, what is the nature of this awareness? In the previous two chapters I showed that it is by virtue of our proprioceptive and interoceptive sensory systems that we are aware of the body as subject, and I also argued that our awareness of the body in this manner is of a particular perceptual kind: bodily-self perception. Bodily-self perception, as I showed, is a form of perceptual awareness that one can enjoy only via proprioception and/or interoception and it is necessarily of the body given subjectively, i.e., not as an object. The reason for these concerns has been to gain a better understanding of our sense of self as bodily — to discover not only how this sense of self arises, but what it means for our conscious lives.

In this final chapter, I want to look at the outcomes of my account for empirical work on issues of embodiment. More specifically, for my purposes here I will consider the following questions: how tightly is your particular body tied to your sense of self as bodily? How certain are you of what constitutes your body? For most of us, our experience tells us the answers to these questions: I know my body, how it looks, feels, moves, etc., and my sense of self stems largely from this body that I know inside and out. As it turns out, however, my certainty might not be as
warranted as I might think. Recent research in psychology and neuroscience\(^1\) has shown that we can, relatively easily, be led to experience a rubber limb or even a virtual body *as our own* (body illusions). This research suggests that our sense of self is not as inextricably tied to our particular body as we like to think, and this finding is worrisome given how deeply our sense of self seems to rely on our bodily experience. The problem, in short, is as follows: what the experimental research purports to show — that my sense of *this* body being *my* body is not as reliable as I think — is at odds with my everyday bodily experience — that I have never failed to experience *this* body as *my* body. In what follows I suggest a resolution to this conflict by proposing that we must review the experimental research in light of my account of our typical bodily experience. In doing so, we will see that it is only a certain aspect of my bodily awareness that is malleable, namely my awareness of my body as object, and that my bodily self-awareness does remain constant even in cases of body illusions. Indeed, we will see that in all cases of body illusion cited in the literature, bodily-self perception is not disrupted, and thus the sense of self which stems from our bodily self-awareness is never challenged.

As I mentioned at the end of the previous chapter, much of the work that has sought to explain our sense of self as bodily has failed to consider the role played by bodily *self*-awareness. As I will show, this is the main reason for the conflicts that have arisen between the empirical results and our experience. My first goal in this chapter, then, is to demonstrate just how current research has failed to consider the distinction between awareness of the body as subject and of

the body as object, and to make clear how this failure has resulted in misguided views that do not fully illuminate how our sense of self as bodily arises. As I progress through my criticisms of the current research on embodiment, one important question will arise: how are we to study our awareness of the body as subject if indeed it relies on a form of perception that is inattentive — bodily-self perception? In other words, if the very nature of our bodily self-awareness is such that we cannot ever attend to our body as subject, as I have been arguing, then what empirical reasons do we have for granting that such an awareness exists?

These questions motivate the most important criticism of my view: if awareness of the body as subject is what underlies our sense of self as bodily, and such an awareness cannot be considered via any means that require observing one’s own body, then we cannot ever account for how our bodily self-awareness underlies our sense of self. Moreover, this lends force to the skepticism that there is such a bodily self-awareness at all. As a result, my concerns with the empirical literature on body illusions lose their basis, as there is no reason to grant the distinction upon which I base my objections. My second goal in this chapter, then, will be to address this criticism. I take it to be a fair and strong point against my view, and one that highlights the real difficulty that comes from granting a distinction between awareness of the body as object and the body as subject. However, as I will argue, there are ways to *indirectly* determine that we have an awareness of the body as subject, and how this awareness might serve to shape our sense of bodily self. I will consider cases where certain characteristics of our awareness of our body as object are indeed traces of our awareness of our body as subject, and thus provide evidence for this implicit bodily self-awareness. By the end of this chapter, then, I will have shown that empirical work on bodily awareness has taken a too narrow view thus far, and I will have
suggested one approach we can use to re-conceptualize and expand how we seek to account for bodily awareness empirically in the future. Let me begin, then, by showing where the current research has gone wrong and what this means for our account of the sense of self as bodily.

1. **Body-Ownership and the Sense of Self**

We all experience our body as our own. There is a mineness that is typical to bodily experience — a sense of body-ownership. However, this experience of body-ownership is complex, and as de Vignemont distinguishes, there is both a sense or feeling of body-ownership that we might say is present in bodily experience, e.g., a felt ‘myness’ of my body, and then there is the judgment of ownership that we make in some instances of body experience, e.g., I judge that the hand is mine.² In either instance, what is undeniable is that my sense of body-ownership, the feeling of ‘myness’ of my body, is closely tied to my bodily awareness. In turn, the felt sense of ‘myness’ of the body is often taken to be what grounds my overall self-awareness and/or sense of self. As such, understanding how this sense of ‘myness’ comes about or can be disrupted is important for understanding our sense of self. That is why most of the empirical work done on bodily awareness has focused on understanding the nature of our sense of body-ownership, and more often than not, when researchers speak of bodily awareness they indeed mean our awareness of our body as our own, i.e., body-ownership.

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As Longo and Haggard have recently pointed out, however, “the central difficulty in any empirical study of bodily awareness is the control condition.”¹ Ideally, we would be able to compare the having of a body with the lack of a body. Clearly, however, this is not possible outside of thought experiments. So, work on body illusions such as the rubber hand illusion or virtual reality⁴ gets us as close as possible by looking at how manipulable bodily awareness is. These cases show how we can be led to mistake another body, or part thereof, as our own, and thus allow us to consider in greater depth what our bodily awareness really involves, and where its limits lie.

Indeed, the work done on the basis of these forms of body illusion is quite fruitful in helping us to understand certain aspects of our bodily awareness. However, we must remain keenly aware of what it actually shows: how and to what degree our bodily awareness can expand. It does not suggest, I argue, that we lose awareness of our body or a part thereof. I contend that as long as we continue to have experiential consciousness, we cannot completely lose our awareness of our body. I hold this because, as I discussed in chapter 1, experiential consciousness is structured such that it is characterized by subjectivity, and as I have argued, this subjectivity is constituted by our bodily self-awareness. Thus, without an awareness of the body as subject, there would be no subjectivity of experiential consciousness, and this simply cannot be the case given the fundamental nature of our consciousness. Consequently, in what follows I argue that the taking of another body part as one’s own is merely a case of bodily extension, and it does not give us

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⁴ I will describe these cases in greater detail in sections 5 and 6 below.
any insight into our fundamental bodily self-awareness, i.e., our awareness of the body as subject.

For reasons of simplicity, as well as because it is the main sensory modality underlying our bodily self-awareness, my focus hereafter will be to consider the relation between interoceptive awareness and specific paradigmatic cases of body-ownership illusions. These cases will serve to highlight the importance of considering our interoceptive bodily awareness in understanding our sense of self as bodily. Surely, most would not deny that we enjoy an interoceptive awareness, and perhaps even of the kind I argue for. However, most of the work done on issues of body-ownership does not address the importance of interoception in constituting the sense of ownership. As a result, many of the conclusions drawn from the research fail to give any accurate insight into the nature of our sense of body-ownership. Indeed, as I will show, in none of these instances of body illusion can the subject be said to have lost a sense of ‘myness’ to his/her body, and this is because, I argue, subjects continue to have a sense of body-ownership by virtue of having an interoceptive awareness of the body as subject.

In addition to cases of body illusion such as the rubber hand illusion or virtual body illusions, there is a peculiar case of greatly disrupted bodily awareness that has been studied quite extensively in the past few decades for its potential to give us insight into bodily awareness — the case of deafferentation. To begin, then, let me consider this case and what it really shows us about bodily awareness.
2. Deafferentation

Deafferentation is a very rare and devastating syndrome wherein a subject loses the sense of touch and proprioception. More specifically, deafferentation typically occurs following a severe infection where the antibodies that are recruited to fight the infectious cells begin to react on the body’s own nervous tissue as well. The result of this cross-reaction is that the patient loses all large myelinated sensory nerve function. Large myelinated nerves are part of the peripheral nervous system. They are responsible for transmitting impulses from the peripheral organs to the spinal cord and brain. Large myelinated nerves originate either in receptors in the skin or with receptors in the muscle. In the case of deafferentation, it is the large myelinated nerves that originate in the muscle receptors that are affected. As a result, deafferented patients are no longer able to sense their bodily posture, the location of their limbs, or whether their body is moving — they lose all proprioception. This loss of proprioception typically results in the inability to engage in movement as one normally would and leads to severe disability.

One of the most well known and discussed cases of deafferentation is that of Ian Waterman. Waterman suffered from infectious mononucleosis when he was 19 years old. As a result of this infection, he was left without the sense of touch and proprioception from the neck down. Following his recovery from the infection, he was unable to do even the simplest of tasks, e.g. raising his arm. It took many years for Waterman to regain the ability to move his body, and to even walk again. Although he underwent rehabilitation, the major factor in his recovery was the discovery that if he maintained visual attention on his body, he could control its movements. In other words, if Waterman cannot see his body, say if the lights are turned off, then he collapses
to the ground. He learned to use feedback gained from maintaining constant visual attention on his body to locate his body and thus execute movements. Understandably, his movements are not as fluid as they were before his deafferentation — they are slow, methodical, and require an extreme amount of attention. However, he has found a way to work around his sensory loss.

Waterman’s case is of particular interest for those concerned with the sense of body-ownership, bodily awareness, and the sense of self because of the importance that proprioception has been taken to play in constituting these aspects of our bodily experience. For many, proprioception is taken to play a key, if not necessary role in generating the sense of body-ownership and the sense of self. As we have seen, there is reason to think that our sense of self is largely constituted by our sense of embodiment and that our sense of embodiment is, in turn, largely constituted by our proprioception. In the case of Waterman, then, if there is a loss of proprioception, there might be reason to suggest that there is also a loss of body-ownership, and even to some extent a sense of dis-embodiment. Such a view, however, is not, I believe, warranted.

3. Waterman’s Case: Interpretations and Mis-Interpretations

There are three main approaches to explaining our bodily self-consciousness in the literature today: one proposes that our bodily self-consciousness has an efferent basis\(^5\), the other proposes that our bodily self-consciousness is an afferent phenomenon\(^6\), and the third proposes that our

\(^5\) On the efferent model, bodily self-awareness corresponds to a predicted sense of self, which in turn relies on efference copies of motor commands to identify the self as the common denominator of self-initiated actions.

\(^6\) I will explain this view in detail in what follows.
bodily self-awareness requires the incorporation of both efferent and afferent phenomena\textsuperscript{7} — the dual view. The view I have developed throughout this thesis can be classified as a dual view of bodily self-awareness, albeit an afferent-leaning one. Indeed, I align myself with those who argue that “the reafferent-efferent processes of sensorimotor integration and homeostatic regulation implement a self-specific, agentive perspective at the bodily level of perception and feeling,”\textsuperscript{8} although I contend that those processes associated with the reafferent-efferent integration of interoceptive stimuli play a larger role in our awareness of the body as subject than they have been accorded to date. Before reviewing my reasons for holding an afferent-leaning dual view, let me first specify what I understand to be afferent phenomena.

As it has been typically understood, the afferent hypothesis leads to problematic consequences when considered in light of the case of deafferentation. Typically, “[the afferent] hypothesis considers that bodily self-consciousness would rest on a specific sense of the body, i.e., proprioception, which is supposed to be the sense of self \textit{par excellence}.”\textsuperscript{9} Accordingly, as Waterman cannot \textit{sense} his posture, movements, or the location of his limbs via proprioception, he is \textit{not aware} of his body — he does not have any bodily \textit{self}-awareness according to such an

\textsuperscript{7} On this view, our bodily self-awareness relies on the sensorimotor integration of efferent and reaferent motor and homeostatic signals in a way that distinguishes between self and non-self, i.e., in a way that is self-specific. See Christoff, Cosmelli, Legrand, and Thompson, “Specifying the self for cognitive neuroscience,” for such an account.


afferent hypothesis. As Legrand points out\(^\text{10}\), this means that Waterman is in one of two contrasting states with regard to his body: either he is observationally conscious of his body, as when he looks at his limbs and is attentionally focused on them, or he is not conscious of his body, i.e., his body is not itself experienced\(^\text{11}\). Indeed, according to the aforementioned afferent hypothesis, there is no awareness of the body as subject for Waterman — when Waterman is not looking at his body, he does not experience it because the main source for bodily self-consciousness, proprioception, is lost.

If the sense of self depends on a sense of embodiment, and this sense of embodiment consists in bodily self-awareness, then the afferent hypothesis implies that Waterman, to some great degree, has lost his sense of self and experiences a degree of disembodiment when he stops looking at his body. Further, although this outcome may seem counter-intuitive, it certainly seems to follow from the interpretation of the standard afferent hypothesis — proprioception is the sense par excellence for bodily self-consciousness. The problem with this outcome is that it does not align with how Waterman describes himself and his experiential mental life\(^\text{12}\). Waterman clearly has a full sense of self, and does feel himself as an embodied being. What, then, does this fact tell us about the afferent hypothesis?

\(^{10}\) I focus here on Legrand’s interpretation of how the Waterman case affects the afferent hypothesis because it exemplifies a common way of interpreting the situation.

\(^{11}\) Legrand, “Pre-Reflective Self-Consciousness: On Being Bodily in the World,” 500, my emphasis.

Although one might take this to show that an afferent hypothesis is a failure, I think the problem lies not with holding that there is an afferent basis to bodily self-awareness, but rather with holding that proprioception is the sensory modality solely responsible for bodily self-awareness. I take it that Ian Waterman’s sense of bodily self does indeed stem from an awareness of the body as subject, just not one that stems from proprioception alone. Rather, I argue, Waterman enjoys a bodily self-awareness by virtue of still possessing an intact interoceptive system and interoceptive awareness, as we will see. I grant that his overall bodily self-awareness is not the same as it was prior to the deafferentation — he can no longer sense his posture, limb position, etc. without visual input, and this sensory information indeed plays a role in our bodily self-awareness, as I argued in chapter 2. However, that is not to say that Waterman does not continue to have bodily self-awareness to some extent. As I argued in chapter 3, interoception is not only involved in, but key to our awareness of the body as subject, and this provides one reason for defending an afferent-leaning dual view.

I showed in the previous chapters that there are two main ways in which we come to enjoy an awareness of the body as subject: proprioception and interoception. I also suggested that interoception is of greater importance to our bodily self-awareness than proprioception, and one reason for this is because of cases like Waterman’s — a case which clearly shows that the total loss of proprioception is possible. If proprioception were the sole, or at least the main source of our bodily self-awareness, then we certainly would not expect patients with deafferentation to continue to feel a sense of embodiment and a sense of self, especially when not attending to their body visually. However, given Waterman’s descriptions of his own experience, we are forced to
look elsewhere for the source of our bodily self-awareness. That elsewhere is interoception, and there is empirical evidence to support this.

First, there is physiological evidence to show that Waterman has an intact interoceptive system. As we saw in the previous chapter, visceral afferent signals rely on unmylenated nerves and small mylenated nerves. Deafferentation affects large mylenated nerves, and in Waterman’s case large mylenated nerves originating in the muscle receptors. Thus, there is no reason to suspect that the afferent pathways are affected by the deafferentation. This means that Waterman’s interoceptive system continues to function normally, and thus the interoceptive neural body maps remain intact. Indeed, as Park and Tallon-Baudry explain: “the redundancy of anatomical pathways and target sites of afferent visceral information implies that only massive, probably lethal, lesions could suppress or at least markedly alter the representation of internal bodily information. Indeed, disorders affecting all three types of subjective experience (self-experience, conscious perception, and emotional feelings) are not reported.” It seems clear, then, that Waterman continues to have the neural basis of interoception. However, as I considered in the previous chapter, having a functioning interoceptive system does not imply that one has interoceptive awareness. We must see, then, if there is evidence to show that Waterman continues to enjoy an interoceptive bodily awareness. If there is, then there is reason to suspect that Waterman can still experience his body as subject.

Given that his interoceptive sensory apparatus has not been damaged by the deafferentation, there is no reason to think that Waterman does not continue to bodily self-perceive his visceral environment in his everyday life. Indeed, according to Waterman, “[my] sense of [my] wholeness and configuration, has altered little as a consequence of [my] deafferentation syndrome.”\(^\text{14}\) Further, insofar as he reports experiencing muscle fatigue, pain, temperature, bladder distention, and a whole host of other interoceptive bodily states, he clearly continues to have a sense of his body. There is ample reason, then, to grant that Waterman maintains an interoceptive bodily awareness. As a result, I contend that Waterman has retained some sense of ‘myness’ of his body and a sense of self as bodily. In this regard, I defend a view of the sense of body ownership wherein the feeling of ‘myness’ is seen as largely based in the interoceptive system. Although I take our awareness of the body as subject to stem from both proprioception and interoception, and thus losing proprioception will lead to a changed awareness of the body as subject, I also take it that so long as interoception is still present there will nonetheless remain a sense of ‘myness’ and a sense of ‘me-ness’ in such cases. Unlike other interpretations, my interpretation is that Waterman’s case reveals the role of interoception for generating our sense of self as bodily. There is no dis-embodiment, nor lost sense of bodily self-awareness\(^\text{15}\). To hold such a view is to fail to see all the elements involved in our experience. Unfortunately, the failure to grant the place of interoception in our account of bodily awareness has been all too common.


\(^\text{15}\) To be sure, the loss of proprioceptive awareness will affect his overall bodily self-awareness. However, I see no reason to suggest that Waterman has completely lost an awareness of his body as subject.
4. **Body Illusion and Interoception**

Body illusions are typically used to uncover the underlying mechanisms that give rise to our sense of body-ownership. We typically experience our body, and only that body, as our own in our everyday life. Indeed, our experience of body-ownership over our body is normally very stable. However, it appears that under certain circumstances, this stability can be challenged, and our experience of body-ownership can change in various ways. For example, in some cases we can extend our experience of ownership to include other body parts (e.g., as in the rubber hand illusion), and in other cases we can experience ourselves as moving out of our own body (e.g., as in out-of-body experiences). The most common body illusion paradigms that manipulate our sense of body-ownership are the rubber hand illusion\(^\text{16}\), the enfacement illusion\(^\text{17}\), out-of-body experiences\(^\text{18}\), and virtual whole body illusions\(^\text{19}\). In what follows I will pay particular attention to the cases of the rubber hand illusion and virtual whole body illusions. Before considering these in greater detail, however, let me first discuss what the common view has been of what occurs when someone experiences a body illusion.

The typical understanding of body illusions is that our sense of body-ownership stems from multi-sensory integration. More particularly, it is the multi-sensory integration of self-related sensory signals that underlies our sense of body-ownership. In cases of body illusion, the self-

\(^{16}\) This illusion involves feeling a sense of ownership over a fake, rubber hand.

\(^{17}\) This illusion involves the enhancement of one’s identifying with the face of another.

\(^{18}\) This illusion involves experiencing oneself as leaving or moving out of one’s body.

\(^{19}\) This illusion involves identifying oneself with either a virtual body or the body of another person.
related sensory signals are skewed, and there is conflicting sensory information regarding the body felt and the body perceived. For example, what one senses via proprioception would differ from what one senses through vision. As a result of the conflicting information, the brain must decide how to reconcile the data. Vision, being the dominant sensory modality, most often wins out, and the brain takes the visual data to be more reliable than the proprioceptive data, thereby leading the subject to experience an illusion of body-ownership. The subject typically reports feeling a sense of ownership over the seen item, whether it be a rubber hand, another’s face, another’s body, etc. What body illusions show is that our exteroceptive perception of the body plays an important role in the multi-sensory integration that underlies our sense of ‘myness’ over our body. This finding, in and of itself, is not problematic — it seems evident that our exteroceptive perception of the body would, and should, play a key role in our sense of body-ownership. What is problematic, however, is how important a role our exteroceptive perception is taken to play. Moreover, it is problematic that much of the research on body-ownership, and specifically on certain instances of body illusion, has not seriously considered the role that interoception plays in the multi-sensory integration that is of interest. Given the importance of interoception to our bodily awareness, in addition to recent research\textsuperscript{20} showing the influence that interoception has on our exteroception, I contend that these problems have led to misguided conclusions regarding what cases such as the rubber hand illusion and whole body illusion show about our sense of self as bodily. To further substantiate my contention, I will consider each of these body illusion paradigms in turn to highlight where the misguided conclusions arise and offer a re-interpretation of the evidence in light of the view I propose.

\textsuperscript{20} See Farb et al. 2013, and Park et al. 2014.
5. **The Rubber Hand Illusion**

5.1 **The Paradigm**

The rubber hand illusion was first introduced by Botvinick and Cohen in 1998\(^ {21} \). It is an illusion whereby the subject’s experience of his body extends to include a rubber hand. Bringing the illusion about is relatively simple (see Figure 1): the subject sits in a chair and places one hand on a table in front of him, say the left hand. His hand is then hidden from his view. Next to his hand is placed a rubber hand. This rubber hand is positioned similarly to the subject’s real hand, but it remains quite evidently a rubber hand. The subject then watches as the rubber hand is stroked with a paintbrush by the experimenter, while his real hand is synchronously stroked as well. After a very brief period of synchronous stroking of the real and rubber hand, the subject’s bodily experience changes.

![Figure 1. The Rubber Hand Illusion. Illustration by Litwak illustrations studio 2004.](image)

5.2 The Findings

Phenomenologically, subjects report: “experienc[ing] an illusion in which they seemed to feel the touch not of the hidden brush but that of the viewed brush, as if the rubber hand had sensed the touch.” This has been interpreted as showing that the subject begins to feel a sense of ownership over the rubber hand. What is most interesting is that the majority of subjects report feeling that the rubber hand is their hand, even though they can clearly ascertain that it is a rubber hand.

Behaviorally, subjects experience a phenomenon called ‘proprioceptive drift’. Both before and after the experiment, subjects are asked to do a series of intramanual reaches. With eyes closed and using their right hand, subjects are asked to move their right index finger along the edge of the table above where their left hand rests and stop at the point where they believe their left index finger lies. “Subjects’ reaches after experiencing the illusion were displaced rightward toward the rubber hand, the magnitude of this displacement varying significantly in proportion to the reported duration of the illusion.” The phenomenon of proprioceptive drift is typically taken to show how the brain’s selection of the visual data as the more accurate data leads to a recalibration of other sensory modalities, in this instance proprioception.

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22 Botvinick and Cohen, “Rubber hands 'feel' touch that eyes see”, 756.
23 Botvinick and Cohen, “Rubber hands 'feel' touch that eyes see”, 756
Interestingly, the dynamic shift in how the brain interprets sensory feedback from non-visual modalities extends beyond just proprioception. In a groundbreaking series of studies\textsuperscript{24}, Moseley et al. sought to look at the effect of the rubber hand illusion on the temperature of the real hand during the illusory experience. What they found was quite surprising: “temperature regulation can be disrupted in healthy volunteers by psychologically disrupting the sense of body ownership. This is the first empirical evidence that taking ownership of a rubber hand is accompanied by a significant drop in skin temperature for the real hand. Second, and crucially, the decrease in skin temperature was limb-specific.”\textsuperscript{25} Indeed, they found that the stronger the illusion was felt by the subjects, the larger the drop in temperature in the real hand. Once again, as with the behavioral measure just mentioned, the stronger the felt sense of ownership over the rubber hand, the deeper the effect of the multi-sensory integration based on the visual feedback.

Following the Botvinick and Cohen paper, many researchers began to use the rubber hand illusion to test the parameters under which the illusion would take place. Just how malleable is our sense of ownership? Could the illusion be brought about using a rubber hand that looked very different from our own hand? One study showed that for the illusion to work, the rubber hand had to be positioned in a similar way to the real hand\textsuperscript{26}. That is, if the rubber hand was

\begin{itemize}

\item \textsuperscript{25} Lorimer Moseley, Olthof, Venema, Don, Wijers, Gallace, and Spence, “Psychologically Induced Cooling of a Specific Body Part Caused by the Illusory Ownership of an Artificial Counterpart,” 13171.

\end{itemize}
positioned at an unnatural angle, say an angle that would not be possible to take with one’s real hand, or if it were positioned in a manner that was diametrically opposed to the position of the real hand, then the illusion would not work. In short, the rubber hand has to look similar enough to the real hand in order for the illusion to work.\footnote{Interestingly, the skin color of the rubber hand does not matter — if you use a dark skin colored rubber hand for a subject with fair skin, the illusion will still occur. See Harry Farmer, Ana Tajadura-Jiménez, Manos Tsakiris, “Beyond the colour of my skin: How skin colour affects the sense of body-ownership.” Consciousness and Cognition 21, no. 3 (2012): 1242–1256.}

### 5.3 The Conclusions Drawn

Overall, the rubber hand illusion has been taken to show that our sense of body ownership is relatively easily shifted. Furthermore, given the association between body-ownership and the sense of self, these results have been taken to show that using this simple experimental paradigm, one can bring about a large shift in our sense of bodily self: we feel the rubber hand as our own, our proprioception shifts towards the rubber hand, and our body temperature in the real hand changes. In sum, our body-ownership and our sense of self as bodily is not as stable as we might think.

### 6. The Whole Body Illusion

As one might expect, there have been criticisms of the rubber hand illusion paradigm and the findings stemming from it since it was first introduced in 1998. One of these criticisms is that what the rubber hand illusion actually tests for is the malleability of our sense of body-part ownership. Because it focuses only on a particular part of the body, the hand, we are not warranted to draw any conclusions from this case to issues of whole body ownership. The rubber
hand illusion relates to our awareness of our hand, not to our bodily awareness per se. For this reason, the rubber hand illusion does not shed light on understanding our sense of self as bodily. In order to look at how malleable our overall sense of body ownership is, and how this malleability affects our sense of self as bodily, we must expand the paradigm to include the entire body.

6.1 The Paradigm

Creating such a whole body illusion is precisely what Lenggenhager et al. did in 2007\textsuperscript{28}. Their background view was that “the fundamental sense of selfhood [...] that is associated with bodily self-consciousness [...] is experienced as the transparent content of a single, coherent whole-body representation, rather than as multiple representations of separate body parts. Accordingly, the latter have been referred to as the sense of body-part ownership, whereas whole-body representations or global ownership are directly associated with the sense of selfhood.”\textsuperscript{29} The whole body illusion paradigm, then, allows us to go further than the rubber hand illusion and gain deeper insight into our sense of self as bodily.

The basic whole body illusion paradigm Lenggenhager et al. used works as follows (see Figure 2): subjects view the back of their body, filmed at a distance of two meters, through a 3D head-mounted video display. The subject’s back is stroked for one minute, both synchronously and then asynchronously with the viewed body in the video display. Two measures are then used to


\textsuperscript{29} Lenggenhager, Tadi, Metzinger, and Blanke, “Video Ergo Sum: Manipulating Bodily Self-Consciousness,” 1097.
assess the subject’s experience: a psychometric measure and a behavioral measure. The psychometric measure is similar to the one used in the rubber hand illusion — it involves a questionnaire that seeks to evaluate the subject’s phenomenological experience during the illusion. The behavioral measure involves a global self-localizing task wherein the subject is blindfolded and then passively displaced after the stroking. He is then asked to return to his initial position.

Figure 2. The virtual body illusion. Illustration by M. Boyer.

6.2 The Evidence

With regards to the behavioral measure, subjects showed a drift in self-localization towards the virtual body if they were moved along the anterior/posterior axis. This result is similar to the proprioceptive drift result obtained in the rubber hand illusion and is taken to show how quickly the multi-sensory integration of proprioceptive feedback shifts according to the visual input.
With regards to the psychometric measure, subjects reported feeling as if the virtual character was their body, again a result akin to the rubber hand illusion.

Since this first whole body illusion study appeared, many variants on the paradigm have been used to test the ways in which we might experience a virtual body as our own. It has been shown that a sense of body-ownership can be induced for real and artificial bodies.\(^{30}\) It has also been shown that once the illusion has taken hold wherein the subject feels a sense of body-ownership over an artificial body, she can then be made to turn around and shake hands with her real body without breaking the illusion.\(^{31}\) Most recently, it was shown that an adult can experience a whole body illusion over a child’s body, and that the subject’s experience of the world, once she feels a sense of ownership over the child’s body, changes to accommodate the difference in body size and age between her original body and the child’s much smaller and younger body.\(^{32}\) Lastly, using a variant on the whole body illusion paradigm described above, namely an immersive virtual reality scenario, Slater et al. showed that a full body-ownership illusion could be brought about quite easily from a male subject to a female virtual avatar.\(^{33}\)

### 6.3 The Conclusions Drawn

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In all these cases, the results are taken to confirm what Lenggenhager et al. concluded in 2007:

“[t]he overall pattern of the data from [the] studies [...] suggests that, under appropriate conditions of multisensory conflict between visual signals conveying information about a virtual body (on a HMD [head mounted display]) and tactile, proprioceptive, and vestibular signals conveying information from the participant’s body, visual capture is still present. [...] Illusory self-localization to a position outside one’s body shows that bodally self-consciousness and selfhood can be dissociated from one’s physical body position.”

If this is in fact the correct interpretation of the results, then it shows that our sense of self, our awareness of our self as bodily is not dependent on our specific body in any necessary manner. Indeed, any body could provide our sense of self as bodily and underlie our bodily awareness, even one that is quite different from the one we currently have.

I find the view that ‘bodily self-consciousness and selfhood can be dissociated from one’s physical body position’ to be problematic. What makes it so, as I will now show, is that it stems from a faulty assumption about the nature of bodily awareness and how it arises.

7. Problems with the Interpretation of Body-Ownership Illusions

Both the rubber hand illusion and the whole body illusion focus on the roles that proprioception and vision play in shaping our sense of body-ownership. Both show how, under these manipulations, vision overrides proprioception and, as a result, our sense of body-ownership (in part or in whole) is easily manipulated. Further, because of the relation that is taken to hold


35 The problematic consequences of these conclusions for issue of personal identity would be very interesting to explore. However, I will set these considerations aside for now as they lie beyond the scope of this work.
between body-ownership and the sense of self, these conclusions have serious consequences for how we view our sense of self as bodily. In other words, if our sense of self as bodily relies in some way on the experience of ‘myness’ over our body, i.e., our body-ownership, then what these body illusion cases show about the instability and malleability of our body-ownership extends to our sense of self as well — our sense of self as bodily is not as definite as we expect or usually experience.

These conclusions seem disconcerting if we take a moment to reflect on our typical experience of our body and our sense of self. As I mentioned above, in my everyday interaction with the world, and indeed throughout my conscious mental life, my sense of self appears to be not only very stable, but the single-most dependable element of my phenomenal consciousness. Put another way, I have never had a self-less conscious experience. Moreover, I have never had a body-less conscious experience. As I have been arguing thus far, our body is an integral part of our phenomenal consciousness and our ability to experience the world depends on our having a body, and having bodily awareness. To be fair, these cases of body illusion do not suggest that we lack bodily awareness or a sense of self, but rather that these are malleable and transferable. More precisely, they show that our visual experience of our body is the dominant source of sensory feedback for giving us a sense of body ownership, and in turn for our bodily awareness and sense of self. But even if the suggestion is simply that our sense of body-ownership and sense of self are malleable and transferable, is this really the correct interpretation to make of the data? I do not think this conclusion can be drawn from the evidence at hand.
It surely seems perfectly plausible that our visual perception of our body greatly influences our sense of self as bodily and our sense of body-ownership — consider body image disorders such as anorexia nervosa and you will quickly see the close connection between our visual perception of our body and our sense of body-ownership and bodily self. However, as we saw with the case of Ian Waterman, proprioception and vision are not the only sensory modalities of consequence when considering issues of bodily awareness and the sense of self. The main problem that belies the interpretations made on the basis of body illusion paradigms is that these fail to consider the effect that interoception has on our sense of body-ownership and bodily self. The consensus, unfortunately, has been to assume that our sense of body-ownership relies mostly on vision and proprioception. As I have been at pains to show throughout these last two chapters, however, that is simply not the case. Indeed, vision and proprioception play a central role in generating our sense of body-ownership, yet, as I will now make clear, one cannot leave interoception out of the discussion of bodily awareness.

There is a reason why subjects in the rubber hand illusion and whole body illusion do not lose a sense of their hand or body altogether. These illusions are not cases of dis-embodiment, but rather of extending one’s sense of ‘myness’ to include more than just their physical body. As Lenggenhager et al. state: “[n]one of the participants reported sensations of overt disembodiment.” I contend that the reason why subjects do not lose their body altogether is

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36 To my knowledge, the only study to look at interoception in relation to the body illusions has been Tsakiris et al’s 2012 work, which I consider in detail in section 11. Aside from this study, all of the work on body illusions has concerned itself only with the relation between vision, proprioception, body-ownership, and the sense of self.

because, in both cases, they continue to enjoy an interoceptive awareness of *their* body. This continued interoceptive awareness is, I argue, what makes these cases ones of body-*extension* rather than dis-embodiment/loss of body-ownership. Moreover, if we take seriously the role that interoceptive awareness plays in our bodily *self*-awareness when studying body illusions, we see that the interpretation of the body illusion findings is not as straightforward as it was at first thought.

In a paper published in 201138, Tsakiris et al. showed that interoceptive sensitivity predicts a subject’s susceptibility to the rubber hand illusion. Interoceptive sensitivity is a measure of one’s ability to perceive aspects of the visceral environment — one’s level of interoceptive awareness. What this study showed is that the higher one’s interoceptive sensitivity, the lower one’s susceptibility to the illusion. I will discuss the details of this study at greater length in section 11 below, but for now it suffices to say that on three separate measures of ownership, there was a significant difference between the high and the low interoceptive sensitivity groups: subjects with high interoceptive sensitivity showed less proprioceptive drift, less change in skin temperature, and less of a feeling of ownership over the rubber hand. These results show that interoceptive awareness is directly tied to one’s sense of body-ownership. Furthermore, the fact that there is a difference in susceptibility to the illusions between subjects with high versus low interoceptive sensitivity shows that failing to take into account the role of interoception can greatly affect the outcome of research on bodily awareness. In short, the results obtained from

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body illusion cases as described above have been taken to apply too sweepingly across various aspects of our bodily awareness. The problems, however, do not stop here.

The results of Tsakiris’ study also serve to support the contention I made above, namely that what makes these cases of body-ownership ones of an *extension* rather than a loss of ownership or the sense of self is the subjects’ continued interoceptive awareness. As long as there is interoceptive awareness, there is a continued sense of body-ownership and of the self as bodily. We saw this to be the case with Ian Waterman. But what Tsakiris et al. show goes beyond this: their study suggests that there are degrees of interoceptive awareness (high-low sensitivity) and that the stronger one’s interoceptive awareness, the stronger one’s sense of body-ownership and sense of self, as exhibited by the reduced susceptibility to the illusion. This result only serves to strengthen my contention.

A problematic association has also been made about our sense of body-ownership and our sense of self. As I argued in the first chapter, there is an important distinction to be made between our awareness of the body as object and our awareness of the body as subject. Throughout this work, I have argued that our sense of self as bodily relies on our bodily *self*-awareness, i.e. an awareness of the body as *subject*, and I have shown that this form of bodily awareness cannot rely on perception that involves an attentional relation to an object. The bodily awareness at issue in cases of body illusion, however, is one that requires the perception of our body as an object — it requires that we observe our body. To be sure, our sense of body-ownership relies in large part on our awareness of the body as object — recall that body-ownership is characterized as the
feeling of ‘myness’ of the body, and as the judgment that this body is mine. Our sense of self, however, relies on our awareness of the body as subject first and foremost. Thus, if our sense of self relies on our awareness of the body as subject, and body-ownership relies on an awareness of the body as object, then any evidence regarding our sense of body-ownership does not necessarily apply to our sense of self as bodily. Most of the research on embodiment has not taken into account this distinction in bodily awareness, and as such findings regarding body-ownership have been mistakenly taken to extend to our sense of self.

Moreover, as I have claimed, our awareness of the body as subject is what underlies our awareness of the body as object. If that is the case, then our sense of body-ownership, although largely driven by our awareness of the body as object — an observational awareness — stems also from our underlying awareness of the body as subject — non-observational awareness. Indeed, I take it that the felt ‘myness’ over our body requires a bodily self-awareness. Our sense of self as bodily, then, plays a role in our sense of body-ownership. As Shaun Gallagher writes:

“The sense of ownership […] does not require an explicit or observational consciousness of the body, an ideational, third-person stance in which I take my body as an object. Rather it may depend on a non-observational access […], an access that is most commonly associated with a first-person relationship to myself. In non-observational self-awareness I do not require the mediation of a perception or judgment to recognize myself as myself. […] In normal experience, this knowledge is already built into the structure of experience.”

On this view, then, body illusion cases do not reflect a loss of ownership, but instead, as I have argued, the extension of ownership, because the loss of ownership cannot occur so long as there continues to be an awareness of the body as subject.

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39 Gallagher, How the Body Shapes the Mind, 29.
A further important point needs to be made about the place of interoception in cases of body illusions. Re-consider the case of the whole body illusion reported by Lenggenhager et al. They account that: “[p]articipants reported varied feelings of ‘weirdness’ or ‘strangeness,’ and some found the experiment irritating. None of the participants reported sensations of overt disembodiment or a change in visuospatial perspective.” These subjective reports are quite telling, and, I take it, stand in opposition to Lenggenhager et al’s conclusion that ‘bodily self-consciousness and selfhood can be dissociated from one’s physical body position’. As I showed in the previous chapter, our background emotional states are the result of our interoceptive bodily self-awareness. States such as feeling weird, strange, or irritated are emotional states and involve felt valence. Thus, there is never an instance where the subject loses awareness of his body entirely during these experiments— in feeling ‘weird’, ‘strange’, or ‘irritated’, I contend that subjects are interoceptively bodily self-aware, and consequently, that they remain interoceptively aware of their inner body as subject throughout the experiment. As a result, there is no basis for claiming that body illusions show any loss of one’s sense of selfhood.

In regards to my first stated goal for this chapter — to show how current research has failed to consider the distinction between awareness of the body as subject and of the body as object, and to make clear how this failure has resulted in misguided views that do not fully illuminate how our sense of self as bodily arises — the lesson to take away is clear: one must be careful with the

conclusions drawn from research on embodiment. Indeed, if we restrict our view of body-ownership to our awareness of the body as object and the extent to which such an awareness affects our sense of selfhood, then the body illusion research does show that insofar as these aspects of our sense of bodily self are concerned, they are malleable. However, as I have shown, this restriction is not explicitly made because the distinction between awareness of the body as subject versus as object is not considered. Therefore, we must be careful not to take cases of body illusion as providing any conclusive evidence to suggest that our sense of self as bodily, or our sense of ownership as given by our bodily self-awareness, is in any way transferable or malleable. In sum, the research on the rubber hand illusion and the whole body illusion has not yielded as full an account of embodiment as has been thought. What must be done to get such a detailed account of embodiment is to supplement the current findings with research on our awareness of the body as subject and the relation of this form of awareness to our sense of self as bodily.

This brings us to the problem that I mentioned at the outset of the chapter, and my second target of explanation: the criticism that if awareness of the body as subject is what underlies our sense of self as bodily, and such an awareness cannot be considered via any means that require observing one’s body, then how are we to study or account for how our bodily self-awareness underlies our sense of self?
8. The Methodological Problem

I suggest that the solution to this problem lies in looking to alternative research methodologies. As has become clear now, most of the research on self-awareness has focused on “the self-attribution of mental and physical features, and thereby focus[ed] on the self as an object of attribution and not the self as the knowing subject and agent.” Under this paradigm, however, we have been unable to give a complete account of what constitutes our self-experience. The reason why there has been such a focus on our awareness of the body as object is because this awareness is observational — one directs one’s attention to the object being observed. It is a form of awareness that is ideally suited to empirical investigation. Our awareness of the body as subject, however, does not rely on observational awareness, rather it involves inattentional, implicit awareness of the body and thereby requires different investigatory tools. As Dorothée Legrand states: “cognitive neurosciences have developed the techniques and methodology to investigate observational bodily self-consciousness in a naturalistic perspective. Now, we need to see if the equivalent can be done concerning non-observational bodily self-consciousness.”

I propose that recent empirical work looking at the effect of certain meditative practices on bodily awareness can serve as one starting point for developing these new techniques and methodologies. Evidence suggests that these meditative techniques can serve to strengthen interoceptive awareness, and in turn, one’s sense of self as bodily, which then renders one less

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susceptible to body-ownership illusions. Looking at the relationship between these meditative practices and their effects on our interoceptive awareness will, I argue, offer us a starting point for investigating non-observational, bodily self-awareness, and thereby begin resolving the methodological problem stated above.

9. Meditation and Interoceptive Awareness

Over the last decade, the interest in the effect of meditation on various aspects of the mind, and particularly in relation to attention and awareness, has been steadily growing. Recently, there has been some interesting research on meditation and interoception. There are many greatly divergent forms of meditative practice across cultures and beliefs systems, but for the purposes of neuroscientific research two specific forms of meditative practice associated with the concept of ‘mindfulness’ have been especially amenable — the first is known as ‘focused attention,’ and the second as ‘open monitoring.’ Focused attention, broadly speaking, involves holding the mind in a state of sustained focus on a particular object. Typically, one focuses one’s attention on the sensations associated with the breath: the feeling of air moving past the nostrils, the rise and fall of the chest wall, etc. Over time, the practitioner increases the duration over which she can maintain her focus on the object without mind-wandering. In open monitoring practice, one drops the focus on a particular object and instead monitors whatever arises in the field of experience from moment to moment. In this way, one cultivates mindfulness of moment to moment experience. Thus, mindfulness meditation seeks to strengthen one’s attentional abilities as well as one’s awareness of the typically fleeting nature of mental processes.

Recent studies by Farb et al.\textsuperscript{44} considering the effects of breath focused, mindfulness meditation have shown interesting effects of this practice on the cortical pathways associated with interoceptive attention and awareness. In one study\textsuperscript{45}, Farb et al. showed that different cortical networks are responsible for exteroceptive attention and interoceptive attention, and that these networks are dissociable. Furthermore, they showed that interoceptive attention modulates interoceptive cortical regions, a finding they take to support the hypothesis that “attention serves to increase the ‘gain’ of viscerosensory receptive fields for bodily sensation.”\textsuperscript{46} These results provide evidence that interoceptive attention affords a heightened awareness of the bodily state being attended to. In another study\textsuperscript{47}, Farb et al. sought to investigate whether practicing sustained interoceptive attention, which is precisely one of the things that mindfulness training is said to develop, would modulate neural representation networks for interoception. They found that mindfulness training not only altered the functional plasticity of interoceptive cortex, but also appeared to provide subjects with “a consistent ‘online’ representation of body awareness.”\textsuperscript{48} Considering the results of these two studies together, we see evidence that an increased ability to sustain one’s focus on one aspect of the bodily environment, e.g., the breath,

\textsuperscript{44} See Farb et al. 2013.


\textsuperscript{46} Farb, Segal, and Anderson, “Attention Modulation of Primary Interoceptive and Exteroceptive Cortices,” 121.


\textsuperscript{48} Farb, Segal, and Anderson, “Mindfulness meditation training alters cortical representations of interoceptive attention,” 23.
has a lasting effect on one’s ability to perceive and attend to various elements of the visceral environment overall. In short, meditative practices lead to an increase in overall interoceptive bodily awareness in everyday experiential life.

These findings are particularly relevant in light of recent work done on the relationship between a particular form of focused attention meditation, namely body-scanning meditation, and interoceptive awareness. Body-scanning meditation, as with other meditative practices, involves maintaining focused attention and avoiding mind-wandering. The way in which this specific form of meditation differs from breath-focused meditation, however, is that it involves moving one’s attention from one part of the body to another in a continuous manner, maintaining a neutral, non-judgmental focus on whatever sensations may arise, be they pain, tingling, itching, heat, etc. To clarify, body scanning meditation is a whole-body form of meditation. The research that has focused on the relationship between this form of meditation and interoceptive awareness has uncovered illuminating evidence with respect to particular aspects of our interoceptive awareness: body scanning meditation increases our interoceptive awareness not only in terms of clarity and accuracy, but also in both an immediate and retrospective manner.\textsuperscript{49} First, body scanning meditation was shown to sharpen the \textit{clarity} of awareness. Second, it was shown to render one \textit{more accurate} at reporting on sensory experiences. Moreover, these benefits are shown to occur across two different contexts: in immediate perceptual detection tasks that involve overt tactile stimulation, and in retrospective evaluative reporting tasks that do not involve any overt tactile stimulation.

\textsuperscript{49} Mirams et al. 2013 and Fox et al. 2012
In a 2013 paper published in *Consciousness and Cognition*, Laura Mirams et al. used a somatic signal detection task (SSDT) to show how body scanning meditation improves interoceptive clarity and accuracy in an immediate perceptual detection task setting. First, they measured healthy subjects’ accuracy at detecting near-threshold tactile sensation on the fingertip. Although they presented the vibrations to the fingertip of subjects on only 50% of trials, subjects reported feeling vibration on their fingertip during trials where there was no tactile stimulation. Mirams et al. suspected that these results were due to an increased attention on the hand, and in the case of false reporting the subjects misperceived their pulse for the tactile vibration. Their hypothesis was that if one has a heightened awareness of bodily sensations, and these sensations are ambiguous, then this leads to misinterpretation. So, in the case of the somatic signal detection task, the hypothesis is that the pulse is misinterpreted as near-threshold vibration at the fingertip.

What Mirams et al. sought to investigate was whether changing the *nature* of interoceptive attention might reduce the misperception of touch during the somatic signal detection task. They looked to meditation as a way to change the nature of interoceptive attention and proposed that because meditation is thought to increase the ability to focus attention, and cultivate a non-judgmental, detached awareness of physical sensations, perception, affective states, and so on, it should result in more accurate perceptions of sensory reality. Using a brief body scanning meditation technique, they predicted that “in addition to improving the clarity of somatic perception (i.e., the ability to distinguish between signal and noise), this exercise might be expected to improve the ability to disengage attention from sensory noise and other distractions
dur

ing the SSDT.” Their results showed that, indeed, not all interoceptive attention is created equally. Not only did the meditators show an increased ability to distinguish signal from noise as compared to non-meditators, but they also had a lower false alarm rate reflecting a decreased misperception of the tactile stimulation. The attention one fosters during body scanning meditation, it is suggested, appears to disambiguate the bodily sensations and thereby reduces misinterpretation. In sum, this study shows that on an immediate perceptual detection task, body scanning meditators showed greater sensitivity and clarity of interoceptive awareness, which resulted in greater perceptual accuracy.

Further, in a paper published in 2012 by Kieran Fox et al., experienced meditators were shown to have a higher introspective accuracy when asked to provide retrospective evaluative reports on their awareness of bodily sensations during a body scanning meditation session. Some forms of meditation are introspective in nature; they require one to focus on one’s own experiences and internal states. This leads to the hypothesis that experienced meditators might have more introspective accuracy, that is, their introspective reports of bodily experiences might correlate to a greater degree with objective neural and psychophysical measures. Recent research seeking to confirm this hypothesis, however, has generated varied results — some have shown meditators to be better at introspecting about their inner bodily states than non-meditators, and others have shown meditators to be equivalent to non-meditators51. Fox et al., therefore, decided to study a

51 Sze et al. 2010, Nielsen et al. 2006, Khalsa et al. 2008
particular form of meditation, namely body scanning meditation, and test whether experienced practitioners of this technique might show greater introspective accuracy of bodily sensations.

Their results showed that “the total number of hours previously spent in body-scanning meditation (BSM) significantly predicted the relationship between first-person sensitivity reports and all objective measures. […] Though subject to wide variability, the general trend suggests that with increasing meditation experience, reports of subjective tactile experience are more and more closely aligned with what would be expected from a purely neurophysiological perspective.”52 So, in sum, greater meditative experience is associated with more accurate awareness of one’s mental and physical experience.

What these studies show is that body scanning meditators are more clearly aware of, and more sensitive to, their interoceptive bodies, both when faced with other sensory stimuli and when focused solely on the inner body. This, in turn, gives them more accurate experiences as well as a better ability to report on these experiences. These studies suggest that body scanning meditation may have an effect on what we briefly distinguished as observational bodily awareness — awareness of the body as object. My reason for discussing these findings, however, is because I take it that they also show an effect of body scanning meditation on non-observational bodily awareness, i.e. awareness of the body as subject, and this might begin to resolve the methodological issue at hand.

10. **New Methodological Ground**

If we grant the distinction between observational (as object) and non-observational (as subject) awareness, then the following questions regarding the recent research on meditation arise. First, is there reason to think that based on the evidence regarding the relation between body scanning meditation and observational interoceptive awareness, body scanning meditation might have an effect on non-observational interoceptive awareness? Second, on the basis of what evidence would we have reason to hypothesize that it does have an effect? I take it that we do have reason to suspect body scanning meditation would affect our non-observational interoceptive awareness, and I make this hypothesis on the basis of Tsakiris et al.’s recent findings on the correlation between high interoceptive sensitivity and a reduced susceptibility to the rubber hand illusion. I argue, based on these findings, that an increased interoceptive sensitivity reflects a stronger non-observational interoceptive awareness, and that body scanning meditation may be a way of increasing our interoceptive sensitivity. As a result, I contend that there is preliminary evidence to suggest that body scanning meditation may strengthen both observational and non-observational interoceptive awareness, and that this practice could thereby serve as a methodological starting point for studying our awareness of the body as subject. To see how this approach could be elaborated, we must first look at Tsakiris et al.’s study in greater detail.

11. **Interoceptive Sensitivity and Bodily Awareness**

As mentioned, in his recent study, Manos Tsakiris et al. investigated the interaction between interoceptive and exteroceptive awareness of the body. To their knowledge, no study had looked
at the influence of interoceptive awareness on the exteroceptive representations of the body. Tsakiris et al. decided to look at the relationship between interoceptive awareness and the extent to which our body-image changes when a rubber hand illusion is induced. More specifically, they sought to determine whether interoceptive sensitivity predicts the malleability of body-representations. The test they used involved two components: they combined an interoceptive sensitivity task with a multi-sensory integration task that brings about a bodily illusion.

The interoceptive sensitivity task consisted of heartbeat detection monitoring using the mental tracking method. Forty-six female volunteers first completed the heartbeat detection task, and based on the results were divided into two groups: high and low interoceptive sensitivity, with the ‘high’ group showing a stronger correlation between reported heartbeat count and actual heartbeats. Next the volunteers completed the multi-sensory integration task that used the rubber hand illusion paradigm. Tsakiris et al. then used three measures of ownership to determine the level of malleability between the high and low interoceptively sensitive groups: a behavioral measure that looked at the amount of proprioceptive drift, an autonomic measure that tracked changes in skin temperature, and a psychometric measure that consisted of a post-task questionnaire.

Their results showed a significant difference between the high and the low interoceptive sensitivity groups. In regards to proprioceptive drift, measures showed that high interoceptively sensitive subjects experienced far less drift than low interoceptively sensitive subjects. In regards to the autonomic response, measurements showed that lower interoceptively sensitive subjects
had a larger decrease in skin temperature. Lastly, in regards to the psychometric measure, there was a higher number of agreement by those subjects identified as having low interoceptive sensitivity with the statement ‘it seemed like the rubber hand was my hand’, which is thought to be the most significant phenomenological measure of the experience of body-ownership during a rubber hand illusion. In summary, subjects with high interoceptive sensitivity showed less proprioceptive drift, less change in skin temperature, and less of a feeling of ownership over the rubber hand. As Tsakiris et al. concluded, “the results show that interoceptive sensitivity predicts the malleability of body-ownership during the rubber hand illusion manipulation.”

I take these results to be particularly interesting here because of the relationship between our sense of body-ownership and our interoceptive bodily self-awareness. The sense of ownership, as I have suggested, stems from an awareness of our body as that through which we act and perceive the world. I need not be directly aware of my body as an object in order to feel a sense of ownership over it. I need not observe my body to feel that it is mine. Rather, merely living through my body gives me a sense that my body is mine. In other words, my awareness of my body as subject is, in large part, what allows for my sense of my body as mine, as myself. As a result, I contend that my sense of body-ownership reflects my bodily self-awareness to some degree.

Working from this understanding of the relationship between body-ownership and bodily self-awareness, we can begin to see how Tsakiris et al.’s findings might be revealing of our interoceptive awareness of the body as subject. If high interoceptive sensitivity correlates to a stronger sense of body-ownership, measured as a decrease in the susceptibility to body illusions, and our sense of body-ownership to a certain extent is a reflection of our bodily self-awareness, then high interoceptive sensitivity can be interpreted as showing a stronger awareness of the body as subject. Given that our bodily awareness is structured in part by our interoceptive awareness, the evidence from Tsakiris’ work suggests, then, that high interoceptive sensitivity reflects a stronger interoceptive bodily self-awareness.

In and of itself, this hypothesis suggests that there is a way to account for our awareness of the body as subject via observations of our awareness of our body as object. Hence, it may offer a possible solution to the methodological problem mentioned above. However, I want to take things one step further and suggest that we might already have the tools that would allow us to do more than simply infer the presence of bodily self-awareness from observations of our awareness of the body as object. I suggest that the findings regarding body scanning meditation and interoception discussed above point to a possible method by which we can affect/change our bodily self-awareness.

12. A New Method

As we saw in the Mirams et al. study, healthy subjects often misperceive or misinterpret bodily sensations. However, body-scanning meditation was shown to be correlated with greater clarity
of awareness. The Fox et al. study showed that with body scanning meditation practice comes a more accurate introspective ability. Body scanning meditation, it was concluded, may increase clarity and accuracy of interoceptive awareness. In the study conducted by Tsakiris et al., interoceptive sensitivity was measured using a heartbeat detection task. Those better able to detect their heartbeat were deemed as having higher interoceptive sensitivity. To my knowledge, though, none of the volunteers was asked about meditative experience. These results lead me to propose the following hypothesis: an increased interoceptive awareness, would correlate with an increased interoceptive sensitivity, at least according to Tsakiris’ interoceptive sensitivity measure. Considering that body scanning meditation practitioners were shown by Mirams et al. and Fox et al. to have greater interoceptive awareness, possibly as a result of their meditative practice, body scanning meditation can be used to increase interoceptive sensitivity, and thus reflect a stronger bodily self-awareness.

At first glance, this hypothesis might appear contentious, particularly given a study published by Khalsa et al. in 2008 showing that experienced meditators were no more accurate at detecting their heartbeats than non-meditators. If meditators are no better at detecting their heartbeat than non-meditators, then why should we think that meditation would have any effect on interoceptive sensitivity? There are a few aspects of the Khalsa study that make me question it as a potential objection to my hypothesis. First, there are many different meditative practices, and as we saw in the Fox et al. study, results obtained on the basis of one practice may not hold for other practices. In the Khalsa et al. study, body scanning meditation was not specifically evaluated. Hence, the results may not hold in the case of body scanning meditation.
Second, there are different methods one can use to measure heartbeat detection accuracy, the two most common being ‘heartbeat detection’ and ‘heartbeat tracking’. Using the first method, subjects are asked to determine whether their heart beats occur simultaneously with an external stimulus, e.g., a light or sound. They are then rated as good or bad heartbeat detectors based on their performance in matching the stimulus occurrence with heart-beat occurrence, and the stimulus absence with heartbeat absence. Using the second method, subjects are asked to count their heartbeats for a fixed period of time. They are then assessed as good or bad heartbeat detectors based on how accurately they can perceive their heartbeat. In the Khalsa et al. study the ‘heartbeat detection’ method was used, whereas in the Tsakiris et al. study the ‘heartbeat tracking’ method was used. Tsakiris et al.’s decision to use the ‘heartbeat tracking’ method was motivated by the fact that it has good test-retest reliability and also correlates with other measures. Hence, the results from the Khalsa et al. study may differ depending on which heartbeat detection method is used, and they therefore do not necessarily negate the results obtained by Tsakiris et al.

Lastly, and importantly, we may want to adopt other measures of interoceptive sensitivity besides heartbeat detection. Many other methods for assessing interoceptive awareness have been described, including gastrointestinal distention\(^{54}\) and adrenergic stimulation\(^{55}\). As we have seen in the Mirams et al. and the Fox et al. pieces, body scanning meditation practitioners show better interoceptive awareness on non-heartbeat detection measures of awareness. Moreover, as


\(^{55}\) Cameron et al. 2002, Khalsa et al. 2008
we saw in the Mirams et al. study, not all interoceptive awareness is created equally. The interoceptive awareness developed through body scanning meditation correlates with more accurate awareness. If we consider these findings with recent work by Herbert et al.\textsuperscript{56} suggesting that a higher sensitivity in cardiac awareness correlates with a higher sensitivity in gastric awareness, then there is reason to think that body scanning meditators would be more accurate on any interoceptive sensitivity test.

In short, then, here are my reasons for contending that body-scanning meditation can strengthen our bodily self-awareness. First, as we just considered, our sense of body-ownership reflects our non-observational interoceptive awareness. So, a stronger sense of body-ownership reflects a stronger non-observational interoceptive awareness. Second, as Tsakiris et al. showed, a stronger sense of body-ownership relies on an increased interoceptive sensitivity. We also noted that interoceptive sensitivity is a measure of interoceptive awareness. So, it stands to reason that an increased interoceptive awareness reflects a stronger non-observational interoceptive awareness. Third, the evidence found by Farb et al. shows that meditation may increase one’s overall bodily awareness, and according to the evidence in Mirams et al. and Fox et al., body scanning meditators have a higher observational interoceptive awareness. Therefore, if body scanning meditation leads to an increased observational interoceptive awareness, then there is reason to think body scanning meditation strengthens non-observational interoceptive awareness as well. I suggest that meditation, and specifically body scanning meditation practice, would increase our interoceptive awareness of our body as object and body as subject, and would, in turn, have the

\textsuperscript{56} See Herbert et al. 2012
effect of strengthening our connection to our body, and our sense of self as bodily. Looking at the interplay between body scanning meditation, body-ownership, and bodily awareness in this manner, I propose, offers one way to begin resolving the methodological problem of how we could study our awareness of the body as subject given that it is non-observational.

Insofar as there is a distinction between the self as object and the self as subject, and consequently between the body as object and the body as subject, then we must find a way to account for the self/body as subject. Although developing techniques and methodologies for investigating non-observational bodily awareness will be challenging, I believe that I have identified two interesting avenues of pursuit. First, as just discussed, there is good reason to suggest that we are warranted to make inferences from the effects of body scanning meditation to our non-observational bodily awareness. Second, taking a dual view approach to bodily self-awareness, as briefly discussed in section 3 above, wherein the aim is to explain the self-specifying processes by which there is sensorimotor efference-reafference involving both proprioception and interoception, affords us a new framework by which to account for the self as bodily subject in the cognitive neurosciences.

13. **Conclusion**

To conclude, there are at least two outcomes of my account of bodily awareness for empirical research on embodiment. First, there is a need to distinguish between our awareness of the body

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as object and the body as subject when investigating any case of bodily awareness. Failure to do so, as I showed, leads to untenable claims regarding the effects of body illusions for our sense of self as bodily. To be sure, the evidence found by way of body illusion research is important, and this work has led to a better understanding of many disorders involving body representations, such as anorexia, somatoparaphrenia, and more. Indeed it is invaluable to our understanding of selfhood that we see how easily our sense of ownership over our body as object can be manipulated. However, it is equally important that we remain as clear as possible when deciding what the starting assumptions for our research will be, and how we interpret the data gleaned from our research. Without a clear understanding of the distinction between our awareness of the body as object and our awareness of the body as subject, we can be led to draw certain conclusions that are not warranted, and that may have serious consequences for future work on the self.

Moreover, the failure to not only acknowledge, but grant appropriate weight to the role that interoception plays in our bodily awareness will disallow for a complete account of not only how we come to be aware of our body, but also how it is that we have a sense of self as bodily. It is key that we consider both proprioception and interoception when studying bodily awareness and its relation to our sense of self.

Lastly, although the contention that there is both an awareness of the body as object and an awareness of the body as subject creates methodological difficulties, i.e., difficulties in studying a non-observational form of awareness, these should not deter us from trying to uncover new
techniques and methodologies for empirical research. Indeed, I suggested one such direction we might take — looking at the effects of body scanning meditation for our interoceptive awareness of the body as subject. If my hypothesis about the relation between body scanning meditation and interoceptive awareness is correct, then it would certainly open up interesting avenues of research into various issues of embodiment ranging from whole body illusion cases, rubber hand illusion cases, somatoparaphrenia, and more. Certainly, however, these are but brief considerations of the outcomes that my account might have on embodiment research, and to be sure there remains much more work to be done to fully elucidate my view.
Chapter 5: Conclusion

My project was to conduct a phenomenological investigation into our awareness of the body from within. More specifically, I sought to explain how the body presents itself experientially in our day-to-day worldly involvement. My target of investigation differed from that of much of the current work on bodily awareness — I was not concerned with our sense of body-ownership, bodily agency, body image, etc. Rather, my concern was to investigate a very specific and ill-explored aspect of our bodily awareness — our awareness of the body as the very subject of experience. To this end, I set myself two guiding questions: first, what is it by virtue of which I come to have an awareness of the body as subject? Second, what is the nature of our awareness of the body in this manner? In answering these two questions, I developed the following argument:

1- If bodily awareness involves an awareness of the body as subject,

2- And we are aware of our body as subject via proprioceptive bodily-self perception,

3- And we are aware of our body as subject via interoceptive bodily-self perception,

4- Then, our bodily awareness is constituted, at least in part, by a proprioceptive and interoceptive awareness of the body as subject given by bodily-self perception.

I began the first chapter by arguing that bodily awareness involves an awareness of the body as subject. For this, I turned to the Phenomenological tradition and the account developed therein of
the structure of consciousness. Relying on this account, I argued that we are aware of our body in two ways: we can be aware of our body as object, as we are when we turn our attention to our body and observe it, or we can be aware of our body as subject, as we are when we experience the world through our body and it is therefore present for us as the very subject of our experience. My goal was to account for our awareness of the body as subject — our bodily self-awareness. I motivated the need to account for this by highlighting the importance of bodily self-awareness to the structure of experiential consciousness. For this, I appealed to the one-level view of the structure of consciousness proposed by phenomenologists. I then highlighted the lack of consideration by many of those working on issues of embodiment of this specific form of bodily awareness, and thus, further motivated the importance of my project.

Having defended my first premise and shown the need to account for our bodily self-awareness, I returned to my two guiding questions. In response to the first question, I suggested that it is by virtue of proprioception and interoception that we are aware of the body as subject, and in response to the second question, I proposed that the nature of this bodily self-awareness is perceptual, but not object-perceptual. I conducted phenomenological analyses of typical everyday experiences — holding a book in one’s hand, playing softball on a hot and humid day, encountering an aggressive dog while out on a walk — to show that we enjoy a proprioceptive and interoceptive awareness of our body as subject. I argued that these sensory modalities provide a bodily self-awareness because they constitute the first-personalness of our experience — by constituting the egocentric spatial framework — and they provide a sense of embodied subjectivity to our experience — by way of our emotions and the presence of our inner bodily environment. Beyond providing an account of what constitutes our bodily self-awareness,
however, I also wanted to explain the way in which proprioceptive awareness and interoceptive awareness constitute our bodily self-awareness. For this I explored what the nature of our awareness of the body as subject might be. There appeared to be two options available in the literature: bodily self-awareness is either perceptual or non-perceptual. However, as I showed, neither of those options could satisfactorily account for our bodily self-awareness.

The perceptual account on offer — object perception — could not explain the kind of relation at play in bodily self-awareness. As I showed, our awareness of the body as subject does not exhibit the features of object perception, namely, discernment, perspectivalness, and attention. Alternatively, the non-perceptual account also could not satisfactorily explain the relation involved in our awareness of the body as subject — a relation that holds between a perceiver and a perceived. As a result, I suggested that we needed to expand our view of what counts as perception and I proposed a view that would explain the nature of our bodily self-awareness. I argued that our awareness of the body as subject is a form of bodily-self perception, and that it exhibits the following three characteristics:

1. Attentional seclusion – there is a self-givenness of the perceived as the perceiver, and thus, there is no attentional relation from a subject to an object.

2. Non-perspectivalness – without a subject/object relation, there is no point of view for a subject to take on an object.

3. Ever-presence – what is given as subject is always present in experiential consciousness because there is always present a subjectivity to consciousness.
Having shown that we are aware of our body as subject via proprioception and interoception, as well as having shown that our awareness in these instances is bodily-self perceptual, I, thus, concluded that our bodily awareness is constituted, at least in part, by a proprioceptive and interoceptive awareness of the body as subject, given by bodily-self perception.

With my account of bodily self-awareness in hand, then, I turned my attention to considering some of the outcomes it might have for current research on bodily awareness. As I argued in chapter 4, there are a number of misguided conclusions being drawn regarding the relation between our sense of body ownership and our sense of self as bodily on the basis of work done on body illusions. Investigations of body illusions, I suggested, would be greatly improved if the distinction between our awareness of the body as subject and the body as object were taken into account. Moreover, I proposed a fruitful methodological avenue that we might want to consider, i.e., body scanning meditation in relation to research on bodily awareness. To be sure, these are only a few considerations that result from the account I propose. In closing, then, I turn to a brief discussion of future directions of research that I plan to take in view of the model I defended here.

First, there is important work currently being done to provide a functional account of what might constitute our sense of self which I must consider if I am to give a complete view of the sense of self as bodily. More specifically, I want to refine my view by looking at work by Legrand and Ruby\textsuperscript{1} on sensorimotor integration, as well as work by Seth\textsuperscript{2} on interoceptive predictive coding.

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\textsuperscript{1} See Legrand and Ruby (2009).
models. Legrand and Ruby are concerned with understanding the cortical underpinnings of the self by integrating theoretical investigations with empirical investigations of the physiological basis of the self. They hypothesize that the functional grounds of the self involve the sensorimotor integration of the subject’s motor commands with the subsequent sensory consequences of these commands in the external world. Their hypothesis, they argue, can account for the basic conception of self, which they take to be a self/no-self distinction in experience. To be sure, their framework offers an interesting basis upon which to integrate my phenomenological investigations with empirical research. However, given that my account is, as I admitted above, an afferent-leaning account, I am also concerned to consider models that deal specifically with the functional grounds of the self in regards to interoception. To this end, I plan to consider in depth the position that Seth has developed — the interoceptive predictive coding model. His view, briefly put, is that “presence [the subjective sense of the world and of the self in the world] depends on a match between informative interoceptive signals and top-down predictions arising from a dynamically evolving brain–body–world interaction.”

For Seth, interoception plays a central role in the sense of self that is present in experiential consciousness. Together, these accounts — the sensorimotor integration account and the predictive coding model — will provide a strong basis upon which to expand and refine my model of bodily-self perception in relation to our awareness of the body as subject.

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2 See Seth (2013), and Seth et al. (2012)

With a more developed account of bodily self-awareness in hand, I plan then to use my model to conduct closer investigations into body illusion and body delusion cases and their consequences for understanding our sense of self as bodily. Specifically, I want to accurately account for how phenomena such as somatoparaphrenia, anorexia nervosa, and other bodily awareness disorders might affect subjects’ bodily self-awareness. I hypothesize that in such cases, there is little to no disturbance of subjects’ bodily self-awareness, and as a result subjects’ sense of self as bodily does not change; rather, it is their sense of their body as object that changes. Indeed, with a better understanding of the extent to which these disorders affect a subject’s bodily awareness might come new therapeutic models with which to treat these disorders.

Lastly, I believe there is new ground to be paved by applying my model of bodily-self perception and our awareness of the body as subject to the area of embodied gender research. Specifically, I believe there is a need to investigate how we are aware of our body as sexed\textsuperscript{4}, and moreover, how our awareness of our body as subject is affected by our body being sexed. I plan to explore how one’s bodily self-awareness is affected by changes in the sexed body, e.g., as experienced during pregnancy, with a view to ascertaining how our sexed body affects our sense of self as bodily, i.e., whether one’s experience of the world as a bodily subject is different for a male from that of a female.

\textsuperscript{4} By ‘sexed’ here I mean the biologically male versus female body. The notion of ‘sexed’ is used to distinguish the biological differences between the sexes, as opposed to the socio-cultural differences between male and female, which are referred to as differences in the ‘gendered’ body.
To be sure, there is still much work to be done not only to develop my account, but also to ascertain the consequences my account might have for future research. Indeed, given the increasing interest in issues pertaining to bodily awareness, it is crucial that we ensure the research is based on a strong and clearly conceived foundation. We must work to specify the phenomena under consideration and the assumptions underlying the research. It is also important for the interdisciplinary dialogue between psychologists, philosophers, and neuroscientists to know exactly what has been shown and what remains to be explained. As a philosopher engaged in the interdisciplinary project of explaining our bodily awareness and our sense of self, my role is to clarify the conceptual assumptions of the models used to interpret the data, and to help guide the research in the right direction. The account I develop here, I take it, serves this dual purpose in a meaningful way, and thus, I hope makes clear why my project is of importance to the field.
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