University of Tartu

Department of Semiotics

Katsiaryna Suryna

Biosemiotic Approches to the Self

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Supervisor: Professor Kalevi Kull

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Introduction

Until recently there has been an implicit presumption of the metaphoric character of terms such as 'message', 'meaning', 'code', 'sign', and the like, if applied to organisms other than humans and the possibility of their reduction to interactions describable effectively in terms of physics and chemistry. However, as reductionist theories have shown little or no promise, biosemiotics tries to offer a new dialogue between life sciences and humanities and takes upon itself the task of formulating "an explicit biological theory taking these recurrent semiotic metaphors at face value and discussing them as real scientific problems" (Emmeche, Kull, Stjernfelt 2002: 9). The shift of the semiotic threshold, i.e. the boundary between the non-semiotic area and semiotic area, opens up a possibility to apply such attributes as 'subjectivity' and 'agency', which have been elaborated in the context of humanities, to other non-human living beings. Thus, for example, contemporary biosemiotician Jesper Hoffmeyer takes the conception of subjectivity as correspondent to the "criterion distinguishing living system from non-living systems: the capacity for selective (i.e., active) incorporation of the present into the future" (Hoffmeyer 1992:103). Against this background, the concept of self and related notions such as 'subjectivity', 'agency', and 'subject' have acquired a special significance in the biosemiotic discourse on life.

The first attempts to introduce the concept of subjectivity in a biological discourse were associated with the need to overcome the inadequacy of objectivism and externalism inherent to the traditional paradigm of life sciences (Uexküll 1982 [1940], 1992 [1934]; Rothschild 1962, 2000). Recently, the majority of references to subjectivity and self have been made in policy texts accentuating the specificity of biosemiotic discourse and biosemiotic approach to life (Sebeok 1991; Uexküll 1995; Hoffmeyer 1996, 1997a, 1997b, 1998a, 1998b, 2001, 2006, 2012; Emmeche et al. 2002; Stjernfelt 2002; Kull et al. 2009). One of the most remarkable characteristics of biosemiotic understanding of life consists in the introduction and justification of causality different from the mechanistic causality, which bears on the formulation of an explicit biosemiotic concept of self. The issue of causality arises not only with respect to how biosemiotics grounds its own position as a scientific endeavour, but also with the view of treatment of the self as a fact of biological and semiotic organization and a causally efficacious locus of meaning

making. Thus Hoffmeyer stipulates for the vindication of final cause, while Deely argues for the objective causality being most suitable to account for the action of signs (Hoffmeyer 2014, Deely 2001). For Barbieri, the interpretive activity of complex living systems might be grounded by formal and final causality. 'Formal' is meant to designate the downward causation from the structure of the organism to smallest units such as individual molecules. This downward causation resides in constraining their action and imparting a functional meaning to them in relation to the whole metabolism. On the other hand, 'final causation' points to the tendency to acquire habits and to produce interpretants about future events (Barbieri 2008). Another important constituent of biosemiotic discourse, which is partially connected to the grounding of new causality and in connection with which the concept of self and related terms come to the forefront, is the status of ideal objects. For Stjernfelt, biosemiotics proceeds from the real existence of a specific kind of ideal objects, i.e. the possibilities. He subsumes under this title a fitness space of all possible genomes, the virtuality in nature, tendencies in the development and evolution, and the possibility for final causes to prioritize one tendency over another (Stjernfelt 2002: 342).

Some of the researchers specify 'self' in the explanation of the dynamics of semiosis in living systems (Hoffmeyer 1998a, 2006, 2008b, 2013, 2014) or see it as dependent on the living being's 'capacity of sense' (Goudsmit 2009). Thus, following this tendency Stjernfelt describes the character of living systems as "an agency equipped with a point-of-view" (Stjernfelt 2002). Others derive the concept of self from the definition of sign relations given by Peirce (Sebeok 1991, 2001b; Uexküll 1995; Brier 2008). Self is touched upon in the inquiry into heuristic potential of Juri Lotman's semiotic theory with regard to biosemiotics (Kull 1999), as well as an attempt to ground a view on animal as a self-reading text (Uexküll et al. 1993; Kull 1998). Moreover, much attention has been focused on the possibility conditions and benefits of introducing the concept of agency in life sciences (Sharov 2002). Additionally, several specifications of self have emerged from the perspective of possible points of convergence between biosemiotics and autopoiesis theory (Weber 2002, Nishida 2011) and potential contributions of biosemiotics to neurosciences (Favareau 2002a, 2002b). Thus, for Favareau, the concept of 'self' is "a rich construction of internally biological, externally physical and historically situated, linguistically-mediated conceptual elements none of

which enjoy a privileged or autonomous causality in structuring or determining the resultant symbol […]" (Favareau 2002b: 10).

The reformulation of the pair subjective-objective offered by Deely is also worth mentioning. For him, the world of which a particular organism is aware differs from the physical surroundings: the latter is the subjective or physical world, "the world where things exists whether or not they are cognized"; the former is the objective world, "the world as it is apprehended and organized within apprehension", which includes only a small part of the physical surrounding (Deely 2001:6). This enables him to take the umwelt comprising the subjectivity and species-specific network of relations as the objective world. Against this background the specificity of the human Umwelt resides in its being transcendent to biology: "The human animal is like other animals in living in an actual objective world or Umwelt; but they human animal is unlike all other animals (at least on this planet) in that its actual objective world admits of an indefinite number of alternative possibilities, some of which can be actualized in turn" (Ibid. 7-8).

One of the main claims of biosemiotics is that the self is not primal, but culminative. This feature is tackled in inquiries into how endo- and exosemiotic processes produce a biological self. In this case, the self might be described as closely associated with processes aiming the preservation of bodily unity. Particularly, Hoffmeyer, Sebeok and Thure von Uexküll offer an examination of how a biological self is formed by interactions between the immune and nervous systems and how it adapts to changing processes in the surrounding of the organism (Hoffmeyer 2008a; Sebeok 1991; Uexkull, Geigges, Hermann 1993). In some cases, self is considered in connection with the set of pathologies or personality disorders that are supposedly caused by disturbance in sign processing. This vision is oriented to approach either human subjectivity in general (Rothschild 1962) or a pre-linguistic self as it is manifested on the level of phenomenal consciousness (Uexküll et al. 1993; Sebeok 2001a, Hoffmeyer 2008b).

If we accept that self is contiguous with, or amounts to, a semiotic individuality it is possible to speak of a prevalent role of indexicals in its constitution (Sebeok 1991, 2001a, 2001b). Thus Sebeok writes: "The body of vertebrate, including humans, is composed of a veritable armamentarium of more or less palpable indexical markers of unique selfhood" (Sebeok 1994: 73). It is likewise possible to insist on the self being the

result of an upper symbolic level of 'inner' continuum of sign processes (Favareau 2002a, 2002b). The acknowledgment that self requires other-reference or other-recognition opens up a way of thinking of it in a broader semiotic context as a problem of self-identity and otherness (Petrilli 2003). In some cases, subjectivity is considered from the perspective of intersubjective dimension inherent to it. Thus, Kawade seeks to reason a structure of subjectivity comprising three distinct components: an individual, phenomenal reality (umwelt) and society (Kawade 2001, 2009). On the other hand, a perspective on human self on a neurological level and with the view of recent discoveries of mirror neurons opens up a possibility to ground its intrinsically intersubjective nature (Favareau 2002b, 2008).

Nonetheless, there is a tendency in biosemiotics to take 'self' as a matter-of-fact term, which does not need clarification; rather, biosemioticians seem to proceed from the presumption of an intuitive understanding of this concept. 'Self' is further obscured because of the difficulty in defining it without enumerating attributes containing 'self' in their composition, such as self-reference, self-representation, self-experience etc. The situation with 'subjectivity' is slightly better since there are a few latent and explicit determinations of it scattered all over the works mentioned above. However, another issue arises from 'self', 'subjectivity', 'subject' and 'agency' being described with reference to one another. Moreover, the concept of 'subject' is a term that should be used carefully because of the context of its elaboration and its role in the history of modern Western philosophy. All this shows a pressing need to elaborate an integrated account of a biosemiotic approach to the self.

With respect to philosophical implications of the given approach to the self, biosemiotics has a great merit to have offered an alternative to dualistic ontologies based on an unbridgeable divide between mind and matter, which originates in the philosophy of Descartes. This enables it to reconsider a problem of intentionality by appealing to a relational character of sign process. In the scope of analytic philosophy, intentionality it is at stake in theories that offer a higher-level account of self-consciousness (Gopnik 1993, 1996; Heal 1996; Gordon 1996; Carruthers et al. 1996, Frith et al 1999), as well as theories that confront them by proposing a one-level account of self-consciousness (Zahavi 2006, 2011; Gallagher at al. 2008; Henry at al. 2011). Therefore, a new concept of intentionality offered by Hoffmeyer (1999, 2012, 2014) might contribute indirectly to

current debates over the self in philosophy of mind, although he does not follow up this possibility further and manages it with general suggestions with respect to the 'hard problem of consciousness'. Hoffmeyer also argues that the body-mind duality should be discarded if any advances in studies on how consciousness could have emerged are to be achieved (1995b, 2013, 2014). Moreover, Hoffmeyer and Emmeche have focused much attention on the question of the subjective dimension of experiential life or qualia by treating it as an attribute of life, thereby rendering it a place in a scientific discourse (Emmeche 1999, 2001; Hoffmeyer 2006, 2008a, 2014). However, a general character of their suggestions creates obstacles on the way to integrate biosemiotics into particular controversies over related issues and the issue of self in particular. In the given work I will use some of the biosemiotic conceptions of self in order to substantiate a particular approach to pre-reflexive self-awareness. Specifically, I will show how the weak points of one of the most influential approaches to self in analytic philosophy – the so-called 'minimal self'– may be overcome with the help of some arguments elaborated from a biosemiotic approach to the self.

The self in analytic philosophy has gained attention due to a general interest in phenomenal consciousness and a need to attend to self-consciousness in its elucidation. Recently issued "The Oxford Handbook of Self" (Gallagher ed. 2011), which comprises publications on the topic of self elaborated across a number of disciplines, including philosophy of mind, psychology and neurosciences, shows a growing recognition of the importance of this topic. Despite the fact that philosophical accounts of self often resort to data from developmental psychology, cognitive and neurosciences, biosemiotics is not in this trend at all. A possible reason for the disregard of biosemiotics might lie in the very specificity of it as a scientific endeavour; specifically, the production of empirical material is outside the biosemiotic domain for it seeks to interpret already existed data in a new synthesis and offer a theoretical framework, that is, theory and metatheory. Whereas philosophy of mind resorts to a big amount of data provided by cognitive and neurosciences, it may not need any external interpretative mode. Another reason why biosemiotics still has little or no position among disciplines supplying philosophy of mind with new ideas is that its language tends to be perceived as too metaphorical. Granted, this work is based on a presumption that particular biosemiotic concepts and arguments

might substantiate one specific position towards the self in contemporary debates over the pre-reflexive self-awareness in the philosophy of mind.

Therefore, the aim of this work is an integrated account of the biosemiotic approach to the self and its integration into current debates over the self in analytic philosophy of mind. The achievement of this aim requires the realization of the following tasks:

1) outline of the prerequisites of a biosemiotic approach to the self laid down in the works of precursors of biosemiotics;
2) positioning of 'self' and related concepts 'subjectivity', 'subject', and 'agency' in the conceptual framework of biosemiotics;
3) exposing conditions of a legitimate and grounded application of 'subject' and 'subjectivity' in biosemiotics;
4) analysis of particular biosemiotic conceptions of self;
5) outline of two versions of 'minimal self' approach in philosophy of mind, their analysis from a biosemiotic point of view and suggestions of possible ways to their improvement.

It should be stipulated that, the current work is more concentrated on The Copenhagen-Tartu school of biosemiotics that on other schools due to an explicit elaboration of the concept of biosemiotic self within its framework. However, some theories that have been formed outside of this school are examined as well. Moreover, the division of the work in two chapters is determined by the existence of two tendencies in thinking of self in biosemiotics. The first consists in the treatment of self as an autocommunicative system or, in other words, as a mode of *being* of the system. This tendency is manifested in attempts of biosemiotics to identify itself as a scientific discipline and in the way in which it relates itself to traditional paradigm in life sciences, that is, in the outline of its conceptual framework. Another tendency consists in meditation over what constitutes and maintains the self in living systems, what it means for living beings to have self, what is the evolutionary significance of experience and emotions with respect to preservation of self. Therefore, the self tends to be taken here as a 'built' bodily self that is possessed by living systems.

Finally, what needs to be stipulated is the position of the author of the work. As a researcher, I have a clear-cut identity as philosopher due to my academic background, my inclination towards philosophy, and the decision to specialize further in the analytic philosophy of mind. However, I believe that, from all semiotic disciplines, biosemiotics has the biggest viability and heuristic potential, especially with respect to philosophy. In addition, my future doctoral dissertation project is informed by biosemiotics and its main claims are influenced by theories of Jesper Hoffmeyer, Thure von Uexküll, Werner Geigges, Jörg Hermann, and Donald Favareau. Given that, this work offers a perspective on biosemiotics from the outside, specifically, from the point of view of continental philosophy represented by French and German traditions, as well as from the point of view of analytic philosophy.

Chapter 1. Mode of being: 'self' in conceptual framework of biosemiotics

1.1. Prerequisites of a biosemiotic approach to the self in the works of Jakob von Uexküll and Friedrich Salomon Rothschild

Even before the establishment of biosemiotics as a full-blown scientific discipline, prerequisites of "the inclusion of a controlled notion of 'subject' in biology" (Emmeche et al. 2002: 18) and an implicit biosemiotic concept of self were laid down in the first attempts to elaborate a semiotic viewpoint on living systems. Particularly, Friedrich S. Rothschild, a precursor of biosemiotics, tried to ground a new perspective on subjectivity according to which it was neither an epiphenomenon of the evolution of life, which would make it just an accident, nor an exclusively human attribute. Rather than speaking about subjectivity as an unmatched phenomenon Rothschild spoke about the degrees of subjectivity or its developmental stages presented in protozoa, invertebrates, vertebrates, and human (Rothschild 1962). The attribution of subjectivity to animals is also characteristic of the umwelt theory, elaborated by Jakob von Uexküll, another predecessor of biosemiotics. The early attempts to extend the terms 'subject' and 'subjectivity' beyond a conventional domain of their application have contributed powerfully to the development of biosemiotics, in which subjectivity and the closely related concept of self constitute the framework of understanding the life.

To begin with, an implicit biosemiotic conception of self was elaborated in the framework of Jakob von Uexküll's theory of umwelt. The notion of umwelt has often been translated as a subjective universe of the animal. Nevertheless, the issue of subjectivity is by no means contingent in Uexküll's works, for it is exactly where the novelty of his approach to the animal comes from. Specifically, it is the notion of subject as applied to the animal that enables to stress an active and transformative character of the animal's interaction with its environment. For him, the world, if it is informative, cannot be neutral, impartial and free from any perspective; rather, it is the immersive

ambience for the animal. The world as it exists for it – and this is what implied by the concept of umwelt – comprises only meaningful relations or signs. Here in the very specification 'subjective universe of the animal' the opposition subjective-objective is raised. Yet, 'objective' refers to either an abstract idea of the neutral environment or the world as it is conceived of and endowed with normative meaning by the human.

In other words, 'subjective' implies here the reference to an idiosyncratic and incarnated point of view. Such an investigating strategy was intended to offer an alternative to a mechanistic approach in biology (Uexküll 1992). His call for attending a phenomenal world of the animal was a proposal to look at what is meaningful for the animal in view of its successful performances. To put it another way, as long as it was the notion of meaning that was a guiding line in Uexküll's studies of the animal's life, the idiosyncratic perspective was understood as a result of the activity whereby the animal models its own world in terms of meaningful relations, absolutely necessary for its survival, which was termed "umwelt" and which could be judged by means of examination of the animal's performances and bodily organization.

Following this further, it is possible to say, that Uexküll's theory of functional cycle lays down prerequisites for the concept of agency and the ground for affirmation of a processual character of self, which was later stressed by Thomas Sebeok and Thure von Uexküll (Sebeok 2001b, Uexküll 1995). It should be mentioned that Jakob von Uexküll himself did not use the term 'agency', although he is ascribed it retrospectively (Emmeche 2001). However, this attribution is legitimate inasmuch as the animal's mastering of its environment is understood in Uexküll's works as an active interpretation, which supposes some degree of the autonomy and non-mechanistic causality. To begin with, the agency here is not a matter of spontaneity taken in terms of cause-effect relations because, for Uexküll, those can obtain only at the outer boundary of the organism where external stimuli are transformed into neural impulses. However, it is already here that the domain of purely mechanistic causality ends up to the extent that stimuli are taken in selectively. After that point different causality characterises the processes, so it is no longer the cause-effect relationships, according to which processing of the information is structured and organized; rather, it is the assignment of the meaning to the input information, its coding in terms of an in-taking system resulting in creation of the perceptual sign. The latter is also referred by Jakob von Uexküll as the 'ego-quality' of an interpreting system.

For Uexküll, those perceptual signs are unified and projected back to the external world as the qualities of objects, which are referred as 'perceptual cues'. What should be emphasized here is that objects enter into meaningful relationships with interpreting subjects, i. e. animals, to the degree that they are meaning-carriers. Further prerequisites for the development of the term 'agency' are delivered by the concept of functional cycle and particularly by the idea of extinguishing perceptual cues and their replacement by effectors cues.

> Figuratively speaking, every animal grasps its object with two arms of a forceps, receptor, and effector. With the one it invests the object with a receptor cue or perceptual meaning, with the other, an effector cue or operational meaning. But since all the traits of an object are structurally interconnected, the traits given operational meaning must affect those bearing perceptual meaning through the object, and so change the object itself. This is best expressed briefly as: the effector cue or meaning extinguishes the receptor cue or meaning. (Uexküll 1992: 323–324)

It is important to stress here that, first of all, the object exists inasmuch it is attributed the qualities eliciting the functions it can perform for the animal in question or performances with that object, which are allowed with the view of its needs, or how Uexküll puts it, its mood (a qualitative characteristic guiding the animal's behaviour). So the animal operates with the functional image it has generated, or to put it differently, the object matters only to the extent that the functional tone has been imparted to it: "Every action, therefore, that consists of perception and operation imprints its meaning on the meaningless object and thereby makes it into a subject-related meaning-carrier" (Uexküll 1982: 31). Objects can exist as real only if they have been transformed into perceptual cues and endowed with the functional tone (Uexküll 1992). This again stresses the fact that, in the scope of the umwelt theory, the only way of defining the self is through the objects, which are correlated with the organism due to their being meaning-carriers. The concept of functional cycle, thus, allows seeing one in the light of the other and, thereby, helps to avoid falling into a one-sided description of the self or impart some metaphysical meaning to it.

Secondly, for Uexküll, there can be no single and ultimate model of the object perceived and acted upon inasmuch as the perceptual cue can be replaced by several functional images (effector cues) depending on the mood: the content of the meaning-carrier differs in various umwelten (Uexküll 1982). Following this further, an active and transformative

character of the animal's mastering of its environment is also grounded with the help of such terms as 'familiar path', 'search image' and 'innate path' (along with magic umwelt), all of which reveal different degree of autonomy of animal's interpretive activity from purely causal influence of external stimuli and the impossibility of its treatment as a mere reactions to them (Uexküll 1992). What also should be taken into account here is a kind of future-directedness of the animal's interpretive activity, in that it is implemented in view of the animal's surviving.

Another predecessor of biosemiotics, Friedrich Salomon Rothschild, argued for the necessity to deal with subjectivity within the evolutionary framework. He tried to ground a hypothesis that the experiential life should be associated with sign-systems in their function of symbolic mediation (Rothschild 2000, 2010). Rothschild offered a perspective on the experience as interpretation of signs or making meaning of the organism's situation in its environment. Rothschild's project of biosemiotics is, therefore, an investigation into communication systems. It seeks to explain the formation of subjectivity and provide not only a new comprehensive and consistent model for it, which would eliminate both the dichotomy of body-mind and postulating their inconceivable unity, but also a new view on numerous personality disorders (Rothschild 2010). Thus, unlike Uexküll's theory, the biosemiotic project of Rothschild is ultimately directed at elucidation of the human subjectivity, although this can be achieved, for him, only by means of a careful examination of the dynamics of sign systems (Rothschild 2000). In addition to this, related concepts 'subjectivity' and 'self' get somehow separated in his theory, which in some respect anticipates a subtle difference between them — peculiar to current biosemiotics — as well as the ground behind its insistence on the need of the concept 'subjectivity'.

Rothschild conceives of the evolution of living systems as the emergence and development of new sign-systems or modes of semiosis, which do not supersede one another but are superimposed in layers upon each other. Thus, the living experience turns out to be entirely determined by the top internal sign-system and, thereby, specific mode of semiosis, as well as interdependent communicative relations between current sign system and evolutionary preceding one, since it is the information of an already established stage that is reflected in a new synthesis within the new and superimposed system (Rothschild 2010:453). This suggests that not only the evolution of sign systems

but also the evolutionary process of adapting one sign-system to another should be in focus of the investigation (ibid. 450). The hierarchy of these inner sign-systems consists, for Rothschild, of somatic periphery (corresponding to the lowest level of communication processes), central nervous system (whose main task is integrating different modes of semiosis into an individual experience and behaviour) and, lastly, language, which is rated as the highest level and which allows interpreting the data provided by the central nervous system in a new way, that is, in thoughts and concepts (ibid. 459). Rothschild writes:

> In each stage, a new sign system overlays the already established ones and makes the unfolding of a new and higher level of experience possible. Using the information stored and forever reactualized within the phylogenetically older systems, man finally achieved his own depth and range of interpretation, and his freedom of response in the dialogue between self and the world. (ibid. 2010: 454)

A new conception of subjectivity, which Rothschild offers in the scope of his 'symbol theory of psychophysical relation', assumes that "[…] history of subjectivity does not start with man, but the human spirit was preceded by many preliminary stages in the evolution of animals" (ibid. 462). For him, subjectivity of a living system is dependent on actual communication processes "that determine its linkage to reality" (ibid. 455). Subjectivity expresses itself "[…] through the spatial and temporal order of physical events or comprehends them, as signs, the meaning of these signs […]" (ibid. 455). This means that subjectivity is essentially bodily, in that its sense-making capability is implemented through the living processes.

Further, it is the hierarchy of inner communication systems that constitutes the subjectivity on respective evolutionary stages. This makes the explanation of the lawfulness of this hierarchy a key point in Rothschild's conception. Rothschild discloses the aforementioned lawfulness by averring three biosemiotic laws. By law, he understands "[…] the rules of syntax of each single communication system and the rules valid for the simultaneous utilization of different communication systems as they coexist in all animals and in man" (ibid. 456). Rothschild holds that there is a structural similarity between the syntax and the meaning of symbolic communication system, or to be more precise, the syntax and the mode of semiosis are connected in a lawful manner.

The first biosemiotic law deals with the inner self-assertion that transforms the organism from an object into a subject of meaning-making or semiosis. Namely, intention of self-realization of an organism can be fulfilled only if the preservation of its unity against all agents of change is possible: "Only if this requirement of inner *self-assertion* is satisfied, that is, the established structure is secured as bearer of the own essence or the self, is self-realization possible" (ibid. 457). Therefore, this intention to preserve the self as a unity is a basic rule of biosemiotic syntax, that is, the syntax of a particular communication system as well as of its interaction with the previous one.

The understanding of the second law requires, holds Rothschild, a reconsideration of the primal structure of life. Specifically, the self-realization demands communication with an alien element to recognize its character, to understand it in order to cope with it: "The monologue of the steadily repeated own word in self-reduplication had to be joined by a dialogue in which alien voices too could be heard" (ibid. 458). There being the conflict between the intentions of self-realization and recognition of the alien, it is possible for the life to develop its diversity only on condition of overcoming this conflict and contrast between the self and non-self. This leads to the second biosemiotic law, which Rothschild formulates in the following way: "Inner polarization is necessary in order to permit the subjectivity of organisms to communicate with the object of the world simultaneously with realization of the own self" (ibid. 459). On an elementary step, this polarization is represented by the formation of the cell and the diploidy of chromosomes that had initiated the inner duality within the unity of organism.

Finally, the third law states that in order to develop its function a new system must dominate a more archaic one. There is a specific dependence of an emerged system on the previous and, at the same time, the former must dominate the latter. Every dominant system has to adapt to the dominated one since it depends on its information and semiotic activity (Ibid. 459). This tension between the required dominance and an informative dependence is crucial and most striking in the human subjectivity. Language as the highest inner sign system is not provided by nature but must be learned by an individual (Ibid. 459). Moreover, in this case, we cannot just speak about a new code for the already existing information. Rather, as Rothschild notices, while still being coded and decoded by nervous system, the data is comprehended in a new mode of semiosis, which is a

logical thinking. In this mode, the thought and will emerge and the transformation of perception and behaviour takes place (Ibid. 459).

What is of considerable value in Rothschild's conception of subjectivity is that he singles out the dynamics of personality as resulted from the opposition or even tension between new and more archaic *subjectivities*. To be more precise, the personality dynamics proceeds from the antinomy of dominance and interdependence. An individual needs the data and semiotic activity, which are provided by previous system, to realize him or herself, to create the image of their own body along with the image of the outside world. By Rothschild, this means that subjectivity must fulfil the first and the second biosemiotic laws prevailing in any given system: first, the true self-realization is possible if and only if the inner "unity with materiality and emotionality" is achieved; second, the human must recognize a necessary interrelation between ego and non-ego as a prerequisite of communication (Ibid. 461). Rothschild concludes: "Each personality reveals in its characteristics the measure of success and failure that the self achieved in confrontation with his long history of evolution" (Ibid. 461).

Thus, the specificity of Rothschild's conception of subjectivity resides in its being derivative from sign systems or modes of semiosis, which leads to the thesis about the possibility to afford subjectivity to various living systems, and even of the conflict between *subjectivities*. Although less explicitly than Uexküll, Rothschild calls for introducing a new kind of causality, different from mechanistic, into a scientific discourse. Apart from lawful relations between internal sign systems, each step in the evolution of subjectivity supposes, for him, a respective degree of "freedom of response in the dialogue between self and the world […]" afforded to an individual by the top sign system and the interdependent communication between it and a more archaic system (Ibid. 454).

Finally, as previously mentioned, Rothschild makes a subtle discrimination between the related terms of 'subjectivity' and 'self', in that the self, or the unity of experiential life, is dependent on the relations of dominance and subordination between subjectivities of the two internal sing systems. Against this background, the self turns out something that is gained and preserved, and a living system is taken to be a 'bearer of self' as long as it exists as a distinct and not a fragmented whole. Overall, it is the integrity

as a precondition of a self-realizing project of the organism that is emphasized in the concept of self in Rothschild's works.

1.2. 'Self' in conceptual framework of biosemiotics: vindication of 'final cause'

A careful examination of the works of predecessors of biosemiotics has shown that the introduction of the concepts of self and subjectivity in a biological discourse was congruent with the attempt to posit the causality different from a mechanistic cause-and-effect relation. The same strategy is characteristic of contemporary biosemiotics, in which the attribution of 'self', 'subjectivity' to living systems and affirmation of life's own causality are two sides of the same coin. This constitutes the way in which biosemiotics defines itself as a scientific project that offers "a theoretical framework for understanding living systems very differently from the metaphysical idea that cells and organisms are simply organized organic molecules" (Emmeche et al. 2002:7). The search for and assertion of the new causality guarantees biosemiotics an unconventional perspective on a set of vexed points that not only biology but, more importantly, philosophy, as represented by contemporary analytic tradition, has doomed to be intractable or driven to the periphery of a scientific discourse. Given that, this section is intended to show how closely related concepts of self and subjectivity arise in the conceptual framework of biosemiotics.

A contemporary biosemiotician, Jesper Hoffmeyer, defines biosemiotics as an "interdisciplinary scientific project that is based on the recognition that life is fundamentally grounded in semiotic processes" (Hoffmeyer 2008:3), or as an "understanding of living systems that takes sign processes or semiosis to be constitutive for life" (Hoffmeyer 2012:105). Those definitions supposedly allude to Thomas Sebeok's famous motto "a full understanding of the dynamics of semiosis may in the last analysis turn out to be no less than the definition of life" (Sebeok 1979:26). Accordingly, understanding of live as based on the generation, action and interpretation of signs assumes specific causality and the attribution of 'self' even to the cell, which is afforded

a status of "the simplest entity to possess real semiotic competence […]" (Emmeche et al. 2002:16).

To begin with, the concept of self figures in the specification of 'semiosis' given by Sebeok himself in a series of articles, which sought to lay down the grounds of an explicit approach to the self, or, how he termed it, 'the semiotic self': "The clandestine interpreter of symptoms is, by definition, the semiotic self. This interpreter corresponds to what Jakob von Uexküll identified, on the cellular level, as 'Ich-tone', usually rendered into English as 'ego-quality'" (Sebeok 2001b:134). For Sebeok, 'Ich-tone' is similar to 'to somebody' in Peircean definition of sign. Likewise, Jesper Hoffmeyer takes Peircean triad as a point of departure in thinking about processes of life claiming that it is "[…] a purely logical relation to be established in any system capable of autonomous anticipatory activity – that is, all living systems" (Hoffmeyer 2013:152).

Apparently, in this definition 'autonomy' and 'anticipation' are indicative of one of the main explanatory strategies in biosemiotics, which can be articulated as follows: *the causality, different from cause-and-effect relation, should be vindicated if the emergence and evolution of life are to be handled in a satisfactory way*. Hoffmeyer picks up the term 'final cause' to designate this causality, which he, following Peirce, understands not as purposive, consciously conceived end cause, valid only in the context of human agency, but as a general principle of causation[1]. There being the rejection of the final cause in a traditional paradigm of the explanation of life, its acceptance constitutes a specificity of biosemiotics as an interdisciplinary scientific endeavour: "[…] it must be concluded *that life and final causation is – at least potentially – inherent in the fundamental physics of our universe* and rather than tabooing final causation right away we should make a distinction between acceptance and nonacceptance of final causation" (Hoffmeyer 2014:98).

In the scope of the semiotic understanding of life, Hoffmeyer specifies final causation as a 'semiotic causation':

[1] Causation is definied in OED as „the action of causing" and „the relationship between cause and effect; causality", which makes, in some cases, 'causality' and 'causation' mutually substitutive terms (http://www.oxforddictionaries.com/)

> Semiotic causation is based on a 'trigger-mechanism' whereby an interpreting system creates the interpretative response by its own means, not by any external intervention – apart from whatever 'trigger-event' it has learned to select. For this reason there is *no need for physical compatibility between the sign and the activity it releases* […] (Hoffmeyer 2012:109)

Although there seem to be an agreement over the need to ground new causality, there might be a different point of view on the choice of terminology. Thus, Deeley stipulates for *specificative* or *objective* causality, which is traditionally required to explain cognition and psychological states. For him, the action of sings is exactly a species of the objective causality, rather than a species of a final causality. Specificative causality appears to be more general than the final causality "inasmuch as it specifies equally both vital activity and the chance interactions of brute secondness at the level of inorganic nature" (Deely 2001:634). In other words, only this causality is suited to ground sign-behaviour in chance occurrences. However, this does not change the main line of thought, according to which it is the grounding of new causality that ultimately brings about the concept of self.

As seen from the passage above, it is a relational nature of the sign, that is, its being a relation or process, which calls for a relation, that bears on the possibility of the new causality. This also opens up a new possibility to explain the phenomenal life:

> However, while an explanation in terms of mechanistic or informational models leaves us with a downright impossible problem, the semiotic model points us to emphasize relational phenomena that, in principle, are independent of the substantiality of related entities, and this opens new channels of explanation. (Hoffmeyer 2014:103)

Interpretant is a relational and mediating process inside the interpreter, "a process whereby the perceived sign vehicle becomes related to the object, in such a way that it somehow mimics the sign vehicle's own relation to that same object" (Hoffmeyer 2014:103). An interpretant is always created as context sensitive response to an event, is never given for good and is a result of the organism's history, which suggests that that former experiences influence the interpretative process from the earliest stages. Therefore, the independence of interpretants from materiality of the sign relata, their unlimited diversity due to the context and needs of the organism, an autopoietic character of interpretation, in the course of which one interpretant gets extinguished by another – all these features, which were already touched upon in the works of Jakob von Uexküll,

show that the sing process does not cause the response in a traditional sense of efficient causation, but it stipulates for admitting the semiotic causation, or "bringing about things under the guidance of interpretation in a local context" (Hoffmeyer 2008b:37).

The vindication of final cause, for Hoffmeyer, points to the need to eliminate the 'sensory mechanics' principle, which is taken as an explanation of how an external world enters the mind. Instead, 'sensory mechanics' should be replaced by 'sensory semiotics'; and instead of a 'mechanic body', life sciences should take a 'semiotic body' as a starting point. (Hoffmeyer 2014:95). In the same vein, it allows considering sensation as an open-ended loop of interactions between memory, sensory impulses, and motor activity. Furthermore, the adoption of the new causality leads to positing one of the most ambitious claims of biosemiotics, according to which the intentionality of phenomenal consciousness is a special and highly sophisticated instantiation of a more general bodily intentionality, whose history is co-extensive with the natural history of signification.

From this perspective, the bridge from semiotic causation to the realization of final cause in an evolutionary framework lies through the foundation of 'semiotic realism' on the issue of intentionality, namely, the perspective on intentionality as implicit in semiosis. Specifically, Hoffmeyer proceeds from semiotic realism of Peirce who grounded intentionality in a generalized treatment of semiosis. For Hoffmeyer, this triadic notion points to intentionality because to the interpreter the sign is 'about' something, and, being the system in which the interpretant is formed, the interpreter is not necessarily a human being. Consequently, human intentionality appears as resultant from a general dynamics of semiosis in nature: "The way the outside world of an organism and its inside world are connected is not, in this view, by way of something from the outside entering into the inside, but by the formation in the organism of a sign relation connecting it to the outside world through an interpretative act" (Hoffmeyer 2012:101).

In the context of survival strategies of living beings, the capability of the sign vehicle to point to something else, or to be about something else, is what opens a possibility of anticipation. To put it another way, intentionality resides in anticipation where present cues point to future conditions (Hoffmeyer 2013). The activities of living beings are always goal-directed: they all depend on a capacity to envisage a range of

possible dangers, as well as where various resources may be available. With respect to this Hoffmeyer contends:

> To achieve this organisms produce internal 'models' of significant part of their surroundings, or Umwelts […] Although the Umwelts of animal may seem extremely limited in both spatial and temporal variety, when compared to our own human Umwelts, they nevertheless usually serve them well in making life-saving choices of action. (Hoffmeyer 2014:100)

As a result, the evolutionary dynamics could be reflected in the creation of species possessing yet more sophisticated umwelten, which match deeper levels of environmental dynamics, or in the creation of species possessing more and more 'semiotic freedom'.

Hoffmeyer defines 'semiotic freedom' as a tendency towards the production of species which demonstrate a bigger semiotic competence in the sense of '[…] increased capacity for responding to a variety of signs through the formation of (locally) meaningful interpretants" (Hoffmeyer 2010:196). Semiotic freedom might be seen as one of the survival strategies in evolution, which would be best suited to free moving species because of the need in them to handle a huge amount of data provided by fast spatial variations (Hoffmeyer 2014:98-99). Incremental semiotic freedom reverberates through the species' behaviour becoming less and less constrained by the natural lawfulness and increasingly hinging upon the interpretative capacity of organisms (Hoffmeyer 2013:162). Given that, increasing semiotic freedom would then feed back into the evolutionary process by strengthening the advantages of species that are in possession of it. In addition, Hoffmeyer notices that on early stages of evolution semiotic freedom might primarily be revealed at the level of lineage, and "only gradually would emerge a more advanced stage of biosemiosis, in which semiotic activity was no longer a property of the lineage but also, and importantly so, a property of individual organisms" (Hoffmeyer 2012:112).

1.3. 'Self' in conceptual framework of biosemiotics: substantiation of 'agency'

The appellation of biosemiotics to the new causality – as represented by either final cause or objective causality – in its attempt to offer a new framework of understanding of life

is also realised by way of affording 'agency' to living units, which is regarded here as their capability to generate end-directed behaviours (Hoffmeyer 2013:148). Agency, therefore, becomes one of the main conceptual tools in biosemiotic handling of the emergence and evolution of life. In other words, biosemiotics proceeds from the treatment of agency as a real property of life residing in the capacity of organisms to interpret signs, or the "the capacity for making contingent choices internally" (Hoffmeyer 2006: 22).

In the same vein, the ascription of agency to living systems marks the rejection of an externalist perspective on the evolutionary dynamics. Externalism seeks to explain internal properties of organisms and their adaptations exclusively in terms of their environments and natural selection pressure. Looking at macroevolution as nothing more than the extension of microevolution in time, it cannot admit the interpretative agency as a real property of organismic life despite the fact that introducing agency in the evolutionary context would resonate well with a highly context sensitive character of the information carried by genes and, thereby, unacceptability of the genetic determinism.

Contrary to externalism, biosemiotics offers an internalist point of view, which asserts the lawfulness *immanent* in processes of life, assigns agency to *individuals* and is motivated by *intrinsically teleological character of semiosis*. An internalist position in biosemiotics then would appear justified in an attempt "[…] to explain how agency and semiosis could arise in the course of processes that finally led to the formation of living systems" (Hoffmeyer 2013: 156). In addition, internalism gains in significance in response to the externalism's failure to produce a satisfactory theory of the evolution of life. Hoffmeyer justifies this step in the following way:

> By according agency to individual organisms, and even cells and embryos, a creative element is introduced in the world that has been forbidden ever since the Newtonian revolution. And the automatic explaining away of this agency by claiming it to be a product of natural selection is logically excluded in this case, since the whole reason why agency must be ascribed to organismic systems was that natural selection could not itself produce the variations upon which it acts. Or, in other words, without agency, there is no natural selection. (Hoffmeyer 2013:151)

Here it must be stressed that it is the introduction of 'agency' in the elucidation of life that paves the way for the concept of subject being extended beyond a human domain specifically, as well as for the treatment of any living system as being the self. For instance, for Hoffmeyer, all living systems are subjects "[…] in the sense that they are

semiotic agents capable of interacting with their surrounding in 'intelligent' ways" (Hoffmeyer 2008a:205). To recap, the status of subject can be ascribed to any living being insofar as it is a semiotic agent, and the ability of any living system to be agentive amounts to its being the self. However, the position of Hoffmeyer may be criticized as he seems to confine the subjectivity to agency, thereby realizing a common dissymmetry between two attributes of a cognitively sentient being: 'agent', or 'agentivity', and 'sentient', or 'sentiency'. Ikegami offers a careful linguistic examination of this pair, which, if applied in the current work, may show a weak point in Hoffmeyer's reasoning brought about by the tendency to prioritize agency over sentience in ordinary discourse. As Ikegami notices, 'agent' is associated with a source, from which the action causing the change of the situation starts, while 'sentient' is associated with a goal to which a stimulus comes (Ikegami 1994:326). Agent serves as "a basis for the type of semiosis in which the subject is clearly separated from the object – which again will serve as a basis for the type of semiosis with a focus on clearer semiosis. The latter underlies the type of semiosis in which the subject is not clearly separated from, but is merged with, the object […]" (Ibid. 328). This makes obvious some inconsistency in Hoffmeyer's tendency to equate the subject with an agent on the terminological level, although there is no strict separation between the object and the subject in the interpretative agency, which all the more requires some qualitative aspects of signs. Deely also suggests that subjectivity does not amount to agency exlusively, but must include other attributes, among which he stress *passion*, according to which an individual is considered as acted upon by another agent. In addition, action and passion are not considered by him as relations of cause and effect, but as "foundations and terminations in subjectivity of those relations" (Deely 2001:76).

Apparently, the specificity of biosemiotic treatment of 'subject' and 'agency', as well as of its approach to life springs from 'agency' being co-extensive with 'selfhood', which allows restating the former as tendency of the living being "to incorporate interactive events into its own project of survival" (Hoffmeyer 2008a:13). Therefore, life and selfhood are considered to exist in the system of mutual references and cannot be conceived of separately inasmuch as understanding of life becomes inextricable from explication of semiosis. In addition to this, it is a specifically semiotic dimension of agency and, thereby, selfhood that determines the novelty of biosemiotic approaches to

the self and which singles them out from the background of the dynamic system approach, artificial intelligence and autopoiesis theory.

In order to stress this novelty, we can refer to the way of how Hoffmeyer shows incompleteness of any theory of self-organization in explanation of life insofar as they leave out "the semiotic aspect of selfhood" and fail to answer "the question of how the possession of subjectivity affects the living system under study" (Hoffmeyer 2008a: 178, 183). For him, it remains unexplained "how the element of first-person perspective that necessarily clings to intentionality – i.e., the fact that intentionality always presupposes an intentional *subject* – might possibly have appeared out of sheer complexity" (Hoffmeyer 2008a:178). The novelty comes from thinking of agency as not only self-assertion of any living being but as a primarily *interpreting activity* serving one's own project of self-preservation. A semiotic aspect of selfhood may be specified here by appealing to a relational character of interpretants and the source of their unlimited diversity; it is, besides, what ultimately motivates insistence of biosemiotics on subjectivity being 'more-or-less phenomenon' and the applicability of the term to all living beings. A semiotic explanation of selfhood or accentuation of its semiotic aspect allows biosemiotics to address the first-person perspective of phenomenal life and the very experiential component of life, or qualia:

> Every person is genuinely an 'I' phenomenon, whereas complexity in principle can be exhaustively described as an 'it' phenomenon. How 'it' can possibly become 'I' is the puzzle that must be explained – and not even dynamic system theory does yet offer a solution to this puzzle. What is missing, I would argue, is the admission of a semiotic dimension of explanation. (Hoffmeyer 2008a:179)

Seemingly, the very concept of umwelt may function as an argument against treating organic life as an instance of an abstract life form simulated by computers. (Hoffmeyer 2008a:176). Thus, Clause Emmeche contends that umwelt exists in a mode of an experiencing subject and therefore cannot be seen or described from a purely external point of view. This subjective aspect of animal sensation can be approached by semiotics due to its triadic sign relations basis, which are "[…] truly significant (in the inner experiential sense) for the animal in question" (Emmeche 2001:680). According to Peircean conception of sign every sign, in addition to being a token of some type, has also an aspect of being a tone, or being qualitatively felt in some way or other. How Emmeche

puts this: “The tone/token/type is a genuine triad, where the firstness property of the tone is always partly hidden, so to speak, within the ‘objective’ or more external property of that sign’s belonging to a type” (Ibid. 680). Thus, the umwelt is dependent on qualitative aspects of sing action and sign interpretation.

In contrast to this, the issue of subjectivity, or the first-person perspective in experiential life, has been granted the status of one of the major intractable problems in philosophy of mind. Thus, Thomas Nagel contends that explaining subjective experience, or how something appears to somebody differently from the way it appears to anyone else, is currently beyond the reach of scientific grasp since the scientific understanding by definition takes an objective and externalist perspective, which directly confronts a subjective first-person point of view (Nagel 1974).

Conversely, biosemiotics claims that “the experiential component of life, *qualia*, is thus seen as an integral aspect of life as such – an aspect that has its own evolutionary history from its most primitive forms in prokaryotic life to the sophisticated kinds of Umwelts that we find in big-brained animals” (Hoffmeyer 2008a:181). This status of qualia as “an integral aspect of life” resides in qualitative tones of signs, or, how Thure von Uexküll puts it, in a private character of signs and a public character of their signified objects. For him, this duality of signs bears on any attempt to ground the feasibility of biosemiotics. What is more important, the private character of signs is “one of the most convincing arguments for the existence of a ‘semiotic self’ in anthropo- and biosemiotics” (Uexküll 1995:101). “Each sign contain the ‘self’ of its receiver as a distinctive code” (Uexküll, Geigges, Hermann 1993:35), meaning that the umwelt comprises signs that are accessible only to an encoding subject and are just ‘noise’ to all others due to the private character of signs. Thure von Uexküll demonstrates it this way: “The private character of signs and their hidden interpreter – ‘semiotic self’ – is the basis for ‘identity’ and ‘individuality’, both of them qualities, that can’t be shared” (Uexküll 1995:102-102).

Overall, subjectivity and qualia are part of a conceptual framework of biosemiotics, that is, they contribute to formation of a biosemiotic approach to the life. Therefore, rather than questioning the ontological status of qualia or the first-person dimension of phenomenal life, biosemiotics seeks to find their evolutionary significance. In other words, instead of eliminating those issues from a scientific inquiry, biosemiotics

strives for answering the question of how anything in the world can have a subjective point of view. Hoffmeyer answers it in an evolutionary framework by seeing "a natural history of subjectivity" reflected in a built-in tendency "[…] to create more and more sophisticated semiotic interactions which were less and less constrained by the laws of the material world from which they were ultimately derived" (Hoffmeyer 2006:21). By him, this process has finally led to the creation of self-conscious and intelligent beings (Ibid. 21).

What is important here is the accentuation of the first-person perspective in the concept of subjectivity. The first-person perspective of experiential life can be taken in a more general sense as a case of unique idiosyncratic perspective, meaning that it is not a derivative or epiphenomenal feature of the experience but attributive one. What should also be taken into account is that the idiosyncratic perspective in question is by no means a point of view from nowhere; instead, it has to be described in terms of bodily immersion into one's environment. This leads to the suggestion that the experience has primitive parallels all over the life world, and thereby, we arrive again at the thesis that subjectivity, is not a 'either-or' but rather a 'more-or-less phenomenon', which was articulated by Hoffmeyer as the third thesis of biosemiotics (Hoffmeyer 1997).

Finally, another constituent of biosemiotic notion of self derived from the specification of sign process is already prompted in Jakob von Uexküll's statement that animal's world or umwelt is modelled with reference to what is significant or relevant for its successful performances. Thure von Uexküll, Werner Geigges, and Jörg Hermann make this explicit by defining the semiotic self through the need and 'reference-value'. For them, all the interpreter's relationship with the other elements of sign process is determined by the need. They assume Jacques Piaget definition of need as presupposing "an organization in 'mobile balance' of which it simply indicates a transitory imbalance […]", and as "the expression of a totality momentarily incomplete and tending toward reconstituting itself" (Piaget 1952: 44). Applying such "totalities tending toward reconstituting themselves" to the context of sign process, they conclude that 'totality' becomes completed only when the meaning is utilized, or to be more precise, when the living systems responds to stimuli with the behaviour or affordance, and the 'object' is established (Uexküll et al. 1993:16).

Then, on all levels of life, from subcellular to organismic, the construction and preservation of living systems, regarded as totalities "momentarily incomplete and tending toward reconstituting themselves", takes place by assimilation of fragments of their surroundings as 'non-self'. Those processes are governed by signs, in that it is signs that ascribe a positive meaning (being beneficial) or negative (being harmful) to 'non-self' in accordance to its relevance to the survival project of the living system (Uexküll et *al.* 1993:19). This perspective on living systems is considered to take into account "the whole action"; thus, a tetradic conception of sign, elaborated by Jesper Hoffmeyer and Claus Emmeche on the basis of Peircean triadic concept, is preferred. In other words, the introduction of the fourth element, that is, the effector in the sign relation, allows them to accentuate that, in reality, not only reflection but also action is always involved in the use of signs. As a part of an active life, interpretation triggers some behaviour involving the object denoted to by the sign.

Thus, a living system, "[…] with receptor for taking in environmental influences as sign vehicles and an effector for answering with a behavior or affordance", gets included into the formula of sign relation (Ibid. 14). Then, the process of sign interpretation may be specified in a way which singles out an active role of self: interpretant attributes a certain meaning to the sign vehicles of the receptor's responses, thereby encoding them into signs; this entails a response for the effector, or creation of an affordance; the interaction of the effector's affordance with the environment's counteraffordance leads the generation of a signified or denoted object; thus the meaning is utilized and momentary imbalance is smoothed away. Affordances, or the effector's response leading to generation of the object, are meaningful only with regard to the interpretant, or, how they consider it, 'the reference value' (Ibid. 14). In cybernetic machines 'reference value' is imposed from the outside, whereas it is immanent in living systems. In other words, only that meaning is followed by the living system, which related parts of its environment assume for its survival. Thus, rather than having a status of entity, the self of living systems appears to be process (of resuming 'mobile balance') with the need or 'a transitory imbalance' being necessary condition of its continuation.

1.4. 'Superficial' self, and origins of life

Yet, the issue of qualia and idiosyncratic point of view does not exhaust completely a biosemiotic treatment of self as a mode of existence of living systems. Biosemiotics thus goes further by separating 'self' from 'subjectivity' and seeking for a topological definition of self, which would account for that idiosyncratic point of view peculiar to all living beings. And it is precisely where selfhood of living systems becomes identified with 'subject-ness', and the origin of life is attended to in the first place.

According to Hoffmeyer, one of the keys to a biosemiotic theory of origins of life, or, how he terms it, 'subject-ness'[2], is a process of the asymmetry formation through membrane closing, followed by the development of mechanisms for semiotic interaction across this membrane (Hoffmeyer 1998:35). Membrane figures here as an elementary realization of a more general principle, namely, surface principle or that of a 'semiotic interface': "The membranes of living systems – at whatever level, i.e. whether they encircle sub-cellular organelles, cells, tissues, organs, or organisms – are in fact best described as interfaces facilitating a highly regulated exchange of signs between interiors and exteriors" (Hoffmeyer 1998a:36).

To recap, 'semiotic interface' is a general principle of functioning of natural surfaces on different levels, of which the skin and cell membrane are the two utmost realizations. In order to understand a living system in its end-directed interaction with its environment, a spatial and structural separation between the system and its environment needs addressing. To put it differently, life, agency, and semiosis are co-existent and "[…] the formation of a closed space defining an inside-outside asymmetry must have been a decisive step on the path leading to appearance of living systems" (Hoffmeyer 2013:158). A fundamental asymmetry on which the life is built is detailed further as the asymmetry between 'inside exterior' and 'outside interior', which supposes the establishment of an inside representation of what is going on outside of the system (Hoffmeyer 2013:158; Hoffmeyer 1998: 41).

[2] Hoffmeyer coins this term, and this spelling with hyphen will be preserved whenever his concept is implied.

A constitutive role of the asymmetry between the 'inside exterior' and 'outside interior' and the formation of an inner representation of the outside suggest that the issue of selfhood is closely associated with that of biological reference. For Hoffmeyer, self-assertion alone is not enough for a biosemiotic explanation of life. What is also needed here is other-reference, or other-representation. In other words, the self exists only insofar as that, which is inside, contains a reference to what is outside. Nevertheless, this outward reference rests upon a corresponding inward reference, such that it becomes possible to say that other-reference presupposes self-reference (Hoffmeyer 2008a: 26). By virtue of this, we have approached another prerequisite for the emergence of life and subject-ness. Specifically, subject-ness presuppose a double asymmetry, or realisation of a temporal asymmetry through the afore-mentioned spatial one. Hoffmeyer writes in this respect:

> The answer is that self-ness presupposes temporality, a self must have an internal temporal link for otherwise it would be meaningless to say that the world matters to it. If something should matter to a system then the system must have an existence in time. The 'written record' or DNA-description serves as a 'present' memory (a proto-value) linking past and future around it. The temporal surface is linked to the spatial surface, the two asymmetries are integrated: time is *situated* and loaded with *agency* […] (Hoffmeyer 1998:42)

Thus, the integration of those asymmetries creates a necessary precondition of the subject-ness taken as criterion of discrimination between living and non-living systems. Moreover, it ultimately grounds the claim that even non-human living systems might be considered subjects in a very general sense of the word: "Living creatures are self-referential, they have a history, they react selectively to their surroundings and they participate in the evolutionary incorporation of the present in the future" (Hoffmeyer 1996: 51). What is crucial for the tasks of this work is that we can finally outline a more or less complete set of attributes of subject-ness or selfhood in biosemiotics: self-reference, history, ability to react selectively and future-directedness. On a stage when life and selfhood emerge, selective reactions are realized by cells, whereas history and future-directedness are assured by DNA, which serves as an evolutionarily primary mechanism of anticipation and, in its functioning as a proto-value, it determines the establishment of reference-value for the system's activity.

As previously stated, biosemiotics grounds the need for causality immanent in processes of life by demonstrating how agency and semiosis could arise in the course of

processes triggering the formation of living systems. As a realization of this strategy, Hoffmeyer offers a five-step model of origins of life, which stresses a constitutive role of both asymmetries, the agency and a semiotic interface. Specifically, the source of agency is questioned and the principle of 'code-duality' as an ultimate criterion of discrimination between life and non-life is established here.

To begin with, for Hoffmeyer, it would be fallible to think that it is DNA that controls and directs agency or life's activity in the first place. Instead, what coordinates biochemical and physiological processes is the membrane. Accordingly, it is in the semiotic function of the cell membrane that the source of agency should be found: "It is, in other words, in the semiotic functioning of the cellular membrane that we shall seek what can be called life's *agency*, its inherent future-directedness, its survival project" (Hoffmeyer 2008a:32).

Following this further, 'code-duality' refers to living systems forming a unity of two coded and interacting messages, namely an analogly coded message of the organism and its re-description in the digital code of DNA. Organisms, in their capacity of analog codes, recognize and interact with each other in the ecological space, whereas, as digital codes, they are carried forward from one generation to another (Hoffmeyer 1998a:34). Besides, as a defining criterion for being alive, the principle of code-duality excludes computers "[…] since they have not (at least not yet) been constructed to depend on the creativity of an analogly coded version interacting with real world processes in such a way as to test the fitness of the digital specifications necessary for its own construction" (Ibid. 35). Moreover, code-dual systems are anticipatory in that the digital code records specifications that worked well in the past and that are then used by organisms to cope with an immediate future, which assures the survival into a more distant future. This is the anticipation in a primitive sense; however, as has already been said, "the fundamentally semiotic character of this system very early in evolution assured the creation of sophisticated sense facilities to strengthen anticipation" (Ibid. 34).

In defining the first step in his model of a prebiotic evolution, Hoffmeyer appeals to the Kauffman's theory of life's emergence where autocatalytic self-sufficiency is taken as the main stage and a condition for the development of living systems from chemical systems. Nonetheless, in the five-step model the formation of an autocatalytically closed

system, which becomes just the first step of a prebiotic evolution, does not suffice for the life to emerge. Rather, there must be established a condition of possibility of semiosis. Therefore, the second step consists in establishing of proto-membrane as a prerequisite for the basic asymmetry between inside and outside, which makes life-sustaining semiosis with its environment possible (Hoffmeyer 2008a:35). However, the autocatalytic system enclosed within the protomembrane cannot yet be assigned a status of living system for it is incapable of an autonomous agency, or in other words, there is no project sustaining the self.

Thus, the solution might be found in supplying the given closed system with the other-reference based on the self-reference. Hence, the third step consists in the emergence of a higher-order autocatalysis in swarms of membrane units, which means that "[…] there must be established not only one closed membrane system, but a whole swarm of closed membrane interacting chemically and reciprocally through the flows across their membranes" (Hoffmeyer 2008a: 35-36). The third step may be explained by the reference to the way biosemiotics situates the object under the study in a broader context: a single unit is nothing on its own, "[…] nothing in the cell or the organism makes sense if not seen in the perspective of the organizing influence of this deeply semiotic system" (Hoffmeyer 1998a:35). Likewise, the environment is not an unspecified outside but that which contains more or less equally active entities. This also anticipates the problem of semiotic emergence, i.e. the emergence of higher-level patterns – in this context, the capacity of the autonomous biological agency – from the semiotic interrelation between particular units or elements.

Following this further, the fourth step suggests the establishment of a self-reference system through digital re-description of protein components in DNA and RNA. However, the self-reference alone does not suffice for the emergence of agency and selfhood because, as Hoffmeyer contends, the system still has no way to assist the fulfilment of its own 'interest', or it has no mechanism for goal-directed action (Hoffmeyer 1998a). In other words, the system is not "an agent in its own interests": it does not matter to the system whether it can distinguish features of its environment or not, and therefore there is no capacity for making distinctions yet. It is the formation of a feedback link between DNA and environment that is needed in addition to the DNA-record (Ibid.). The surface, in other words, must turn into an interface linking the interior

to the exterior. Therefore, the final step consists in membrane becoming a real interface thanks to the establishing of feed-back loop between the system's self-reference and the other-reference (Hoffmeyer 2008a). Hoffmeyer formulates the following transformations this way:

> Only then does the system's understanding of its environment matter to the system […] relevant parts of the environment become internalized as an 'inside exterior', a phenomenal world or perceptual model which was called the Umwelt […] and in the same time the interior becomes externalized as an 'outside interior' in the form of 'the semiotic niche', i.e., the diffuse segment of the semiosphere that the lineage has learned to master in order to control organismal survival in the semiosphere. (Hoffmeyer 1998b:42)

Thereby, this five-step model of a prebiotic evolution might contribute to making up an integrated account of how the self may be conceptualized in biosemiotics:

- biosemiotics singles out the inside-outside asymmetry as basic for semiosis and the semiotic bridge that joints them;
- this asymmetry implies the interdependence between self-reference and other-reference that is indicative of the future-directedness of living system, or in other words, the availability of a self-sustaining project of the living system;
- these features constitute the true agency which becomes the main attribute of life in biosemiotics and the basis of ascribing self to the living systems;
- a genuine selfhood consists then in the capacity of any living unit to be the agentive self-sustaining system;
- finally, the agency can be further specified as a controlled selective activity with the self-reflexivity and future-directedness being necessary conditions of it, as well as a self-sustaining project being the goal of any semiotic activity; an agentive unit (or an agent) acts in a constant semiotic interaction with other agents.

At this point, there appears a link to a human self, which is treated as a specific instantiation of an evolutionary developing self of other living systems. The whole set of issues implied by the surface principle is relevant to the problematic of a human self in the first place. What is of considerable importance here is that, as a particular manifestation of a semiotic interface, the skin delimits us from the outside world and defends against its damaging forces. This is quite close to a philosophical reflection upon it: both claim that if we are to point to a "place" of the self it should be the skin. Although

in a postclassical philosophy when the skin is addressed as having a primary relevance for the formation or existence of a human self what is emphasized here is its individualizing and defending capacity. In this case, the skin is contrasted to the flesh as anonymous bodily basis common for all units of phenomenal world (Gritsanov 2011). And yet, what is further accentuated in biosemiotics is a creative and meaning-generating aspect of the skin when it is regarded as an indispensable part of the self. Therefore, it is not only a sort of a topological boundary, but, on the other hand, the skin in its semiotic capacity opens up the world to us by being "[…] a highly specialized manifestation of the very same interior interface principle whereby life processes are most generally built up" (Hoffmeyer 2008a:27).

1.5. 'Self', 'subjectivity' and 'subject': the legacy of a classical philosophical discourse

The extension of 'subjectivity' to the domain of all living systems, which is peculiar to biosemiotics, can be contrasted with a posthumanist attempt to bridge an ontological gap between the human and animal by way of transforming the concept of subject in what concerns the sphere of its application. This step is especially evident in Cary Wolfe's attempt to establish a specifically posthumanist view (in that it refuses humanists' way of defining subjectivity) of posthumanism (in that it challenges an ontological and ethical bridge between humans and animals), or simply, to ground a view on animal as a nonhuman subject which must be treated properly. Although the posthumanist perspective on the animal takes upon itself a task of treating it as a direct moral subject, it is an argument supporting the extension of the term on the animal world that is of interest here.

According to Wolfe, even in state-of-the-art cognitive sciences the issue of the animal is addressed in terms of capacities for either thought or language, which determines its understanding of other issues concerning the animal's power or capability. Further, an ontological divide established between animals and humans is based on a conclusion that subjectivity is directly dependent on the attribution of language. Therefore, the main strategy of bridging this gap consists in thinking of man and the

animal in terms of inabilities and passivity, of what they are not capable of. And here an issue of the embodiment comes to the forefront as it is a common feature shared by them: "What is fundamental to the ethical standing of both humans and nonhumans […] is […] the embodiment and finitude of creatures of whatever species who may be deemed, to use Tom Regan's term, 'the subject of a life'" (Wolfe 2010: 66).

Against this background, a biosemiotic extension of subjectivity on living systems is based on thinking of them exactly in terms of 'abilities', specifically, in terms of a semiotic competence and the capability of making sense of their surroundings. To put it another way, biosemiotics dismantles the tradition of considering the difference between the human and nonhuman in terms of the human's abilities and power inasmuch as those abilities and power should be regarded as special instances of a more general biosemiosis unfolding in the biosphere:

> […] humanity's cognitive and emotional characteristics cannot be considered so miraculously great that we can justify setting humans 'inside parentheses' in the study of natural phenomena of this earth. The mental system of humans has grown from nature through an evolutionary process, and we must expect to find phenomena in nature that remind us of humanity in all its forms. (Hoffmeyer 2008a: 6)

Further, the application of 'subjectivity' and 'subject' within the scope of biosemiotics can be legitimated on the basis of its comprising a linguistic framework in terms of R. Carnap, that is, the language of description coupled with a particular ontology (Carnap 1950). However, it is also legitimate inasmuch as it avoids pitfalls of the concepts of subject caused by its polysemy. Therefore, the task of this section is to show how biosemiotics copes with the implications of introducing a polysemous concept of subject into its discourse and avoids a metaphysical connotation of the term.

According to Etienne Balibar, Barbara Cassin, and Andre de Libera, the meaning of the concept "subject" can be divided into three groups:

- the subjectness, which unites the meaning of logical subject ("what" that a predicate is spoken about) and physical subject ("what" that accidents exist in);
- subjectivity, which is emphasized in the opposition between subject and object, particularly, when it is necessary to discriminate the realm of mental from that of physical;

- subordination or submissiveness.

The multiplicity of meanings of "subject" has been brought by a double Latin etymology, that is, on the basis of a neutral noun *subjectum* (which has been used along with the term suppositum as a translation of Aristotle's *υποκειμενον* ever since the Scholasticism) and a masculine noun *subjectus*. From the first word a line of logic, grammar, and ontological meanings has derived, whereas from the second that of legal, political, and theological meanings has sprung (Balibar et al. 2009). Introducing the concept of subject in a philosophical discourse has triggered the formation of two separate paradigms of interpreting "subject". Within the first framework, the accentuation of logical-grammatical and ontological-transcendental connotations of the term has led to endowing the term with a status of substance (what was supposedly done in the nineteenth-century German idealism). Within the second paradigm, political and legal connotations of the concept have been emphasized in the studies of a subject of subordination (Balibar et al. 2009). The second paradigm has a particular meaning for any attempt to ascribe a status of moral subject to the animal; however, provided that it is not the topic the given work, this paradigm can be left aside.

What should be taken into considerations here is that the first paradigm of interpretation of subject, which draws upon the idea of subjectness and ascribes a status of substance to the subject, claims that subjectivity has something to do with the causality different from cause-effects relationships. Specifically, the tendency to substantialise the subject, revealed by German idealism of the first part of the nineteenth century, was congruent with a treatment of cognition from the point of view of a goal-setting activity, or to put it in another way, with the understanding of thinking as a spontaneous creativity in its relation to things with their own lawfulness. The ontological-transcendental connotations of the term have come to the forefront in the attempt, undertaken by J. G. Fichte and F. W. J. Schelling, to unite theoretical and practical philosophy and, thereby, extend a principle of practical reason, that is, the autonomy, as it was defined by Kant, to the domain of cognition (Fichte 1982; Schelling 1978). The autonomy was understood by Kant as the subject's independence from a radical otherness that would impose its own laws on it (Kant 1996). Therefore, the autonomy supposed the causality immanent to the subject and was opposed to the cause-effect relationship peculiar to the natural world, which formerly had been thought to dominate in the domain of cognition.

This point in thinking about applicability of the term 'subject' outside a conventional domain of its use is of considerable importance inasmuch as biosemiotics stresses the limitation or even the inadequacy of mechanistic causality in the explanation of life. This potentially opens up a possibility of imposing a metaphysical connotation of 'subject' as an ontologically distinct entity staying apart and above the stream of consciousness. It is important to stress again that biosemiotics supposes "the inclusion of a controlled notion of 'subject' in biology […]" (Emmeche et al. 2002: 18).

Therefore, inclusion of an uncontrolled notion of 'subject' might lead to endowing 'self' with an additional meaning of an ontologically distinct being, detached from or staying over and above the rest of the world. However, the shift of semiotic threshold and the attribution of agency to living systems, which are paradigmatic of biosemiotics, do not lead to positing self as an ontologically distinct entity staying apart from processes of life, or semiotic activity, as well as a pure principle of unity. Instead, the self is understood here as a result of semiotic processes, specifically, as arising "from the modelling based on different codes available in the living organism" (Maran 2011: 40). And this is characteristic not only of a current state of affairs in biosemiotics, but also to the works of the precursors of biosemiotics.

Thus, the theory of umwelt, elaborated by Jakob von Uexküll, which extended the term 'subjectivity" and offered the prerequisites for a biosemiotic perspective on self, shows the capability of avoiding the imposition of the metaphysical connotations of 'subject' as well. Although it introduces the organism as a self-enclosed entity in a plan of nature, the self is defined here only through the objects that the organism relates to. What should be questioned further is a treatment of the subject in Uexküllian works, specifically, whether the subject should be taken as a self-contained entity, substance, or it should be treated in a relational context. With respect to the connotations of the term it is its first two meanings that are of special interest here. Subjectivity as it is taken against the background of objectivity can be applied to the umwelt theory inasmuch as it is the perspective of the animal's phenomenal world, implied in the attribution of subjectivity to it, and the difference between informative and uninformative worlds that are at stake in the works of Uexküll. Nevertheless, the situation with the connotation of subjectness is not as clear. Uexküll's appellation to bodily organization of the animal, i.e, the claim that it is the amount and organization of receptor organs that determine how rich the

animal's umwelt is, may create an impression of the animal being treated in the sense of subjectness as a self-contained entity. However, it is the idea of a contrapuntal correlation between meaning receiver (or subject) and meaning-carrier that prevents the concept of subject from being treated that way: "The organized body (Organismus) of the subject represents the meaning-utilizer or, at least, the meaning receiver. If these two factors are joined together by the same meaning, then they have been jointly composed by nature" (Uexküll 1982: 52). Moreover, even in those cases when Uexküll appeals to the animal's body, he still ascribes a primary and formative role to the meaning; in other words, it is a meaningful relation that accounts for pairing the subject with the meaning-carrier: "[…] there can be no doubt that the meaning-program acts upon the form-shaping so that the meaning-utilizer faces the meaning-carrier, and vice versa" (Ibid. 49). Overall, in the scope of umwelt theory, the animal's being the subject is crucial and yet relational quality.

Besides, what is of great importance in Uexküll's theory in view of biosemiotic perspective on self is the accentuation of a recurrent character of the functional cycle. It is characterised by the recurrence inasmuch as effector cues with respective performances lead to a new functional cycle being enacted. Therefore, the functional cycle allows for the meaning being assigned and pragmatically verified. This feature was taken by Sebeok as indicative of an autopoietic nature of interpretation on a biological level, where "autopoietic" means actively self-maintaining process operating on the products of its own operations (Sebeok 2001a: 126). The accent on an autopoietic nature of interpretation together with his locating the self on the level of the umwelt and the claim that "[…] the self is never interrupted, the self is continuous from conception to death" leads to a conclusion that the self has a character of process rather than that of a stable entity (Sebeok 1991: 192; 2001a: 124). This conclusion is also grounded by his considering the self as cognitive, where "[…] cognitive is meant to suggest unlimited semiosis […] with respect to a potentially infinite string or cluster of interpretants" (Sebeok 2001b: 132).

On the other hand, Rothschild's project of biosemiotics shows a similar tendency to avoid the imposition of a metaphysical connotation of substance, although in a different way. A derivative character of subjectivity, its emergence from the interaction of different modes of semiosis is at odds with the conception of subjectivity typical of a classical philosophical discourse and, thereby, avoids imposition of an additional metaphysical connotation into his project of biosemiotics. A similar strategy is seen in Hoffmeyer's

claim that life or 'subject-ness' "[…] should fundamentally be seen as organized around the nested set of membranes or interfaces which we call organisms" (Hoffmeyer 1998a:37). The idea of 'surfaces inside surfaces' and that of life residing in a border-crossing exchange of information might prevent an outwardly similar term 'subject-ness', coined by him, from alluding to 'subjectness' connotation of a classical concept of subject.

Furthermore, biosemiotics pretends to address the issue of subjectivity scientifically, which is possibly by directing a primary attention to its counterpart or 'semiotic niche'. The concept of semiotic niche "makes the Umwelt concept easier to handle in an evolutionary perspective, since now one may pose the question of whether the Umwelt of a species is up to the challenges posed by the available semiotic niche conditions" (Hoffmeyer 2008a:185). The umwelt may serve to guide the animal's activity in the semiotic niche: it is supposed to regulate its behaviour, and a good fit between the umwelt and semiotic niche is at stake in the evolutionary selection. Consequently, on a conceptual level, 'semiotic niche' emphasizes a regulating role of the umwelt, thereby increasing chances of biosemiotics to avoid a one-sided definition of self.

To conclude, although biosemiotics has succeeded in avoiding the imposition of metaphysical connotations while introducing 'subject' and 'subjectivity' in its discourse, it is questionable whether its exploitation of 'subject' in particular is reasonable, in that it could totally get rid of any kind of anthropocentrism, and necessary, in that it can make do with the concept of self. What should be taken into account is that 'subject' is a clearly humanist idea – that of a substance in a classical treatment of the concept – and an idea of subordination whose subsequent interpretation has specified it as a specifically human attribute. Namely, the latter connotation of 'subject' has been developed in the framework of the twentieth-century French philosophy in its efforts to overcome classical (or humanist) models of subject. The subordination was interpreted as caused by language in general or by particular discourses. This interpretation, as well as that peculiar to a humanist view of man, has rendered subject a specifically human attribute. Therefore, in general, the expansion of the concept of subject, whatever a common ground of human and non-human living beings may be, to the realm of animals is somehow problematic since 'subject' already presupposes some legal standing of its bearer. Overall, while 'subjectivity' taken as an idiosyncratic perspective of phenomenal life should still be

preserved, biosemiotics should withdraw from the application of ‘subject’. It would be all the more reasonable to do so since biosemiotics has elaborated its own concept of self, which can pick up all attributes featured by ‘subject’ as used in its framework.

Chapter 2. Mode of possessing: bodily self

2.1. 'Collective self'

This chapter offers an examination of several biosemiotic theories that handle the concept of self from the perspective of sign processes of different levels that build and maintain it. Those conceptions stress such aspects of self as individuality and identity, bodily integrity or the unity of a multicellular organism, which all appear to proceed from the assumption that self is not given from the very beginning but achieved. To be more precise, they spring form the idea that the self is collective, which is a biosemiotic realization of a more general consideration that self is dialogical. This assumption focuses biosemiotic inquiries on a question of how coherency could be gained or how a collective self may be maintained.

In the first approximation, those theories are based on the understanding of the body as a 'web of semioses', as Sebeok puts it (Sebeok 2001a). Biosemiotics regards meaning and signification as inherent to the body, which is taken not in a strict physical sense, but in a semiotic sense as "[…] a body that is inherently engaged in communicative processes that serve to coordinate the activities of cells, tissues and organs inside the body as well as to exchange integrating messages across hierarchically distinct levels" (Hoffmeyer 2012:113). When applied to humans, this perspective on the body leads to the interpretation of the mind or mental system as the interface that assures coupling of the organism to its environment (Ibid. 113). In the same vein, the human cognition appears to be a product of the semiotic emergence in multicellular organisms, which makes it a very sophisticated solution to the problem of the unity of multicellular life. Therefore, it cannot be considered a normative model of cognition in general; rather, it is an "[…] extraordinarily interesting – but obviously species-specific – development of the cognitive capacity that quite generally characterise all moving, living, adaptive semiotic systems" (Hoffmeyer 2008a:233).

The understanding of the body as a web of semioses fits in with a claim that there is no need to stipulate for a 'central planner' in order to account for a coherent working of units of semiosis on all integration levels of the organism – from the subcellular level to the level of coupling the organism with its environment. The need for an alternative to positing a central controlling agency underlies the attempts of biosemioticians to answer the question of how a massive-parallel working of cells, tissues and organs in the body is achieved; and they do so by offering bottom-up models of body-mind, of which the model of swarm organism, offered by Jesper Hoffmeyer, is highly representative. In this model the body is conceived of as the "infinite swarm of swarming swarms" (Hoffmeyer 1996:126), where a swarm is defined as "a set of (mobile) agents which are liable to communicate directly or indirectly (by acting on their local environment) with each other, and which collectively carry out a distributed problem solving" (Hoffmeyer 1997:937). The smallest unit of this model, i.e. the cell, is thought to store historical information that allows it to perform effectively the task of interpretation at its own level. The body is then understood as a swarm of cells and tissues – or swarms of swarms – that stick relatively firmly together and are engaged in a massive-parallel problem solving based on idiosyncratic interaction patterns traced only with the reference to an individual history of the body (Ibid.). The affordance of a semiotic competence to decentralized units opens up the possibility for the intelligent behaviour to be induced without any central controlling agency (Hoffmeyer 1996: 125-126; 1997:939).

In the model of swarm organism, the brain is functionally integrated in the body in virtue of interaction between swarms of nerve cells and swarms of immune cells (Hoffmeyer 1997). A joint effort by the nervous and immune systems and distributed information processing in the brain leads to rejecting the idea of a cognizing centre in favour of thoughts and feelings being treated not as localized entities, but as swarming out of the body collective (Hoffmeyer 1996:114).

2.2. Semiotic individuality

Thomas Sebeok introduces the concept 'semiotic self' by pointing to the existence of phenomena that cannot be determined by the action of language; rather, they are not

amenable to a verbal expression because of their lack of external referents and their resistance to unfolding into narratives. They can only be denominated. Among these phenomena, he mentions the establishment of self-images and their translation into performances, incorporation of a changing bodily side and other bodily parameters into daily activities, as well as all kinds of anomalous semiotic phenomena such as effects of wrongly parsed sign processes or their impairment, including long-lasting images of amputated extremities (Sebeok 2001a). For Sebeok, they indicate the presence of the 'semiotic self'.

As a "recondite interpreter of our world in the semiotic chain of transmission", 'semiotic self' might be ascribed even to the cell, which would point to an active interpretative agency (Ibid. 126). Nevertheless, Sebeok is rather interested an a more or less comprehensive description of the semiotic self in animals and humans that would be the result of the work between three pattern-recognition systems, or networks of sign interpretations: the immune code, the genetic code and the neural code. Due to 'the private character' of signs and unlimited possibilities to generate interpretants, the self acquires characteristics of a semiotic individuality. On the other hand, Sebeok seeks to locate such self, which leads him to a suggestion that the semiotic self is not limited by an organism.

The localization of semiotic self may serve as a point of departure in its description. Sebeok locates it as follows:

> Clearly, in the organisms' *milieu extérieur*, on the level of an idiosyncratic phenomenal world, tantamount to Jakob von Uexküll's Umwelt (1973: 334-340) – [...] the 'model' of a species-specific segment of individual reality – made up of *exosemiotic* processes of sign transmission […] This semiotic self, which of course enfolds and thus 'contains' in its *milieu intérieur* some body's immunocompetence, occupies, as it were, a sphere of space/time bounding the organism's integument, although the programs for the fabrication of subjective constructs of this sort are surely stored within the subjacent realms of its endosemiotic organs […] This semiotic self, furthermore, is composed of a repertoire of signs of necessarily sequestered character […] (Sebeok 2001a:124)

The localization of the 'semiotic self' on the level of umwelt apparently shifts the attention from the question of interpretative agency to the question of what contributes to the formation of the self (i.e. exosemiotic and endosemiotic sign processes) and what is indicative of it. In other words, Sebeok tries to provide a one-level account by seeing the

self as inherent in phenomenal life of the animal or the human. Besides, when applied to the context of humans, the 'semiotic self' presents self as pre-conceptual and is intended to be an elementary account of selfhood on which following accounts might be based.

The self being "composed of a repertoire of signs of necessarily sequestered character" may point to an invariant dimension of the first-person givenness of experience (Ibid. 124). Similarly to the umwelt, the semiotic self exists in a way that cannot be grasped externalistically. Thus, following Uexküll, Geigges, and Hermann, we can reformulate the first-person perspective of phenomenal life in terms of each sign within the umwelt containing the 'self' of their receiver as a distinctive code (Uexküll et al. 1993). Yet, at this point, it is still not clear if the semiotic self amounts to the first-person perspective of phenomenal life. However, it is important to stress here that, when applied to the human, the self being composed of the set of sequestered signs "implies limits to which human self has the plasticity to become disembodied […]", and thereby demonstrates its bodily character (Ibid. 134).

Sebeok locates the self in the sphere of exosemiotic processes, although endosemiotic processes contributes to its formation as well. This makes him define it as "an amalgamated projection of composite non-verbal sign-assemblies called supersigns […]", implying, first of all, the immune and neural sign networks as 'sign-assemblies' (Sebeok 2001b:128). This leads again to the issue of location of the semiotic self, which apparently is neither a single organism nor is situated within its borders. To be more precise:

> The arena of the immune reaction (Ir) is contained within the skin. The arena in which the semiotic self officiates – and which contains the former – is between an ill-defined region of the body beneath the skin of an organism and the outer perimeter of what I have labelled the 'Hediger bubble', discussed, and provisionally redefined thus: "a variably shaped impalpable sphere of personal space that admits no trespass by strangers and is defended when penetrated without permission". (Sebeok 2001b:130-131)

Thus the semiotic self occupies the 'borderlands' of an organism, although it is not bound to a bodily surface or skin alone because 'Hediger bubble' implicitly points to another border, i.e. a highly movable boundary of personal time/space, the invasion in which is accompanied by an emotional reaction of some sort. That is to say, organism and umwelt together form a unified system, which follows Hoffmeyer's claim that the

asymmetry fundamental to the selfhood is not between the organism and its surroundings, but between the subjective universe or umwelt and its counterpart, the semiotic niche. This position of the semiotic self leads Sebeok to speak of the self as having a "double skin": an "immunologic, or, biochemical, with semiotic overtones" and a "semiotic, or social, with biological anchoring" (Ibid.130).

Yet, Sebeok also points to the genetic code contributing to the formation of 'the supersign cognitive self' provided that "[…] cognitive is meant here to suggest unlimited semiosis […] with respect to a potentially infinite string or cluster of interpretants" (Ibid. 132). This stresses an aspect of a semiotic individuality. Furthermore, 'cognitive self' also implies the capability of the central nervous system to discriminate "the organism, or 'self', within which it is lodged" from its umwelt or the perceived world. This discriminative capability evolves from a primal ontogenetic and phylogenetic sign relation that is the opposition between self and non-self (Ibid.132).

Now it is possible to conclude that the semiotic self seems to comprise but does not amount to an invariant dimension of the first-person givenness of phenomenal life partially by virtue of a demarcation line that Sebeok draws between the self and consciousness: "One of the differences is that consciousness in interrupted by sleep, the self is never interrupted, the self is continuous from conception until death" (Sebeok 1991:192). Being uninterrupted, the semiotic self is, thus, the very basis of identity, and in view of "a potentially infinite string or cluster of interpretants" it is primarily a semiotic individuality.

2.3. 'Built' self

The concept of semiotic self elaborated by Sebeok points to two domains of sign processes that contribute to its constitution and preservation, that is, exo- and endosemiotic processes. Overall, self officiates – as the subject felt, the dimension of the first-person perspective of phenomenal life or through the semiotic anomalies mentioned by Sebeok – on the exosemiotic level and, at the same time, it is constituted by the work of sign systems functioning on the endosemiotic level. Endosemiotic and exosemiotic processes are closely interconnected, which renders conditional a discrimination based

on the opposition ‘within the body’/ ‘between the body and the outside world’. Given that, Thure von Uexküll, Werner Geigges, and Jörg Hermann propose to distinguish them on the basis of their codes.

Sebeok mentions the nervous and immune systems in his inquiry into endosemiotic processes, which may contribute to the formation and preservation of the semiotic self, although he does not elaborate this issue in details. Conversely, Uexküll, Geigges, and Hermann, on the one hand, and Hoffmeyer, on the other, dwell on the operation of the immune and nervous systems, thereby offering a more comprehensive account of an endosemiotic constitution of self.

As long as the organism and the subjective universe (or umwelt) together form a unified system, it is not an individual body but the whole ‘unit of survival’, or the organism coupled with its universe that is to be investigated as hierarchically structured in integration levels. The self is thought to manifest on the exosemiotic level, or the level of umwelt, primary through the dimension of the first person perspective of phenomenal life, which, when applied to the context of humans, can also be taken as the unity of consciousness whereby sensations do not ‘float somewhere’ but are always enclosed in one and the same self. The distributed information processing in the brain or the working of separate and relatively independent mental systems seems to contradict the idea of the unity of consciousness. Moreover, those discoveries have become the basis of the so-called ‘non-self’ theories in philosophy of mind and cognitive sciences, which hold that self is a mere illusion since there is no ‘center’ in the brain that could account for our sense of self. However, the biosemiotic approach to the self does not adhere to the idea that self is an entity, and rather than dooming it to be illusionary because of the impossibility to localize it within the brain, it argues for the self as resulting from the series of processes whereby the organism preserves its integrity and copes with its environment. Thus, the unity of consciousness is seen as a function of the body’s own historical oneness, implying ‘history’ both the information handed from past generations as well as the one gained ontogenetically. In other words, what is crucial here is that all brain modules work together and *interact within one and the same body*, or as Hoffmeyer writes:

> What happens is this: during every second of human life, the body is effecting an *interpretation* of its situation vis-à-vis the biographically rooted narrative which the individual sees him- or herself as being involved in at that moment. This interpretation is what we experience as consciousness. (Hoffmeyer 1996: 119-120)

Consciousness is seen here as the "body's governor within the brain" which leads to questioning an evolutionary meaning of the phenomenal reality. For Uexküll, Geigges, and Hermann, the meaning of the umwelt resides in its providing animals with the means of orienting and actively coping with their environments, that is, the means of orienting the motor activity. Hoffmeyer approaches this question in a similar way, particularly: the experiential reality is a model allowing the organism to handle a bulk of incoming information and incorporate it into its performances. The quality of such reality evolves with the development of the nervous system (and the brain in particular) and is co-extensive with the increase in the information, which is triggered by fast changes of spatial configuration during movements and which needs processing as to enable the animal to make proximal decisions, which might not be based on a genetic anticipation (Hoffmeyer 2008a: 206). Thus, the incremental refinement of the experiential reality fits in with the growth of semiotic freedom, which, as already mentioned, may be seen as one of the survival strategies in the evolution essential to free-moving species.

This becomes the basis for the 'holistic markers hypothesis' put forward by Hoffmeyer: "We shall suggest that experiences quite generally serve as holistic markers, causing the brain machinery to focus its (our) attention upon one single truck in the spatio-temporal continuity" (Ibid. 179). To specify, the holistic control is required as to focus brain processes according to the organism's changing needs and intentions by means of creating "*an approximated isomorph or analogue virtual reality, a single dominating 'lead track'* […]" (Ibid. 180). This means that it is not a direct control of processing of a limitless and multiple input delivered to the brain. Rather, it establishes "an overarching directional perspective" (Ibid. 181).

Thus, "the experience is at each moment the superior, immediate, and unconventional *interpretant* in the ongoing *biosemiosis* [exo- and endosemiosis] of the organism" (Ibid. 181). There is an indirect connection between endosemiotic sign processes and the phenomenal world of the animal. For example, the immune system contains a minute list of substances in the environment that can cause harm to an

organism. On the other hand, the central nervous system contains programs for construction of the umwelt, which contain all the details necessary for orientation of the motor activity (Uexküll et al. 1993: 5). This suggests that both systems produce their own models of the organism's umwelt, the specificity of which hinges on the coding peculiar to them. Uexküll, Geigges, and Hermann retain the notions 'counterworld' or 'inner world' (Gegenwelt and Innenwelt) coined by Jakob von Uexküll for those programs for the umwelt construction:

> We would like to reserve the term 'counterworld' for organic system like nervous system and the immune system which, independent of other organic systems, store 'world program' of their own. When these 'counterworlds', by means of circular sign relations between nervous system and immune system, intertwine and from a unity on the higher integration level of the organism, we speak of 'inner worlds'. (Uexküll et al. 1993: 6)

Particularly, those 'counterworlds' comprise samples of the sectors of the environment that are essential to the survival project of the animal; those samples are encoded in signs exchanged between cells and organs. The counterworlds of the immune and nervous systems merge to form a common 'inner world' of the organism. Exosemiotic sign processes translate surroundings of animals or humans, through zoosemiotic or anthroposemiotic sign systems, into the umwelt. However, in order to do this, a collateral work of exosemiotic and endosemiotic sign processes is required. The umwelt, therefore, performs not only a connecting role, but also a protecting one inasmuch as it supposes translation of endosemiotic signs pertaining to the 'inner world' into signs of exosemiotic sign systems, i.e., anthropo- or zoosemiotic (Uexküll et al. 1993: 6).

What should be taken into account here is that our body, as it is experienced, needs sign processes that already pertain to the level of the organism's integration into its environment, or how Uexküll, Geigges, and Hermann formulate it, "a psychological integration level" (Ibid. 9). Moreover, in animals and humans "[…] sign processes on the psychological and the *social integration level* influence the order of endosemiotic sing processes, and vice versa" (Ibid. 9). Particularly, they propose the following bottom-up reconstruction of processes that build up and maintain the bodily self: the interaction of the cytosemiosis of numerous single nerve cells and attuning of their codes to each other leads to emergence of a complex code of an organ; apparently, the organ belongs to a new

level of integration, on which it responds to signs received and encoded by its individuals. A more complex level of the integration – coupling of the organism with its environment – consists in the resultant being "translated into the psychological sign of a vital body sense" (Ibid. 33).

The 'counterworld' created by the central nervous systems deserves a special attention: "Its sign processes as a whole are an endosemiotic mirror, so to speak, of the exosemiotic *Umwelt* or subjective universe (but not of the environment – i.e., the outside world)" (Ibid. 33). Being joined by the locomotor apparatus, the 'inner mirror of the world' it generates is, as it were, inserted between the sense organs taking in stimuli from the outside and the motor parts of the nervous system. This leaves its mark on the programs of the umwelt construction it stores:

> […] in this phenomenal universe, the objects of the environment are represented by schemata which are not, as in a mirror, products of the environment, but rather 'tools of the brain' ready to come into operation if the appropriate stimuli are present in the outside world. In these schemata, sensory and motor processes are combined […] to form complex programs controlling the meaning-utilizing (*bedeutungsverwertend*) behavioural responses. (Uexküll et al. 1993: 34)

The sensorimotor schemata, which comprise the neuronal 'counterworld', are continually shaped and changed by a ceaseless flow of the sensory data delivered to the brain. In this sensory input, the data that belong to proprioceptive or kinaesthetic senses are of particular importance because of a primitive or elementary bodily self-awareness they trigger: "At each moment they convey to the 'I' not only the exact position of all limbs, but also that it actually does possess a body" (Ibid. 42). Overall, continually reshaped schemata, which result from proprioceptive sign processes in the brain, comprise a 'neural counterbody' forming the centre of a 'neuronal counterworld'. Both are in the state of a constant flux. 'Counterbody' and 'counterworld' form a unity "[…] because all the events we perceive in the environment are counteraffordances – that is, they are related to actual or potential affordances of our motor system and combine with these to form the spatial grid by which we orient ourselves" (Ibid. 44). The 'counterworld' is translated into the umwelt, the world experienced as 'reality'.

In a similar vein, Hoffmeyer takes "[…] construction of sophisticated senso-motoric systems coupled to a corresponding finely tuned regulation of a *milieu interieur* that could safeguard the stability necessary for reliable performance" as a key point in

building up and preservation of the bodily structure, or, as he puts it, in the integration of a 'multicellular self' in animals (Hoffmeyer 2008a: 225). He likewise pays special attention to the sensorimotor schemata comprising the 'neuronal counterworld' and considers the bodily integrity dependent on modelling of bodily dynamics, which leads him to a conclusion that "the deepest sources for the *cognizing self* lay inscribed in the very basic senso-motoric *unity* of animal multicellular life" (Ibid. 233). In moving animals, the sensorimotor integration has been the main topic in evolution: the modelling of bodily dynamics has apparent evolutionary advantages because the activation of particular sensorimotor schemata 'selected' from the organism's behavioural repertoire provides it with the possibility of fast reactions and orients it for the immediate actions. Thus, those schemata may be understood as results of coding the environment in terms of possible operations upon it, which liberates the animal from the necessity to process the incoming information in time-consuming ways as to perform accurately and effectively. Although the choice of which schemata is activated stays stochastic, it is informed philogenetically and ontogenetically. "It thus functions as a qualified guess that will be continually recalibrated by the actual incoming inputs from the proprioceptive senses for well-tuned accuracy and appropriateness" (Ibid. 233). This makes the schemata similar to what Uexküll, Geigges, and Hermann called 'tools of the brain' activated if the appropriate stimuli are present. Then mental processes may be seen as organized around a central series of 'I can's, which follows Merleau-Ponty's suggestion that consciousness is primarily 'I can' rather than 'I think that' (Merleau-Ponty 1945), which also agrees with the predisposition of human brains to the narrative thinking.

Further, the translation of a non-conscious 'neural counterworld' into a consciously experienced 'reality' might be influenced by an 'immunological counterworld', which is designed to fight harmful substances unapparent to our sense organs. The two 'counterworlds' are interwoven by sign connections to form a unified 'inner world", although their participation in the formation of consciousness is quite different. Uexküll, Geigges, and Hermann put it as follows:

> In the counterworld of the nervous system, programs are stored for constructing a world which we consciously perceive and experience. This world includes our body, which is, as 'experienced body', its center; […] In contrast, the counterworld of the immune system contains programs for

> confronting the environment in ways which elude our conscious experience. (Uexküll et al. 1993: 35, 41)

Overall, an experienced body turns out to be the translation of the 'neural counterbody'. Yet, the body-sense also has a biological counterpart generated by the immune system, which may provide the earliest biological basis for our conscious self-experience (Uexküll et al. 1993: 35, 42). Overall, the sense of self as it is conceptualized here presents the self as intrinsically bodily, which means that the disturbances of bodily schemata of any kind or errors in translation from 'counterbody' to the actual body-sense will affect the self in one way or another. Apparently, those conceptions also argue for a kind of primitive self-awareness, which is resultant from translating neuronal and immune 'counterbodies' into signs of exosemiotic sign systems. Specifically, it is proprioceptive and kinaesthetic senses that from this bodily self-awareness.

Additionally, the possibility to endow this bodily self with some emotional tone might be considered inasmuch as emotions play a role as important as that performed by the experience in assuring the survival of the animal. Hoffmeyer proposes to think of origins of experiential life as quite closely connected to the evolutionary origin of emotional life (Hoffmeyer 2014: 105).

Emotions are spontaneous bodily reactions, which are unmediated by consciousness and accompanied by well-defined physiological patterns: "Through emotions are established characteristic functional states of the body, or rather, kinds of readiness that are connected to basic survival functions such as defence against dangers, reproduction, foraging, or aggression" (Hoffmeyer 2008a: 251). Therefore, emotions may be seen as bodily interpretants that immediately trigger subsequent interpretants in the form of particular kinds of behaviour. Given that, it is possible to consider them as a specific coding of the environment, which is representation of the outside world in terms of modifications it causes on the body. Feelings consist in experience of emotions, which thereby function as frame of their reference.

To conclude, endosemiotic and exosemiotic sign processes generate the unity of the organism, which is a key point in the presented conceptions of self. Then, on the endosemiotic level, the self is concerned in connection with the bodily structure or integrity of a 'multicellular self' and can be considered with reference to the series of

events whereby the bodily integrity is maintained, which stress the self's processual character. On the exosemiotic level (felt) self is specified through either the 'body being experienced' or the repertoire of 'I can's.

2.4. 'Minimal self'

There have been many controversies over the issue of self-consciousness that fits in with a broader tendency, which is the revival of interest in phenomenal consciousness characterising the state of affairs in analytic philosophy since the late 1980s. In this situation, the question of self has gained attention by virtue of the recognition that elucidation of the phenomenal consciousness requires self-awareness to be taken into consideration, as well as due to a common agreement over the existence of a constitutive link between experiential phenomena and the first-person perspective of experiential life. Dan Zahavi and Shaun Gallagher express this connection this way: "Experiential episodes have, to use Searle's terminology, *a first-person ontology* from the start, i.e. even before the subject acquires the conceptual and linguistic skills to classify them as his own" (Gallagher, Zahavi 2008:47).

However, despite this agreement, the notion of 'self-consciousness' is rather ambiguous, which brings about numerous definitions that may compete with, contradict or supplement each other, likewise with the theories of self that hinge upon a particular understanding of self-consciousness. Among the approaches to self, which have been elaborated in the framework of philosophy of mind, the one called 'minimal self' is considered as promising the best exchanges of ideas between philosophy and cognitive sciences (Gallagher 2000:14). It pushes aside questions about the degree to which the self is extended beyond the short-term present to include past thoughts and actions, i.e. this approach limits the self to what is accessible to the immediate self-consciousness.

One way to specify the concept of minimal self is through the problem of self-reference involved in the usage of the first-person pronoun. This self-reference has a specific feature, which Sidney Shoemaker called "immunity to error through misidentification relative to the first-person pronoun". The 'immunity principle' or IEM (Immunity to Error through Misidentification), as it is sometimes called, can be specified

as follows: while using the first-person pronoun 'I' to refer to herself, the speaker cannot commit a mistake about the person that she is referring to. Ultimately, this suggests that my access to my self is non-referential and direct, and the immediate self that is being referred to in the usage of 'I' is a pre-reflexive point where experience and actions originate (Shoemaker 1984).

Nonetheless, in case of self-reference the speaker is apparently capable of linguistic communication. This might mean that one's immediate and pre-reflective access to self already presupposes a conceptual mediation. Given that, some versions of minimal self seek for possibilities to talk about a non-conceptual access to self, that is, "a more primitive self-consciousness that does not depend on the use of a first-person pronoun" (Gallagher 2000:17). In other words, those versions of 'minimal self' hold that there is a yet more primitive sense of self than that involved in the usage of the first-person pronoun. They are, therefore, based on the notion of pre-reflexive self-consciousness, which is related to the idea, that experiences have a certain phenomenal quality of 'what it is like' to have them.

The 'minimal self' is of special interest in the given work because there seem to exist some points of convergence between it and biosemiotics. Biosemiotics argue for a sort of primitive self-awareness, the biological and neurological basis for which is provided by the immune and nervous system and which is seen as proprioceptive awareness or the repertory of 'I can's. The 'minimal self' resorts to disciplines outside of philosophy in order to support its claims, which enables us to look at the biosemiotic approaches to the self under investigation and the particular arguments they use as possible frames of reference for the 'minimal self' and a source of ideas that may contribute to it.

The versions of the 'minimal self', which stipulate for a primitive sense of self, may be divided into two groups: the first group draws on data from developmental psychology and contends that pre-reflexive self-awareness presents the self as *embodied*; the other version of 'minimal self' is put forward in the scope of recent trends in phenomenology and argues that the pre-reflexive self-awareness presents the self as *bodily*. Both approaches confront 'non-self' conceptions, which argue for an illusionary nature and the 'theory-theory' approach, which is similar, up to a point, to Peirce's

concept of 'fallible self' and contends that the experience of self and of others is theoretical, inferential and quasiscientific in nature. Both 'minimal selves' have their advantages and disadvantages. It is in connection with these 'minimal self' theories that a biosemiotic approach to the self might contribute to current debates over pre-reflexive self-awareness in philosophy of mind. Particularly, it can help to overcome weak points and inconsistencies of both of them, which cast doubt on their reliability and ultimately get involved in the main arguments against them.

However, the resort to biosemiotics in order to criticise and suggest possible ways of enhancing both versions of the 'minimal self' supposes the application of biosemiotic conceptions of self, which is not limited to a human self alone, to an exclusively human context, thereby posing the problem of anthropomorphizing the biosemiotic self. As a top-to-down perspective on the biosemiotic self may anthropomorphize the concept, a bottom-up perspective on the biosemiotic self may lead to a reductionist perspective on self with respect to the human. There always exists this danger in the choice of terminology. Thus, Balbieri rejects using the term 'interpretation' with respect to animals, while Hoffmeyer follows Pierce and applies the term whenever there is semiosis. Given that, we will follow the suggestion of looking at subjectivity, emotions, and phenomenal life – all of which are concerned in the biosemiotic concept of self – as more-or-less phenomena. This suggestion implies that there does not exists an unbridgeable ontological divide between animals and humans and the evolutionary dynamics of subjectivity and the experiential dimension of life may be taken as realization of the tendency of increase in semiotic freedom. With regard to this, Hoffmeyer writes:

> Let me suggest that semiosis, emotion, and experiential life is a graded series where semiosis is a fundamental characteristic of life as such – life without semiosis is unthinkable; emotions are somehow less fundamental property but most likely some preliminary kind of emotions must be at play in every multicellular organisms where a fast coordination of body parts is necessary in response to danger, or food, etc., since such coordination would presuppose a capacity for producing an instantaneously propagated 'emotional' wave throughout the body; genuine experiences, on the other hand, probably only occur in species possessing a central nervous system. The important point in the present context is that semiosis, emotion, and experiences are not thought to be essentially different categories, but rather to be a succession of more sophisticated elaborations of the same basic theme of teleodynamic existence. (Hoffmeyer 2014: 106)

This may justify up to a point the usage of the biosemiotic conceptions of self in the discussion of the 'minimal self' approach, in which the self that is dealt with is only human. Moreover, while analysing the 'minimal self' theories we will apply only particular arguments or ideas formulated with respect to them rather that the whole concept of biosemiotic self.

We need to stipulate the terminology that will be used henceforth: 'self-consciousness' and 'self-awareness' are taken as mutually substitutive terms. The first approach (let us call it the psychological 'minimal self') pursues the implications of studies of neonate imitation and argues that infants have a primitive sense of self or self-awareness even before they acquire conceptual skills around the age of four and master the first-person pronoun. It, therefore, insists on acknowledgment of a *non-conceptual* and *pre-linguistic* self-consciousness. Another version of 'minimal self' (shall we call it phenomenological 'minimal self') argues for the existence of a primitive self-awareness that is an intrinsic feature of phenomenal consciousness in general and, therefore, it characterises it even before we direct our attention or reflect upon it. In this sense, it is a *pre-reflexive* self-awareness; however, inasmuch as we need conceptual skills to thematize our experience, it can also be specified as 'non-conceptual'. Besides, this sense of self holds forth for the one stipulated for in psychological 'minimal self', therefore, 'non-conceptual' and 'pre-reflexive' well be used interchangeably as well. Finally, 'minimal self' refers to the approach itself, while the minimal self (without quotation marks) refers to the primitive sense of self or self-consciousness.

Several versions of the 'minimal self' approach, which draw on data from developmental psychology, contend that pre-reflexive self-awareness presents the self as embodied and enactive within the environment. Thus, Jose Bermúdez argues that a proper understanding of self-consciousness cannot be reduced to the issue of linguistic self-reference; rather, it should broaden its scope and recognize the existence of non-conceptual and pre-linguistic forms of self-awareness that are "logically and ontogenetically more primitive than the higher firms of self-consciousness that are usually the focus of philosophical debates" (Bermúdez 1998:274). Ulric Neisser, Daniel N. Stern, and Philippe Rochat have also drawn similar conclusions. Unlike Piaget defending that initially the infant's experience does not suppose any distinction between

self, world and others, they all contend that infants are in possession of self-experience from birth.

Daniel N. Stern holds that, although language transform the infant's experience of self, it does not constitute it. From the very birth, the infant has different pre-reflexive and pre-linguistic 'senses of self'. Four types of self-experiences are available around the first three months of age:

- self-agency, which is the sense of authorship of one's own actions;
- self-coherence, which is the sense of being an integrated and not a fragmented whole;
- self-affectivity or the experience of subjective feelings;
- self-history, that is, having the sense of endurance or continuity between present state and one's own past (Stern 1985:71).

Among them, the sense of self-agency or the authorship of one's own actions deserves special attention. In order to understand what allows the infant to distinguish between her own actions or movements and those produced by others, Stern defines two experiential invariants: the sense of volition that foregoes a motor act, and the proprioceptive feedback or lack thereof during the act. Usually, what the infant faces are three different types of actions, namely: 'self-willed action of self" (the experience of the action comprises both the sense of volition and the proprioceptive feedback), 'self-willed action of other' (none of the invariants are present), and, finally, 'other-willed actions of self' (the experience of volition is absent, but there is a proprioceptive feedback) (Stern 1985:76).

In keeping with Stern, Ulric Neisser and Philipp Rochat defend the view that self-experience has an early developmental outset. Adopting Gibson's notion of affordance, Neisser distinguishes five selves, that is: ecological, interpersonal, extended, private, and conceptual (Neisser 1988:35). The ecological self is the most basic and primitive among them and it consists of the individual's self-experience as an active and embodied agent, enacted within the immediate environment. Whenever we perceive we are aware of ourselves since perception, for Neisser, involves the information about the relation between the perceiver and the environment: all perception involves co-perception of self. In addition, perception is, as it were, body-scaled, which means that the distance is not

measured in relation to one's bodily dimensions and capabilities (Neisser 1993:8). For instance, a few-weeks-old infant can distinguish between objects that are within the reach and those that are beyond grasp. To be capable of this, the child should be aware of the location of objects in relation to herself. This makes Neisser to conclude, that although, at this stage, the infant does not have any explicit representation of herself, she is capable of perceiving a specific kind of affordance, i.e. she is in command with self-specifying information (Neisser 1993:4).

Jose Bermúdez offers a very similar perspective on a primitive sense of self. He elaborates the concept of 'non-conceptual first-person content', which is close to Neisser's 'ecological self'. 'Non-conceptual first-person content' points to a minimal self consisting of information specifying one's own embodied position in the environment (Bermúdez 1998). This information is pre-linguistic and non-conceptual, which leads to the conclusion that the infant is already equipped with the minimal self that is embodied and ecologically tuned. The existence of this non-conceptual self-awareness may be illustrated with the role it plays in neonate imitation. Neonates, less than one hour old, are capable of imitating the facial gestures of other people, which is not triggered by reflex or release mechanisms and involves the capacity to learn how to match the gestures presented to them (Gallagher 2000:17). To be capable of it, the infant must be able to do the following:

- to discriminate between self and non-self';
- locate and use particular parts of her own body proprioceptively without seeing it;
- recognize that the face she sees is of the same sort as her own because, as findings show, infants would not imitate non-human objects.

To interpret those findings meaningfully we need to acknowledge the minimal self (Gallagher 2000:17). Following this, Bermúdez specifies a minimal form of self-consciousness as involving, first, primitive proprioceptive sense of one's body; second, the capacity to differentiate between self and non-self; finally, the recognition that the other is of the same sort as oneself. By him, minimal self may be involved in monitoring of one's own action in a way that allows her to know what she is doing without having to reflect on it. Furthermore, minimal self plays an essential role in intersubjective

interaction with others, specifically, proprioceptive-kinaesthetic aspects of non-conceptual self-awareness are involved in and may be activated by our perception of others (Bermúdez 1995).

Finally, based on the observed ability of the neonate to distinguish specify self and non-self stimulation, Philipp Rochat claims that infants are able to develop an early sense of self (Rochat 2001). They possess the proprioceptive information from the birth onwards, and proprioception is "the modality of the self par excellence" (Rochat 2001:35). In other words, long before the mastery of first-person pronoun, even before she becomes able to pass the mirror-recognition step, the infant has a sense of her own body as organized and environmentally embedded entity and, hence, an early perceptually-based sense of self. Similarly to Neisser and Bermúdez, he considers this self to be the infant's ecological self. Moreover, infants have a predisposition to explore their own bodies, which makes Rochat think that it is through those investigations that they specify themselves as differentiated agents in the environment, and ultimately developing an explicit awareness of themselves. This becomes the basis of the child's ability, which is developed over time, to recognize her reflection in the mirror and, thereby, to adopt a detached perspective on herself, which marks the increasing capability to assume the perspective of others on herself.

Overall, the psychological 'minimal self' emphasizes self-ownership, taken as the sense that it is my body that is moving or being moved, or, in a more general way, that it is I who is undergoing the experience, in their description of primitive self-awareness. Moreover, some of them include the sense of agency, which may be specified as "the sense that I am the one who is causing or generating an action" (Gallagher 2000:15). Finally, they contend that this non-conceptual self-awareness presents the self as embodied, embedded within the immediate environment and ecologically tuned.

A phenomenological 'minimal self' will be dealt with here as it is presented in works of philosophers such as Shaun Gallagher, Dan Zahavi, Aaron Henry, and Evan Thompson. Phenomenological 'minimal self' insists that we have an innate and non-inferential access to our experiential life. It is possible and justified to speak about a primitive type of self-experience whenever we are phenomenally conscious (Zahavi 2005:197). Phenomenology, thus, offers a one-level account of self-awareness by

considering a minimal form of self-consciousness be a constant structural feature of conscious experience. Experience happens for an experiencing subject in an immediate way and it is marked as *my* experience. This immediate and first-person givenness of experiential phenomena has to be accounted for in terms of a pre-reflexive self-consciousness. 'Pre-reflexive' is meant to accentuate here that it does not involves any additional higher-order mental state, which is somehow directed explicitly towards the experience at issue. Conversely, the self-consciousness should be taken as an intrinsic feature of phenomenal consciousness. In addition, it is not brought about in thematic, attentive or voluntary ways; rather, self-awareness is tacit, genuinely non-observational, in that it is not a sort of introspective observation of myself, and non-objectifying, that is, "it does not turn my experience into a perceived or observed object" (Gallagher et al. 2008:46). Apparently, I can reflect on or attend to my experience, but prior to this reflection, I was not 'self-blind'; rather "the experience was already present to me, it was already something *for me*, and in that sense it counts as being pre-reflexively conscious" (Gallagher et al. 2008:46).

However, it should be stressed that there is a clear difference between having a first-person perspective of phenomenal life ('weak' first-person perspective) and being able to articulate it verbally ('strong' first-person perspective). A weak first-person perspective is just a matter of subjective manifestation of one's experiential life, whereas a strong first-person perspective supposes mastering the first-person pronoun and adoption of a perspective of others on oneself. Gallagher and Zahavi insist on the significance of the weak perspective as a most basic form of self-awareness that precedes the usage of first-person pronoun (Gallagher et al. 2008:46). This weak self-awareness, in other words, does not exists apart from the ordinary conscious perception, thoughts or feelings, as a sort of an additional mental act; it is not triggered by reflection or introspection.

The pre-reflective self-consciousness delivers an implicit sense of self at an experiential or phenomenal level. It is treated by Zahavi as a mode of existence where self reveals not as a separate entity standing either at the basis or over the stream of consciousness; rather, self appears inextricable from it and consists in its characteristic feature of being an experience from the first-person, "*mine*" perspective. Thus, Zahavi defines minimal self as "a ubiquitous dimension of first-personal self-givenness in the

multitude of changing experiences" (Zahavi 2005:325). In his opinion, there is no pure experience-independent self because the self "is the very subjectivity of experience and not something that exists independently of the experiential flow" (Zahavi 2005:325).

To be pre-reflexively self-aware does not involve the interruption of "the experiential interaction with the world in order to turn the gaze inward". Conversely, this self-awareness presents the self as world-immersed self and bodily, or the self is present to itself only when it is worldly engaged (Zahavi 2005:125-126). This also means that pre-reflexive self-awareness amounts to bodily-awareness. Kinaesthetic activation during perception produces an implicit and pervasive reference to one's own body; therefore, pre-reflexive self-awareness of actual and possible movements of the body frames the experience that an individual has of the world. In other words, she experiences the world bodily: the body attains self-awareness in actions, in inclination to actions when it relates to something (Gallagher et al.2008).

Understandably enough, according to the phenomenological minimal self, there is no self when we are non-conscious. However, this does not threaten the diachronic unity of self insofar as the identity of self is defined in terms of givenness and not in terms of temporal continuity. As Zahavi puts it: "Whether two temporally distinct experiences are mine or not depends on whether they are characterized by the same first-personal givenness, it is not the question of whether they are part of an uninterrupted stream of consciousness" (Zahavi 2005: 327-327). The point is that experiences that share the same first-personal self-givenness are the same.

However, it may be questioned to what extent the self as it is presented in pre-reflexive self-consciousness is bodily. According to Henry and Thompson, an implicit sense of self amounts to 'perspectival ownership', which is connected with experiences or actions presenting themselves in a distinctive manner to the subject whose experiences and actions they are. Moreover, minimal self requires being a bodily subject, i.e. being pre-reflectively aware of oneself as a living body inasmuch as it is the body that allows for perspectival experience of the world. This means that bodily self-awareness supposes a basic distinction between one's subjective body (self) and one's phenomenal world (other) and, therefore, entails an experience of boundedness understood in a weak sense

as “experiential distinction between one’s bodily perspective and whatever is perceived from that perspective” (Henry et al. 2011:242).

Nonetheless, phenomenological ‘minimal self’ acknowledges that subjectivity of experience may not suffice for selfhood, and yet it is a necessary condition for it. Therefore, any account of self that disregards the fundamental structure and features of our experiential life, holds Zahavi, is stillborn since it “provides the experiential grounding for any subsequent self-ascription, reflective appropriation, and thematic self-identification” (Zahavi 2005:330).

2.5. ‘Bounded’ self

The psychological and phenomenological versions of ‘minimal self’ seem to be quite similar in that they both point to the role of proprioceptive and kinaesthetic senses in pre-reflexive self-awareness. However, the main difference between them lies in their definition of minimal self as embodied or bodily. It is important that the phenomenological ‘minimal self’ has been elaborated partially in response to the psychological approach. According to the phenomenological ‘minimal self’, pre-reflexive self-awareness is bodily-awareness, and the latter presents the self as bodily. The psychological approach takes minimal self as ‘embodied’, which makes the definition of self too Cartesian implying that the self might be of a different nature than that of the body. In this direction goes the criticism of the psychological ‘minimal self’. Nevertheless, the phenomenological approach likewise cannot avoid some inconsistency and its account of primitive sense of self may appear uninformative regarding some particular issues.

A weak point in the psychological ‘minimal self’ consists in that the position of its representatives with respect to body-awareness constituting genuine self-experience is not clear as it should be. Those theories suffer from certain inconsistency that ultimately leads to the sense of self being conceived of as a kind of object-awareness, which, in turn, discounts the possibility of a non-observational access to self. Thus, Rochat contends that there are three fundamentally different kinds of experience, i.e., experience of self, of object, and of other people. However, he does not seem to follow up with his distinction when he talks of the body as an object of the infant’s exploration and, especially, when

he thinks of self-perception as a matter of differentiating one's own body from other objects in the surroundings (Rochat 2001: 37). Likewise, Stern seems to consider the infant's self-experience derivative from that to distinguish herself from other, which is, in turn, an instantiation of her general ability to discriminate between different entities. He argues that the infant perceives and organizes multiple stimuli into different categories: she has innate abilities allowing her to discern inconsistent batteries of stimuli in a way that keeps self and other separate (Stern 1983). However, this does not elucidate how the infant senses that one of the experiential configurations is herself. Stern admits that the experience of proprioception and volition are highly important here, and yet he takes the infant's self-experience as the question of accurate discrimination between two different objects. Similarly, Neisser considers the ecological self to be an object of perception (Neisser 1988:56). Therefore, self-awareness appears to tantamount to object-awareness. However, self-awareness cannot be identified with object-awareness without posing some problematic issues because, as Zahavi puts it:

> For something to be given as an object is for it to be given as something that transcends the merely subjective. For something to be given as an object of experience is for it to differ from the subjective experience itself. However, if it is so, if object-awareness always involves a kind of epistemic divide, a distinction between the subject and the object of experience, it cannot help us understand self-experience (Zahavi 2005:203).

Besides, seeing the primitive sense of self as resultant from self-recognition based on distinction between different objects disregards the idea that the most fundamental and primitive self-experience should be non-observational and non-inferential. For Shoemaker, to recognize some object as myself, I need to know something true of the object that I already know to be true of myself. There is no choice but to acknowledge the existence of non-objectifying self-awareness, if we are to avoid an infinite regress. Shoemaker writes: "The reason one is not presented to oneself 'as an object' in self-awareness is that self-awareness is not perceptual awareness, i.e., it is not a sort of awareness in which objects are presented. It is awareness of facts unmediated by awareness of objects" (Shoemaker 1984: 105).

In response to this, the phenomenological 'minimal self' contends that "first-personal experience presents me with an immediate, non-objectifying and non-observational access to myself" (Zahavi 2005:204). It then insists on the need to consider

the relationship between phenomenal consciousness and self-experience in order to make a well-founded attribution of the latter. As a primitive self-awareness is involved in phenomenal consciousness, "[…] the question of self-awareness is not primarily a question of specific what, but of a unique how. It does not concern the specific content of an experience, but its unique mode of givenness", that is, the dimension of mine-ness of experience (Zahavi 2005:204). This is the reason why phenomenologists claim that the infant can be self-aware in a non-inferential and non-objectifying way.

Biosemiotics can help to overcome this inconsistency of psychological 'minimal self', the source of which may reside in confusing endosemiotic and exosemiotic processes of interpretation that constitute the self with the self as it appears or gets felt on the level of phenomenal reality. To begin with, the idea of self-specifying information seems to misguide the interpretation of minimal self, which finally makes Neisser identify the ecological self, i.e. the experience of oneself as an agent enactive within the environment, with the object of perception.

The biosemiotic understanding of affordance, offered in the work of Uexküll, Geigges and Hermann, may be of some help here. A tetradic model of sign interpretation, that considers the whole action and active self, presents the affordance as part of an overall process and not as its result, which is 'utilizing of meaning' or actualizing the object. That is, affordance is not something *perceived* in addition to the object or as an 'inviting' quality of it, but it participates in the very construction of the object. To specify, affordance is the effector's response, the interaction of which with the environment's counteraffordance 'creates' the object of perception. Affordance, thus, has something to do with sensorimotor schemata and, therefore, with endosemiotic sign processes. Therefore, 'self' is manifested in generation of affordances, which determine the formation of objects of perception. However, this is not the level of phenomenal consciousness, but the level of endo- and exosemiotic processes that underlie the phenomenal consciousness. This casts doubt on the idea defended by Neisser and Bermúdez that the infant's self-awareness lies in perception of a distinct kind of affordances. What is implied in their notion of ecological self is quite similar to Sebeok's concept of semiotic self. The semiotic self is accounted for incorporation of bodily parameters, which, of course, change over time, into daily performances. This implies the

collaborative working of exo- and endosemiotic sign processes, the result of which, on the level of phenomenal life, may be presented as either 'I can' or 'I can't'.

Following this further, the fact that perception is body-scaled does not necessarily lead to the conclusion that perception of objects implies the perception of myself as a perspective-lending object. Rather, pre-reflective awareness of my body is registered as 'I can' or 'I can't'. For, as Hoffmeyer points it, there is an inextricable connection between mental recognition and bodily senso-motoric activity, which is most evident on the level of our senses (Hoffmeyer 2008a:277).

Besides, the representatives of psychological 'minimal self' claim that the acknowledgment of ecological self is motivated by the need to explain the very possibility of the neonate imitation. However, we may gain in understanding of the primitive sense of self if we invert this statement: the neonate imitation shows that the so-called self-specifying information is acquired in the intersubjective interaction with others, that is, in bodily movements, therefore, it is the neonate imitation that might help in explaining the minimal self and not vice versa.

Apparently, the infant gets involved into intersubjective interaction from the very birth, which is, as Gallagher writes, the very fact of our existence determined by a more primary 'intercorporeal interaction' taking place during a pre-natal period (Gallagher 2011). For Meltzoff and Moore, there is "an intrinsic relatedness between the seen bodily acts of others and the internal states of oneself (the sensing and representation of one's own movements)" (Meltzoff et al. 1995:53-54). The infant might be capable of bridging a gap between the visual appearance of the other's body and proprioceptive givenness of her own body thanks to her body having an outside and comprising an anticipation of the other.

Therefore, the fact that proprioceptive-kinaesthetic aspects of the sense of self are involved in or activated by perception of others together with the fact that sense of self is acquired in active imitating movements puts the question of proprioceptive awareness to the forefront: the intersubjective interaction becomes a primary context of modelling bodily dynamics. It is partially in keeping with the inclusion of self-agency (Stern) and self-ownership (Rochat and Bermúdez) in the list of self-experiences. However, the non-conceptual self-awareness should be understood not as derivative from differentiation

between objects or as based on some sort of inferential self-recognition; rather, it should be interpreted as a repertory of 'I can's' and 'I can't's. Pre-reflexive self-awareness, which is understood this way, presents the self as bodily, which blurs body-mind duality latently present in the psychological 'minimal self'.

Besides, self-experiences, as the data on neonate imitation show, are obtained in an emotional attuning to others, which means that they are tinted emotionally. As biosemiotics shows, evolutionary history of emotions is somehow co-extensive with that of experience. Moreover, as Hoffmeyer states, being the function of experience, holistic control "is an emotionally anchored focusing of our brain processes" (Hoffmeyer 2008a:181). This justifies the inclusion of an emotional component into the minimal self. The repertory of 'I can' may be boosted emotionally since the imitating movements are triggered in response to actions of others. The accent on the emotional component of the sense of self will enable to consider a unique mode of givenness of the experience, i.e. 'how' rather than 'what' and, thereby provide a non-objectifying approach to pre-reflexive self-awareness. It is possible to make even a stronger claim that the sense of self is scaffolded emotionally in the intersubjective interaction. Here 'scaffolding' is taken in general sense as "an entity or process which supports another, primary process and thus enhances the stability, functioning, or space of possibilities of the latter […]" (Emmeche et al. 2002:29).

A shortcoming of the phenomenological 'minimal self' consists in its claim that bodily-awareness presents the self as bounded in a weak sense. Henry and Thompson suggest preserving a *weak* sense of *boundedness*, which consists in "experiential distinction between one's bodily perspective and whatever is perceived from that perspective", while rejecting a *strong boundedness* (Henry & Thompson 2011:242). They elaborate the distinction between weak and strong boundedness in their critical response to the neo-Buddhism-inspired 'non-self' theory offered by Miri Albahari. For her, the subject's awareness in not essentially bounded, in that the experience of boundedness can be dropped away. However, we tend to think of our subjectivity as being based on a self that is bounded and an ontologically distinct entity (Albahari 2006:72). In reality, self is just an emotional and cognitive construct, which arises as a result of some sort of emotional craving and is constituted by four modes of self-identification: 'this-importance-of-being-this-very-thing', 'agency', 'consistent self-concern' and 'personal

ownership' (thinking of psychophysical attributes as belonging to the subject), each possessing some emotional value (Albahari 2006:107-109). In response to this, Henry and Thompson argues for self being an intrinsic feature of phenomenal consciousness and the need of weak boundedness in its definition inasmuch as it is a body that lends the perspective.

However, weak boundedness may not suffice for the description of minimal self since it might easily be challenged by data on autism and body integrity identity disorders. The idea that bodily-awareness presents the self as bounded in a weak sense (as bodily perspective different from what is being perceived) also disregards the meaning of self-ownership (sensing that it is I who is undergoing the experience) for the neonate imitation insofar as self-ownership requires bodily integrity inextricable from individuating and protecting function of bodily boundary.

Based on the biosemiotic approach to the self, it is possible to suggest how the phenomenological 'minimal self' can be amended. Specifically, non-conceptual self-awareness requires bodily-awareness, however, unlike proponents of phenomenological 'minimal self', I suggest that such bodily-awareness needs to present the bodily-self as bounded in a strong sense. 'Strong boundedness' means not just the sense of bodily boundaries or the distinction between one's body and the perceptual world, but also the self-ownership connected to it and its emotional significance. I proceed from the idea that the importance of a functional asymmetry between the inside and outside, which is essential to processes of life, must be reflected phenomenologically in pre-reflective self-awareness as an emotional significance of bodily boundaries and overall bodily integrity. The boundary represented here by skin 'mediates contact with the surrounding world via its manifold of surfaces, on the physical, biological, psychological, and social levels" (Hoffmeyer 2008a:213).

As mentioned previously, the decision to exclude strong boundedness from bodily-awareness may be challenged by data on autism. Data on autism, especially on the inability to respond to others and unusual reactions to sensory stimuli, are most indicative of the need to include the strong boundedness in an informative account of bodily self-awareness. For example, Temple Grandin's description of panic attacks caused by her missing sense of stable bodily boundaries emphasizes an emotional significance imposed

on the self-world distinction supposed by the strong boundedness (Grandin 1995). The inclusion of strong boundedness allows defining the first-person perspective in terms of feeling one's embeddedness into one's environment and the sense of being protected, i.e. being a distinct and not a fragmented whole. Given that, it is an emotional response to derangement of self-ownership and instability of bodily boundaries that determines the sense of self in autistic persons.

In the scope of biosemiotics, a functional meaning of boundary resides in its capability of individuation and protection against external intrusions, and in its giving the experience of belonging to the world (Hoffmeyer 2008a). Therefore, the instability of bodily boundary may have two emotional effects: experiencing the lack of embeddedness in phenomenal world, and being undelimited from the 'outside' and defenceless against its damaging forces. Both must have frustrating effects on the sense of self, be it self-closure or threat to the self. Several pathologies, unified under the title of body integrity identity disorders, demonstrate a connection between derangement of bodily integrity and disorder of self-ownership, an emotional response to them, and their effects on the sense of self. The Guillan-Barré syndrome and somatophrenia may illuminate a role of boundary and self-ownership in self-understanding. In case of the former, 'disappearance' of bodily boundaries provokes intense feelings of being locked inside oneself and cut off from the physical world, experiencing one's body as blurred and insubmissive to instructions, which is followed by the feeling of hopeless loneliness (Fyrand 1997:65). In case of the latter, somatophrenia, the request of patients to cut off, for instance, their left hand may be compelled by the feeling of an external intrusion. The emotional significance of bodily integrity and self-ownership may go unnoticed unless in extreme pathological cases, and yet it contributes to the primitive sense of self.

For Uexküll, Geigges and Hermann, body integrity identity disorders may be seen as disturbances of the body schemata or as a translation error. They demonstrate that "[…] our living body, which we experience as the center of our reality, is the product of a 'neural counterbody' which is continually shaped and reshaped by ceaseless flow of proprioceptive signs from the muscles, joints, tendons of our limbs to the brain" (Uexküll et al. 1993:43). If the formation of the 'neural counterbody' in the brain is disturbed, either because of a disrupted stream of proprioceptive signs from limbs or because the interaction of the respective cerebral system is blocked, "the translation into the

experience of a ‘real body’ in a ‘real world’ collapses” (Uexküll et al. 1993:44). Speaking differently, the disturbances of the body schemata of any kind or errors in translation from ‘counterbody’ to actual body-sense must reveal themselves on the phenomenal level, thereby affecting bodily-awareness. Derangement of self-ownership triggering some emotional response, for example, anxiety, and threat to bodily integrity are exactly the cases when “translation into the experience of a ‘real body’ in a ‘real world’ collapses”. Therefore, they must affect the minimal self, which ultimately suggests that it should be conceived of as bounded in a strong sense.

To conclude, the biosemiotic revision of psychological and phenomenological ‘minimal selves’ suggests that any account of bodily-awareness is uninformative or weak with regard to neonate imitation and set of pathologies unless strong boundedness is included. In addition, it makes these versions of ‘minimal self’ complementary.

Conclusions

The aim of the current work is achieved through the realization of five tasks. First, an outline of the prerequisites of a biosemiotic approach to the self as laid down in the works of the precursors of biosemiotics. It is shown that the umwelt theory lays the preconditions of an explicit concept of self by affording the status of subject to animals and suggesting a processual character of the self. Furthermore, speaking about the degrees of subjectivity and modes of semiosis that constitute it, Rothschild anticipates one of the theses of biosemiotics, according to which subjectivity should be treated as a 'more-or-less phenomenon'.

Further, 'self' and the related concepts 'subjectivity' and 'subject' are positioned in the conceptual framework of biosemiotics. It is demonstrated how those terms arise in the attempt to ground the new causality, which would differ from the mechanistic cause-and-effect relationship. The causality that is immanent in the processes of life has been reasoned by way of, first, elaborating the concepts of semiotic freedom and semiotic causation, second, affording 'agency' to living systems. Biosemiotics treats agency as a real property of life residing in the capacity of organisms to interpret signs, or to produce end-directed behaviours. It is demonstrated that it is exactly the introduction of 'agency' in the elucidation of life that has paved the way for the application of 'subject' to all living beings. Particularly, in biosemiotics the status of subject might be ascribed to any living being insofar as it is a semiotic agent, and the ability of any living system to be agentive amounts to its being the self. In addition, it is stressed that the specificity of a biosemiotic interpretation of self is determined by the status of an integral aspect of life being granted to qualia and the formulation of a topological definition of self, which associates the issue of self with that of biological reference.

In the last section of the first chapter, the extension of 'subjectivity' on all living systems, peculiar to biosemiotics, is contrasted with a posthumanist attempt to bridge an ontological gap between human and animal. In addition to this, the conditions of a

legitimate and grounded application of 'subject' and 'subjectivity' in biosemiotics are exposed. In the biosemiotic framework, the application of 'self', 'subjectivity', and 'subject' is congruent with the search for a criterion distinguishing living system from non-living systems. However, it may be questionable whether this extension can avoid the imposition of a metaphysical connotation of 'subjectness' due to the concept of subject comprising an apparently humanist idea – that of a substance in a classical treatment of the concept – and the idea of subordination whose subsequent interpretation has been specified it as specifically human. Nonetheless, it is concluded that the shift of the semiotic threshold and the attribution of agency to living systems has not led to positing self as an ontologically distinct entity staying above and beyond processes of life, or semiotic activity, due to, first, the understanding of self as a result of semiotic processes, and second, accentuation of the first-person perspective of experiential life in the notion of subjectivity.

In the second chapter, an analysis of particular biosemiotic conceptions of self is offered. It is stipulated that, in biosemiotics, the self is regarded as collective, which is a specific realization of a more general understanding of self as dialogic. The examination of the swarm organism model of the body-mind allows making a conclusion that the biosemiotic self may be regarded as resultant from the series of processes whereby the organism preserves its integrity and copes with its environment. The conceptions of self as semiotic individuality and 'built' self address the issue from the point of view of endo- and exosemiotic processes that contribute to preserving the unity of a multicellular organism: on the endosemiotic level, the self is concerned in connection with the series of events whereby the bodily integrity is secured; on the exosemiotic level self is specified through either the 'body being experienced' or the repertoire of 'I can's.

Finally, two versions of 'minimal self' approach to the human self in philosophy of mind are analysed from a biosemiotic point of view. Particularly, the exposition of their drawbacks and suggestions of possible ways of their improvement are offered based on the arguments from the conceptions of the self that were surveyed. The main drawback of the psychological 'minimal self' resides in its treatment of self as embodied, which leads to a perspective on the pre-conceptual self-awareness that takes it as the object-awareness, whereby the possibility of a non-objectifying and non-observational access to the self is dismissed. On the other hand, the main shortcoming of the phenomenological

‘minimal self’ springs form its claim that the pre-reflexive self-awareness presents the self as bounded in a weak sense, which may be challenged by the data on autism and body integrity identity disorders. The drawback of the first version of the ‘minimal self’ may be overcome with the help of a biosemiotic interpretation of a primitive sense of self as a repertory of ‘I can’s’ and ‘I can’t’s; the second version of the same approach may be enhanced by grounding – from a biosemiotic viewpoint – the claim that body-awareness needs to present the bodily-self as bounded in a strong sense.

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Resümee

Biosemiootilised lähenemised minale

Antud magistritöö eesmärk on ühtlustatud lähenemine biosemiootilisele "mina"-käsitlusele ja selle käsitluse kaasamine vaimufilosoofilistesse aruteludesse "minimaalse mina" teemal. Selleks esitatakse töös ülevaade biosemiootilise "mina"-käsitluse eelloost, mis lähtub biosemiootika eelkäijate uurimustest. Seejärel paigutatakse töös "mina" ja sellele lähedased mõisted "subjektiivsus" ja "subjekt" biosemiootika kontseptuaalsesse raamistikku. Töös näidatakse, kuidas need mõisted kerkivad esile püüdlustest mõtestada uut kausaalsust, mis erineks mehhaanilisest kausaalsusest, ning mis oleks omane eluprotsessidele ja võimaldaks indiviidide agentsust. Lisaks rõhutatakse töös, et biosemiootilise "mina"-käsitluse eripära tagab kvaalide (fenomenoloogiliste omaduste) tähtsustamine ning topoloogilise "mina"-definitsiooni sõnastamine.

Esimese peatüki viimases osas tuuakse välja biosemiootikale omane "subjektiivsuse" laiendamine kõigile elussüsteemidele kõrvutatuna posthumanistliku püüdega ületada ontoloogilist lõhet inimese ja looma vahel. Lisaks näidatakse töös "subjekti" ja "subjektiivsuse" biosemiootikas põhjendatud ja õigustatud rakendamiseks vajalikke tingimusi. Teises peatükis analüüsitakse erinevaid biosemiootilisi "mina"-kontseptsioone. Tingmuseks seatakse, et biosemiootikas nähakse "mina" kollektiivsena, mis on spetsiifiline osa üldisemast arusaamast, mille järgi "mina" mõistetakse dialoogilisena. Sel juhul võib "mina" uurida protsesside näitel, mis seda määravad ja säilitavad, mille tulemuseks on "ehitatud" ja semiootilisel individuaalsusel põhinev "mina"-kontseptsioon. Viimaks analüüsitakse kahte erinevat vaimufilosoofiast tulenevat lähenemist "minimaalsele minale" biosemiootilisest vaatepunktist. Iseäranis tuuakse esile nende puudusi ning pakutakse lahendusi nende võimalikeks parandusteks ja edasiarendusteks mõnede biosemiootiliste "mina"-käsitluste argumentidest lähtuvalt.

Võtmesõnad: biosemiootiline mina, minimaalne mina, agentsus, subjektiivsus, subjekt, subjektsus, Umwelt, kvaalia, semiootiline suhtlus

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