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The Objectivity Of Touch

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The Objectivity of Touch

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Why does touch seem to be more objective than the other senses ?

- *General hypothesis* : because of a special connection between touch and the feeling of effort.

P1 Tactile perception is an essential constituent of the feeling of physical effort.

P2 Perceptions from other sensory modalities are not essential to the feeling of physical effort.

P3 The feeling of physical effort is the only experience that presents us with the physical world as existentially independent from us.

C Touch is the only sensory modality essential to the experience of the physical world as existentially independent from us.

I shall only defend P1 here. The intimacy between touch and the feeling of effort comes, I submit, to the following :

P1' Touch is the direct perception of pressures and tensions, i.e., of pairs of antagonist forces.

P2' Physical effort is the exercise of a force by an agent on a body in order to make it move, this body exerting in return an antagonist force on the agent.

P3' Feeling an effort requires being directly presented with the essential constituents of the effort. (I will assume this claim)

C' Tactile perception is an essential constituent of the feeling of physical effort. (=P1)

1 Touch as a sense of pressures

1.1 Individuating the senses

Assumption: Sensory modalities are individuated by their proper objects. Hearing is the direct perception of sounds, sight the direct perception of colours, etc.

Objection: There is no single type of proper sensibles in the case of touch (temperature, solidity, hardness, humidity, texture, weight, vibration...).

Answer:

- accept to distinguish the sense of pressure (touch strictly speaking) from the sense of temperature.
- argue that pressures are the direct perceptual objects through which one perceives weight, texture, solidity.

→ In order to individuate sensory modalities, we should focus not on the biology of their organs, but on the metaphysics of their intentional objects.

→If we want to understand what touch is, we should look at the metaphysics of forces and pressures.

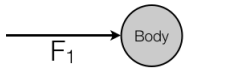
1.2 The nature of pressures

Pressures are *dynamic* entities. Dynamics is to be contrasted with kinematics (NOT with statics). Kinematics describes motion, dynamics causally explains it. Consequently, the entities appealed to in dynamics:

1. are not themselves motions.
2. cause motion.

Forces, mass, energy are some of the basic types of entities appealed to in dynamics.

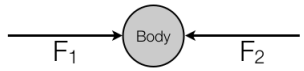
When a single forces acts on a body, such as in free fall, the body accelerates in the same direction than the force, and in proportion to the intensity of the forces and the mass of the body ($\overrightarrow{F} = m\overrightarrow{a}$).



Solitary force

When several forces act on a body, the motion of the body is determined by the sum of those forces ($\Sigma\overrightarrow{F} = m\overrightarrow{a}$).

Sometimes several forces act on a body and the body does not move because forces cancel each other (the resultant force is null). This yields pressure and/or tension in the body:



Pressure (=antagonist forces)

F_1 and F_2 are antagonist forces : they prevent each other from causing an acceleration. *Pressures are pairs of antagonist forces.*

1.3 Perception of pressures & tensions

Solitary forces cannot be directly perceived nor observed. During a free fall, one can measure the acceleration. But any hand, dynamometer or scales placed just under the falling body will either fall with it and not indicate any force ; or exert an antagonist force on the body, making the fall non-free (gravity ceasing to be a solitary force).

In order to be perceived, forces have to be counteracted by other forces, i.e. have to appear in antagonist pairs of forces.

That pressures can be passively felt is attested by:

1. the cutaenous experiences that occurs when: a cat jumps on your knees, a drop falls on your hand, a baby grips your finger, somebody taps on your shoulder, the plane you are in accelerates at take off...
2. the presence of a sets of mechanoreceptors in the skin dedicated to the perception of pressures & tensions.

→Sensitivity to pressure and sensitivity to temperature are distinct both with respect to their physiology and with respect to their intentional objects.

→This suggests to identify touch with the pressure & tension sense and to distinguish it from thermoception.

2 The experience of effort

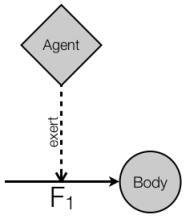
2.1 The nature of physical effort

Typical physical efforts occur when we try to lift a heavy weight, to swim against the current, to hold back a pram in the stairs, to stay on tiptoe, to push a car, to fly a kite, etc.

Some plausible claims about effort:

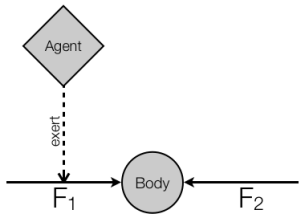
1. *Efforts are tryings*: each time A makes an effort to φ, A tries to φ (not necessarily the reverse).
2. *Efforts entail the encounter of some resistance.* A makes an effort on $O \rightarrow O$ resists to A.
3. *Efforts can fail or succeed* (like tryings). Consequence: the feeling of effort/resistance is not a feeling of success or failure.
4. *Physical efforts involve the exercice of some muscular force by the agent.* If S makes a physical effort to Ψ, then some muscles of S liable to make Ψ happen are tensed.

Physical effort$_1$: A makes a physical effort on a body $B =_{\text{df}}$ A exerts a force on B in order to make it move.



This is insufficient: suppose A is in a spacecraft exerting a force on a bottle in order to lift it. He does not make any effort because he does not meet any resistance (because of the absence of gravity). He is therefore not making an effort, but an *effortless trying.* A better definition:

Physical effort$_2$: *A* makes a physical effort on a body $B =_{\text{df}} A$ exerts a force F_1 on B in order to make it move and F_1 (or part of it) encounters an antagonist force F_2.



Examples: Paul pushes a door in order to open it (=he exerts a forces F_1 on the door), but a table behind it exerts an antagonist force (F_2) on the door.

2.2 Feeling of physical effort

In order to feel an effort, we therefore have to be directly aware (i) of a pressure or tension (ii) that one of the antagonist forces constituting that pressure is a force we exert (iii) that the other antagonist force is not exerted by us (but in return by something alien to us).

The awareness of the pressure or tension, (i), is the tactile part of the experience of effort. The awareness of one of the forces as the one we exert and the other not, (ii) and (iii) are the non-tactile parts of the experience: they amount not to perception, but to the experience of agency.

One plausible claim: we become aware of exerting a force only when this force encounters an opposite force. Effortless tryings lack phenomenology, because solitary forces are inobservable. Experience of agency requires obstacles.

2.3 Two objections answered

First objection: The forces we exert are muscular forces. Relatedly, physical effort is typically felt in the muscles. But the antagonist forces involved in the above examples are either at the contact surface between us and the external object (in the skin) or in the external object (in the door).

Answer: One important law of continuum mechanics is the *law of transmissibility of forces* according to which forces are "sliding vectors" in rigid bodies. A force applied at one point of a rigid body is transmitted to all other points of that body.

Thanks to that law, and to the rigidity of our bones :

- we can act on external objects by exerting muscular forces on our bones.
- the forces exerted by external objects on our skin are often conveyed through our bones to the mechanoreceptors present in our muscles. Weighting a melon, we have sensations not only in our skin but also in our muscles informing us about its weight.

→We can both exert forces on external objet by tensing our muscles, and perceive, by those same muscles, the forces exerted in return by external objects.

Second objection: Physical efforts are typically felt in the muscles, and muscular sensitivity is not part of the sense of touch.

Answer: Muscular sensitivity is part of the sense of touch. Touch is not limited to the skin. Follows from the definition of touch as direct perception of pressures and tensions, and from the following remarks:

- Muscles spindles are sensitive to mechanical pressures or tensions, like the Pacinian or Meissner corpuscles of the skin.
- There are some *passive* muscular tensions that are not part of any effort (cramps, spontaneous contractions, externally stimulated contractions). The way they are presented to us is not fundamentally different from the way tension of our skin is presented to us.
- When using a tool to detect the property of a distant object, we still consider the cutaneous sensations, which are yet distant from the object explored, as tactile ones. Why not say the same about the muscular sensations when we use our arm to detect the properties of objects?

→The feeling of physical effort requires the feeling of muscular tensions, this later feeling being an instance of tactile perception. Touch is essential to the feeling of physical effort.