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Socially extending the mind through social affordances

Eros Moreira de Carvalho*

eros.carvalho@ufrgs.br

Abstract: The extended mind thesis claims that at least some cognitive processes extend beyond the organism's brain in that they are constituted by the organism's actions on its surrounding environment. A more radical move would be to claim that *social actions* performed by the organism could at least constitute some of its mental processes. This can be called *the socially extended mind thesis*. Based on the notion of affordance as developed in the ecological psychology tradition, I defend the view that perception extends into the environment. Then I will expand the notion of affordance to encompass social affordances. Thus, perception can in some situations also be socially extended.

Keywords: social affordances, extended mind thesis, ecological psychology, social perception, James Gibson.

1. Introduction

Roughly speaking, the thesis of the extended mind claims that at least some cognitive processes extend beyond the organism's brain in that they are constituted by actions performed by that organism on the environment around it. Following Rowlands, I understand that thesis as being about mental processes, not mental states (Rowlands, 2010: 8). When such actions are narrowly construed, that is, as *bodily actions*, the organism's mental processes extend to the organism's body.

* Associate Professor at the Federal University of Rio Grande do Sul. E-mail address: eros.carvalho@ufrgs.br. Acknowledgments: This work was supported by CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, process number 88881.119656/2016-01).

In this sense, the embodied mind thesis is a special and limited case of the extended mind thesis. When the actions are broadly construed, as *individual actions*, the processes extend to the environment around the organism. A more radical move would be to claim that *social actions* performed by the organism could at least constitute some of its mental processes. In that case, the organism and its social environment jointly constitute some mental processes of that organism. We could call that the *socially extended mind thesis*.¹

Thus, the mind, understood here as a set of mental processes, can be extended in three stages: from the brain to the body, from the organism as a whole to the organism's environment, and from the organism in its physical environment as a whole to the organism's social environment. The last stage is more controversial, since it is not clear how the organism can be attuned to its social environment in order to perform a social action, which in turn has a constitutive role upon some mental processes of that organism. It seems that an explanation is necessary for how at the same time (1) an organism can track a social fact of its environment, and (2) that tracking can in part constitute other mental processes of that organism. One of the aims of this chapter is to show how these two processes can be explained based on the notion of affordance as it was developed in the ecological psychology tradition. This notion is rich enough to give us a clear picture of how the organism and its environment are, by virtue of their mutual interactions, coupled with each other, bringing about cognitive processes of an interwoven nature—that is, processes constituted by elements from the organism and the environment at the same time. I will show how this notion can be understood in order to incorporate social affordances. Upon that basis, I will make a case for the socially extended mind thesis.²

I begin in Section 2 with an explanation and motivation for the extended mind thesis. Then, in Section 3, I introduce Gibson's approach to perception and elucidate how it is closely associated with or even implies the extended mind thesis. In Section 4, I present the theory of affordances and discuss three positions in relation to what in the organism accounts for its possibilities for actions. Affordances are relations between environmental features and the organism's abilities. Finally, in

¹ That thesis should not be confused with another, stronger, one, namely, the *group mind thesis*. The latter thesis claims that groups themselves can have mental processes and states. A group of this kind is to be understood as something over and above the individuals who compose that group (THEINER, 2013: 195). The socially extended mind thesis is not a thesis about the constitution of groups as cognitive agents. It is a thesis about how the states and processes of an *individual* organism depend constitutively on social factors present in its environment.

² At the end of their seminal paper on this subject, Clark and Chalmers suggested that the thesis of socially extended mind is tenable, but they did not defend that claim or develop it in that paper (1998: 17-8). Instead, they suggested that the thesis could be taken as a possible result from the fact that cognition is embedded in language. I will defend that socially extended mind emerges earlier, in perception, even before the acquisition of language. My defense is based on the ecological approach to perception. Another approach to the socially extended mind thesis is found in Gallagher (2013), where is investigated how "cognition is socially extended in the legal institutional practices" (2013: 6). His main idea is that social institutions such as contracts and property are tools to accomplish certain aims and solve certain tasks, extending and transforming our cognitive processes.

Section 5, based on the phenomenon of joint attention, which is a kind of social action, I extend the notion of affordance to encompass social affordances. At least some affordances are socially shaped and, I sustain, this implies the socially extended mind thesis.

2. The extended mind thesis

The extended mind thesis was introduced in Clark and Chalmers' article "The Extended Mind" (1998), although versions of this thesis can be found in the works of James Gibson (2015), Michael Polanyi (2009), and Merleau-Ponty (2012), to mention just a few. In Clark and Chalmers' original thought experiment, we are invited to imagine a person, Otto, with a severely impaired memory, and to compare him with Inga, a person with normal memory. As the story goes, Otto develops the ability to use a notebook to register and consult relevant facts for his daily tasks. We should imagine that he becomes proficient with using his notebook to the point that we cannot see any relevant functional difference between the role that his notebook plays in his ability to recover past facts and the role that Inga's brain areas for storing information play in her ability to remember facts. Both Otto's notebook and Inga's information-storage capacity, let's suppose, are equally reliable and fluent. Thus, by the parity principle, if we think that Inga's brain areas for storing information are part of her cognitive process of remembering, then we should think that Otto's notebook is part of his cognitive process of remembering. Understood this way, both play the same role in their cognitive processes. The conclusion that Clark and Chalmers draw from this thought experiment is that sometimes things outside the organism are parts of the cognitive system. In the case considered, the notebook constitutes part of Otto's cognitive process of remembering facts, so Otto's mind extends to his environment.

A more mundane and common example of the extended mind thesis comes from the assimilation of tools and instruments. Take, for instance, the classical case of the blind person with a cane, extensively discussed by Merleau-Ponty (2012: 144–46, 153–55) and others.³ What happens when the blind person assimilates the use of a cane is that he extends his power of tactile perception. Initially, he feels the cane pressing the skin of his hand. However, after exploring the world around him with the cane for a while, touching objects with it, getting familiar with its length and weight, feeling how it absorbs the impact of different kinds of objects, how it slides on different kinds of surfaces, the blind person begins to perceive with the cane. At this stage, the cane is no longer perceived as an object, but it has become an instrument with which the blind person perceives the hardness, the texture and the form of the objects within his reach, as well as their

³ See, for example, Michael Polanyi (2009: 12–14) and Rowlands (2010: 196–202).

spatial relation to himself, as being “in front,” “near,” “to the left,” and so on. He has learned to attend to these object features and spatial relations with the cane. The process of habituation and assimilation of an instrument turns this instrument into part of one’s own body and in this sense expands it. As Merleau-Ponty points out,

To habituate oneself to a hat, an automobile, or a cane is to take up residence in them, or inversely, to make them participate within the voluminosity of one’s own body. Habit expresses the power we have of dilating our being in the world, or of altering our existence through incorporating new instruments. (Merleau-Ponty, 2012: 145)

To habituate to an instrument involves also the transformation of our own conscious perception. In the case of the blind person, his awareness of the impact of the cane on his hand is transformed into a sense of its end touching the objects he is exploring (Polanyi, 2009: 12). Instead of perceiving the cane with his hand, he begins to directly perceive the objects with which the cane is in contact; that is, he begins to perceive *with* his cane. At least from a phenomenological point of view, it would be completely mistaken to describe this process of habituation as involving an inference, an interpretation, or a construction of an object from the bodily sensations produced when his hand is pressed by the cane. Actually, “the pressures on the hand and the cane are no longer given, the cane is no longer an object that the blind man would perceive, it has become an instrument with which he perceives” (Merleau-Ponty, 2012: 154). The blind person now relies on that new whole, constituted in part by the cane, to perceive his environment. Thus, the assimilation of instruments has the power of transforming and extending our conscious perception.

This discussion on the habituation to instruments is interesting because it helps us see how our own relation to our body is transformed to extend our power of perception. We learn to use our bodily sensations to attend to and become aware of what is in touch with our body. For instance, we are not normally conscious of our tactile sensations when we step on the ground; what we attend to and perceive is the firmness of the ground, not our own foot or the skin of our foot being pressed by the ground. Nevertheless, we can suppose that the child had to learn to use her body to attend to the firmness of the ground at the same time she was learning to crawl and walk⁴. She had to assimilate her own body, exploring how it reacted to touching the ground and other surfaces, in order to attend to what was around her body. At the end of this process of assimilation, she stopped being aware of

⁴ For a detailed discussion about the first distinctions we normally make based on tactile and kinesthetic information, see Sheets-Johnstone (2011).

her body as an object, at least in the normal situation, and began to perceive the world around with her body. Her power of perception was extended through the assimilation of her own body. According to Polanyi,

In all our waking moments we are relying on our awareness of contacts of our body with things outside for attending to these things. Our own body is the only thing in the world which we normally never experience as an object, but experience always in terms of the world to which we are attending from our body. It is by making this intelligent use of our body that we feel it to be our body, and not a thing outside. (Polanyi, 2009: 15–6)

How do Clark and Chalmers' thought experiment and these examples of habituation match with our initial considerations of the extended mind thesis? Remember that it was said that the processes of an organism extends onto its environment if they are at least in part constituted by actions performed by this organism in its environment. Rowlands spells this out in more detail. The key idea is that those actions that perform a constitutive role should in some way transform information that is present in the environment into information available to that organism in a manner that the organism can use it to perform its cognitive tasks (Rowlands, 2010: 59). By that transformation the organism is released from having to compute or infer information that is necessary or relevant for further cognition⁵. To summarize, a cognitive process extends the mind onto the environment if information stored in some structures in the environment and relevant to the task being solved by that process is made available to the organism by its manipulation, exploitation, and transformation of those environmental structures.

The process of Otto's remembering actually does extend to his notebook. His manipulation of the notebook (by opening it or searching for the right page) and then his exploitation and transformation of the information present on the page into available information (by perceiving and then reading, for example, the sentence "The Mário Quintana Cultural House is on Andradas Street") are part of the remembering process of Otto's belief that the Mário Quintana Cultural House is on Andradas Street. These actions of manipulation and transformation constitute in part the process by which Otto remembers his belief (Rowlands, 2010: 63). Because Otto's brain areas for storing information are damaged, he has to offload onto the environment the activities normally

⁵ Clark and Chalmers formulated a similar point by suggesting that the mind is extended through what they called *epistemic actions*, actions that "alter the world so as to aid and augment cognitive processes such as recognition and search" (1998, p. 8).

carried out by the brain, such as information storing and processing. A last caveat in Otto's case is this: In an ideal situation, Otto's notebook is completely assimilated in that, although he needs to read the words written on the pages of his notebook, he is aware not primarily of those words but of what those words are about. Instead of attending to the sentences, he remembers *with* the sentences that something was the case. This is similar to what happens when the blind person habituates to the cane and begins to perceive *with* the cane.

As to the habituation to instruments, it will soon become clearer how it implies the transformation of information present in the environment into available information through the discussion of affordances, the main theme of this chapter. It can be said in advance that habituation, as much as it involves exploitation and manipulation, discloses to the organism patterns of information, or what Gibson calls "invariants."

3. Gibson's approach to perception

The first thing to point out about Gibson's approach to perception is that he intends to reshape how perception is conceived and empirically studied in psychology. To better understand his position, it will help to have a brief summary of the opposing view, which he calls the *snapshot view* of perception (Gibson, 2015: xiii) and which is closely associated with the *sandwich view* of the mind (Hurley, 2001: 3–4). According to the latter, sensation, cognition, and action should be sharply distinguished but are related to each other in accordance with the input-output model. Sensations are the inputs to the cognitive system, which, in turn—after manipulating, transforming, and processing the information carried by the sensations—yields as outputs representations for further cognitions or actions. In this model, cognition, understood basically as information-processing operations, is the filling of the sandwich. Vision, for example, is an information process that has as inputs retinal images caused by the impact of light upon the photoreceptors in the retina and generates as output enriched representations of the objects around.⁶ According to this approach, actions do not constitute vision or participate in vision processes in any sense; vision has only to do with processing the information coming from visual receptors. The problem that vision has to face is the difficult problem of information-processing: at every moment the visual system receives two-dimensional information about the light reflected by objects in the environment and it needs to compute a three-dimensional representation of those objects. In order to know how vision computes

⁶ So, for example, in order to explain the perception of constant properties of objects, like shape and size, Rock says that "we first must know how scenes actually are represented on the retina" (1995: 15), and Marr specifies a little further: "in the case of human vision, the initial representation is in no doubt – it consists of arrays of image intensity values as detected by the photoreceptors in the retina" (2010: 31).

a three-dimensional representation at a specific time, it is necessary to determine precisely what is the two-dimensional information released by visual receptors at that time, for then it becomes possible to have a clear idea of the contribution that the visual system has to make to the formation of the three-dimensional representation.⁷

This brings us to the snapshot view of vision. To better study vision, researchers should do experiments with viewers in idealized situations of observation, preferably situations in which the viewer is prevented from moving his body, head, or eyes. By this procedure, making the eye work as if it were a photographic camera, vision scientists can isolate the information coming from the visual receptors, “vision is simplest when the eye is held still, as a camera has to be, so that a picture is formed that can be transmitted to the brain” (Gibson, 2015: xiii). Looking around and getting around are left out of the understanding of vision, as they are not crucial for the explanation of the real task of the visual system, according to the snapshot view of perception.

For Gibson, these views of perception and cognition are misguided. His main departure from those traditional studies on perception is rooted in the realization that before starting to study how perception processes information⁸ released by the receptors, it is crucial to ask what kind of information can be found in the environment itself. Only then we are in a good position to investigate how the perceptual system can pick up that information. As Shaw clearly puts it, the orientating question is not anymore how the perceptual system can construct complex representations of the environmental objects from such meager inputs,

rather the question should be how information “stored” in the world can be perceptually extracted by active, investigative creatures in their relatively successful effort to survive calamity and achieve well-being. (Shaw & Bransford, 1977: 5)

Take for instance the case of the perception of size constancy, that is, the perception of an object as having the same size although its apparent size changes while the perceiver approaches or

⁷ The nature of this contribution is a matter of debate. Some claim that vision relies on hardwired information or hardwired inductive transitions to extract those three-dimensional representation from two-dimensional information, especially those committed to the thesis of the modularity of mind, see Fodor (1983) and Pylyshyn (2003), while others claim that that information comes from influence of high-order cognition upon perception, as is defended by proponents of the New Look, see Bruner and Goodman (1947).

⁸ I do not intend to discuss the nature of information in this paper. It is a delicate question that already has drawn much debate. Without getting into the details, I want at least to say, following Chemero (2009: 116-120), that, taking A and B as types of situations, a token of A carries information of a token of B if there is a regular causal connection between the types A and B. This regular causal connection need not be lawlike; it can be the result of a convention. This weaker notion of information is especially important for the possibility of social affordances.

moves away from the object. The traditional approach explains that perception as resulting from an inference or processing that concludes the real size of the object from the information about its apparent size and the information about the distance between the object and the perceiver. Although it seems a simple inference, the perceptual system needs to parametrize the variable representing size in order to compute it. Moreover, the information about the distance between the object and the perceiver is not given, so more processing is necessary to obtain it. Gibson's approach is very different and simpler. First, he notes that patterning of surfaces is a gradient of surface textures, and then he points out that the number of ground texture units that an object hides when resting on the ground remains the same regardless the distance from the perceiver. This relation between an object resting on the ground and the number of ground texture units that the former occludes is an invariant, information "stored" in the environment, which can appear as such to the perceiver along his locomotion. Thus, without having to rely on any inference, the perceiver can see the object as constant in size over time, while he approaches or moves away from the object. As Gibson points out, "the extracting of invariants over time is the key process to perception" (Gibson, 1967: 166).

The description of the rich informative structures present in the environment is complemented by his suggestion that these structures can be turned available to the perceiver/organism over time through its movements, explorations, and manipulations. This has consequences for how perception is conceived and studied. Instead of focusing on static retinal images registered in idealized situations, the visual psychologist is now invited to do experiments focusing on the stimulus flux in the situation of ambient and ambulatory vision (Gibson, 2015: xiv)—that is, while the perceiver turns his head and moves himself through the environment in order to accomplish common tasks.⁹ Invariants emerge only in the flux generated by the interaction with the environment, sometimes only in a long flux. We have then a new picture of the processes of the perceptual system in which perception and action are interwoven. Action is not only crucial for generating the stimulus flux but also contributes with information for picking up invariants in the flux. As Gibson has noted, we use information from our motor skills to disambiguate between a changing in the object and a changing in our spatial relation to the object (Gibson, 2015: 65–6). To pick up an invariant, we need to distinguish it from what is varying in the stimulus flux by virtue of our own movements. Thus, perception depends on action constitutively.

Perception, in this new picture, is less dependent on computational processes by offloading part of the cognition upon interactions with the environment that bring into the stimulus flux the

⁹ Yarbus has collected evidence that the pattern of our eyes movements is correlated to the task accomplished. In relation to the same situation, for instance, seeing a picture, the eyes movements will have precise but different patterns, whether we are scanning for a type of object or judging the age of the people in the painting (1967).

invariants that are “stored” there. Instead of computing the invariants of the environment, we make them emerge in our stimulus flux through movement, exploration, and manipulation, and then the work left to the brain part of the perceptual system is that of picking up patterns in the flux. Gibson’s approach to perception implies the extended mind thesis, but not without reconceptualizing perception, action, cognition, and the relation between them. Perception is not reduced to brain activity; rather, it involves a “whole body activities devoted to actively extracting, isolating, or clarifying informative structure in the world” (Mace, 2015: xx). Cognition itself is thought differently in the sense that it is not seen as completely separated from action; on the contrary, it is constituted by action and, because of that, it extends to the body and to the environment.

4. Affordances

The theory of affordance is a response to the question: How does the perceptual system pick up invariants present in the environment? According to ecological psychologists, our primordial encounter with the world is mediated by opportunities for behavior. Thus, environmental invariants are picked up in terms of what they afford. Being able to perceive what the invariants afford is crucial to controlling behavior. During locomotion, animals avoid obstacles, stop before a cliff, select surfaces that will support their weight, etc., suggesting that their behaviors are being controlled by the perception of the affordances in their environment, that is, by the perception of what they can do. As we will soon see, this is relevant to understanding how the environment can have meaningful features, maybe even socially meaningful features.

Affordance is a term of art coined by Gibson meaning “something that refers to both the environment and the animal” (Gibson, 2015: 119). Although affordances have a base in the physical structure of environmental objects, they are individuated in relation to the animal’s possibilities for action. Affordances and possibilities for actions complement each other. A flat, sufficiently extended and rigid surface on the ground affords support and locomotion to animals like us. If a similar surface is knee-high above the ground, then it affords sitting on. In all these cases, what the object affords depends on the features of the objects. Whether a surface can be sat upon depends on its height. At the same time, it depends on the animal in question, what width or height precisely constitutes an affordance. The proper scale to measure an affordance must be “relative to the animal” (Gibson, 2015: 120). A stub that affords sitting on to a child may not do so to an adult. As such, affordances “are relational in nature” (Heft, 1989: 6).

To what feature of the animal an affordance is related? This is a matter of debate between ecological psychologists. We find in the literature at least three responses to this question: the animal's possibilities for action might be cashed out in terms of body-scale properties, in terms of dispositions, or in terms of abilities. I will explore the first and the third proposals.¹⁰

In a classical experimental study, William Warren suggests that stairs are perceived as climbable based on the ratio between the leg length and the riser height (Warren, 1984). Varying the riser height, the optimal point can be measured, in relation to a person, for the climb-on-able affordance—that is, a climbing situation of minimum energy expenditure. If the riser height is too low, it's better to walk, if it's too high, it's better to shift to a quadrupedal gait (1984: 686). Between these extremes, Warren claims, we find the optimal point for the climb-on-able affordance, which can be expressed by a ratio between the leg length and the riser height. This explains why the same stair-step can be perceived as climbable by an adult, but not by a child.

Although the possibility of climbing certainly bears on the ratio between riser height and leg length, it may be questioned whether the latter explains the former completely. It would not be a surprise if two persons with the same leg length but very different physical conditioning did not agree as to whether a stair-step affords climbing. More recently, Warren's study was questioned by Cesari, Formenti, and Olivato (2003). Indeed, Warren's study was limited to young adults and could not be generalized to other populations. In their new study, Cesari et al (Cesari et al., 2003: 113) proposed to show that people of different ages and different motor skills perceive stair-climbing affordances as the ratio between the riser height and the distance taken from the feet to the bottom edge of the stair. According to Chemero's interpretation of that study, this means that the fundamental feature in the individual for that affordance relation is the stepping ability, since the distance taken from the stair depends on the level of flexibility expressed by the individual (Chemero, 2009: 143–4). As the results of the study showed, the distances taken by older adults, who are less flexible, vary less in relation to risers of different height than those taken by young adults. It seems then that older and young adults are perceiving the ratio between riser height and the distance taken from the stair, which is the aspect of the environment determining climbability, in terms of their stepping ability.

As we are trying to understand and explain the notion of possibilities for actions by which affordances are perceived, it is reasonable that they cannot be explained completely by properties of the body. The physical possibilities of the body are too broad to understand the possibilities for action. Many possible physical states of the body are not possible actions in any sense. Therefore,

¹⁰ For a presentation and discussion of the second proposal, see Turvey (1992).

reducing the possible physical states of the body to those that are possible manifestations of the animal's abilities is a welcome clarification of the notion of possibilities for action. Abilities are irreducible to body physical properties, although they may supervene on the latter. In the ecological approach tradition, Chemero (2003), Heft (1989), and Costall (1995) clearly appeal to this more broadly construed notion of abilities in their accounts of affordances.

I will not offer in this chapter a metaphysics of abilities, although I recognize that a solid defense of the ecological approach to perception could benefit from that. What I will do is to offer some features of the abilities that I think are crucial to a proper understanding of the possibilities for action. The first point, emphasized by both Chemero (2009: 145) and Heft (1989: 9–10), is that abilities are to be taken as functions specifiable in relation to the organism's survival and flourishing. They have history, evolutionary or developmental. What this means is that an ability is constituted, in the case of an inherited ability, by the interactions of the species with its environment over many generations and, in the case of a developed ability, by the interactions of the individual with its environment over time. Each loop in such history of interactions selects a behavioral response better fitted to the organism's survival and flourishing than the past ones. This history of continuous interactions aiming at the organism's survival and flourishing is the key to understanding a second fundamental feature of abilities, its relation to intentionality. Abilities, in the organism, are what keep the organism adjusted to its environment, while affordances, in the environment, are what keep the environment affordable to organisms. Such power of adjustment, acquired by that history of continuous interactions of exploration, manipulation, and transformation of the environment, is the locus of our more primitive intentionality. Rowlands coined the expression *revealing activity* to capture this point. "Intentional directedness toward the world," he claims, "is best understood as revealing activity" (Rowlands, 2010: 163) and, I would emphasize, as history of revealing activity. The idea indeed is very mundane. An organism that has the power to keep its adjustment to certain features of the environment, sustaining then its survival and flourishing, is an organism able to act in relation to those features, with more or less success. Thus, it is an organism whose abilities manifest, when exercised, intentional directedness toward the world. History of interactions, of revealing activity, is crucial since an organism depends on it to acquire and maintain an ability to intentionally direct toward some feature of the environment.

Possibilities for action, then, are the set of actions that can be manifested by the organism's abilities, at least those abilities that, by virtue of a history of interactions and revealing activity, have intentional powers. Our body can express intentional acts not by virtue of its physical properties or its dispositions, but by virtue of its abilities. As affordances are related to abilities in the animal,

they have meaning for the animal in the sense that they offer possibilities for actions that are relevant for its needs and plans. Therefore, action is much more than just mechanical behavior; it is infused by intentionality. These abilities are in operation in the perception of affordances. Invariants in the stimulus flux are picked up by a perceptual system in a body prepared for them in terms of possibilities for action. Therefore, the notion of ability is central also to the explanation of the perception of affordances. As we will see in the next section, “the extension of affordances to the culturally based meanings of objects,” what may be called *social affordances*, “is justified if we view affordances in relation to what an individual can do, or rather what an individual knows how to do” (Heft, 1989: 18). That is, abilities is the key notion in order to socially extend the notion of affordance.

To return to a question that I have left partially unsettled in the second section, the process of habituation to an instrument is just a special case of acquiring or learning an ability. The history of interactions between a blind person using a cane and the environment, in order to adjust and control his behavior while aiming at the successful locomotion, explains not only the emergence in his stimulus flux of recurrent patterns of information related to the form and texture of the surfaces touched by the cane, but also his ability to attend to these surface properties instead of to the bodily feelings in his hand and skin. An animal ability resonates through whatever was used by the animal to explore, manipulate, and transform its environment. For that same reason, the intentionality disclosed by the acquisition of an ability travels to that very part of the environment in relation to which the animal has become able to keep in tune.

Intentionality is revealing activity, and this activity takes place, in part, in the cane (and in the brain and in the body, etc.). The cane can with as much justification be regarded as the (partial) locus of the blind man's revealing activity as his brain. The nature of the blind person's revealing activity is that it travels through his brain, through his body, through his cane, out into the world itself. (Rowlands, 2010: 201)

5. Social affordances

Gibson was not opposed to socially extending the notion of affordance; he even gave many examples of social affordances. He mentions, for example, the postbox that “affords letter-mailing to a letter-writing human in a community with a postal system” (2015: 130). Places for hiding, places that afford concealment, require that the animal perceives them as safe in relation to what

other animals afford, what they can do. So the notion of hiding affordance brings forth issues of social perception, as Gibson recognizes (2015: 128). As other animals and persons are in the environment interacting with each other all the time, it is to be expected that “the other animal and the other person provide mutual and reciprocal affordances at extremely high levels of behavioral complexity” (2015: 129). As Gibson points out, “behavior affords behavior” (2015: 127). Sexual behaviors and nurturing behaviors all depend on the perception of what other animals afford or can do.

When one talks about social affordances, one may mean two different, although related, things. As in the case of the postbox, it may mean that the affordance relation of letter-mailing is available only to subjects of a certain social group. That is, the perception of a certain affordance of the postbox depends on participating in a social practice that gives support to certain affordances of the postbox. In this sense, the letter-mailing affordance is social in nature; it is constitutively related to a social practice. Persons outside this group will not perceive the postbox as offering letter-mailing. A second sense of the notion of social affordance is specifically related to affordances of animate beings. To perceive what an animal or a person can do, that is, to perceive what they afford as animate beings, is to perceive their minds in some way. The issue here is whether we can “have a direct perceptual grasp of the other person’s intentions, feelings, etc.” (Gallagher, 2008: 535). The social dimension of these affordances has to do with the possibilities for actions related to the perception of other person’s mental states and actions. It is appropriate to talk about social affordances in the sense that in the ecological approach some of the other person’s mental states and actions are perceived in terms of what she affords, what possibilities for interactions an animate being offers.¹¹ This sense of *social affordance* is in some respect more fundamental than the first one, since the participation in a social practice, which may socially shape the affordances of a physical object, as in the case of the postbox, depends on one’s ability to perceive others as affording interaction and collaboration.

If we can have revealing activity by interacting cooperatively with others, and if this activity is driven by the perception of what others afford, then our minds are socially extended—that is, our minds extend to the social environment. Those activities performed in cooperation with others constitute cognitive processes by which information present in the environment is transformed in available information to the organisms involved in solving a task cooperatively. Therefore, the possibility of social affordances in the second sense is crucial for defending the socially extended

¹¹ For more discussion on the first sense of social affordance, see Costall (1995) and Martens and Schlicht (2017) for a detailed explanation of the second sense.

mind thesis. To claim the truth of that thesis, not all cognitive processes need to be so constituted; it is sufficient that some are.

Situations involving joint attention are rich for exploring the phenomenon of social affordance. The activity of joint attention follows a specific pattern of behavior, involving detecting a gaze, following its direction (sometimes more than once if nothing interesting is found), establishing eye contact, and further following the direction of the gaze. Two or more observers engage in joint attention when they are simultaneously aware of the same region or object in the environment and of the other's attention in the direction of that region or object.¹² The latter awareness is necessary for social cognition, since it affords the behaviors of competition or cooperation. That is, the animal engaged in joint attention perceives the other's attention as opportunities for certain kinds of behavior. For instance, "the perception that another individual attends to the same focus as ourselves makes possible social affordances such as *outnumbering our foe*" (Shepherd & Cappuccio, 2011: 206), which controls the cooperative behavior of mutual defense against a predator. Joint attention is a social ability from the beginning. It enables animals to coordinate their behavior with one another to sustain group cohesion, exchange information, and negotiate alliances. There are variations between species as to what behaviors following the gaze and joint attention afford. For instance, there is evidence that in some primates, "the gaze following behaviors is modulated by the social relevance of the cue" (Shepherd & Cappuccio, 2011: 211). Since joint attention affords possibilities for cooperation between those engaged in such activity, it involves social affordances in the second sense of the term by default.

Infants from nine to twelve months of life start to engage in activities of joint attention (Shepherd & Cappuccio, 2011: 211). At this age, infants constantly check the eyes of their caregivers and join in mutual gaze. These activities of joint attention happen to be very useful in situations of social learning. Let's take the case of the perception of a cliff in order to see a case of social affordance in the first sense of the term. Normally, since a cliff affords falling off, it is dangerous to us and it looks dangerous to many animals and infants. Some classical experiments using a visual cliff show that cliffs are in fact easily perceived as dangerous. Visual cliff is an apparatus built with a platform. A piece of glass is placed on top of the platform and extends well off of the platform. At the edge of the platform, it will continue to look dangerous, since the cliff is still visible. But it is safe, since the glass affords support. However, "when human infants at the

¹² Shepherd and Cappuccio distinguish between nonrepresentational joint attention, which many animals can manifest, from "full-blooded" joint attention, which only humans manifest. The latter, but not the former, requires the representation of a common ground, the shared goal of the observers engaged in joint attention. In the former case, the joint attention can afford cooperation without the observers representing a shared goal. As the authors emphasize, "I can cooperate, taking that individual's side in a conflict while he or she is unaware that I'm behind him or her, threatening his or her foe" (2011: 206).

crawling stage of locomotion were tested with this apparatus, many of them would pat the glass with their hands but would not venture out on the surface” (Gibson, 2015: 133). The information in the optic flux is sufficient to specify the cliff. The infant normally picks up this information without the help of others and stops at the edge of the cliff. Her behavior is controlled by the affordance of falling off. In another study, Sorce et al. used a modified visual cliff, which allows for varying its depth, in order to produce situations of ambiguous information in which it is unclear whether the cliff affords falling off. The aim is to test whether “the infant looks to the face of another in order to search for emotional information to help appraise or evaluate the ambiguity” (Sorce et al., 1985: 196). As the results show the behavior of the infant is controlled by the emotional information available. When the infant approaches the border of the cliff, she tries to establish joint attention with the caregiver to look for relevant information in the face expression of the latter. In the first test, the caregiver signaled a fearful expression, and none of the infants ventured across the edge of the cliff. In a second test, the caregiver signaled a happy face, and the majority of the infants crossed the edge of the cliff. Therefore, the emotion signaled by the caregiver significantly influenced the infants’ perception and consequently their behavior.

This is a clear case of social affordance, in both senses of the term. First, the infant’s perception of what the cliff affords, in the situation of ambiguous information, is in part shaped by the cooperative interaction afforded by the joint attention established between the infant and the caregiver. Second, by engaging in joint attention activity directed to the cliff, the caregiver affords cooperative behavior of a special kind. Her facial expressions, which in other context would mean very different things, offer to the infant the behavior of crossing or standing still. The infant then modulates her behavior according to what the face of the caregiver affords. In this situation, the infant’s perception of what the cliff affords is socially modulated. Information present in the environment, but only partially available in the stimulus flux of the infant, is turned completely available to the infant through this cooperative activity. Thus, from less than one year old, our minds are already socially extended.

6. Concluding Remarks

The extended mind thesis claims that some cognitive processes of an organism are in part constituted by actions of that organism in that information necessary to perform a task becomes available to the organism through its manipulation, exploration and transformation of the environment. We saw how Gibson’s ecological approach to perception allows to understand the way in which the organism offloads onto the environment part of a cognitive process. Its interactions

with the environment bring about patterned and ordered stimuli over time. Such inflow of stimulus contains the relevant environmental information which the organism perceives in terms of affordances, that is, possibilities for actions. In a case of ambiguous stimuli, as in the situation of the modified visual cliff discussed in the former section, it's possible that interactions with other organisms can help to disambiguate them. In this sense, behaviors afforded by joint attention, which are a kind of social action, can shape the perception of the affordances of a cliff. This being the case, the mind is socially extended as well, at least some perceptual processes are.

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