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WHAT WE SEE DEPENDS ON HOW WE MOVE. THE EMBODIED ROOTS OF VISUAL PERCEPTION

abstract

The aim of this paper is to highlight the role that our lived body has in shaping our perceptual life. Through Husserl's description of the way in which we perceive the world around us, we will underline the fact that our body is not just an object among others for us, but a fundamental constitutive principle of our own experience. In this way, we will try to maintain that to perceive is, in some sense, to have an implicit and pre-reflective knowledge of our embodied relation to the world.

keywords

Husserl, embodiment, phenomenology of perception

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In *The Ecological Approach to Visual Perception*, the American psychologist James J. Gibson states:

> *We human observers take it for granted that one sees the environment with one's eyes...But the truth is that each eye is positioned in a head that is in turn positioned on a trunk that is positioned on legs that maintain the posture of the trunk, head, and eyes relative to the surface of support...One sees the environment not with eyes but with the eyes-in-the-head-on-the-body-resting-on-the-ground.* (Gibson 1986, 205).

This is not a banal claim. It highlights, instead, one of the most important aspects of the constitution of visual perception and perceptual objects– that is, the *embodied* nature of our experience of the world. As the phenomenological tradition has well underlined (Husserl 1907; Merleau-Ponty 1945), our body is not just an object among others for us but it plays a primary role in shaping our perceptual life. In this sense, despite the great variety of meanings that the notion of "embodiment" has today in the philosophical and psychological debate, what we will mean by this term here is just the phenomenological fact that our *lived body*– that is, our body as we experience it from the first-person perspective– plays a fundamental function as a *transcendental principle*– that is, a condition of possibility– for the constitution of the objects of our own experience.
One of the most important fields in which this fact can be appreciated is *visual perception.* Husserl, in particular, has developed an interesting description of the phenomenology of our perceptual experience of the world around us, underlining the conditions of possibility for our experience to be as it is and trying to show the roots of the *constituted* perceived object– that is, the roots of the object as it appears in the acts of consciousness. Doing this, he has perfectly recognized how our lived body and, in particular, the *experienced sense* of our body and its abilities, are necessary conditions of possibility for the phenomenology of visual perception.

The aim of this paper, then, is, in the first place, to recollect those analyses of Husserl's of the phenomenology of vision that highlight the role of our *lived body* for the constitution of perceptual objects; in the second place, to put these descriptions together with some empirical findings that can

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underline the same topics from a psychological point of view. In this way, we will try to maintain the idea that to perceive is, in some sense, to have an implicit and pre-reflective knowledge of our embodied relation to the world; or as the American philosopher Alva Noë says, "...to understand, implicitly, the effects of movement on sensory stimulation" (Noë 2004, 1).
Now, Husserl's analysis of the constitutive function of the body is well developed into two important works: the course of lectures of 1907, known as *Ding und Raum*, and the second volume of the *Ideas* (Husserl 1952). In this paper, then, I will follow Husserl's thought through these two works, analyzing, in particular, the role of the body as the bearer of the zero point of orientation and the role of *kinaesthesia* (that is, the sense of our movement or stillness) for the "constitution of the object as an identity in a manifold of appearances" (Zahavi 1994, 68).

1. The Zero-Point of Orientation

One of the first and main features that Husserl underlines when he talks about visual perception is the fact that perceptual objects are never given in their totality, but always in a certain *profile* (Husserl 1952, 160-161). Every perspectival appearance, nevertheless, presupposes not only something that appears, but also something that it appears for; this has to be the point from which that particular perspective is originated or, better, the point of view that *motivates*– that is, that *gives reasons for*– the appearance of that certain profile of the object instead of another. Now, the bearer of this privileged point of view, that Husserl calls "the zero point of orientation" (Husserl 1952, 160), is our body.
Everything in the world, in fact, has a particular orientation in relation to our body and the way in which we can talk about the place of things in the surrounding space reveals this relationship. We can say that something is near or far *from us*, that now, in this room, this book is on *my right* and that cup of coffee on *my left*, or that there is a door in *front of me* and a piano *behind me*. The orientation of things can obviously be changed: thanks to the ability of free movement of my body, in fact, I can move around in the room so that the piano will appear in front of me and the door behind, the cup of coffee on the right and the book on the left. But, though they have been changed in their orientation, the objects I see continue to be oriented in relation *to me*, to that "here" where my body always is. In our immediate experience of the external world, then, we have a unique position because we are the centre around which the spatio-temporal things are organized. But this is possible only because we have a three-dimensional body that is in space as the other material things are and that can, in this way, be in a particular perspectival relation to the objects

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of the world. In other words, spatial things can appear as they do only to an embodied subject, whose body, then, must be regarded as a *condition of possibility* for other objects.[1]

Let us come back for a while to the previous scenery of the objects in my room. I can say that the door is in front *of me* and the piano behind, and that, if I turn back to 180 degrees, I can find the piano in front *of me* and the door behind. But, being able to describe this situation in this way means not only that every object is oriented to me and, so, that I am the centre of this orientation; but also that, in some sense, I am able to experience my body, its position and its relation to the surrounding world. In other words, my perception of the door or the piano must contain some information about *my body* too, to allow me to know how those objects are oriented towards me. The psychologist James J. Gibson well underlines this point when he describes some experiments about *affordances perception*– that is, the perception of the pragmatic possibilities that the objects in the environment offer to the subject. The most significant studies, in particular, were those with the *visual cliff*– that is, a simulated drop-off arranged by the psychologists E. J. Gibson and R.D. Walk to investigate depth perception in human and animal species (Gibson and Walk 1960). These experiments showed that most infants with the ability to crawl avoid crossing over the simulated drop-off even though a rigid glass surface extends over it. The idea is that this happens because "optical information specifies a drop-off, and the conflicting haptic evidence for a solid supporting surface is generally insufficient to tempt the infant to move out on it" (Gibson 1988, 29).

Now, how can visual perception give information about a drop-off– that is, about something dangerous for the subject? Gibson's thesis is that this can be possible mainly because every objective perception is strictly linked to the *co-perception* of the body, so that the information I gain about the world implicitly contains some information about myself. Our perceptual experience, in fact, is full of information about our *embodied* position in the world and can provide, then, some data about the relationship between the observer and the observed object. In the empirical studies with the visual cliff, therefore, the drop-off can be perceived as something dangerous– or something that affords "falling"– because the perception of the cliff is inextricably linked to the co-perception of one's body in that situation. In this sense, the infants involved in the described experimental setting have

1 On this point see Zahavi (1994).

information about the fact that *their feet* are *far away from* the ground and this leads them to avoid crossing over the glass surface (Gibson 1986, 247). But there is a final step to take, here. If every perceptual experience is a *co-perception* of my *embodied* position in the world, so that every objective perception is, in the meantime, the perception of the relationship between *myself* and the object, then I need to have at least some kind of perceptual experience of myself and, specifically for this purpose, of *my body*. In other words, visual perception can give me some information about my position in relation to the objects in the surrounding environment only if I have some kind of preliminary experience of myself and of myself as having a body or, better, as *being* a body; that is, only if I have some *sense* of me and, in particular, of me as an embodied subject. Now, this primary sense of self is guaranteed by a specific kind of experience, that is *proprioception*. This is the implicit and pre-reflective awareness of my body as an organized entity in the environment. It seems to be a kind of experience that children have from birth and that constitutes the first base for the subject for a more explicit and reflective sense of himself. [2]

Proprioception, then, is our first access to our body. But it is not as the other object-perceptions. In particular, it is not the perception of the body as an object among others, because it cannot be a perspectival awareness of the body without resulting in an infinite regress. As Shaun Gallagher states in *How the Body Shapes the Mind*, "If one accepts the premise that sense perception of the world is spatially organized by an implicit reference to our bodily framework, the awareness that is the basis for that implicit reference cannot depend on perceptual awareness without the threat of infinite regress. To avoid the infinite regress one requires a pre-reflective bodily awareness that is built into the structures of perception and action, but that is not itself egocentric" (Gallagher 2005, 137). In other words, proprioception does not offer a perspectival perception of my body because, if it did, it would require a second body as an index and this would generate the same problem of reference again. Nevertheless, though it does not require the body itself to be a perceptual object, our pre-reflective proprioceptive experience gives us the first basic awareness of our embodied nature.

As we have said earlier, this *sense* of ourselves as having a body and a spatial position between the objects we perceive is one condition of possibility for our perception to be as it is. For the *constitution* of our perceptual experience and of the objects of vision, then, it is necessary not only to have a body, but to have a *sense* of our body. In the next section we will focus on one specific

2 On this point see Gallagher and Zahavi (2008, 301-329) and Gallagher (2005, 65-85).

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aspect of this "sense of our body" which is particularly important for the analysis of the constitution of the visual object.

2. Feeling Kinaesthetic Sensations

Let us consider the following situation. I am moving in a dark room where there is only one visible object thanks to the illumination of a spotlight. If I move in a certain way– for example from the left to the right– I will experience the transition of a certain number of visual images which are constantly transformed into each other in a specific way. Now, let us suppose that it is not me the one who is moving, but the object, and that it is moving in a way that makes me experience the same transition of images of the previous situation, when it was my body that was in movement. In both cases, then, I can see the same visual images; but if in the first scenario, I perceive a stationary object seen from different points of view, in the second, on the contrary, I perceive an object in movement.[3]

This mental experiment clearly shows that mere visual images are not able to give us all the information we gain in our perceptual experience; in this case, in fact, they do not allow me to distinguish if it is me or the object I see the one which is moving.

So, how can we have such different perceptual experiences if mere visual images do not give us sufficient information? Husserl clearly answers that it is possible thanks to the awareness of the *body states* (stillness or movement) – that is, thanks to the *kinaesthetic sensations* – that we constantly experience during every perception (Husserl 1907, 215). In the situation we have described, in fact, I can experience my body as stationary or in movement and this possibility gives me the information I need to disambiguate my perception. In this sense, the same visual images that first show something stationary in relation to my kinaesthetic situation, can then show something in movement if I am in *another* kinaesthetic situation. The perceived difference between the object's stillness and movement, then, is guaranteed by our *kinetic* relation to the objects we perceive.

There are, of course, some situations in which our own movement is not so easy to detect. Let us suppose, as Husserl proposes, that we are sitting in a coach in movement (Husserl 1907, 344-345). If I am stationary in the coach, I will experience a *constant kinaesthetic sensation*– that is, a sensation of stillness, together with stationary images of the inside of the coach and a transition of images from the outside landscape. But this does not mean that I perceive myself as stationary and the landscape outside as in

3 These scenarios, although slightly modified and simplified, are drawn from Husserl (1907, 214-215).

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movement. On the contrary, I experience a stationary landscape and me as "in movement" or, better, as *being moved*. This can be possible because, even though we experience our body as stationary in the coach and the coach as stationary in relation to us, we can also experience the *coach in movement* through something such as the coach shaking, the noises of the wheels and so on. According to Husserl, these conditions can take the place of the *kinaesthetic sensations*, thus making us perceive the scene as we do. So, if we exclude possible situations in which there is no perceivable element that can explain our perception as, instead, the coach shakes and the wheel noises in our example do, then we can say that the function mostly pertaining to the *kinaesthetic sensations* can also be played by other circumstances, though in an indirect way.

Notwithstanding their differences, all the situations that we have presented in this section show something fundamental for our purposes. They demonstrate, in particular, that conditions of possibility for the constitution of the objects of visual perception are not simply our body and the awareness of its *position*, but also our *kinaesthetic sensations*. As we have noted, in fact, feeling our own movement or our stillness is the way in which the same visual images can lead to different object perceptions.

As we said at the end of the previous section, there is a specific aspect of proprioception worth underlining for a better account of the constitution of the perceptual object: it is our ability to experience our body movements or our stillness– that is, to have *kinaesthetic sensations*.

But, as Husserl clearly underlines in the lectures of 1907 (Husserl 1907, 189-246), kinaesthetic sensations are fundamental, in some particular cases, for another central aspect of our perception– that is, as Zahavi says, "the constitution of the object of perception as an identity in a manifold of appearances" (Zahavi 1994, 68).

We know that one of the main features of visual objects is the fact that they can be seen from different points of view. As a consequence, they show different profiles depending on the perspective they are looked from. But, if we start moving around the object so that we can have the opportunity of seeing it from several perspectives, how can we know that we are looking at the same object? Or, better, how can two different adumbrations be seen as the adumbrations of one and the same object?

Husserl's idea is that this can be possible only if there is a continuous and uninterrupted transition between the two, so that, in some sense, they can "be able to merge into each other" (Zahavi 1994, 67). In other words, the

perceived unity of the object is guaranteed by the continuous transition that links many perceptions together. But, if it is me the one who is moving around the object, this transition between different perceptions can be guaranteed only by the continuous and uninterrupted course of *my* movement– that is, of my *kinaesthetic* course (Husserl 1907, 227-230). This means, in other words, that, *in situations like this*, the experienced sense of the continuity of my movement is a necessary *condition of possibility* for two adumbrations to be experienced as two different perspectives of the same object.

All the situations we have described in this section clearly show that our *kinaesthetic sensations* play a fundamental *motivating* function for the objects to appear as they do. As Husserl reminds us (Husserl 1907, 244-245, 262-265), there is a strict and specific correspondence between the position of the observer and the visible profile of the observed thing. In the same way, given a certain relation between the subject and the object, there is a specific correspondence between a certain movement of the former and a specific transition of the visual images of the latter, so that, if in a certain position I can see a certain adumbration of the object but I want to have another visual image that makes me see, for example, in the left part of my visual field what I previously had in the right one, there are some specific movements that I need to make (Husserl 1907, 218). In this sense, Husserl states that all the aspects of the objects of perception are correlated through some rigid *if-then connections* (i.e. if I move this way, then this aspect will become visually accessible) and that these connections determine how the objects will look in relation to our movement.
So, our position and our movement *motivate* the specific perceptions we have and it is only because of this fundamental function of our *body states* that being proprioceptively aware of them let us perceive as we do, making us, for example, distinguish two different perceptual situations notwithstanding the identity of the visual images– as we have previously seen– or allowing us to recognize two different profiles as two different adumbrations of the same object.
Now, it is worth noting that the relationship between the experienced sense of our body states and the way in which we experience the world around us is underlined by many empirical findings too. Bauermeister (1964), for example, shows some important effects of body tilt on the perception of verticality. After having tilted the subject in a dark room through a heavy iron framework that could be rotated up to 360°, the experimenter measures the perceived verticality of a luminescent rod. Data show that, depending on

the degree of the body tilt, there was a tendency to displace apparent from objective vertical either in the direction of the tilt or opposite to it. Clearly, this experimental situation shows how the perception of our own posture can contribute to how we visually perceive the surrounding environment. In another experimental setting, described by Gibson in *The Ecological Approach to Visual Perception* (Gibson 1986, 286-289), the subject is sitting in a dark room whose movable walls are illuminated by a fluorescent lamp; this time, contrary to the previous study, the subject is stationary in the room but, as the walls are moved, he feels as if his body and the chair are moving too. Here, it is not the case that our posture influences what we see, but, on the contrary, that vision contributes to an illusory proprioceptive sense of posture and balance. How can this be possible? Our hypothesis is that in certain experimental settings in which there are no points of reference and no other visible and perceivable reasons that can explain the changing of the perceived object, as in our experiment, we can have illusory kinaesthetic sensations that could *motivate* what we are seeing. If this hypothesis were reasonable, it would provide other important empirical support for the *motivating role* of kinaesthesia for perception.

Let us come back for a while to the idea of the *if-then* connections. We have said that these connections tell us how the objects of perception look in relation to our movements. We will see now, in the end, how these connections are correlated to another important feature of perception, the one that Husserl calls "horizontal intentionality". In this way we will have sketched, at least, the most important aspects of the connection between the "sense of our body" and our perceptual experience.
As we have repeatedly said, when we visually perceive a three-dimensional object, we always see it from a particular point of view, so that we can actually see only one of its profiles. However, through the perceived adumbration, we can perceive the *object itself*– that is, an entire three-dimensional thing. How can this be possible? Husserl's idea is that the hidden sides of the object that are not *intuitively given* are, nevertheless, *co-apprehended*. He states, moreover, that it is only through the co-apprehension of the absent profiles that we can see the intuitively given as *one profile of the object*: it is only in relation to the other sides, in fact, that it can appear as *one* face of an entire thing (Husserl 1907, 53-68).
This co-apprehension of the horizon of the absent profiles, which allow us to see the object itself in the actually seen side, is what Husserl calls "horizontal intentionality".

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Now, while the perceivable side of the observed thing is correlated to our present orientation in space, the unperceived profiles are nevertheless correlated to my *kinaesthetic horizon*– that is, to the movements and the positions I can take thanks to my embodied nature. In this way, the co-apprehended but momentarily absent aspects can be intended as correlated to the perceivable one through some specific *if-then* connections and they can be consequently meant as the backside, the bottom, etc., of the object we are perceiving. In other words, to perceive an entire three-dimensional thing *in and through* the adumbration that you actually see means to understand how the object's look would change if you were moving in a certain way (Noë 2004, 77) or, as Husserl would say, to know the specific *if-then connections* of the object you are perceiving.
Obviously, to perceive an entire three-dimensional thing through its adumbration means, at the same time, to know how the perceivable side would change if it were the thing itself the one moving around me. This means, however, that I should know how the object would change if *it* were moving *while I experience a constant kinaesthetic sensation*– that is, a sensation of stillness. This shows that, in one way or another, our kinaesthetic sensations are involved in the constitution of the object of perception, because, as we have already stated, every visual perception is, in the meantime, the perception of the relationship between the objects in the world and me. In this sense, as we have already said in the introduction, we can state that to perceive is, in some sense, to have an implicit and pre-reflective knowledge of our embodied relation to the world.

What we have tried to do in this paper is to provide a description of the *phenomenology of perception* that could account for the primary role of our body in the constitution of our perceptual experience. As we have noted, this function becomes unquestionable when it comes to an accurate analysis that stresses, for example, the role of the body as the bearer of the zero point of orientation or of *kinaesthesia* as the condition of possibility for the constitution of perceptual objects.
In this sense, what we have finally found is that only an embodied subject with a *proprioceptive* sense of his body and, in particular, of his states of stillness and movement, can make our perceptual experience to be as it is.

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