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IS INTENTIONALITY A BETTER CONCEPT THAN TELEOLOGY TO DESCRIBE BIOLOGICAL INDIVIDUAL BEHAVIOR?

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ABSTRACT. The author proposes that the phenomenological concept of intentionality is consistent with the idea that the living organism is structurally coupled with its environment, as stated by the theory of Autopoiesis of Humberto Maturana and Francisco Varela. This theory affirms that living organisms produce themselves as systems in response to the disturbances they experience in their environments, and takes their responses as primordial cognitive acts. It is argued that their responses are intentional since they are elemental ways of standing in a world. In the first part, it is explained what Autopoiesis is, how cognition works in living organisms, and what structural coupling is. In the second part, it is stated that living organisms cannot be understood in mechanistic terms since they respond to a teleology inherent to intentional beings. In the last part, it is discussed how structural coupling and intentionality are analogous, and why intentionality is more comprehensive concept than teleology to describe the structure of individual organisms.

Keywords: Autopoiesis, cognition, intentionality, machine, teleology

During the last decades, there has been a discussion in Cognitive Sciences and Philosophy concerning what theories or models of mind are more convient to understand cognition[1]. In this context, some theories take cognition as a form of symbol manipulation that can be performed, in principle, by any Turing machine or by some living beings[2]. The Google Neural Machine Translation could be an example of it. This is a neural network for translating based on a deep learning, in an accumulative or progressive way. For some of the current theories, this is a legitimate cognition just as much as human learning is, although a deep learning

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[1] Varela, Thompson and Rosch, 1991, Gallagher and Zahavi, 2008, and Bermudez, 2014.
[2] Varela, Thompson and Rosch, 1991.

system is not capable to explain how the translation process proceeds while a human being can do it[3].

In Cognitive Sciences, living processes are usually understood in terms of processing inputs and production of outputs. This statement is very useful for "predicting" behavior by "explaining" the mechanisms of a variety of cognitive processes. However, some of its constraints are evident, because it does not understand Cognition in its holistic, embodied, and embedded character, neither it can explain the first-person character of Cognition since experience seems to be excluded from it.

In the symbolic-manipulation paradigm, some of the core aspects of Cognition are neglected. On the contrary, Enactivism takes cognition as an embodied activity which depends on a know-how acquired in the history of the agent's interactions with its environment. Cognition goes beyond a function's execution since it implies the agent's history and its relation with its environment. In fact, Cognition is what makes the agent to conform a set of possible interactions with its environment, and to make it meaningful (a world).

Cognitive acts can also be traced in the responses that some living beings for adapting to their environment. Cognition could be considered a biological function which is involved in decision making processes and behavior's regulation. In what follows, it will be suggested that the biological perspective on Cognition could be complemented with some ideas of Phenomenology and Autopoiesis4 to understand Cognition in its unity.

1. Autopoiesis & Cognition

The aim of Santiago's Theory of Cognition (Maturana and Varela) was to describe how biological individual's behavior operates. Rather than explain it by focusing in its phylogenetic-evolutionary aspects5, it intended to highlight its organization and how it works, proposing that Autopoiesis is at the center of their behavior. In other words, Autopoiesis is what makes an individual a living organism. Autopoiesis has been defined as the self-producing dynamic of an

[3] Cfr. Engel, 2001.

[4] Originally published in Maturana, H. and Varela, F. (1972) De máquinas y seres vivos: Una teoría sobre la organización biológica. Santiago: Lumen.

[5] In a certain sense, this theory complements evolutionary theories since it offers a definition of the living being that is only taken for granted by them.

individual, which is originated in the dynamic of its components, in response to the environmental disturbances[6]. From the components' dynamics, it emerges some patterns that could be considered systemic since they later regulate the low-level components' interactions. For Maturana and Varela (M&V), this behavior is not teleological, and they assumed that can be explained by mechanics because, at the time they proposed the theory of Autopoiesis (1980), only mechanistic explanations were taken seriously by the scientific community. Even if this approach can predict behaviors, it neglects subjective experience. Although it is a matter of discussion whether living beings are subjects or not, they are simply different than predictable machines. However, the aim of this paper is to suggest that they are intentional entities. In the first part, what Autopoiesis is and how Cognition in biological entities operates will be explained. In the second part, it will be introduced the criticism asserted by M&V against Teleology. The last part of argues that this criticism does not affect the phenomenological concept of Intentionality, which is compatible with the current developments of Cognitive Sciences. Let us begin by introducing the definition of Autopoiesis as presented by Maturana and Varela (M&V):

> "An autopoietic machine is a machine organized as a system of component production processes that i) generate the processes (relations) of production that produce them through their continuous interactions and transformations, and ii) constitute the machine as a unity in the physical space. Therefore, a continuously specific autopoietic machine produces its own organization through the production of its own components, under conditions of continuous disturbance and compensation of those disturbances (production of components) [...]. An autopoietic machine is a homeostatic system that has its own organization as the variable that keeps constant"[7].

Autopoietic machines[8] are autonomous in the sense that their behavior does not depend on an external agent that programs their behavior[9]. Instead, they spontaneously and internally produce changes in their environment and in themselves. It should be said that as systems, they possess structures and components. For example, some of the components of the human being are its

[6] Cfr. Maturana and Varela, 1980.
[7] Maturana and Varela, 1980.
[8] In the next part of this paper, I will discuss the convenience to refer the living organisms as machine.
[9] Cfr. Maturana and Varela, 1980.

organs, its extremities, and its nervous system, while its structure is the dynamics between its components which allow the system to live (as a human being and not as a sum of parts). In the same way, molecules do not subsist as discrete units, but in molecular dynamics. Their structure is what sets their boundaries, in other words, what elements of the environment can be integrated and which of its components need modifications, subordinating any system's changes to the maintenance of the system's unity[10].

The limits of a living system are determined by the domain of interactions that it can experience without disintegrating[11]. When a component participates in the system's dynamics, it can be considered a system's part. When an external agent is not integrated to the system's dynamic, it can be considered a perturbance and the system intends to overcome it[12]. The responses the organism gives to external stimuli, by integrating them or excluding them from the dynamics, imply a constant adjustment of their own components' dynamic which is subordinated to the maintenance of their systemic unity. Thus, these systems are homeostatic because they remain as relational unities and not as mere aggregates of components, which are insufficient for Autopoiesis since they lack a structural dynamic that determines which elements belong to the system. In the same respect, if an organism cannot overcome the environmental' perturbations[13], it loses its Autopoiesis, disintegrates and die[14].

As mentioned above, cognition plays a central role in Autopoiesis. In this regard, M&V were influenced by Bateson, who argued that mental processes are features of all living organisms, as well as unavoidable consequences of primordial life processes prior to the development of brains and nervous systems. In this perspective, the mind is a common pattern in organisms that can be extended to social systems and ecosystems[15]. However, this perspective does not distinguish between living and non-living systems[16]. Following Bateson, M&V affirmed that

[10] Cfr. Maturana and Varela, 1980.
[11] Cfr. Maturana and Varela, 1980.
[12] Cfr. Maturana and Varela, 1980.
[13] An external influence can deform an organism only when it is sufficiently strong to force the organism to make a progressive change in its structure. In some instances, the deforming agents can be perceived by the system. In other cases, only an external observer can appreciate them. Since the organism is not able to assume the external agent, neither it can describe them.
[14] Cfr. Maturana and Varela, 1980.
[15] Cfr. Capra and Luisi, 2014.
[16] Both authors avoid using the word "Mind" to refer to this a phenomenon since it is usually associated with a thinking substance, while they refer to a process. Cfr. Capra and Luisi, 2014.

"living systems are cognitive systems, and living is a process of cognition. This statement is accurate for all organisms, having them or not a nervous system[17]. Or that Cognition

> "[…] is the activity involved in the self-generation and self-perpetuation of living networks. In other words, cognition is the very process of life. The self-organizing activity of living systems, at all levels of life, is mental activity. The interactions of a living organism — plant, animal or human — with its environment are cognitive interactions. Thus, life and cognition are inseparably connected."[18]

Cognitions are the mechanisms that organisms employ to maintain themselves. They depend on the specific coordination between the various components of organisms' structures, which also determine "all the changes that may occur to compensate for disturbances"[19], which means that a non-assimilable influence would not be part of the organism. One of these mechanisms is the sensory-motor apparatus of the organism. An example of it is the auditory system of bats, which allows them to coordinate their movements through echoes (echolocation), which help them to capture their preys[20]. The sophistication of the sensitive apparatus influences the way an animal is engaged in its environment. In the same way, cognitive capacities such as consciousness allow unforeseen synchronizations with the environment, although this not implies the domain of possible interactions of a conscious agent is unlimited. Each cognition is specific since depends on how the organism as system behaves, which determines what can or cannot integrate to itself. For this reason, knowledge depends on how the individual is organized and how it is embedded in its environment. Thus, if there is a structural modification of the individual, there is a variation of its cognitive domain[21].

M&V used the term "Structural coupling" to refer to the cognition of living organism because this structural self-modification the individual produces to

[17] Maturana and Varela, 1980.

[18] Maturana, 1974. Modern philosophy placed the thinking or spiritual substance, what is called cognition here, as an exclusive property of the human being, unlike other living beings that were interpreted as machines. In contrast, in the theoretical biology of Maturana and Varela, phenomena such as consciousness or subjectivity, modes of the thinking substance, are only particular modes of being of the broader phenomenon of cognition.

[19] Maturana and Varela, 1980.

[20] Cfr. Jacobs and Bastian, 2016, chapter 2.

[21] Cfr. Maturana and Varela, 1980.

maintain itself also implies an engagement with its environment. Since the permanent change forces the individual to adapt, this gives rise to adaptive processes of learning and development that occur throughout its existence.

The usual rejections of the employment of terms such as learning or development for referring non-human cognitions do not consider these are analogous behavior patterns in multiple organisms since the structural coupling is the same in its multiple manifestations, not only in humans. Obviously, certain types of interactions, such as linguistic ones, belong only to human beings, and they allow to organize and structurally adapt to a specific environment, the social life. In an analogous way, other living beings adapt their processes of self-production in relation to a specific environment and to the possibilities of variation. One last consequence of this approach is that cognition is not anymore a representation of the world, nor located in brain activity. According to Capra and Luisi,

> "Mind and matter do not appear more as belonging to two separate categories, but as representing two complementary aspects of the phenomenon of life - process and structure, which are inseparably connected. For the first time, we have a scientific theory that unifies mind, matter, and life."[22]

We can affirm that cognition is a more primordial phenomenon than consciousness, which supposes a brain and a sophisticated nervous system[23]. Consciousness is the result of the dynamics of the brain with the different sensory-motor organs of the body, and with the environment, and not all these components are needed for other cognitions. As an emerging process, it is the living dynamics, process, and structure of the organism.

2. Maturana and Varela on Teleology

The previous section has pointed out that cognition is a structural coupling with a meaningful world. Nevertheless, M&V have refused to interpret it as teleologically oriented. In what follows, the difference between an extrinsic and intrinsic purpose will be introduced, and M&V' rejection of teleology will be

[22] Capra and Luisi, 2014.
[23] Cfr. Capra and Luisi 2014.

discussed. The phenomenological concept of intentionality will be later presented as a theoretical alternative.

Initially, M&V have denied teleological explanation in biology, considering Autopoiesis theory a mechanical explanation to living organisms' behavior, rejecting an immanent purpose behind it. By rejecting that organisms' behavior is goal-directed, Maturana and Varela also deny that Autopoiesis involves teleology, addressing living organisms as autopoietic machines, whose operations are determined by the structures and produce their components while self-produce themselves as systems, which are mechanically driven to homeostasis or balance, and overcoming environmental disturbances. The system itself is not goal-directed to being in homeostasis; in any case, teleology is at most a descriptive notion that an observer employs to make it understandable. This viewpoint is against Kant's position since he claims that mechanics cannot explain some behaviors such as regeneration, growth or reproduction that occurs in the animal world. To make them intelligible one must postulate that their behavior is goal-oriented.

According to Kant, organisms have a structure that seems to have been produced from an idea, this means that their different elements are integrated in such a way that they produce adequate behaviors to live in their specific environments, they seem to pursue a telos. However, the telos is not an extrinsic purpose for the organism, as in the machines, but an intrinsic one, which means that it resides in the organism and not in an external agent. The natural, intrinsic or immanent purpose, as it has been usually called, resides in organisms that are cause and effect of themselves.

Contrary to M&V, Thompson refuses to interpret autopoietic systems as if they were "machines" or "artifacts" by considering their genesis. Living organisms do not depend on an idea that causally determines their production, which is the case of artifacts. For instance, to produce a chair a designer must previously have in his or her mind a model. This idea externally regulates the production of the entity. Contrary, organisms' organization is not separated from them, in other words, their causality is immanent. As Thompson said, "an organism is 'self-producing' (self-producing) and 'self-organizing' (self-organizing) because each of its parts produces the other reciprocally. It follows that we cannot take the idea or concept of the organism as the cause of the organism itself (...)"[24]. Similarly, Weber and Varela consider metabolism as an empirical case of self-organization

[24] Thompson, 2007.

since it plays the role to keep the organism in a material steady flux [25]. Besides, they address metabolism as an emergent causality which involves two domains of processes, a local and a global, in which organisms' identity is constituted as an emergent causality between these two domains[26].

A biological individual is defined as, "(…) a locus of sensation and agency, a living impulse always already in relation with its world" [27]. While standing in the world, the organism is intrinsically teleological oriented towards 1) the maintenance of its own identity (self-production), and 2) the sense-creation by which it differentiates to its environment (self-organization)[28].

As it was mentioned, Artifacts depend on a designer who produces them following an external model and, therefore, their purpose depends on the attribution of an interpreter, someone who use them in respect to its possibilities. Mechanical principles can explain their functioning. In opposition, living organisms have a self-organizing capacity that cannot be grasped by these principles, because their behavior differs from the movement of a matter. Machines respond to an external purpose. For example, a car is a set of assembled parts that need a specific gear to operate. The designer's idea determines how these parts should be assembled for it, in that sense, its structure is not determined in the dynamic of its components[29]. Although artifacts are organized in such a way that they produce coherent movements, as their components are related to each other, they are mere replaceable means integrated by an external agent. On the contrary, the components of living organisms are co-produced or maintained between a reciprocal causality of self-production. This is referred to an immanent purposiveness[30].

Thompson advocates for a reconciliation between naturalism and teleology and considers that Kant had denied this possibility since the self-organizing causality of organisms was an inexplicable subject for the science of his time. Thompson argues that the development of the sciences on complex self-organizing systems could overcome this gap. The theory of Autopoiesis, for example, offers a detailed scientific characterization of self-production or organization, a subject that Kant banished outside science. Two advances that

[25] Weber and Varela, 2002.
[26] Weber and Varela, 2002.
[27] Weber and Varela, 2002.
[28] Weber and Varela, 2002.
[29] Thompson, 2007.
[30] Thompson, 2007.

would allow scientific explanation, according to him, would be "the detailed tracking of the molecular systems of self-production in living cells" and "the invention of mathematical concepts and techniques for the analysis of self-organization in dynamic systems non-linear"[31]. To solve this gap, teleology should be considered a constitutive principle of living organisms, as the following quote states:

> "Life is an order of emergent nature that results from certain morpho-dynamic principles, specifically those of Autopoiesis. According to this perspective, an autopoietic system is not merely analogous to life, but the minimal instance of life and the elementary (the basis) of every living form known to us"[32].

Another reason to distinguish living organisms and machines is their non-fractionable character. Rosen affirms that, unlike machines, an organism cannot be preserved if the dynamics of its components or its functioning as a unified whole is fractioned. An organism dies when it is fractionated since its functioning as a whole depends on the low-level interactions of its components. On the contrary, machines' components can be replaced by different ones with similar or equal functions and remain useful[33]. Even if their components are structured, they only depend on a sensory-motor contingency (in the sense of a behavioral autonomy)[34].

As we have seen, M&V argued that teleology is not essential to the explanation of the behavior of living organisms and that, fundamentally, is an extrapolation of the discourse of the action[35]. Likewise, according to Thompson,

[31] Thompson, 2007.
[32] Thompson, 2007.
[33] Thompson, 2007.
[34] Thompson, 2007. Rosen notes that other computational models that do not fit under this scheme, such as the Metabolism-Repair System [(M, R) system], could serve to characterize Autopoiesis. In this model, each of the functions is involved with the other functions within a system. This fulfills the previous requirement for a system to not be fractionable without losing its systemic unit. Autopoietic systems are a subclass of (M, R) systems, but the problem with the latter is that they are very general and lack two characteristics of the former: the ability to generate their own limits and delimit their internal topology. Cf. Letelier, Marín, and Mpodoliz, 2003.
[35] Thus, purposiveness would belong only to the thoughts made by the interpreter when integrating the machine into a wider network of meanings. For example, we believe that the purpose of the refrigerator is to conserve food, even if it is only a thermally insulated cabinet. If only the operation of the machinery and not the purpose were considered, then the aspects of it that are not linked to the purposes that man attributes to it could be described. Supposedly, when doing

both authors have in mind the intrinsic purpose described above[36]. In addition, they stated that the operational coherence of living organisms is what has led them to interpret their behavior as intentional[37]. Indeed, it is not easy to explain a spontaneous genesis without referring to finalism. However, for M&V living systems do not operate because they are programmed to do so, but for the maintenance of their relational dynamic that excludes and integrates elements from an environment[38].

Even when living beings could be constrained by their structures but not determined by them since the interactions with their environments can modify this structures. Living beings as open systems are considered social entities since they have the possibility to change by adapting themselves to the challenges that an environment imposes. This does not happen with machines, whose possibilities to change are given in advance by their structural conditioning. They are capable to resist a set of possible disturbances, but no more than that. It follows that it is questionable to understand living beings as machines since they have no purpose and it is living organisms are immanent teleological since they intend to conserve themselves by resisting disturbances or by adapting themselves to them.

Additionally, it is also difficult to consider them as machines because of their spontaneity. Maturana and Varela mistakenly claimed that their spontaneity is a reason to deny their teleological nature. However, as Thompson has pointed out, that could only be correct for an extrinsic purpose, that is, by affirming their spontaneity one neglects that there are externally determined by someone else. However, this is a very narrow sense of purposiveness and their argument cannot deny that there is an immanent purpose that rules their spontaneity. Moreover, Maturana and Varela did not consider that, in a certain way, autonomy is immanent purposiveness. Consequently, they have fallen into a confusion of terms and have forgotten a crucial element in their initial explanation of living beings.

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this type of descriptions one would be being objective. However, this type of description is given in explanatory contexts in which the intention is to highlight certain aspects of a phenomenon for specific purposes, for example, in an engineering class. The rejection of the term of purpose is related to the theoretical interest of the functioning of living organisms.

[36] Cfr. Thompson, 2007.

[37] Maturana and Varela, 1980.

[38] Maturana and Varela, 1980.

As we have seen, the original formulation of Autopoiesis theory intended to understand living beings as machines, but it has been reviewed some of the difficulties that arise from this viewpoint. They two main points of the argument were that 1) machines' acts are meaningless unless an observer or interpret declares that they have a purpose, 2) living beings are not-fractionable systems, and 3) living beings are also open-systems that can modify their structures in the history of the interactions with their environments. It has been considered that these differences are sufficient reasons to not refer living organisms as machines.

3. The intentionality of autopoietic systems

In what follows, it will be argued that structural coupling, or the capacity that living organisms possess to self-produce as systems in the interactions with their environments, can be understood as their intentionality. First, the concept of phenomenological intentionality considered as the constitution of meaning and being grounded in a meaningful world will be explained. Then, it will be discussed whether it can be pertinent to describe living organisms.

One of the meanings of intentionality is consciousness[39]. Intentional entities are meaning-directed, that is, they transcend themselves. However, not all the mental states are intentional in this senses[40]. For example, Heidegger considers that consciousness is not the most relevant aspect of intentionality. Even if is appropriate to explain the theoretical relationship with an object of reflection, it fails to address the engagement of subjectivity in the world[41]. Instead of it, Heidegger understands subjectivity in its rooting and confrontation with the mundane life: in other words, subjectivity is grounded in a meaningful world which is the horizon[42] of all possible meanings and from which the Dasein interprets itself. Being in a world is different from representing a world since subjectivity is structurally coupled in its environment, and does not represent it. Following this, Levinas points out that

> "The transcendental activity does not consist in reflecting a content, nor in the production of a thought being. The constitution of the object is situated in a pre-

[39] Husserl, 2013, §74.
[40] Cfr. Kriegel, 2003.
[41] Cfr. Zahavi, 2003a.
[42] Cfr. Rizo-Patrón, 2012.

> predicative 'world' that, nevertheless, the subject constitutes; conversely, being in the world is nothing other than the spontaneity of a constituent subject, without which being in the world would have been simple belonging of a part to a whole and the simple subject result of an element"[43].

The world is, then, the horizon of non-conscious meanings that support all activities. About the concept of 'world', Heidegger affirms that "the stone is without world" (Weltlos), "the animal is poor of world" (Weltarm) and "man shapes the world" (Weltbild), that is, that the criterion that distinguishes the living from the non-living is the belongingness to a world[44]. "The stone is without" or "lacks world" is a first-person observation that is made by comparing the relationship of the stone with its environment with respect to the one we as humans have with our world[45]. From another perspective, the stone lacks a world because cannot be irritated o perturbed, that is, it does not configure structural changes based on the influences of its environment. Since it is indistinguishable from its environment, it has no environment. By extension, the animal or the amoeba, in their respective "poverty" do have a relationship with a world that deserves to be discussed. Poverty does not mean the mere absence of the world, which is the case of the rock, nor does it mean that the animal world is less complex than the human one[46], but in the sense that

> "The world of every single animal is not only limited in its scope, but also in the way of penetrability in that which is accessible to the animal. The working bee knows the flowers it visits, its color and aroma, but it does not know the pistils of these flowers as pistils, it does not know the roots of the plants, it does not know such thing as the number of the pistils and the leaves"[47].

It is interesting that Heidegger has pointed out to the impossibility to recognize an active and conscious intentionality in the animal as the cause of its poverty of the world. Does this make the human world an open horizon of senses and possibilities? Is the animal world static? Is the animal engagement with its environment as much as complex as the human being in the world? In

[43] Levinas, 2010.
[44] Cfr. Candiloro, 2012.
[45] It can be said that in the definition of the stone as a wordless, the Dasein is in a certain way presupposed. Cf. Candiloro, 2012.
[46] Heidegger, 1995.
[47] Heidegger, 1995.

other words, is the active and conscious intentionality the only one that constitutes meaning? In any case, both humans and other animals live in an environment that is significant to them and with which they maintain an open relationship.

Searle adopted a similar stance when considered intentionality as an explicit awareness of something. He did not take it as the constitution of meaning, as phenomenology does. An objection to his position is that there are intentions that are not explicitly conscious, without being "less intentional" for that reason. In any case, he replies that they should at least be potentially conscious[48]. However, what he is confronting is whether intentionality is the gender or a species of consciousness. If it were species, it could not be extended to living organisms, while, if active consciousness were only a species of consciousness, intentionality would be the gender of it and, then, intentionality should not necessarily mean consciousness.

The problem for accepting Searle's position is there are intentional experiences in which the subject and the object are not easily distinguishable, but rather they behave in a similar way to the structural coupling, the unity between the organism and its environment, thus it does not fit with the species "explicit awareness of something". For instance, when touching a hot object, one does not experience the pain as a propositional awareness of pain, rather, it is experienced as an irritation or bodily pain. Consciousness in its rational significance is not relevant here because pain is experienced whether it is experienced by an adult, by a child who has not learned to speak, or by an animal. In all of them, pain involves an intentional response, the excess of pain motivates the body to evade, a response that does not need reflective self-awareness, which is not possible for most of the animals. The irritation that motivates that embodied response is independent of consciousness shapes both human and non-human interactions with the environment. But it is not extensible, for instance, to a stone, because it cannot be disturbed as it lacks thermal sensations, which are linked with the possession of a nervous system. What is being denied here is that to feel the burning is to form a representation of the heat, even when both in the feeling and in the representation, there is a movement that, in the case of feeling, is directed towards an object.

[48] Searle, 1983.

Another aspect of intentionality is that living being stands themselves in a world[49]. In “From the Existence to the Existant”, one of Levinas's first writings, he employed the term “positioning” to refer to this kind of intentionality situated at the level of the living body. He considers that subjectivity, before taking the form of consciousness or reflective consciousness, means being situated or embedded, that is, "the location of consciousness is not subjective, but the subjectivation of the subject"[50]. The individual acts in a world in which is situated. Being embodied means, then, being grounded in a world. Being part and, at the same time, different from the world that, "before being a geometric space, before being the concrete environment of the Heideggerian world, is a base"[51]. The surrounding Heideggerian world, of what is "at hand", is less original than the environment that supports conscious and non-conscious life. The distinction between the organism and the environment is not situated in the capacity to categorize, rather, on a sensitive level, as in the case of pain shows.

The location or intentional standing is then a property that can be extended to organisms in general. Levinas takes intentionality as the self-referential character of subjectivity, which consists in being open to the possibilities or to transcend itself, for instance, for a transformation of our environment that forces us to modify our behavior is a transcendence. What is transcendent is simply an exteriority which challenges our engagement in the world. To Levinas, subjectivity, regardless the exteriorities, intends to maintain itself as an immanence[52], that is, as a static system that can overcome external influences. However, Marder has suggested that plant behavior responds to a certain form of intentionality which does not involve consciousness, in the sense that they open themselves to a transcendence by immersing themselves in their environment, "they merge" in it, "proliferating without the intervention of conscious representations”[53]. The transcendence here alluded is directed to the

[49] The term is used for the first time in "Sur les Ideen de M. E. Husserl", to refer to the standing of the active consciousness. However, later Levinas employs it to refer what is presupposed in the active sense of intentionality. In Totality and Infinity, the standing no longer means the active consciousness, but the consciousness that "sets" or "merge" in its world, in a similar way than the *Geworfenheit*.

[50] Levinas, 2006.

[51] Levinas, 2006.

[52] Cfr. Levinas, 2012.

[53] Marder, 2013.

alterity of the world, which is different and prior to this distinction between the self and the other [54]. The alterity proper to plants would be the medium in which they emerge as individual organisms. This point is crucial for our argument because even when intentionality is understood as self-reference, intentionality is always a relation to an exteriority. Considering this, the peculiarity of the intentionality of living organisms is that they have their environments as a horizon, those elements that are not part of their internal dynamics and with which, however, they interact.

To conclude, I would like to draw some guidelines for the dialogue between the theory of Autopoiesis and the phenomenological concept of intentionality. In the first place, the concept of intentionality, which supposes an immanent purposiveness, can describe the open nature of the organism and its dynamic with an environment that constrains and supports it. Also, it affirms the spontaneous character of the constitution of meaning. The relationship with an environment, which I have described as structural coupling, cannot be explained only through the concept of intrinsic purposiveness, hence the need for the concept of intentionality as a theoretical alternative. Intentionality, in this respect, reveals that structural coupling is a self- and world constitution. Finally, under the light of this concept, Autopoiesis is exhibited as the idea that all the actions of a living organism are autonomous but context-dependent, spontaneous but constrained by the mechanism that regulates the organism.

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