Biosemiotics and Bioenergetics: Two Perspectives Compared

Giulia Degl'Innocenti

Abstract The purpose of this work is to show how the body, understood as a biological body or as the expression of psychic phenomena, represents a dimension that is open to the world, expressive and inhabited by meaning. To this end, two disciplines will be juxtaposed: biosemiotics and bioenergetics. They seem alien to each other and come from two different disciplinary fields; nevertheless, they present some interesting similarities. According to biosemiotics, the living world is generated, structured, and evolved through semiosis, and the biological body is, therefore, the place of signification. At the same time, bioenergetic analysis shows how the body is inscribed in particular psychic meanings related to the individual's relational and affective experience. In both, therefore, the body is delineated as a reality characterized by meaning.

Keywords Biosemiotics · Bioenergetic analysis · Semiotic relations · Umwelt · Living world · Constraints · Character analysis

1 Introduction

Although they stand as two disciplines with separate origins and development, the biosemiotic paradigm and bioenergetic analysis present many similarities and offer an original contribution to an interpretation of the body as a dimension inhabited by meaning. Therefore, this study aims to do a comparative survey that will bring to light the common features of the two approaches.

In the first place, biosemiotics and bioenergetics share the idea that the body, which may be understood as a biological body or as the expression of psychic phenomena, constitutes a creative dimension open to the world and not reducible to a simple pre-established mechanism. In this context, relationship, the rapport with

G. Degl'Innocenti (✉)
Department of Humanities, University of Studies of Florence, Florence, Italy

E. Pagni, R. Theisen Simanke (eds.), *Biosemiotics and Evolution*, Interdisciplinary Evolution Research 6, https://doi.org/10.1007/978-3-030-85265-8_13

what is external, plays a primary role and is the mode in which the body lives and defines its structures.

In the second place, the possibility that the body represents a dynamic, not predetermined, dimension is given in both approaches by the specific link that they maintain with meaning. Indeed, for biosemiotics, the living world generates itself, evolves, and creates its own forms through semiotic processes. In this sense, every structure represents the result of a relationship that is semiotic in nature.

In parallel to this, bioenergetics interprets an individual's physical attitude as the outcome of psychic processes and affective and relational experiences. Thus, the body is capable of producing a system of symbols and transforming into a totality of meanings formed over time in a dimension that bears on itself the inscribed signs of a narrative, of its relation to the world, like a map that helps guide therapists.

The present study is divided into two parts: the first concentrates on analyzing the biosemiotic paradigm, the second on bioenergetics. Both disciplines are situated in a historical, ontological, and epistemological framework.

In the first part, an initial section is devoted to locating biosemiotics in a historical context, illustrated with precursors and pioneers (1.1). In a second section, the concepts of "*Umwelt*" and "*Innenwelt*" are analyzed and reread in the light of studies of biosemiotics (1.2) in an attempt to understand the ontological considerations that these concepts may suggest. By contrast, the third section will try to outline, from a biosemiotic viewpoint, the modes by which life structures, experiences, and knows itself (1.3). In this context, the concepts of relationship and limit will emerge and occupy a central place, being essential for delineating the organism as an open and relational dimension, but at the same time defined by its own boundaries.

The second part will deal with bioenergetics and the original interpretation of the body that it offers. As before, the first section provides some historical notions aiming at contextualizing the discipline (2.1). The second section investigates the concept of bioenergy and analyzes the connected functions of charge and discharge (2.2). By contrast, the third and final section studies the expressive modes in which the body gives voice to its own psychological experience, with particular attention to the analysis of characterological structures (2.3).

2 Biosemiotics: Body and Meaning

2.1 Historical Hints: Precursors and Pioneers

The paradigm of biosemiotics offers an original contribution to the idea that the body weaves a privileged relationship with meaning. According to this perspective, life emerges, generates, and evolves through semiotic relations: semiotic processes characterize the living world, and the biological body (in the broad sense of the term, as living matter) constitutes the epicenter of meaning. At the same time, meaning is not the prerogative of a disembodied mind, as a human privilege, but

is rooted in the body, in its organic processes: life has always been meaning and meaning exists only as a living product.

The main idea behind biosemiotics is the belief that biological processes are semiotic processes. Therefore, meaning is how life expresses itself: "biosemiotics," writes Maurita Harney (Harney 2007, p. 134) "is premised on the idea that all living organisms engage in processes of signification and communication by means of signs."

If signs are the foundation of organic life, communication, and the relationship with the other represent the conditions of life for any organism. Therefore, biosemiotics is concerned with analyzing how this happens, showing how, if we deal with life, both at a macroscopic and microscopic level, we necessarily talk about meaning.

Admitting the existence of an indissoluble link between life and meaning involves establishing a union between two subjects such as semiotics and biology: biosemiotics represents the possibility of endorsing the union since it constitutes the point of arrival of two disciplines which, structured as separate, realize that they cannot live without each other, having always been intimately interconnected.

Although biosemiotics appeared relatively recently in the scientific panorama as a defined and specific field, the idea that life is meaning right from the outset starts to take shape between 1961 and 1966 (Barbieri 2008a) with the discovery of the genetic code. The theorization of the genetic code—and hence of a linguistic principle, of a "communicative" order in the organism's depths—opens up new research possibilities. However, the idea was not enthusiastically accepted within the scientific community. In fact, communication has always been the concern of a different field from biology, a field with different methods and objectives. Thus, after such a discovery, how can a linguistic principle be combined with the life sciences without abandoning the quantitative methods and categories of scientific investigation? The answer comes quite easily. The term "genetic code," it is said, must be used in a metaphorical sense, as "a linguistic expression that biologists have adopted just because it was intuitively appealing. Deep down, according to this view, the genetic code is but a metaphor because all its features must be completely accounted for by physical quantities" (Barbieri 2008a, p. 578). Therefore, "code" simply means a sequence of "information" reducible to a set of biochemical processes. With this interpretation, the biological body continues to be conceived as a quantitative dimension that responds to mechanical principles.

In parallel to the discovery of the genetic code, something starts to move in the field of semiology. The Hungarian semiologist Thomas Sebeok realizes the limitations of a purely semiological approach compromised by an excessive anthropomorphism and proposes a widening of the subject's boundaries.

In 1963, inspired by the contents of Jakob von Uexküll's work, *Theoretische Biologie*,[1] Sebeok suggests the hypothesis that even communication between

[1] Here begins a long collaboration between Sebeok and von Uexküll's son, the physician Thure von Uexküll. Cf Barbieri (2008a); cf. Petrilli and Ponzio (2013). Von Uexküll is considered, together

animals is founded on the sign and introduces the term "zoosemiotics" (Barbieri 2008a). Subsequently, detecting the further limitedness of the term, which confines meaning to the animal world, he proposes using "biosemiotics" to indicate how semiotic processes concern life in general and are indeed its foundation.[2]

In the 1980s, the idea that semiotics might apply to more varied research fields begins to make powerful advances, but it will only be in the 1990s that biosemiotics will find a way to assert itself as a specific and defined field. In 1992 Jasper Hoffmeyer met Kalevi Kull and Thomas Sebeok in Glottertal (Petrilli and Ponzio 2013), and the first avowedly biosemiotic research group is formed. As the years' pass, it is configured more and more as a discipline defined by its own principles, though these are polyvocal and varied.

Sebeok is today considered the father of biosemiotics. He suggested the idea of a "global semiotics,"[3] which promotes an interactive, interdisciplinary, and cooperative approach to the subject.

Although Sebeok is the initiator of biosemiotics, he acknowledged Charles Sanders Peirce, Charles Morris, and Jacob von Uexküll as worthy precursors (Petrilli and Ponzio 2013). As an example, biosemiotics inherits the Peircean concept of interpretation and readjusts it to the world of life. Organisms inhabiting a semiosphere move between signs and are involved in processes of interpretation.

> Peirce claimed that "the universe is perfused by signs, if not entirely composed of them", thereby indicating that the locus of meaning in the case of the sign is not the human mind, but rather processes in nature. (Harney 2007, p. 133)

However, what precisely interpretation means?

According to Peirce, the sign has a triadic structure that consists of a "sign vehicle" (sometimes called "representamen"), an "interpretant," and an "object." The "sign vehicle" represents the sign, something that stands for something else and refers to an "object." The interpretant is the most interesting figure of the three in that it constitutes the action that connects sign, vehicle, and object, which implements signification. Let us take an example provided by Maurita Harney:

> Suppose, looking at the horizon, I see smoke and I take this as a sign that there is a fire in the vicinity. Here, the relation between the *sign vehicle* (smoke) and its *object* (fire) is mediated by a third term, the *interpretant* (my thought of the fire). The sign relation here cannot be

---

with Charles S. Peirce, Juri M. Lotman and Charles Morris, the biosemiotics' precursor. Cf. Ibid., p. 382.

[2] On the question of the year when the term was coined, cf. Barbieri (2008a): "I am not quite sure that I can pinpoint Tom's original coinage of the term "biosemiotics"—I think it is 1975, but Kalevi Kull has suggested 1972′ (Ibid). Other authors differ on the date. Cf. Petrilli and Ponzio (2013, p. 380). In fact, it was a 'term that had already been proposed by Juri Stepanov in 1971, but which had appeared for the first time in 1962, when Friederich Rothschild used it to illustrate a new approach to psychology' (Ibid.).

[3] "After a paper of 1994 entitled 'Global semiotics,' Sebeok consolidated this expression, proposing it as the title of his book of 2001 (the last published before his death that same year)" (Petrilli and Ponzio 2013, p. 375).

> reduced to two dyadic, causal relations, one between *object* and *sign*, and the other between *sign* and *interpretant*. (Harney 2007, p. 138)

Therefore, we encounter meaning where there is a process of interpretation that associates a particular sign to a specific object. From a biosemiotic perspective, the hypothesis of an "interpretant" guarantees the irreducibility of biological systems to pure mechanisms; it makes them semiotic.

Admitting the presence of interpretative procedures in the living world implies breaking free from the idea that the exchange of information that characterizes biological processes is regulated by a cause-effect relationship, where the relationship between the sender and the receiver is previously determined.

On the other hand, the receiver is always an interpreter. According to the biosemiotic hypothesis, the processes that involve the organism do not follow a predetermined path but are defined by an act of signification: the interpretant is what establishes the meaning of the sign and therefore what provides an "interpretative decision" on every occasion, a "response" that is never the only one possible.

In addition to Peirce, another author recognized as a worthy precursor of the biosemiotic paradigm is the biologist Jacob von Uexküll, to whom we owe the concept of "*Umwelt*" elaborated in 1909 (the concept was later developed in 1920 in *Theoretische Biologie*). *Umwelt* means the subjective and qualitative environment in which each animal lives, by which it is "wrapped" and maintains a relationship that, in the light of biosemiotic studies, can be defined as semiotic. It is defined as the "perceptual world," the world perceived by the animal, and as "an effector world," a world in which the animal does not assimilate external stimuli passively and mechanically but "acts" on its environment and contributes to its definition.

This world environment is formed by a series of components that von Uexküll defines as "marks" (*Merkmalsträger*) and which are the only elements that make sense to the animal. Therefore, the concept subverts the anthropocentric belief that every living being has access to the same world, understood as an objective totality regulated by quantitative principles.

2.2 *Biosemiotics and the Concept of Umwelt: Some Ontological Considerations*

The biosemiotic paradigm inherits and adapts the concept of *Umwelt,* conferring a specifically semiotic connotation upon it. According to this perspective, the *Umwelt* is defined as "a qualitative and meaningful model of a species' significant surrounding" (Sebeok 1986, p. 23) and also "Umwelt is not a set of objects in the environment but rather a system of signs interpreted by an organism" (Sharov 2001, p. 211). Therefore, the organism and its environment are not linked by predetermined relationships, by physical laws or quantitative principles, but move in a semiotic and qualitative relationship of reciprocity. The specific and experiential relationship

that the organism establishes with its surroundings and the system of symbols created determine the Umwelt.

"The experience," Hoffmeyer writes, "is at each moment the superior, immediate, and unconditional interpretant in the ongoing biosemiosis of the organism [. . .]. In other words, we suggest that the phenomenon of experience has primitive parallels all over the lifeworld" (Hoffmeyer 2008, p. 188).

Furthermore, the *Umwelt* does not represent a neutral dimension, a "blank sheet of paper" on which the living being inscribes its meanings, just as the organism is not parachuted into its environment as into a structure already pre-ordered or involved in an exclusively perceptive dimension. There is no priority of one of the two terms over the other, but they are in an experiential relationship of co-determination and co-specification. In this sense, *Umwelt* is not defined as an accidental feature of a living being but represents its foundation, how an organism is structured as such (Tønnessen et al. 2018).

The animal body, its sensorial apparatus, which takes the name of *Innenwelt*, is structured by the meanings of its world environment (i.e., the marks). The *Umwelt*, in turn, is delineated thanks to the action of the animal body. *Umwelt* and *Innenwelt*, therefore, represent two different notes within the same musical score. The organism confers the former's meanings, and the latter takes its form thanks to its relationship with the environment.

Varela, Thompson, and Rosch provide an example of the co-determinant relationship between living beings and their environment in analyzing the relationship between bees and flowers.

> It is well known that honey bees are trichromats whose spectral sensitivity is shifted toward the ultraviolet. It is also well known that flowers have contrasting reflectance patterns in ultraviolet light. [. . .]. It is therefore interesting to observe that the colors of flowers appear to have coevolved with the ultraviolet sensitive, trichromatic vision of bees. (Varela et al. 1993, p. 201)

The bees' sensory-motor apparatus and the flowers' chromatic structure evolved and were structured together through what Varela, Thompson, and Rosch define as a history of "structural coupling." This coupling is responsible for forming the various structures, both of the spectral sensitivity of the bees and the ultraviolet reflection patterns of the flowers. The example sheds light on the fact that *Innenwelt* and *Umwelt* are two dimensions enveloped in each other and developed from each other, established together in a relationship of co-determination.

A central notion in biosemiotics and linked to the concept of *Umwelt* is that of "dialogue." As it is understood here, the concept dates back to the Russian theorist Mikhail M. Bakhtin but is adapted by biosemiotic studies and provided with biological bases. The main idea is the belief that the semiosis of biological systems is articulated in a dialogical form.

Meanings are continually inscribed in the living world and arise from a dialogic relationship, a continuous dialectical comparison between what is "proper" and what is "other," between "inside" and "outside." Therefore, dialog does not merely represent a means of interaction, but rather the a priori that makes life possible,

allowing forms, stabilizations and therefore organisms to be created. It is the basis of every individual formation.

The organism always falls into a dialogical context. This condition means that the living world takes the form of intercorporeity, of a dimension with evanescent borders and connoted by otherness.

> Dialogism and intercorporeity denote interconnectivity among bodies in the great sign network that is life. The mere fact of being alive already places living beings, including human beings, in a sign network, or to evoke an organic metaphor dear to Sebeok, in a semiotic web, that is, in a situation of interconnectivity with the other, including other forms of life not human (nonhuman animals, plants) as well as the inorganic. To set aside the other, to ignore the other is impossible, just as to ignore dialogue is impossible. (Petrilli and Ponzio 2013, p. 386)

The concept of Umwelt, as well as the hypothesis of an intercorporeity, suggests some ontological considerations. The various *Umwelten*, the many semiotic worlds in which organisms are involved, and their relative interaction constitute what some authors define as "semiosphere." This concept was first developed by Juri Lotman in 1982, as distinct from that of "biosphere" formulated by Vladimir Vernadsky (Kotov and Kull 2011). Thomas Sebeok then introduced the concept into biosemiotics and extended its meaning (Petrilli 2003). From a biosemiotic perspective, the biosphere and the semiosphere coincide.

Considering the living world as a semiosphere, as a semiotic dimension, means abandoning a conception of reality understood in an objective sense, as a set of predetermined and universal rules. It means understanding the living world as a result of semiotic exchanges and interactions. It means giving relationships a primary role.

However, does breaking free from the realm of objectivity entail looking out to that of subjectivity? Does *Umwelt* represent the subjective ontological space that every living being occupies? What is the position of biosemiotic thought about the possibility of attributing a form of subjectivity to the living being? In this regard, it is necessary to suggest some points for reflection. As Tønnessen emphasizes, "biosemiotics depicts a world of the living in which all living beings are to be regarded as true subjects actively engaged and involved in (and through) their life-worlds" (Tønnessen 2009, p. 58). Therefore, according to this perspective, it is appropriate to extend a principle of subjectivity to the whole living world. However, Tønnessen also reminds us to be careful not to confuse a biosemiotic interpretation with an anthropocentric conception, which provides for the attribution of mental states to every living being. In this regard, he proposes a distinction between "mental states" and "semiotic states:"

> In analogy with notions such as "mental state" and "cognitive state", I suggest to use the term semiotic state. While in philosophy of mind a 'mental state' refers to a certain performance which is unique to rational or sentient beings, a 'semiotic state' is to be understood as the state of a sign process, an inner state (in its most general form) which might be said to be distinctive not only for all living beings, but for all living systems, as far as they possess what we could call semiotic integrity, defined as an autonomous (self-organized) coordination of semiosis. (Tønnessen 2009, p. 63)

In conclusion, biosemiotic thought and its concept of *Umwelt* allow a rethinking of the living world, freeing it from its objective and deterministic interpretation, which understands it as a uniform structure regulated by mechanical principles instead of understanding it as a dynamic, creative, and relational dimension. Furthermore, according to some authors, every living being can be conceived as an acting subject. However, this consideration does not imply the "humanization" and attribution of a form of consciousness to the entire biological world.

2.3 The Living World Between Relationships and Constraints

The ontological considerations raised above and the biosemiotic readjustment of the Umwelt concept enable some reflections. There is a relationship of co-specification and co-determination between the living being and its environment, and the exchange of information takes place through semiotic processes. As a result, the definition of a permanent structure comes after the establishment of a relationship. Therefore, a biosemiotic perspective suggests an interpretation of the living being according to which the relational element represents the primary element and structures life.

Since symbolic processes have a bodily matrix and the biological world is connoted by meaning, adopting a biosemiotic perspective means definitively moving beyond the Cartesian dualism of mind/body, *res cogitans* and *res extensa*. The consequences of this dualism, on an epistemological level, are the reduction of semiosis to an incorporeal mental act and of the body to a quantitatively determinable physical matter regulated by mechanical and quantitatively determinable laws. According to biosemiotics, "life and semiosis are coextensive" (Kull et al. 2008, p. 43).

> [. . .] dualism, the idea that *soma* and *sema* represent equally inescapable but incompatible dimensions (substances, properties or whatever) of our world. [. . .] The main problem is that it is not obvious what the matter-spirit distinction is all about. The idea of passive matter as ruled by natural laws (or by the heavenly ruler) has long ago lost its credibility. Instead, modern conceptions of physical nature make ample space for the vision of the world as an emergent process in which those peculiar things we call living systems and their bodies might well have evolved as genuinely semiotic creatures. (Hoffmeyer 2008, p. 170)

Overcoming a dualistic logic has two implications. First of all, the abandonment of reductionist biology; secondly, the redefinition of semiosis as a non-purely mental prerogative of human beings.

Reductionist biology reads the processes that underlie life in quantitative terms, as physical-chemical processes regulated by physical laws. Thus, living beings are reduced to objective entities, to surfaces that can be analyzed *partes extra partes* and function mechanically. Furthermore, the organism is conceived as "the sum of its parts," so that the whole's properties represent the direct expression of its constituent elements, and each component corresponds to a particular function. Giorgi (Giorgi 2017) says in this regard that the strictly reductionist analysis represents the

functions as attributes of the parts. For example, the heart is used to pump blood, the lung to breathe oxygen, and the brain to think. According to a biosemiotic perspective, however, a reductionist biology addresses the phenomenon of the living being only a posteriori, positing it in terms of a re-composition of its functions, as if they constituted predetermined entities. Therefore, its *modus operandi* consists in isolating the single parts and subtracting them from the set to which they belong.

According to Giorgi, while this strategy can be valid on an epistemological level and adopted as a cognitive procedure, it is not ontological. The error is to consider the parts' properties as predefined and previous to the relation that binds them, conceiving the mechanism as what determines the interaction, not as its result. Thus, the subjective nature of the living and the relative behavioral autonomy it enjoys compared to the physical-chemical mechanisms are disregarded. In fact, when one observes an organism or its parts without considering the whole they belong to, they are subtracted from all the potential interactions that define the context within which their functions manifest themselves (Giorgi 2017).

Therefore, analyses of this kind apply to the world of objects, whose behavior is determined by the law that describes it and is therefore predictable. However, they do not apply to the living world, where the interactive element is essential: every property emerges from relationships and is configured as the realization of one alternative among the many available.

The second implication resulting from overcoming a dualistic logic consists in the need of redefining semiosis. Biosemiotics, connecting meaning to the sphere of life, offers an appropriate response to the problem: meaning is not reduced to a verbal reality but becomes the prerogative of the living being understood as an organism. Consequently, the processes of signification do not concern only the human being but every living being. After dismantling anthropocentrism, "human language" is therefore configured only as a specific modality, "a species-specific modelling device" (Petrilli and Ponzio 2008, p. 34), of a much wider semiotic process that involves the whole biological world.

From an epistemological perspective, it is interesting how the living being known itself, creating and defining its own structures. As previously mentioned, organisms are structured and take their shape through a semiotic exchange and thanks to a relationship. Therefore, the consolidation of a structure can be understood as the establishment of semiotic boundaries, as a negotiation between inside and outside.

The genotype/phenotype relationship can provide a classic example. According to a gene-centered view, the phenotype is expressed deterministically from the genotype and "the organism is left with the purely passive role of container of genes" (Giorgi 2017). However, from a biosemiotic perspective, the genotype does not contain its phenotypical realization within itself, and any coding of "information" takes the form of an interpretation. In turn, the interpretation occurs based on a "context," which provides the key to reading the message.

Therefore, in the passage from genotype to phenotype, the transmission of characters does not take place directly, but thanks to the intercellular universe's interpretative context. In this regard, Pagni writes:

> (. . .) [the] genotype does not contain a complete description of the phenotype that genetic constraints do not exert unidirectional (linear) causal influence from DNA to RNA [. . .]. There is therefore no simple relation between genome and the construction of the organism: biological information is inseparable from its context, meaning that it needs to be interpreted [. . .] the genetic code cannot operate out of its coextensive array of cellular and molecular mechanisms, which, in turn, are determined by specific historical and functional contexts. (Pagni 2016, p. 63)

In this sense, according to Giorgi (Giorgi 2017), the information transmitted has a "semantic" rather than "syntactic" character: it is not merely reconstructed from the phenotype in its structure but instead interpreted in its content. In fact, the phenotypic realization does not represent the direct execution of a pre-established message in the genetic structure. The information "is formed" during its transmission.

Therefore, the reception of the message takes place actively, based on a shared repertoire of which the source is already in possession and which the receiver must only interpret. Cellular differentiation and embryonic development do not occur because of pre-established information, but, on the contrary, because there is information that is gradually being constructed according to stage-by-stage choices (Giorgi 2017). Furthermore, the gene-centric vision leads to a deterministic conception of the living being, for which the genetic structure directly causes the organism. On the contrary, the biosemiotic believes that even equal-level relations intervene even from the hierarchically inferior levels.

The interpretative capacity of the living being, expressed at each level (Barbieri 2008b), makes the organism a semiotic dimension formed step by step through "choices" and whose path cannot be entirely predictable. In this perspective, the cells "respond" to signals with interpretations, and the body acts by taking account of its personal history, its registered meanings, its structures. Therefore, every living being, at whatever level of complexity—from cells to human beings—is endowed with the capacity to interpret its own environment and to choose among the alternatives that the environment makes available to it (Giorgi 2017).

A further contribution to the idea that the living being is structured by semiotic "choices" comes from Sebeok and his theory of the immune system as a defining system of the self. According to this perspective, the organism's ontogenesis begins with distinguishing between the self (*ego*) and the other (*alter*). This distinction is obtained through the recognition by the immune system of the antigen as something foreign, a non-self (Petrilli and Ponzio 2013).

The fact that the distinction "ego"—"alter" is not an a priori, something defined once and for all even within the organism, supports the hypothesis that the living being does not represent a stable dimension but is the temporary result of a continuous and inexhaustible tracing of borders. Therefore, as something distinct from otherness, the organism as unity is never a predetermined and immutable structure. Instead, its evanescent boundaries result from a series of interactions, negotiations, and exchanges between an "inside" and an "outside."

The "skin" metaphor, proposed by Jesper Hoffmeyer, can be useful to show the semiotic essence of the living world. "On one hand," Hoffmeyer writes, "the skin

thus serves us as a kind of topological boundary; while, on the other hand, its semiotic capability opens up the world to us" (Hoffmeyer 2008, p. 174). The skin is configured as a border, a liminal layer, an interface between an outside and an inside. It represents the semiotic space par excellence, where the dialog with the outside takes on a form in which the first meanings are assigned.

> It reminds us how indispensable the skin is in semiotic terms as well. The skin keeps the world away in a physical sense but present in a psychological sense. It is the skin that gives us the experience of belonging—it allows us to feel the world. But the very fact that the world can be felt is already a complex phenomenon that doesn't just presuppose that there are receptors (sensory cells) in the skin that register touch, pressure, pain, cold, warmth, pH, and various chemical influences, but also that biological meanings are assigned to these sensations. (Hoffmeyer 2008, p. 172)

"Skin" generally means the outermost layer of the body. However, a particular type is also present in the body's depths, both as a cellular membrane and as a coating inside the cell (think of the structure of the "organelles"). The epidermis, understood as a surface, a membrane and a place of exchange between outside and inside, affects the organism at every level. It best defines this organism as an interface, a decentralized semiotic unit where there is a constant reference to an outside, to its surroundings.

Thus, the skin is configured as the place of passage between an outside and an inside. It follows that the living being is also a closed unity, identifiable from otherness, despite being "open" to a continuous exchange with the exterior. "While living entities," writes Sebeok, "are, in a commonly recognized sense, open systems [. . .], they are at the same time closed systems, in the sense that they make choices and evaluate inputs, that is to say, in their semantic aspect" (Sebeok 1989, p. VII).

The concept of limit, therefore, plays a fundamental role in biosemiotics. The limit represents the constitutive principle of life, of how the biological world is organized. There are no unlimited organisms.

However, the hypothesis of a binding principle is not contrary to the relationality that characterizes the living, but merely the "form," the "limit" as per our previous definition. The "constraints" are therefore configured as necessary elements to ensure certain stability and permanence to the organisms, to guarantee their equilibrium and keep them cohesive under an identifying sign (Pagni 2016).

Nevertheless, the limits are also the premise for living beings to experience certain freedom. In fact, since the boundary between self and other is not clearly marked in the biological world, the organism must use a mobile and flexible principle that allows it to measure itself against what is happening around it. In this sense, in biosemiotics, the concept of "limit" replaces that of "law." The law appears as a definitive enunciation, established once and for all. On the contrary, the "limit" represents an approximate principle that does not mark any definitive attitude.

> Contrary to physical objects, a biolon (a cell, an individual, a species) is far from the state of equilibrium and nested within an unpredictable and contingent phenomenon [. . .]. Moreover, whereas the physical objects are characterized by the preservation of laws during

> transformations, the global structural stability of biological systems is associated to variability and permanent changes of symmetries. (Pagni 2016, p. 67)

The limit, thus understood as a regulating principle of the exchange between organism and environment, has a semiotic nature. Therefore, the living being is defined as a structure "bound" by semiosis, by interpretative processes that establish its form. In this sense, the organism can be understood as "semiotic closure." Since an organism is situated, limited, and the result of a singular history, not everything is possible. Only in this context can meaning emerge. In artifacts, by contrast, there are no mechanisms of self-regulation that would limit their functioning (Benasayag 2016).

In this perspective, the concept of "interpretation" undergoes a restriction. The interpretative processes in which the living being is continuously involved are only possible within a context, a range of limited possibilities. Giorgi (Giorgi 2017) claims that "interpretation" means the living being's capability to explore the surrounding environment actively and, therefore, be constantly confronted with the interactive possibilities offered by it.

Therefore, the interpretative margin available to the organism is restricted by the presence of constraints of meanings formed over time that have established its operating rules. Thus, the previous choices constrain future ones by restricting the field to grant the body a limited degree of freedom of action. Once a semantic *habitus* has been established, this becomes binding for all the interpreters who share the same semiotic system as a map to orient the exploration of the territory (Giorgi 2017).

In this regard, a relevant notion in the biosemiotic paradigm is the "scaffolding," a term coined by Hoffmeyer in 2000. The scaffolding is a kind of "structure," which ensures the organism's equilibrium. This structure is not predetermined and given once and for all but has crystallized over time due to its interactions and semiotic processes. The temporal element is fundamental in this perspective.

> This network of semiotic controls establishes enormously complex semiotic scaffolding for living systems. Semiotic scaffolding safeguards the optimal performance of organisms through semiotic interaction with cue elements which are characteristically present in dynamic situations. History thus not only matters to the cell, but literally operates inside the cell through the structural couplings—or semiotic scaffolds—that it has served to build into the system. And this is exactly what distinguishes living systems from non-living systems: the presence in the former of historically created semiotic interaction mechanisms which have no counterpart in the latter. (Hoffmeyer 2015, p. 149)

Hoffmeyer (2015) reports the example of the *Escherichia coli* bacterium. This species can detect the concentration of nutrients in the surrounding environment and record any changes. Any change in the concentration of an edible amino acid causes the bacterium to swim upstream towards the amino acid source. This behavior depends on a sophisticated interaction of different proteins that cooperate to compare two measurements taken at different times. The result of the comparison is transmitted to the surface of the cell where the flagella, responsible for the movement, are located. Interpreting the message, they move the body of the bacterium in the indicated direction. Therefore, the *E. coli* has a structure, a "scaffolding," in which

the sensor apparatus and the motor system are connected. This structure also refers to an "external" element present in the bacterium's *Umwelt* (the concentration gradient of nutrients in the liquid).

The behavioral pattern of *E. coli* has evolved over time, establishing itself as a typical structure of the species: history thus not only matters to the cell but literally operates inside the cell through the structural couplings—or semiotic scaffolds—that it has served to build into the system (Hoffmeyer 2015, p. 151). The relational processes that involve the organism, therefore, sculpt its biology in various scaffoldings.

In this context, another central notion is that of "memory." Memory understood as biological or corporeal memory, both ontogenetic and phylogenetic, represents the context in the light of which every interpretation, which makes it possible, takes place.

Therefore, each structure derives from an experiential, qualitative relationship that does not respond to any law, to any principle that can be quantitatively expressed. In fact, scaffolding has a semiotic and relational nature: it is a reality which "derives" from dialog with the outside world, not a pre-programmed operation.

The living organism, the biological body, is a qualitative dimension that is formed through relationships, semiotic experiences, which is "equipped" and structured in patterns, in models of orientation that are not definitively established but respond to the environment with their constraints, with their history, with their experience. In short, to put it in the words of Varela, "we are always constrained by the path we have laid down, but there is no ultimate ground to prescribe the steps that we take" (Varela et al. 1993, p. 214).

3 Bioenergetics: Body and Meaning

3.1 Historical Notes: From Reich to Lowen

As a generating principle of meaning and dimension characterized by it, a further look at the body is offered by bioenergetic analysis. The bioenergetic analysis is a form of psychotherapy conceived by Alexander Lowen, a physician and psychotherapist, who puts the body at the center as an energy dimension. In its founder's words, it is "the study of human personality in terms of the energetic processes of the body" (Lowen 1994, p. 45).

Lowen elaborated and developed the bioenergetic method after meeting Wilhelm Reich, his teacher from 1940 to 1952 and his analyst from 1942 to 1945. Lowen met Reich in New York, at the New School for Social Research, on the occasion of a course entitled "Biological Aspects of Personality Formation." The encounter with the master immediately proved fruitful. "I sensed," Lowen reports, "Reich was introducing me to a new way of thinking about human problems, and I was immediately excited" (Lowen 1994, p. 15). The theories of Wilhelm Reich

(physician, psychotherapist, and student of Freud) focus on the hypothesis that there is a functional unity between a person's character and their bodily attitude, so that body and psyche are intimately connected.

His investigation starts from the Freudian principle of "repression," developed starting from the studies on hysteria. According to Freud, the hysterical pathology is generated following a sexual trauma repressed and converted into a physical symptom. Reich's criticism of the master concerns the fact that the concept of repression only explains the *cause* of the illness, without providing any information on its formation process, on *how* a repressed psychic phenomenon translates into a bodily manifestation.

Therefore, Reich's work is an attempt to fill this gap. To do so, he introduces an energy principle. The body, says the Austrian psychiatrist, is an "energetic" dimension, "maneuvered" and structured by the individual's personal experience. Consequently, neurosis can only be understood by analyzing the distribution of energy within the body, thus making use of an "economic" principle: "the energy or sexual economy of an individual concerns the balance that he maintains between energy charge and discharge or between excitement and sexual discharge. The symptom of hysterical conversion develops only when this economy or this balance is upset" (Lowen 1994, p. 15).

Moreover, Reich noticed the correlation that exists between muscular tension and inhibition of emotional expression. He hypothesized that a precise psychic attitude corresponded to a specific bodily attitude and determined muscular tensions.

The bioenergetic analysis is, therefore, grafted onto this background. However, although Lowen maintains the Reichian analysi's central concepts, he develops, deepens, and partly departs from them until he develops his independent thought.[4]

At a therapeutic level, the bioenergetic approach attempts to combine an analytical methodology, dear to traditional psychoanalysis, with work on the body, interpreting the individual as a unitary complex. Bioenergetic work acts simultaneously on two levels: the somatic one, through the elimination of chronic muscular tensions, which leads to a particular mobilization of energy, and the psychic one, through the awareness of one's own body history. Lowen believes that no lasting change is possible if the therapist does not work on both levels.

The bioenergetic analysis is defined as a bodily mediation therapy, in which the body, as an energy complex, becomes the bearer, with its expressive baggage, of the personal psychic past. "The life of an individual," declares Lowen, "is the life of his body" (Lowen 1994, p. 54).

[4]Lowen's theories differ from the Reichian analysis in several respects. First, Lowen distances himself from the orgonic drifts of his master's thought, according to which the energy of the body would be part of a cosmological energy dispersed in the universe. For Lowen, the energetic principle of the body acquires meaning and must be understood only within the clinical practice; secondly, according to Lowen, Reich's analysis does not consider the ego and the reality principle, focusing only on the body as a vegetative-energetic complex. Instead, the purpose of Lowen's therapy is an integration of the ego with the body (Helfaer 2013).

3.2 An Energetic Principle: The Functions of Charge and Discharge

Lowen claims that the body is suffused with a vital energy called "bioenergy." Although rooted in Freudian *libido*, the concept combines the idea of transferable psychic energy with that of physical body energy. Indeed, bioenergy is responsible for both psychological and somatic phenomena.

> We work with the hypothesis that there is one fundamental energy in the human body whether it manifests itself in psychic phenomena or in somatic motion. This energy we call simply "bioenergy". Psychic processes as well as somatic processes are determined by the operation of this bioenergy. All living processes can be reduced to manifestations of this bioenergy. (Lowen 1971, p. 18)[5]

Agreeing with Reich, Lowen argues that an individual's psychic attitude is determined by his energy economy, i.e., by the amount of bioenergy employed in the body and the way it is distributed. An individual in good psycho-physical condition lives a body with a high energy level and whose bioenergy is adequately distributed; consequently, one can understand mental disorders in the light of energy disturbances as dysfunctions in the body's bioenergetic organization.

> The relationship of energy to personality is most clearly manifested in a depressed individual. Although the depressive reaction and the depressive tendency result from the interplay of complicated psychological and physical factors, one thing is abundantly clear. The depressed individual is energetically depressed. Cinematic studies show he makes only about one-half the spontaneous movements usual in the nondepressed individual. [. . .] He generally feels that he lacks the energy to get moving. [. . .] The depression of his level of energy is seen in the decrease of all energy functions. His breathing is depressed, his appetite is depressed, and his sexual drive is depressed. In this state he should not possibly respond to our exhortations that he interests himself in some pursuit: he literally *does not have the energy* to develop an interest. (Lowen 1994, p. 47)

More specifically, defining a psychic attitude from a bioenergetic point of view means putting it in terms of a relationship between the charge function and the discharge function. Therefore, a body with a high energy level and psychic harmony is one in which the activities of charge and discharge are balanced. Conversely, a psychic problem must be read in the form of imbalance and dysfunction of charge and discharge.

Therefore, clarification is needed regarding the body dynamics that affect the charge and discharge functions, showing in what terms a balance is possible. Lowen believes that we can distinguish an upper and a lower part of the human body, ideally divided by the diaphragm. From a bioenergetic point of view, the first is in charge of

[5] However, as Elizabeth Michel points out, one must understand the concept of energy within the therapeutic practice and following the meaning attributed to it by common sense, i.e., as "vigour," "vitality," and "strength," rather than with a scientific meaning, which would require further clarifications. Bioenergetic analysis talks about "core energy" and says that some structures are "high energy charge," and others, instead, are "low energy charge." Using "energy" in this way, Michel declares, is right when you look at the patients' bodies (Michel 2014).

the charge functions, the second of discharge functions. The charge function supplies the body with energy through food, oxygen, or sensory excitations. Dynamically, it is represented by an upward flow of energy. The discharge function affects the lower part of the body: it is described as a downward movement aimed at discharging the excess energy through two exit channels, the legs and the genital apparatus.

Regarding the discharge function, Lowen analyzes the importance of an anatomical element, such as the pelvis. It fulfills a storage function, an energy accumulator preceding the discharge. According to Lowen, the presence in the human body of this element constitutes the bodily foundation of the psychic principle of reality (which for Lowen corresponds to the "grounding,"[6] the ability to remain "well-rooted to earth").

In fact, the pelvis acts as a "temporizer," an element capable of postponing the energy discharge and hence the pleasure connected to it. The reality function:

> [. . .] demands the acceptance of a state of tension and the postponement of pleasure in accordance with the demands of an external situation [. . .]. The essence of this function is the interposition of a time interval between the impulse and its expression in overt action. (Lowen 1971, p. 56)

Therefore, pleasure can be postponed since the human body is provided with "containers." Within these containers, the charge accumulates before it is discharged to the outside in a discharge.

The possibility of a deferral does not depend on the voluntary exercise of an ego that, by contracting the musculature, represses the impulse, but by the capacity of the reserves, by their amplitude and flexibility. In an individual in physical and psychic equilibrium, the two reserves function adequately, making it possible to defer the impulses without inhibiting them.

Assigning a somatic base to the reality function, Lowen maintains the close connection between reality and pleasure. From a bioenergetic perspective, a strong sense of reality and a good grounding ensure a fuller experience of pleasure.

Therefore, an individual with a good sense of reality does not have an inhibition on the discharge (perceived as pleasure); he can simply postpone it. Moreover, since the charge is directly proportional to the discharge, the more a body can accumulate energy, the greater the pleasure gained. The reality principle develops from the pleasure principle. It is its modification, its "temporalization." The reality function, in fact, "[. . .] cut off from its motivation and energy source in the pleasure principle becomes sterile" (Lowen 1971, p. 67), dependent on a disembodied ego.

Following Reich, Lowen pays particular attention to the study of muscular tensions in which he identifies repressed impulses at an unconscious level. Every chronic muscle contraction, in fact, constitutes an impediment to the free flow of energy directed upwards and downwards. More precisely, "muscle block" means a set of chronic muscle contractions that prevent a natural and integrated body movement (Michel 2014).

[6] For a discussion on the reality principle in bioenergetics, cf. Lowen (1971); Lowen (1993, 1994).

For example, anger suffocated at an early age can cause chronic contractions in the shoulders' muscles or tension in the arms and hands. The repression of the anger impulse, which at the conscious level is operated by the ego by blocking the outgoing energy, can establish itself unconsciously in the musculature. The adult in question will have difficulty expressing feelings of anger since the muscles in charge of the choleric outlet will find themselves in a state of contraction.

> Anger as expressed in striking out can be inhibited by contracting the muscles of the shoulder girdle, thereby pulling the shoulders back. At first the inhibition is conscious and aims to spare the person further conflict and pain. However, the conscious and voluntary contraction of muscles requires an investment of energy and cannot therefore be maintained indefinitely. When an inhibition against some feeling must be maintained indefinitely because its expression is not accepted in the child's world, the ego surrenders its control over the forbidden action and withdraws its energy from the impulse. The holding against the impulse then becomes unconscious, and the muscle or muscles remain contracted because they lack the energy for expansion and relaxation. (Lowen 1994, p. 144)

Michel (2014) explains that the muscles present a rhythmic pattern of low-frequency contraction in a state of relaxation. On the contrary, in a stressful situation, the body produces a fight-or-flight response that activates many muscles. If the tension is not resolved, this widespread activation will remain and acquire chronic features.

Therefore, every muscle contraction represents an energetic block that delimits areas in which the body's motility is reduced, identifiable by their "inanimate" aspect or by palpation. Furthermore, it is an indication of an emotional conflict present at an unconscious level. In this sense, the muscular tension model is a mirror of the individual's psychic attitude, and bioenergetic therapy aims at retracing the etiology of the block and dealing with the related emotional disorder.

The body, therefore, registers its own relationship with the world, its interpretation. In this perspective, one can represent the body as a tangle of meanings of which physical evidence and psychological attitudes are the signs.

3.3 The Language of the Body: The Formation of Characters

Therefore, the correlation between bodily attitude, muscular tensions, and psychic attitude emerges more clearly in Lowen's analysis of the various "characters."

Lowen inherits from Reich and his 1933 work *Analysis of character*, the notion of "character." By "character," Reich means a defensive psycho-physical structure developed in childhood after traumatic relational experiences.[7] The term "structure" indicates a certain fixity in the form: it occurs following freezing of the natural energy movement and has a pathological significance.

[7] The organization of Reich's therapy derives from the analysis of resistance to therapy. In this way, he realizes that these resistances represent personality structure, a structure developed during childhood and defensive by nature (Reich 1980).

Following the master, Lowen defines the "character" as "the unitary expression of the individual's function on both the psychic and in the somatic realm" (Lowen 1971, p. 119) and distinguishes five fundamental "types:" the schizoid character, the oral character, the masochistic character, the rigid character and the psychopathic character. According to Lowen, character constitutes a sort of behavioral model, a habitual orientation in which the individual finds himself trapped.

Without entering the thorny and delicate question of the relationship between pathology and state of health, the study of character is useful here to bring out the close connection between bodily behavior and psychological behavior and show the body's tendency to express itself in meanings structured following precise relational experiences.

First of all, Lowen stresses that the elaboration of five "kinds of character" is motivated by functional rather than theoretical reasons. Identifying characterological types is useful for the therapist to carry out the work of analysis, tracing the patient's defensive structures and related bioenergetic dynamics, and therefore has an orientation function rather than a taxonomic value. In other words, the therapist is dealing with people, not structures.

> In bioenergetics, the different character structures are classified into five basic types. Each type has a special pattern of defense on both the psychological and the muscular levels that distinguishes it from the other types. It is important to note that this is a classification not of people but of defensive positions. It is recognized that no individual is a pure type and that every person in our culture combines in different degrees within his personality some or all of these defensive patterns. [. . .] Nevertheless, it is necessary to speak in terms of types for the sake of clarity in communication and understanding. (Lowen 1994, p. 151)

Each character, therefore, presents a specific energy distribution, specific muscular tensions and distinctive psychic attitudes.

The schizoid character is defined by the tendency to dissociate, to "split in two." The subject does not feel connected to his own body, the perception of which is extremely reduced; the result is a split between the upper and lower part. This splitting is embodied in the body of the schizoid, which has a disproportion between the upper and lower half. Bioenergetically speaking, energy is held in the body's center and does not flow to the extremities. The bodies in charge of contact with the world do not receive energy, which strongly limits the individuals' sensitivity and communicative capacity. The energy charge, blocked by muscular tensions at the head's base, in the shoulders and at the pelvis, is frozen in the nucleus region. The impulses are retained and compressed in the center.[8]

Michel (2014) explains that a pattern of blocks in the schizoid body prevents the energy of the core from reaching the peripheral body areas that allow contact with the world. These blocks serve to separate the individual from the world, which has been the setting of some traumatic experience. The schizoid body often presents

[8] However, if the body were subjected to such a quantity of charge that the defenses could not block it, the energy could pour out violently, without the subject being able to exercise conscious control over it.

contractions in the micro-musculature around the joints. These contractions have the symbolic function of "holding together" the body parts to counteract the schizoid tendency to psychic disintegration, generated by a terrible fear experienced during childhood.

Since the extremities are lacking in charge, Lowen compares the face of the schizoid subject to a mask in which the eyes appear devoid of life and communication. The feet and hands are often cold, with little sensitivity. In the etiology of the schizoid character, the mother's rejection is identified, experienced by the child in the first years of childhood. The maternal hostility, manifest, or hidden behind compensatory attitudes, leads the subject to believe that any request or initiative is rejected. To avoid pain and distress, the child, therefore, avoids facing the outside world. The outwardly directed charge suffers inhibition through the intervention of the musculature, which functions as a defense and contracts, thus repressing the impulse. To survive terror, the child makes the body insensitive.

Therefore, the adult's behavior will be characterized by a poverty of feelings and difficulty in establishing intimate relationships. Lowen defines the attitude of the schizoid character as an "as if" attitude: "that is, as if it were based on feelings, but the actions themselves are not expressive of feeling" (Lowen 1994, p. 154).

The second type, the oral character, is defined by the presence of oral elements related to early childhood in the psychological behavior and the physical structure. The body has immaturity and weakness features, such as a depressed chest and a belly with an inanimate and empty appearance. The legs tend to be rigid and not very sensitive, being used to compensate for the back's weakness, which is usually responsible for the support function.

An early deprivation of nourishment, contact, or maternal affection represents the determining historical factor, which leads to the conscious renunciation by the child of explicit requests for satisfaction. However, the repressed desire is imprinted on an unconscious level, creating a state of perpetual dissatisfaction. Due to his history of "malnutrition" (understood in a broad sense), the oral individual is bio energetically characterized by a reduced charge. Energy flows weakly from the center to the extremities, preventing the musculature from forming adequately and giving it a hypotonic appearance. This condition gives the oral personality a low level of aggressiveness. For example, the collapsed chest affects the energy level of the whole body: breathing is superficial and reduced and not able to provide enough energy for substantial efforts.

Thus, the oral character has weak muscles and does not provide the muscular system with sufficient oxygen to produce a vigorous and integrated aggressive movement (Michel 2014). Basal metabolism is slow, blood pressure is low and genital function is reduced: "orality and genitality," in fact, "are antithetical tendencies. One is related to the function of charge, the other to discharge. The sexual drive of the oral character [. . .] represents the need to take in, to feed from the partner" (Lowen 1971, p. 175).

The masochistic character is frequently generated by an asphyxiating mother, who attributes excessive importance to food and hygiene, resulting in attitudes aimed at the compulsion to eat and control over evacuation. At first, the child

responds to impositions with open hostility and heated expressions of anger. In a second moment, however, the threat that the aggressive expression causes the loss of maternal love and, therefore, pain leads to suppressing the impulse and directing it towards the interior.

From a bioenergetic perspective, the masochistic structure works "with a high energetic charge." It is characterized by inverting the aggressive drive towards the inside, with consequent compression of the tender feelings.[9] The two instincts, the aggressive and the tender, are antagonistic, and the second is engaged in a perennial struggle to break the compression inflicted by the first. However, every attempt at affirmation fails, causing the individual to sink into a state of profound depression that is called the "masochistic swamp."

The masochistic individuals present a corpulent, massive, and squat physical structure since the pressure exerted at the two ends prevents the body from lengthening. The musculature, contracted for retaining aggressive impulses (for example, the limbs express in their appearance both aggressiveness and inhibition) and regulating the natural ones, is exaggeratedly developed. There is strong muscular tension in the shoulder girdle (whose muscles hold back resentment) and the pelvis.

The mother's control over natural functions also causes the child to have an intense fear of discharge and an early regulation of the evacuation movements. According to Lowen, "premature insistence upon excremental cleanliness forces the child to employ the *levator ani* muscle, the gluteals and the hamstrings to gain anal control since the external sphincters have not yet come under voluntary control" (Lowen 1971, p. 214). The result is the aspect of a "dog with the tail between the legs," due to the contraction of the pelvis that is pushed forwards.

The masochistic individual is an individual who has been denied the right to independence and self-assertion. Therefore, his manifest behavior is compliance and eagerness to please (renunciation of the self). Behind this renunciation, however, there is intense hostility and resentment. He often assumes a provocative attitude with which he induces others to express negative feelings towards him. In this way, the masochistic subject justifies his own aggressive or violent reactions: he seeks, in fact, the possibility of "discharging" himself, but since he cannot authorize himself to do so, he provokes the phenomenon indirectly by pushing responsibility for it onto others.

The rigid individual's history is characterized by "the experience of frustration in the striving for erotic gratification, especially at the genital level" (Lowen 1994, p. 169). In fact, at the genital stage, the child received a refusal of his/her search for erotic and sexual pleasure, to which he reacted by stiffening.

Bioenergetically, the rigid structure is highly charged, and the discharge activity is working. However, the aggressive component's prevalence over the tender

[9] From this idea of an internal upheaval of the aggressive instinct, Freud theorizes the existence of a death drive as characteristic of the human being. On the other hand, to Lowen, what Freud calls the death drive is simply the result of a specific character structure, the masochistic one. Generally, the human body's energy is not "programmed" to turn against itself (Lowen 1971).

component prevents the body from reaching significant energy levels. The body presents rigidity elements in the front part and takes on an "armored" shape.[10] This structure was erected as a defense to eliminate the possibility of a new rejection.

> Dynamically, the tension in the front is produced by pulling back the shoulders and the pelvis, thus putting all the front muscles on the stretch at the same time that they are contracted. When the front and back of the body are thus encased in a rigid sheath of tight muscles, we can say that the organism is armored. (Lowen 1971, p. 258)

The fear of rejection has been denied on the unconscious level, covered with an attitude of pride and aggression.

Finally, the psychopathic character is defined by a denial of feelings, a dissociation of the ego from the body and an attempt to dominate it. The same attitude of domination manifests in psychopathic individuals' behavior towards others, a behavior that can take two forms: that of arrogance or that of seduction.

The psychic structure's energy is concentrated in the upper part of the body, which assumes larger dimensions than the lower one. The diaphragm area is taut, preventing the energy flow from passing freely downwards. The eyes are wary and suspicious, and tensions in the occipital area are frequent. Moreover, the excessive concentration of energy in the upper part of the body causes a disproportionate load on the head, which is strongly contracted.

The etiological reconstruction of the psychopathic character identifies the presence of a seductive parent: "seduction is covert and is done to meet the parent's narcissistic needs. It aims to tie the child to the parent" (Lowen 1994, p. 162). However, in terms of support and affection, the seductive parent rejects the child. Moreover, the seductive element's presence gives rise to a form of competition towards the parent of the same sex, preventing identification. As a result, the child is emotionally isolated. In response to this, in defense, he rises above his feelings, emotional needs, and, therefore, his body.

A look at character analysis is useful for understanding the close connection between psychic attitude and body expression. From the analysis of the character emerged the body's tendency to inscribe on itself in a bioenergetic way, traceable in the bodily and psychological attitude assumed by the subject. Therefore, the character allows us to see the significant relationship between muscle blockage and emotional conflict: a particular psychic dynamic corresponds to every energetic tension within the organism.

In this perspective, the body is configured as a narrative offered to the expert eye of a therapist.

> A person is the sum total of his life experiences, each of which is registered in his personality and structured in his body. Just as a woodsman can read the life history of a tree from a cross section of the trunk showing its annual growth rings, so it is possible for a bioenergetic therapist to read a person's life history from his body. Both studies require knowledge and experience, but they are based on the same principles. (Lowen 1994, p. 57)

[10]The concept of "armor" was developed by Reich to describe a defense mechanism that, on a bodily level, is expressed as a muscular armor.

The history of an individual, therefore, is recorded on his own body. Like the personality, the physical structure contains a meaning, reflects an experience of life, and is the sign of a particular psycho-somatic interpretation of the world. Thus, the therapist, reading the body, interpreting the signs that it bears, can retrace that history and help the patient do the same.

Therefore, the body constitutes a colorful and expressive panorama in which each region corresponds to an emotional meaning. The topography of the body reflects how it has interpreted the surrounding environment. It indicates the attitude with which the organism faces the world, of a specific aspect of life. As a result, a muscle block located in a particular area or the dysfunction of an organ contains emotional meanings (Lowen 1995).

From this viewpoint, the concept of "self-expression" is central. Lowen argues that the body expresses itself mainly through three channels: movement, voice, and eyes. Attention to these aspects provides a useful tool for the therapist to ascertain the patient's body condition.

The voice's quality depends mainly on three elements: the flow of air under pressure, the vocal cords, which allow vibration, and the resonating chambers, which determine the volume. Any interference in their regular functioning influences vocal expression. The contractions of the neck and throat, for example, generate head or chest sounds. Usually, a high-pitched voice, which is associated with a difficulty in producing deep notes, is an indication of an expressive block of feelings of sadness; on the other hand, a low and chest voice is a sign of a denial of the feelings of fear that are expressed in the cry. The schizoid individual, for example, tends to have a flat voice caused as much by tensions in the throat as by a limited breath that prevents the flow of air passing through the vocal cords from being full and spontaneous.

Lowen observes that in the vocal apparatus, there can be three main rings of tension: the first around the mouth, the second in the area where the pharynx is connected to the esophagus and trachea, and the third between the neck and the chest. Among the three, the second ring, set up in the area where we witness the passage from voluntary to involuntary control of swallowing, has a significant psychological significance. It represents an unconscious resistance to the passage of something considered unacceptable, be it an external element that one does not want to swallow (frequent in masochistic individuals) or an internal feeling that one is afraid to express.[11]

Therefore, if the body always contains an affective and emotional meaning, a bioenergetic reading of physical disorders is also possible. A specific case is represented by myopia, to the analysis of which Lowen dedicates copious pages (Lowen 1994). From a bioenergetic perspective, the myopic eye is wide open and fixed, therefore marked by low mobility. The etiological factor of the disorder is found in the presence of a feeling of fear on an unconscious level fixed in the eyeball as a muscle contraction. Observe in detail the genesis of this phenomenon:

[11] Furthermore, the work of the jaw reinforces tension, and the jaw tightens to prevent passage.

> Wide eyes [. . .] enlarge the field of peripheral vision but reduce central vision. To regain its visual acuity, the child will forcibly constrict its eyes, creating a condition of rigidity and strain. There is another element. Frightened eyes tend to roll upwards. This tendency, too, must be overcome by an effort of will if the child is to maintain its ability to focus. Now the strain of these efforts cannot be maintained indefinitely. At some point, the eye muscles tire. and the child gives up the effort to look out. Myopia sets in when this compensation breaks down. (Lowen 1994, p. 290).

Lowen also devotes a few pages to the "headache" disorder. Headache is described as the result of interference of the aggressive upward flow. Similarly, according to Lowen, migraine is caused by a block of desire and the upward flow of excitation. In every migraine, one can notice the development of a strong tension on one side of the neck, under the jaw, functional to the block of desire, the palpation of which causes a sharp pain behind the eye.

Therefore, considering the body from a bioenergetic perspective means avoiding an objectual and mechanistic conception of it and espousing the idea that the body is a dimension that generates meaning and is inhabited by it, an iridescent reality that inscribes its own relational experiences on itself. "Bioenergetics," Lowen writes, "does not see the body as a machine, not even as the most complex and beautiful machine ever created" (Lowen 1994, p. 84).

4 Conclusions

The journey that is now complete has aimed to take the form of exploration across the range of biosemiotics and bioenergetics in the attempt to show how two disciplines that are so different in scope, objectives, and methods present certain similarities.

Both perspectives offer an interpretation of the body as a dimension open to the world that defines its own structures thanks to a relationship, an exchange, with the external. At the same time, however, they recognize the limits and constraints that an organism or an individual establishes based on its experiences and history: life is, therefore, as much a continuous creative possibility as it responds to rules set up over time.

However, the most original and substantial aspect of our research consists in that both biosemiotic and bioenergetic thought acknowledge the indissoluble link that life maintains with meaning, with a system of signs through which and thanks to which it communicates, defines itself, and takes on forms. In this sense, the body defines itself as the semiotic dimension *par excellence*.

To conclude, it is important to recall how the work completed here represents only a limited perspective, the attempt to carve out one route through a much broader and more complex panorama. Nevertheless, taking some first steps in this journey may help suggest reflections on the subject and promote a dialog between two disciplines that, originating and developing differently, offer a similar and original interpretation of the body.

References

Barbieri M (2008a) What is biosemiotics? Biosemiotics 1:1–3
Barbieri M (2008b) Biosemiotics: a new understanding of life. Naturwissenschaften 95:577–579
Benasayag M (2016) Il cervello aumentato, l'uomo diminuito. Erikson, Trento
Giorgi F (2017) Un mondo di relazioni. La logica del vivente: dalla certezza dell'essere alla esplorabilità del divenire, Tangram, Trento
Harney M (2007) Merleau-Ponty, ecology, and biosemiotics. In: Cataldi SL, Hamrick WS (eds) Merleau-Ponty and the environmental philosophy. Dwelling on the landscapes of thought. State University of New York Press, Albany, pp 233–148
Helfaer PM (2013) I fondamenti dell'analisi bioenergetica. In: Heinrich-Clauer V (ed) Manuale di Analisi Bioenergetica. FrancoAngeli, Milano
Hoffmeyer J (2008) The semiotic body. Biosemiotics 1:169–190
Hoffmeyer J (2015) Semiotic scaffolding of living systems. Biosemiotics 8:153–158
Kotov K, Kull K (2011) Semiosphere is the relational biosphere. In: Emmeche C, Kull K (eds) Towards a semiotic biology. Life is the action of signs. Imperial College Press, London
Kull K et al (2008) Biosemiotic questions. Biosemiotics 1:41–55
Lowen A (1971) The language of the body. First Collier Books Edition, New York
Lowen A (1993) Depression and the body. The biological basis of faith and reality. Penguin Books, New York
Lowen A (1994) Bioenergetics. Penguin Books, col. Compass, New York
Lowen A (1995) Joy. The surrender to the body and to life. Penguin Books, New York
Michel E (2014) Bent out of shape. Anatomy and alignment for bioenergetic trainees, trad. It. In: Filoni MR (ed) L'emozione e la forma. Manuale di anatomia e postura per analisti bioenergetici e conduttori di classi. FrancoAngeli, Milano
Pagni E (2016) Why explicit semiotic grounding is essential to biology as a science? The point of view of biosemiotics. HumanaMente Journal of Philosophica Studies 31:57–72
Petrilli S (2003) Sebeok's Semiosic universe and global semiotics. Cybernetics And Human Knowing 10:61–69
Petrilli S, Ponzio A (2008) A tribute to Thomas a. Sebeok Biosemiotics 1:25–39
Petrilli S, Ponzio A (2013) Review article biosemiotic scenarios. Semiotica 195:373–408
Reich W (1980) Character analysis. Farrar, Straus and Giroux, New York
Sebeok TA (1986) I think I am a verb. More contributions to the doctrine of signs. Indiana University Press, Bloomington
Sebeok TA (1989) Preface. In: Lee B, Urban G (eds) Semiotics, self, and society. De Gruyter Mouton, Berlin, New York
Sharov A (2001) Umwelt-theory and pragmatism. Semiotica 134:211–228
Tønnessen M (2009) Umwelt transitions. Uexküll and Environmental Change Biosemiotics 2:47–64
Tønnessen M et al (2018) Phenomenology and biosemiotics. Biosemiotics 11:323–330
Varela et al. (1993) The embodied mind cognitive science and human experience. MIT Press, Cambridge