

"Unless I put my hand into his side,

I will not believe"

The Epistemic Privilege of Touch

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Abstract : Touch seems to enjoy some epistemic advantage over the other senses when it comes to attest to the reality of external objects. The question is not whether only what appears in tactile experiences is real. It is that only what appears in tactile experiences *feels* real to the subject. In this chapter we first clarify how exactly the rather vague idea of an epistemic advantage of touch over the other senses should be interpreted. We then defend a “muscular thesis”, to the effect that only the experience of resistance to our motor efforts, as it arises in effortful touch, presents us with the independent existence of some causally empowered object. We finally consider whether this muscular thesis applies to the perception of our own body.

Keywords : touch, mind-independent, resistance, effort, depersonalization, bodily awareness, feeling of presence, feeling of reality, force

“Except I shall see in his hands the print of the nails, and put my finger into the print of the nails, and thrust my hand into his side, I will not believe.” (John, 20: 25).

Thomas’s emphasis on touch echoes the long-standing idea that touch enjoys some epistemic advantage over the other senses when it comes to attest to the reality of external objects. This tactile preference can be found as early as in the atomists, as Plato depicted them, “who think

nothing is except what they can grasp firmly with their hands” (Theaetetus, 155e), and “maintain stoutly that alone exists which can be touched and handled” (Sophist, 247c). The epistemic privilege of touch has been constantly recurring in philosophical writings since then¹ and appears to be constitutive of our ordinary thinking as well, as reflected in our use of “tangible” as a synonym for “real”.

In this chapter we first clarify how exactly the rather vague idea of an epistemic advantage of touch over the other senses should be interpreted. We then defend a “muscular thesis”, to the effect that only the experience of resistance to our motor efforts, as it arises in effortful touch, presents us with the independent existence of some causally empowered object. We finally consider whether this muscular thesis applies to the perception of our own body.

1. What privilege?

1.1 *A more reliable sense?*

A first way to interpret the epistemic privilege of touch is in terms of its reliability. This is the view adopted by Descartes among others (see also Kant, 2006, §17; Schopenhauer, 1958, Bk II, chap. 3):

Of all our senses, touch is the one considered least deceptive and the most secure (Descartes, 1998, 5).

Why should it be so? A common hypothesis is that unlike auditory or visual objects tactual objects are *in contact* with our body, and thus at least one kind of misperception is excluded: those that arise from perturbations in the perceiving medium:

there are fewer ways of going wrong about what we touch than there are about what we see. Our eyes may deceive us, and our eyes may be deceived. Mirrors, sleight of hand,

¹ See Massin, 2010 (13-15) for references.

queer conditions of light or atmosphere, mirages and visions, optical illusions, even ordinary perspective –in all sorts of cases, for various reasons and in various ways, we may be led into mistakes. It is much less easy, though not of course impossible, to play tricks on the sense of touch. After all we are always very close to what we touch, and we are not dependent upon a variable intervening 'medium'. (Warnock, 1953, p. 54; see also Heider, 1959, pp. 19-20)

However, one may question whether touch is a contact sense (Fulkerson, 2014), and correlatively one may consider the body as a tactile medium (Massin and Monnoyer, 2003; Vignemont and Massin, 2015). The spatial content of tactile experiences are indeed structured by bodily awareness: one feels pressure on one's *right hand* thanks to the awareness of the structural organization of one's body (O'Shaughnessy, 1980; Martin, 1993). The fact is that one can play many tricks on bodily awareness, and thus on the sense of touch. For instance, if you are touched on two spots on your finger after observing the image of a smaller version of your hand, you experience the distance between the two tactile stimuli as relatively smaller (Taylor-Clarke et al., 2004). This is just an example of the many ways that the complexity of bodily awareness can pave the way for a variety of tactile illusions. We do not believe that such criticisms are fatal to the view of a higher reliability of touch but we think that they have together sufficient weight to shift the burden of proof to the upholder of this approach.

1.2 A more materialist sense?

A second way of interpreting the hypothesis of an epistemic advantage of touch is to argue that only touch gives us direct access to material objects or properties and to assume that material objects or properties are in some sense prior or more fundamental than non-material ones.

Touch is the sense that gives us 'access to reality', because even in immediate tactual

perception the object of perception is something material. (Armstrong, 1962, p. 31)²

We agree that touch, more than the other senses, gives access to material objects or properties (see Vignemont and Massin 2015 for a proposal along these lines). Bracketing complex issues about fundamentality, we also agree that material objects or properties are in some sense more fundamental than non-material ones (such as phenomenal colors or sounds). One question, however, is why material entities are ordinarily conceived of as being more fundamental than non-material ones. Perhaps the reason of our naïve materialism is that material entities are accessed through touch, which enjoys some epistemic advantage over other senses. That is, rather than explaining the epistemic privilege of touch by appealing to ordinary preference for matter, one may want to explain our ordinary preference for matter by appealing to our ordinary preference for touch, as suggested by Bennett:

If one could explain the differences between primary and secondary qualities by adducing facts about their respective sensory bases or correlates, I suspect that the crux of the explanation would turn out to be the fact that the sense of touch –or rather of touch-and-movement– is involved in all the primary qualities in a way in which it isn't with any of the secondary. But that is only a suspicion. Someone should write a book on the epistemology of the sense of touch. (Bennett, 1971, 102)

Although we cannot deliver a book in defense of Bennett's suspicion, we want at least to make room for it. Accordingly, the view that the epistemic priority of touch explains commonsense materialism (or the distinction between primary and secondary qualities) should not be precluded by one's interpretation of the epistemic privilege of touch. But starting from the assumption that material properties are prior to non-material ones does seem to preclude such an explanation. We thus turn to another account of the tactual privilege.

² See also Sanford (1967, 333); Strawson (Hampshire and Strawson, 1961, 107); Perkins (1983, 250-251 –who however rejects the view). This may have been Aristotle's view as well, as argued by Freeland, 1992.

1.3 *A more realist sense?*

On our view, the epistemic privilege of touch is neither due to its higher reliability, nor to the materiality of its objects, but to the fact that only tactile perception presents us – under certain conditions – with its objects *as being real*, in a sense to be specified below.

Let us readily dismiss a possible misunderstanding. The proposal is *not* that only what appears in tactile experiences *is* real. Two questions should be distinguished: one thing is to ask whether the objects of perceptual experience are real, another is to wonder whether their reality is experienced. Call these respectively the question of the *reality of appearances* and the question of the *appearance of reality*:

1. *Reality of appearances*: are appearances real? E.g. Do the objects of our perceptions exist independently from us?
2. *Appearances of reality*: do appearances seem real? E.g. Are the objects of our perceptions presented to us *as* existing independently from us?

The question of the reality of appearances has historically drawn most of the philosophical attention. It is at stake in the debate between direct realists, indirect realists, and phenomenologists about perception. The question of the phenomenal character of reality has received comparatively less attention (see however Siegel, 2006; Campbell and Cassam, 2014, chap. 3), maybe because its answer seems obvious to many, for whom it is a basic phenomenological fact that the perceptual world appears to be independent from us. Crane, for instance, notes that:

all (or almost all) serious theories of perception agree that our perceptual experience *seems as if* it were an awareness of a mind-independent world. (Crane, 2005; see also Strawson, 1979: 97, Allais, 2015: 53)

Whatever the reason of the relative neglect of the question of the appearances of reality, the question matters for the ontology and the epistemology of realism. Samuel Johnson proposes to refute Berkeley's immaterialism by kicking a stone with "mighty force" (Boswell, 1973, p. 292): if

Johnson's stone is indeed presented as being real, then it becomes difficult for phenomenologists like Berkeley to maintain that appearances are to be taken at face value. Furthermore, if the stone indeed seems real, then there is an *internalist* answer to the question "on what grounds do you believe that the stone is real?" (whereby "internalism" we mean the view that such beliefs have justifiers of which one can become aware). The answer is the same as to the question: "On what grounds do you believe that the stone is round", namely: "Because it seems so". More precisely, that proposal is an application of one version of internalism: *phenomenal conservatism* (Huemer, 2006, 2007). According to phenomenal conservatism, we are justified in believing that p if it seems to us that p (and if no defeaters appear to us). In the present case, we are justified in believing that x is real if it seems to us that x is real. As an internalist proposal, it may not readily address skeptical objections of the evil demon sort (see however Huemer 2007). But it may at least help us to refute other kind of objections against realism, such as the challenge –associated with "quietism"– according to which the notion of reality is not meaningful. If some things appear to be real, then one may answer to this challenge by arguing that predicate in "to be real" is as meaningful as the predicate "to be red", insofar as the corresponding properties are accessible through experience. Our aim now is to specify in what sense touch can give rise to a specific appearance of reality.

2. The muscular thesis

Let us start with a description of a specific type of touch that has played a central role in the discussion of the epistemic advantage of touch, namely, effortful touch. All the examples provided in support of an epistemic privilege of touch involve some voluntary effort: Plato's atomists believe only in what they "can grasp *firmly*"; Thomas "*thrusts*" his hand into Jesus' sides; and Samuel Johnson kicks a stone with "*mighty force*". As it happens, the feeling of effort has often been ascribed an epistemic privilege akin to the one ascribed to touch: "There is no commoner remark than this, that resistance to our muscular effort is the only sense which makes us aware of

a reality independent from ourselves”, writes James (1880). The proposal has indeed a very rich history³. France is arguably the country where effortful touch has been granted most privileges. Malebranche (1991: 40-43) already argues that if resistance to our physical effort gives us reason to believe in the reality of solid bodies, then a fortiori, resistance to our will should give us reason to believe in the reality of ideas.⁴ Condillac (1997 [1754], Part II, Chap. V) argues that it is only when equipped with effortful touch and the capacity of motion that his statue becomes aware of a world distinct from itself. But it arguably with Destutt de Tracy (1801) and Maine de Biran (2001[1812]), following him, that the idea of that effortful touch present us with the distinction of the external world from ourselves received for the first time a careful formulation.

That touch and efforts are granted similar epistemic privilege is no accident, we take it. There are not two different kinds of experiences – the feeling of effort on the one hand, and tactile experiences on the other hand– which present us independently with the reality of external objects. Instead, there is *one* complex form of tactile perception, called *effortful touch*, which provides us with an exclusive entry point to the reality of external objects.

2.1 *Effortful touch*

What is effortful touch? It involves four ingredients: cutaneous pressure sensitivity, muscular sensitivity, effortfulness, and the sensation of effortfulness.

- (i) *Cutaneous pressure-sensitivity.*

³ See Massin (forthcoming) for detailed references.

⁴ Arguments of the sort, we think, pass too quickly from the premise that *x cannot be modified at will* to the conclusion that *x resists to our will*. Another possibility is that *x* is a kind of thing that we cannot want or try to modify: with respect to idea, and other phenomena which are beyond our agitive powers, we might be in a state of *aboulia*, rather than in a state of being impeded (see Massin, 2010, 652). Note that Descartes (1993: 101; 2000, *Seconde Partie*, §1) had already pointed that we experience the fact that what we perceive comes from something else than ourselves, since cannot modify what we perceive at will.

By touch in the strict sense we here mean here the sense of pressure (de Vignemont and Massin, 2015). Pressures and tensions are states of material entities (solids, liquids, gases) that arise as a result of being acted on by several opposite forces. To exert two opposite inwards forces on both ends of a stick, as in pushing, amounts to put the stick under pressure, and exerting two opposite outwards forces on such ends, as in pulling, amounts to put it under tension.

(ii) *Muscular sensitivity.*

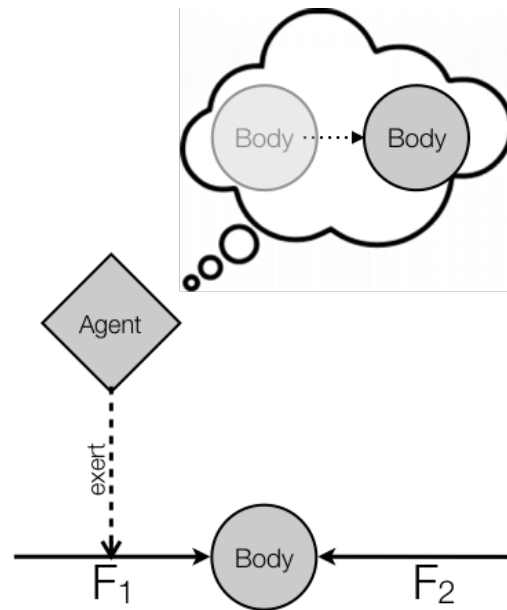
Tactile sensations are felt to be located in the parts of the body that is in contact with the objects such as the feet and the hands. By contrast, the muscle sense gives rise of perception of tension in our muscles and in some larger part of our body. The muscular sense, which is only a part of what Sherrington (1906) calls proprioception, involves muscle spindles, which are sensitive to muscle stretch, and Golgi tendon organs.⁵

(iii) *Effortfulness.*

Cutaneous pressures and muscular tensions can occur in absence of any intentional action of the subject. For touch to be *effortful*, the muscular tensions and continuous pressures felt must result from some activity of the subject. In short this means that one of the force constitutive of pressures or tensions must be *intentionally exerted by the subject*. More precisely, making a motor effort, we submit, amounts to:

- a. *exerting a force (F_1) on an object in order to make it move (or stay at rest)*
- b. *this intentionally exerted force being at least partly counterbalanced by an external opposite resistive force (F_2):*

⁵ Joints receptors are involved in another species of proprioception which are not yet part from the muscle sense. The reason why we excludes such receptors from the muscle sense is that they are responsive to kinematic (and trigonometric) properties such as positions or motions, by contrast to muscle spindles and tendons organs, which are sensitive to dynamic properties such as forces or tensions (Massin, 2010: 468).



Opposite forces act on a same body, they have opposite direction and they may have different magnitudes. To say that they “counterbalance” each other is to say that each prevents (part of) the other from causing the acceleration of the body that it would have caused, had it acted on it alone (see Massin, 2016 for details). For instance, to make an effort to lift a bag is to exert some upward muscular force on it, which is at least partly counteracted by the weight of the bag –a downward gravitational force. That effort essentially involves some external resistive force allows one to understand the connection between effort and resistance: necessarily, in virtue of the nature of effort, if a subject makes an effort on some object then that object opposes some resistance to the subject’s effort. It is beyond the scope of this paper to defend such a force-based account of efforts (but see Massin, 2010; forthcoming).⁶

What unifies these three features (pressure sensitivity, muscular sensitivity, effort) in a single perceptual system, we submit, is that at the heart of each of these stands a relation of *opposition between forces*: cutaneous pressures consist in antagonist inward forces being exerted on the dermis

⁶ Three main alternative accounts of efforts are (i) efforts are primitive feelings; (ii) efforts consist in, or arise from, a comparison between efference-copy of the order sent by the will, and the subsequent afferent signals received from the muscles; (iii) efforts consist in expending some energy or limited resource in order to reach one’s goal.

or epidermis; muscular tensions consist in antagonist outwards forces exerted on muscles; effort consists in exerting a force against an opposite one.

(iv) *The feeling of effortfulness.*

Effortful touch, as we use the term, does not only involve the exertion of a force against some resistive force, but also the feeling that one's intentionally exerted force is resisted. Cutaneous and muscular sensitivity to pressures and tensions by itself only presents us with pressures in a passive way: the pressure between one's back and the backrest of one's chair, and the pressure we feel when a cat jumps on our knee, are not presented as constituted by a force we *intentionally* exert and another force that resists to it. In such passively felt pressures, the opposite forces felt are on an equal footing: none of them is intentional or resistive. In feeling efforts, by contrast, we experience one of the forces constitutive of the felt pressure as one force that *we* exert, and we experience the other force as a force that we do not exert and that *resists* to the force we exert. An effort consists in one intentionally exerting forces counteracted by a resistive force. Correspondingly, on top of the feeling of pressure or tension the *feeling* of effort involves agentive feelings, namely, the feeling of intentionally exerting some force that meets some opposition.

We can now better understand the epistemic privilege of effortful touch. The thesis we propose, which we call the muscular thesis, is that effortful touch, and only it, provides us with an experiential access to the reality of external objects in the following sense:

Muscular thesis: Only the experience of resistance to our motor efforts, as it arises in effortful touch, presents us with the independent existence of some causally empowered object.⁷

Accordingly, when we say that effortful touch is the only sense that present us its objects as being real, our sense of *being real* encompasses two main components: mind-independency and causal efficiency. Such a sense of *being real* is not pulled out of the hat but combines two common views.

⁷ The contrapositive thesis has also been considered in some details: in the same way that *effortfulness* has been claimed to be the chief source of our knowledge of the distinction between ourselves and the world, *effortlessness* has been advanced as explaining cases in which the subject-object distinction vanishes.

A first influential understanding of *being real* is indeed to equate it with some relational property: that of *being subject- or mind-independent*. Something is real, on this understanding, if and only if it exists independently of us, by which is generally meant independently of mental episodes of ours directed towards it. Another common way of understanding *being real*, tracing back to Plato's *Sophist*, is to equate *being real* with *having causal power* (see e.g. Armstrong, 1997, 41-43 Berto, 2012). Something is real if and only if it can act, or have an effect, on other entities. The sense of “real” that we adopt is a combination of both proposals: to be real is to have both mind-independent and efficient existence. Key to the reconciliation of these two understanding of “being real” is the idea that mind-independency, instead of being understood in terms of independency *from perception*, should here be understood in terms of independency *from the will* –where willing is understood as a kind of striving.⁸

The privilege of effortful touch is thus the following: only effortful touch presents us with the contrast between ourselves as striving agents and an independent causally empowered being that resists our effort. We identify with the powerful being that exerts the first force – *by contrast* to the external being that exerts the resistive force. Thus, while passive touch is mute with respect to the self-world distinction, *effortful* touch, which brings in agency, discloses that distinction, and thereby, the reality of its objects.⁹ Only a certain kind of touch presents us with there being something that has causal power independent from us. That species of touch does not only present us with there being something beyond us; neither does it only present with there being something causally empowered. It presents us with both, *at once*. *A tour de force*.

2.2 *Feeling of reality in others senses*

⁸ On the idea that willing is a kind of trying or striving, see e.g. see e.g. Anscombe, 2002: §36; O'Shaughnessy, 1980: 100; Lowe, 1996: 157 sqq; 2000: 246 sqq; McCann, 1998: 89; Massin, 2014.

⁹ See e.g. Scheler: “reality is not given to us in perceptual acts, but in our instinctive and conative conduct vis-à-vis the world ». (Scheler, 1973 [1927] : 318).

The immediate corollary of our view is that in sight or hearing we are not presented with the reality of visual or auditory objects. This may seem obviously false:

all (or almost all) serious theories of perception agree that our perceptual experience *seems as if* it were an awareness of a mind-independent world. (Crane, 2005; see also Strawson, 1979: 97; Cassam and Campbell, 2014, chap. 3; Allais, 2015, 53)

Let us focus here on sight: is it the case that visual objects do not appear to be real in our sense? A first possible answer on behalf of the muscular thesis is to bluntly reject Crane's description of our visual experiences and maintain that vision does not present us its object as existing independently from us. Such a view was indeed standard among modern philosophers, who regarded the experience of mind-independency as clearly impossible:

As to the independency of our perceptions on ourselves, this can never be an object of the senses. Hume, *Treatise*, 1.4.2. (see also Berkeley, *Principles*, §18; *Dialogues*, 201; Reid, *Inquiry*, 687).

None of these philosophers had the impression that such a view clashed with perceptual appearances, quite the contrary. Claiming that visual objects do not appear to exist independently of our perception of them does not necessarily commit one to an absurd account of the phenomenology of experience.

This is so first because denying that existential mind-independency is presented in sight is compatible with other forms of subject-independency being visually presented. Siegel (2006) usefully distinguishes the subject-independence of the existence of a thing from the subject-independence of the properties of that thing. For instance, changing one's perspective relative to a tree does not change the perceived location of that tree. The subject-independence that is visually available here, however, does not concern the existence of the tree itself, but only its location. Moreover not experiencing visual objects as mind-independent does not entail experiencing them as mind-dependent. The present proposal merely assumes that visual

phenomenology is *mute* with respect to the mind-(in)dependency of its objects. Finally, the muscular thesis is compatible with the claim that the background beliefs of every perception may include a *belief* in the present existence of its objects, as Reid maintained. Reid endorses epistemic foundationalism with respect to such a belief:

The sceptic asks me, Why do you believe the existence of the external object which you perceive? This belief, sir, is none of my manufacture; it came from the mint of Nature; it bears her image and superscription; and, if it is not right, the fault is not mine: I even took it upon trust, and without suspicion. (Reid, *Inquiry*, chap. 6 §20)

The upholder of the muscular thesis may thus grant that in vision the existential belief arises irresistibly, although without being justified by the visual experience. By contrast, in the case of *effortful touch* there is another answer to the skeptic's question: "Why do you believe the existence of the external object which you perceive?". Namely, because it seems to exist apart from ourselves. Thus, one plausible proposal, we surmise, is this: all sensory perceptions come with an instinctive belief in the reality of their object. In all ordinary perceptual experiences, that belief in the reality of perceived objects is not justified by the content of perception –call this "*Reidian foundationalism*". By contrast, effortful touch provides us, on top of this, with some experiential justification for this belief –in accordance with *phenomenal conservatism*.

Although we confess being tempted by this bold line of answer – denying that mind-independency is present in visual experiences – a second more cautious line of answer is available to us. Recall that our sense of "real" is quite demanding: mind-independency *and* causal efficacy. Hence our proposal is compatible with sight presenting its object as mind-independent, as long as it does not also present its objects as causally empowered. This will still sound implausible to those who think that sight presents us with causal relations. But they may be convinced by the following comment: in effortful touch, we become aware not just of two causally empowered objects interacting *in front* of us, but of an interaction between *ourselves* and another external

causally empowered object. This causal contrast corresponds to the spatial contrast between the perception of the distance between two objects and the perception of the visual depth between some objects and oneself. Thus we need only deny that vision presents us with “causal depth”, that is, with *our* causal encounter with an external object.

3. The body as one object among others?

We argued in the previous section that it is in virtue of the feeling of resistance that tactile experiences provide the appearance of external reality. But do they also provide the appearance of *bodily reality*? In other words, does touch also have an epistemic advantage when it comes to one’s own body? One of the peculiarities of touch is its duality. So far we have focused on its exteroceptive dimension but tactile experiences are also bodily experiences: we feel the pressure of the ball on *our hand*. How is the hand presented to us in our tactile sensations?¹⁰

3.1 *The resisting body*

Let us consider the following bodily version of the muscular thesis.

Muscular bodily thesis: The experience of resistance to our motor efforts presents us with the independent existence of one’s causally empowered body.¹¹

At first sight, the muscular thesis seems counterintuitive: efforts do not appear to break the normal unity of the body and the self, as famously described by Descartes in the *Meditation VI*:

¹⁰ To be clear, the question here is not about self-touch. To some extent, touching one’s body is like touching a book or a chair. One might then claim that in self-touch I can become aware of the existence of my body in the same way as I am aware of the existence of other objects. But what we are interested in here is whether the appearance of bodily reality can be provided by the bodily component of tactile sensations.

¹¹ What is at stake here is not whether you experience this body as being your own (sense of bodily ownership), but whether you experience it as being you.

I am not only lodged in my body as a pilot in a vessel, but that I am besides so intimately conjoined, and as it were intermixed with it, that my mind and body compose a certain unity.

But should this normal unity between the subject and her body be conceived of as a counterexample to the muscular thesis? Let us analyze in detail four distinct cases, in which our body seems to resist to us.

The heavy box: Your friend asks you to help him move out from his house. You must carry boxes full of books. One of them, however, is too heavy for you. You manage to lift it a little bit but not for long and it falls down on the floor. You are simply not strong enough.

There is no doubt that one experiences effort while trying to lift a heavy box. There is also little doubt that one becomes vividly aware of one's body and of its incapacity to lift the box. Yet in such a case, instead of describing one's body as something that is causally empowered independently of the subject, one takes one's bodily incapacity to be *one's own* incapacity: "I cannot lift the box" is the natural description of the situation. If anything, then, pace the muscular thesis, such a situation *reinforces* the subject's identification with her resisting body, rather than presenting it as distinct from her. This example, however, does not cast doubt on the muscular thesis. Indeed, what resists to the subject's effort here is the box and in conformity to the muscular thesis, *it* does feel real. On the other hand, it is unclear that the subject experiences the *resistance* of her body. Instead, what she feels is the *incapacity* of her body to lift the box. Feeling of resistance and feeling of incapacity are two distinct, although tightly interrelated experiences. In particular, the feeling of resistance is largely sensory and instantaneous, whereas the feeling of bodily incapacity involves monitoring one's performance over time, and can thus be qualified as being metacognitive along other noetic feelings (Vignemont, forthcoming-a). One can become aware of what one can and cannot do by exploiting two cues: the ratio of success to failure and the ease or difficulty associated with performing the movement. While the latter indeed

consists in one's feeling of effort, the former does not: the intensity of an effort is not essentially tied to its chance of success or failure: intense efforts can be vain, and slight efforts can be pointless. The feeling of incapacity is thus clearly distinct from the feeling of resistance insofar as it involves a more enduring awareness of agency (e.g., a repeated experience of failure). Furthermore, the sensations of resistance and effort normally lead to success, whereas one can repeatedly fail independently of any sensation of resistance. Suppose, for instance, that you try to move your arm by uttering "Move!" in your mind. Such an attempt to move your arm will fail, and repeatedly so, but it is unclear that it involves significant effort on your part. One may reply that *repeating* such a mental order on and on requires some effort. But the resistance involved in such an effort is not that of your arm, but rather of your mind. The next case will help to make that distinction clearer.

The trek: Your friend invites you for a relatively challenging trek in the Swiss Alps. Although you rarely do any kind of sport, you decide to go but you soon realize that it is more difficult than expected. At the end of each day, you feel that you will never be able to make one more step and still you do it. Every morning when you wake up, you feel that you will never even be able to get up and still you do it. Until the last day, you struggle.

Again, the subject's body is not presented to her as being causally empowered independently of herself. Yet there is little doubt that she makes efforts. However, we need to distinguish between two kinds of effort. First, there is the physical effort to raise one's legs. But there is also the mental effort to keep on walking instead of giving up. One should not reduce the sensation of *making an effort on the body* to the sensation of *trying to move the body with effort* – the latter not being sufficient for the former. For instance, Delboeuf (1881) argues that mountaineering efforts and physical efforts usually require making second-order mental efforts: efforts to overcome aversion to first-order physical efforts: the mountaineer struggles against the nagging temptation to stop on walking. On his view, the mountaineers' effort is more mental than physical.

Mental efforts are ubiquitous. One may, for instance, talk of effortful hearing – e.g. listening. One may fear that if effort can be combined with any modality, then touch would lose all epistemic privileges. This is not so. Despite similar surface grammar, effortful hearing and effortful touch capture distinct categories of phenomena. Effort, we have here assumed quite standardly, is a goal-directed phenomenon: we make effort in order to achieve some goal. Now the goal of the effort involved in effortful hearing is typically to focus one’s attention on which is being heard, to understand what is being heard, or to listen: these are *mental* episodes. By contrast, the goal of the effort involved in effortful touch, is to move things around: that is, a physical, kinematic episode. If anything, mental effort present us with the resistance of our mental inclinations –of our distracted attention– not of physical bodies. Whether mental efforts present us thereby with the reality of our psychological tendencies is a question we leave here open. We are here concerned only with the muscular the muscular thesis, which is literally muscular: in so far as the mountaineer’s effort is mental, it does not constitute a counterexample to the muscular thesis.

Still even Delboeuf grants that the mountaineer experiences a first-order physical effort, such as struggling against the weight of one’s body and making one step over a high rock. This muscular effort requires the mountaineer to exert an intense physical effort with her limbs, and she may use her hands to get over the rock, for instance. And yet it is unlikely that the feeling of resistance it prompts gives to the mountaineer the impression that her body is distinct from her. Why not? Maine de Biran suggested that the body displays only a relative resistance because it obeys to one’s voluntary efforts whereas the rest of the world can display an absolute resistance that can be invincible. But this is hardly convincing. It is true that the external world can oppose a resistance so important that no effort can overcome it: no matter how hard we push the mountain with our hands, it will not move. However, the resistance of the external world does not need to be invincible to yield the impression of its reality: the swimmer who feels the resistance of the water to the motion of her hands has a clear sense of the mind-independence of

the causal power of the water. On the other hand, the resistance of our own body might be invincible: no matter how much we try, we cannot fly. Yet we do not experience the resistance of our body in the way we experience the resistance of the mountain.

At this point the upholder of the muscular thesis might simply bite the bullet and insist that the tired mountaineer's body really seems to her to exist apart from her. One should, however, first consider two other options open to the muscular thesis, which allow explaining the contrast between the resistance of our body and the resistance of objects external to our body.

The muscular thesis concerns effortful touch, which, we submitted, includes cutaneous pressure sensitivity. One may then suggest that what is missing in the mountaineering example is this latter component. It is only if one has both a muscular and a cutaneous feeling of resistance that one can have the impression that there is a mind-independent object at the origin of the force exerted against one's body. When hiking, one can feel the contact of the floor on one's feet and when lifting the box, one feels its pressure on one's hands. But the sense of bodily resistance is not part of the passive tactile phenomenology; it is part of the kinesthetic effortful phenomenology. One may then suggest that the muscular thesis is equally a tactual thesis: it involves the sense of resistance but it needs to be experienced through touch for it to provide the appearance of reality. This would explain why one does not experience the body in the same way one experiences the mountain.¹²

A second strategy consists in looking for defeaters to the mind-independent causal power of the body. There may be nothing missing in the case of bodily resistance but there may be something extra that prevents us to experience our body as being distinct from us. The fact is that in the cases described earlier, the sense of resistance is associated with *pain*: each of your muscles feels painful while hiking and you feel that you are breaking your back while trying to carry the box. Unless in very extreme circumstances, pain does not separate the self from the

¹² This account, however, is not satisfying if one assumes that proprioception and touch, which both consist in perceiving forces, belong to the same family (Massin and Monnoyer, 2003).

body but instead anchors it there: one does not feel distinct from one's suffering body (Vignemont, forthcoming-b). If this analysis is correct, then one should have more the feeling of the independence of the body when there is bodily resistance with no pain. Consider the two following examples:

The anarchic hand: After a brain lesion you suffer from the anarchic hand syndrome. You feel that you have no control over one of your hands, which is often undoing what your other hand is doing or displaying aggressive behavior toward you (including trying to strangle you). You try to stop your anarchic hand but it resists.

The safety strap: You wake up and you see that you are in hospital. You feel that your legs are restrained by safety straps. You still try to move them a bit but you completely fail. You try again but the pressure exerted by the straps does not even increase and your legs remain still. You then realize that your legs are paralyzed.

In both cases, patients can experience their body as being distinct from them. In the anarchic hand syndrome, patients do not deny that this is their own hand but they still deny that the movements performed by the hand are their own. The anarchic hand seems to have a will of its own (Pacherie, 2007). In other words, its causal power is experienced as being mind-independent. Paralyzed patients can also treat their legs as if they were alien or foreign to them, as if they were mere objects (Scandola et al., 2017). This seems to be in line with the muscular hypothesis. The problem, however, is that it is not clear whether the appearance of bodily reality in their cases is due specifically to the sense of bodily resistance. Indeed the paralyzed patients may try to move their limbs at the beginning but they soon give up because they have updated what they can and cannot do and do not attempt to perform actions that are impossible. They then have a feeling of bodily incapacity, but as said earlier, this is different from a feeling of resistance. The question is: do they experience a feeling of alienation towards their body exclusively at the beginning when they still try to move their limbs?

The fundamental problem that this question raises is that the sense of bodily resistance is at most occasional and there are good reasons for the normal lack of bodily resistance: actions are planned on the basis of the knowledge of one's bodily capacities and to guarantee the success of one's actions one generally plans only movements that are physically possible.

The self-awareness of a self-consciously competent bodily agent includes a familiarity with the possibilities for bodily acting that come with having the kind of body she has: for instance, a familiarity with the different movements that are feasible at different joints. (McDowell, 2011: 142)

It is thanks to the awareness of bodily possibilities that one does not over- or under-reach when trying to get an object. It is also thanks to it that one does not attempt to move in biologically impossible or painful ways. In short, the body does not resist because it does not have to: one usually asks only what it is possible for it to do. Hence, the sense of bodily resistance is the opposite of the way one normally experiences the control that one has over one's body. One does not have to force one's body to do things. Instead, one's body *typically* obeys one's will. The difference between controlling one's body versus controlling another object is the transparency of the bodily medium and the fluidity of control. Therefore, experiencing the mind-independency of the causal power of one's body is at most occasional and anecdotal, revealing the breaking down of the unity between the body and the self.

3.2 Derealization and depersonalization: feeling of reality or of presence?

To finish, we would like to consider a last potential objection to the account we have presented so far by analyzing in detail the two related psychiatric conditions of depersonalization and derealization. Depersonalized patient report that they feel detached from the world and from their body, as if they were external observers of their mental and bodily processes or as if their body had disappeared:

I do not feel I have a body. When I look down I see my legs and body but it feels as if it was not there. When I move I see the movements as I move, but I am not there with the movements. I am walking up the stairs, I see my legs and hear footsteps and feel the muscles but it feels as if I have no body; I am not there. (Dugas & Moutier, 1911, p. 28, translated by Billon (2017))

Interestingly, these patients often feel the urge to touch their body or to pour hot water on it to reassure themselves of its existence.

Even if I touch my face I feel or sense something but my face is not there. As I sense it I have the need to make sure and I rub, touch, and hurt myself to feel something. (Sierra, 2009, p. 29)

Self-touch is thus used for them as a mean to try to re-establish their feeling of bodily objectivity. In the same way, we might pinch ourselves to make sure that we are not dreaming.

Their behavior may at first sight appear as in line with the epistemic advantage of touch that we have defended so far. However, it is not clear how the syndrome of depersonalization fits with the muscular thesis. The difficulty is twofold. On the one hand, depersonalized patients experience the lack of reality of the external world and yet they can still experience the resistance of objects on their skin and their sense of effort is not disturbed (Billon, 2017). On the other hand, they no longer experience the reality of their body and feel alienated from it and yet they have no motor deficit and their body does not appear to resist more to them than to healthy individuals.

These objections, however, are not fatal. They simply invite us to clarify further the view that we defend. One way to answer is to suggest that these patients suffer from a more fundamental disruption, namely, a disruption of the sense of the self. Let us return to our origin proposal. We argued that self-world dualism finds its experiential origin in the experience of effortful touch. The main issue we were concerned with was how one was aware of external objects as being independent from the subject. In other words, we were interested in how to differentiate the

world from the self. But this question makes sense only if one has already a sense of self. However, in depersonalization this may not be the case. Billon (2017) argues that depersonalized patients have a fundamental distortion of subjectivity. They may feel resistance but they no longer experience their sensations as being their own. For effortful touch to provide the appearance of reality, one needs some level of self-awareness. In short, if there is no sense of the self, there cannot be a self-world dualism. On this view, these patients lack not only the feeling of presence, but also the appearance of reality normally provided by effortful touch despite their preserved tactile and motor abilities. The case of depersonalization thus does not invalidate the muscular thesis; it merely shows that effortful touch does not suffice for the appearance of reality: one also needs subjectivity.

An alternative reply is that these patients have lost is not what we target with our muscular thesis. As said earlier in our discussion of vision, we propose a highly specific definition of the sense of reality, according to which external objects are presented to us as having mind-independent causal efficacy. In other words, in effortful touch one experiences that there is something that exerts the force that opposes us. One might then argue that patients who suffer from depersonalization/derealization do not lack this specific sense of reality. What they lack is something different. One might for instance suggest that they lack the feeling of presence only (Vignemont, forthcoming-a).

The notion of *feeling of presence* has originally been proposed to characterize the distinctive visual phenomenology associated with actual scenes, which is lacking in visual experiences of depicted scenes (Noë, 2005; Matthen, 2005; Dokic, 2010). When you see a picture of your children, your experience of them feels different from the experience that you have when you see them in front of you: they do not feel as being here. Seeing an object as present involves being aware of it as a whole object located in three-dimensional space, as an object that one can explore from different perspectives and that one can grasp, while seeing a picture of the same object only involves being aware of its material surface with certain configurational properties. In the same

way that there is a feeling of presence associated with visual experiences of actual objects, we suggest that although there is no feeling of bodily reality as we defined it, there is nonetheless a feeling of *bodily presence* normally associated with bodily sensations: we normally experience our body as being 'here' in a space larger than our body (Vignemont, forthcoming-a). As Martin (1993) notes:

In being aware of one's skin as a boundary of one's body, one has some sense of space extending beyond that boundary. (Martin, 1993, p. 213)

The awareness of bodily boundaries and the awareness of a larger space are two facets of the same coin. Insofar as we are aware of the boundaries of our body, we are also aware that there is something beyond of these boundaries. Being aware of bodily boundaries indeed involves being able to contrast what is inside from what is outside. Martin follows that we are aware not only that there is a space larger than our body but also that our body is part of this larger space.

We have a sense of ourselves as being bounded and limited objects within a larger space, which can contain other objects. (Martin, 1993, p. 211)

When we feel touch on our hand, we experience the pressure in a specific location within the map of our body (i.e. *bodily location*), but we also experience this part of our body in a specific location in the external world (i.e. *egocentric location*). As O'Shaughnessy (1980) claims, bodily sensations are "sensations-at-a-part-of-body-at-a-point-in-body-relative-space". Thanks to the egocentric locations of bodily sensations, the body that one feels is experienced as being here in three-dimensional external space.¹³

¹³ Smith (2002) claims that bodily sensations are devoid of phenomenal three-dimensional spatiality because there cannot be any felt distance between the sense organ and the object since they are one and the same, namely, the skin. Consequently, one cannot occlude one's bodily sensations by changing one's spatial perspective on one's body. This is true but this does not prevent bodily sensations to be experienced within an egocentric frame of reference (Vignemont, forthcoming-c). This is well illustrated by the Japanese illusion. Cross your wrists, your hands clasped with thumbs down. Then turn your hands in toward you until your fingers point upward. If now I touch one of your fingers, you will have difficulty not only in moving the finger that is touched, but also in reporting which finger it is. This difficulty shows that the relative location of body parts matters. Further evidence in favor of the egocentricity of tactile sensations can be found in the actions that we perform. As Evans (1985) defines it, the egocentric space is a "behavioural space", the space within which one acts. Imagine that you feel an intense itching sensation on your back. It is true that you cannot occlude it by changing your perspective on it but you can still try to relieve it by scratching your back. In order for you to appropriately guide your actions towards your body you need information

Now experiencing something as being here or as being present is not the same as experiencing it as being real. Although feeling of presence and feeling of reality are often confused, we believe that it is important to keep them apart. Unlike the feeling of reality, the feeling of presence indeed is not specific to tactile phenomenology but can be found in all sensory phenomenology. It might even possibly be found in imagination and in dream, and we clearly do not experience a feeling of reality there. The feeling of presence only expresses the awareness of the spatial relationship between the perceived object and the perceiver. It may not be as fundamental as the feeling of reality as we defined it but it is important and its absence can be cruelly experienced, as in depersonalization.

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about the itching location in external space. Furthermore, you need to be aware of your body as a three-dimensional object in this space, an object that you have to get around to reach your goal.

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