Chapter 16
Communication and Evolution

Vivian Romeu

Abstract This text proposes a conceptual model to understand and study the communicative phenomenon. It does this by understanding communication as a phenomenon of life, so that it can be conceptualized as an expressive behavior that results in an expressive act within the framework of the theory of evolution, which makes the expression as a unit viable of primary observation of communication. Although it is based on a concept of communication slightly different from that assumed in the cybersemiotic program, we consider that the biophenomenological proposal of the communication presented here can serve as an articulation for the development of at least three of the arms proposed by Brier in his Star Cybersemiotics, so that it contributes to the development of this ambitious and necessary transdisciplinary program.

Keywords Communication · Evolution · Behavior · Expression · Experience · Meaning · Cybersemiotics

16.1 Introduction

The cybersemiotic program is an emerging program, still in development, that seeks to offer a comprehensive and transdisciplinary response to the necessary problem of scientific knowledge, and in particular to the body-mind dualism that is registered today, both by the natural sciences and on the part of the social and human sciences. For this, it has focused it's attention on semiotics as the episteme of knowledge, but not on the anthropomorphic semiotics that has dominated the academic and scientific scene so far. The cybersemiotic is installed in a different and novel paradigm that assumes the postulates of the biosemiotics that in turn, explains the evolution of life from the processes of semiosis. However, this biosemiotic paradigm has been

V. Romeu (✉)
National Autonomous University of Mexico (UNAM), Mexico City, Mexico

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questioned by cybersemiotics as an epistemological proposal, since they point out that biosemiotics lacks the necessary historical basis to account for how living organisms -specifically human beings- evolve through semiotic processes that they deploy, especially in regards to drawing an evolutionary line between unconsciousness and conscious phenomena.

To alleviate this problem, they resort to peircian semiotics and specifically to the concepts of sign, information and code that it provides, concepts under which not only a logic of relationship and understanding, but also a phenomenology. The cybersemiotic program, moreover, is closely related to Luhmmanian thought, specifically with its concept of communication as the structuring of life, which in turn is based on the theory of autopoiesis. But from our point of view it is about irreconcilable traditions that, in their meeting, affect the clarity of the cybersemiotic postulates. We will explain why.

For Peirce, knowledge evolves from less to more, that is, hierarchically, in search of patterns or regularities or habits, in the manner of a rule or a disposition to know, insofar as it puts the subject in a cognitive relationship with the object through a series of mediations that he called signs. In this way, for Peirce the regularities could only be configured logically but not from a binary conception, but from a ternary logic, where the sign was the form communicated by the object to an interpretant (Peirce 1955). This makes the Peirian logical system a phenomenological system for the explanation of the emergence of knowledge; only that it is a formal, mathematical model, where all cognitive interactions must be described ternary, that is, in terms of the relationship between sign, object and interpretant, which in turn presupposes the relationship of the mind with the qualias (Firstness), the relationship of the mind with reality (Secondness) and the relationship of the mind with the world of perceived regularities (Thirdness).

These three categories form the basis of Peircian logic, from an epistemological imprint that denies the existence of an ontological world, of an objective reality. Therefore, when Søren Brier (2017)[1] emphasizes that the cybersemiotic program seeks to explain the five ontological levels of meaning, an essential contradiction emerges. In our view, what cybersemiologists seek to define are rather explanatory levels of reality, that is, paradigms of knowledge that in no case allow to classify or divide it more than for its analysis, since to assume the existence of an objective reality regardless of the cognitive processes by which it is constructed, it does not go hand in hand with the Peircean approach, but rather with one of Luhmmanian, structuralist and ahistorical stock, which downplays the agent's explanatory importance, that is, the fact that experience and know.

[1] The five ontological levels are: the level of physical existence, from where they assume the existence of animate life and the principle of causality, based on the principle of Peircean synechism, that is, the continuity between matter and consciousness. The second level is called the level of the efficient cause, specifically linked to what they call Peirce following the will power of the mind. The third level is that of objective information, meaning the ontological world. The fifth level is that of self-organized life and the fifth is that of human self-consciousness.

Leaving aside an explanation about the cognitive agenciality of the living being, and even about the role that living beings have in evolution -as it is affirmed from the evolutionary biology that is the paradigm in which cybersemiosis is sustained via the biosemiotics (Brier 2008)- results in the questioning of the explanatory bases of biosemiotics being unclear in the cybersemiotic bet, so that the tacit appeal to an objective understanding of reality where the processes of cognition are imbricated, significance, information and communication that try to understand in the explanatory domains -that not of reality- where they are carried out, mine their purpose of objecting a mechanistic view of science, from the evolutionary point of view.

But because Peirce puts on the table, above all, a phenomenology of interpretation, that is, an explanation of the way in which the perceptive and intellective experience makes the semiosis emerge progressively, that is, through degrees each once more sophisticated interpretation, its semiotics in any case should be informed and contrasted with the most recent developments in the field of phenomenology in conjunction with those paid for the philosophy of the mind and especially for the neurobiology, specifically for the case of the human beings.

This would allow us to rethink the pertinence of making Peircian theory the basis for the construction of a transdisciplinary concept of communication in the terms in which cybersemiotics conceive it, as it equates interpretation as a semiotic act with communication, this can not be understood rather than as a mechanism of "passage", that is, as the way something emerges from the mind, since from the Peircean logic, this (referring to interpretation, not communication) is constituted from the regularity, the habit, the given. Although Peirce himself referred to the sign as the communicated form of the object, this does not allow communication to be conceptualized as the rule of action or the disposition to know that configures his concept of interpretation. In any case, the communication would be in Peirce a kind of representation by means of which the sign emerges to the mind, that is, it develops; what happens through a phenomenological approach that puts in the center of the reflection the experience and the subject that experience that is, according to the same Peirce, from where the processes of cognition are explained where the semiosis occurs, that is, where the representational configuration of the sign.

Nevertheless, the Peircean legacy in this regard is today largely developed by the advance of scientific knowledge by phenomenology, cognitive sciences and neurosciences, from which it is postulated that living organisms do not live in differents domains of reality, that the conscious and the unconscious do not separate even in the same organism, and that the distinction of the occurrence of these processes among living organisms could pose a categorical difference around the binomial consciousness-unconsciousness, the continuity to the who appeal should be treated rather as a difference of degree.

The New Cognitive Science offers a clear answer to the above. From the incorporation of the concepts of agency, adaptability, autonomy, identity and precariousness as crucial explanatory inputs in the understanding of cognition phenomena, the designers make the life experience of the organisms the basic core of the processes of construction of meaning, which they call without further: cognition. These processes are defined based on what they call the search for meaning (Varela 1991,

1997; Weber and Varela 2002; Di Paolo 2005, 2009; Di Paolo et al. 2010; Thompson 2007), present in all living beings, thus correct the theory of autopoiesis of Maturana and Varela (2009) to explain how internal cognitive adjustments occur through the processes of cognition for the sake of adaptation and survival of the living unit. In this way, the New Cognitive Science allows us to explain the emergence of creativity, not from a cognitive connectionist or representationalist view of knowledge, but from the autonomous, precarious, adaptable condition and agency of living organisms as beings with creative response from the organic-material organization that allows it and as far as this allows without affecting the structural identity of organisms, both in terms of environmental changes and in terms of internal changes in it.

On the other hand, neurobiology has brought to light a series of explanations, experimentally verified, that allow to sustain the own developments of the New Cognitive Science from an explanation about the functioning of the human brain. From both perspectives, the theory of autopoiesis, where the cybersemiotic proposal also rests, due to its Luhmmanian roots, must be revised by the New Cognitive Science in order to integrate cognitive experience in it from understanding living beings as agents. This necessarily undermines the idea of communication as an autopoietic system, substituting the closed system principle, operationally closed, by one that makes it differentiated according to the agency capacity of living organisms, which also implies its ability to adjust its own patterns cognitive that has configured and evolved.

Although from Luhmmanian logic communication is made an abstract principle to describe the functioning of life that fits Brier's cybersemiotic reading of Peirce, communication has been converted into interpretation from the imprint of the autopoietic structural coupling; nevertheless, both as a whole cancel an explanation of communication linked to the creative life experience of individuals who are, in our view, those who know, interpret and communicate. To deny the above supposes break with the biosemiotic postulates and in general with those of the evolutionary biology, to which it is not possible to accede without giving crucial importance, determinant, to the capacity of agency and adaptation of the living individuals[2] that is what, that according to Jonas (2017), allows to refer to the emergence of new meanings, new ways of life and also new forms of semiosis.

The thesis that we develop in this text walks in this direction, starting from a reflection of the postulates of evolutionary biology and its application in the construction of a communicative analytical perspective of a new type that goes on to understand communication as a behavior, specifically as an expressive behavior. Under the cover of biosemiotics, phenomenology, New Cognitive Science and

[2] From this perspective it is assumed that the biological-experiential substrate of living individuals provides the basis for thinking about the emergence of culture and even of society. An incipient approach to these questions can be found in the texts of the author *The problem of understanding in language and communication. Reflections from a biophenomenological approach to communication in human beings* (Romeu 2017), *The problem of culture in the social sciences* (Romeu 2019a) and *Sociability and sensitivity in Simmel. Reflections from the phenomenology of communication* (Romeu 2019b), these latter in the press.

neurobiology, we offer an explanation of the processes of cognition, the emergence of meaning and the construction of information that are valid for proposing a transdisciplinary conception of communication, but from these epistemic courses. Finally, before moving on to develop the hypothesis that we hold here, it is necessary to delve into more detail in what we have said previously, with the purpose of establishing our position within the cybersemiotic paradigm, as well as the possible contribution that this work can make do to it.

16.2 Coincidences and Disagreements with the Program of Cybersemiotics

As we have already pointed out, the research program in Cybersemiotics, founded and directed by Søren Brier, of the University of Copenhagen, proposes the construction of a naturalist paradigm of information processing in the universe. This paradigm is supported by two major theoretical sources: the phenomenological and pragmatic semiotics of Charles Peirce, and the systems theory of Niklas Luhmann. Brier's proposal and the researchers in charge of it, is based on the absence of an integral theory of information that can account, from an evolutionary point of view, for the processing of information in the universe, from a first-class perspective (subjectivity), second (intersubjectivity) and third person (science). This is: that it encompasses both the individual that experience – which is always a corporeal individual – and its intersubjective nature, and also science. It is about building a transdisciplinary paradigm that can explain the emergence of the processes of meaning in the natural world: from the Cosmos to Culture. In the end, as can be seen, there is a theory of information, knowledge, consciousness, meaning and communication, from where it is intended to account for how the cognitive and experiential production of meaningful knowledge of human beings emerges evolutionarily.

This theory is positioned against the physicalist paradigm of information. In this way, he understands information as something that is in reality, but that is present to human consciousness through experiential perception. Thus, from understanding the relationship between mind and matter as natural and continuous, cybersemiotics strives to build a natural theory of information processing that overlaps the latitudes of consciousness, meaning and communication. From these premises of departure, the Cybersemiotic develops an explanatory model from which it tries to understand how the displacement of an information society occurs (in the informational terms that we have briefly described above) to a society of knowledge, where according to Brier they are involved the processes of meaning, communication and language. Brier's proposal brings together both the natural and social sciences and the humanities, articulating them through a first-person perspective via human consciousness, since for this author an embodied consciousness is absolutely necessary to develop an ontology of information from the conscious mind in the living body.

It seems idle to point out the relevance of this ambitious scientific commitment. But we nevertheless add to the criticism of Hofkirchner and Larsen (2009) regarding the difficulty not only of defining information separately from meaning, but also of the relevance of this separation. In this sense, to our understanding, cybersemiotics is entangled in the information theory of Shannon and Weber, as well as that of Schödringer, based on the fact that meaning is not a necessary condition to define information as it is defined as patterns or codes that have nothing to do with meaning, with which they assume that meaning emerges essentially from the relationship between form and background (Brier 2010). This point of view about the meaning not only does not correspond to Peirce's notion of Firstness, but has been overcome by the New Cognitive Science and its paradigm of the "search for meaning" that Varela (1997) himself accepted, questioning some form, the same concept of autopoiesis that helped to found (Weber and Varela 2002).

Peircean radicalism, although it differentiates between the real and the existent, refers to the real as that to which we can only access through signs that are formed or configured from the experience of perception. And it is from this experience of perception, at least in human beings (although it is presumed since the New Cognitive Science this is also applicable to all living organisms), that the real acquires existence for us: first through feelings or intuitions we have about the world, then through associating these feelings or intuitions with the real, and finally establishing habits of relationship between what is felt and what is perceived as real through units of meaning that are in themselves patterns of meaning, that is, codes.

This not only verifies that codes or patterns not only contain information, but also meaning, as it is structured by them, as already Ascombre and Ducrot (1983) pointed out and demonstrated from argumentative linguistics. In that sense, if we well understand Brier, we think, he ran his conception of information in a kind of naive objectivism, the result of the positivist tradition of physics (even the quantum) that despite the scientific evidence that supports it has not been able to radicalize his view to understand philosophically the implications of assuming information as a dependent magnitude of observers and the observation processes themselves.

Brier (2004) argues, in agreement with Bateson (1972) and others, that information is difference; hence, it appeals to the fact that information is potential knowledge. This distinction between information and knowledge also appeals to the distinction between the "objective" and the subjective, between that which depends on our conscience and what does not. In that sense, information is in the things of the world, but it is used when it is known; this point of view needs of what Brier calls an embodied consciousness. Based on this distinction, the beings that naturally inhabit the world, according to Brier, do not produce knowledge, they only process information; while human beings and some animals, by having consciousness, we do.

The scientific contributions coming from the neurosciences and the New Cognitive Science, especially from the latter, deny, or at least question the above, by pointing out in broad strokes that the imperative of life to continue living, that is, to preserve the identity autonomy of living organisms makes them come in a certain way neurally and genetically programmed to "understand" what they have to do to

survive and manage life in the environments or environments in which they are inserted. Certainly, in the environments that the human being faces, this "knowledge" is not enough, due to the complexity of them and the free will of sentient beings and willingness as we are to act, even within the organic limits or natural Therefore, as we will see later, understanding information as something alien to meaning does not make much sense from this perspective.

Regarding the above, also, from the Peircean theory that is profoundly phenomenological and pragmatic, this is endorsed. As Deely (1990) points out, in Peirce there is a pansemiotic conception that disable the difference between the sign and the real, not due to a negation of the real, much less due to an equivalence between both. Rather, we think what Peirce points out is that reality, even existing, becomes an instance for the construction of information through signs.

Peircian semiotics puts the accent on the experiential perspective of the first person, but Brier (2003), in our opinion, makes an incorrect interpretation of it arguing that if this difference between the sign and the real were not present, there would be no difference between the representation and the object, or the idea of truth should be discarded. Right, in this last premise, our argument is paraphrased. The existence of the real is not given, in our opinion, by the presence of information, but by the perception itself – through consciousness – that there is something outside of us, what we call Reality, but that is inaccessible without making use of it through the signs that, in addition, we build mentally, thus constructing reality itself, and even, as it is proposed from the neurosciences and the New Cognitive Science, constructing ourselves as part of it through our vital interactions.

Thus, the conceptual proposal of communication that is developed in this text bears the imprint of "bottom-up" that according to Brier (2013) sustain the theoretical physicalist approaches on the information-knowledge relationship, but without assuming in any case the information as a magnitude alien to the subject that processes it. Although reality, as conceived from Luhmann and Peirce, is a precondition for the production of knowledge, the truth is that this reality does not become present or does not emerge (no longer to consciousness, but to perception itself) if it is not within the framework of an interpretative relationship of different degrees of the living individual throughout the length and breadth of his own individual and species existence.

Consequently, when Luhmann points out that only communication can communicate, which is one of the systemic postulates on which Cybersemiotics is based, it not only detaches the communication of life, but inserts it into a tautological structure of meaning that our way of seeing does not support the construction of a comprehensive theory about information, meaning, cognition and communication. Luhmann postulates that communication only takes place to the extent that there is mutual understanding, understanding communication as a synergistic phenomenon that occurs through language and social praxis, that is, in situations of intersubjectivity.

As we will see later, this text proposes another starting point to deal with both the concept of information and the language, which brings as a consequence the emergence of a different way of understanding communication that, however, can

contribute to developing the Cybersemiotic Star with respect to the relationship of articulation between living systems, conscious life and the world of meaning. Thus, the proposal on communication that in this text is made seeks to situate the communicative phenomenon in the articulation between the level of formal causes and that of the final ones, establishing a bridge between one and the other from articulating the cognitive processes that take place within the living organism with those of external cognition, from where, through rationality, logical thinking and the inferences derived from it, social language and culture appear, to our knowledge. Although the latter will not be developed in this text, but only mentioned, in other works we have tried to account for it. However, we consider that this omission -because the objectives we pursue in this issue- does not diminish the importance of the possible contribution that, from the field of communication and through this biophenomeological proposal of communication, is tested here.

16.3 Raising the Study Problem

The epistemological conditions that guide communication studies today (specifically those that understand it from a sociocultural o funtionalistic perspective and centered on the media) have made it difficult to consider communication from an evolutionary standpoint. Nevertheless, this point of view is needed, because communication is a phenomena of live and therefore is necessary focusing on a comprehensive outlook that, put succinctly, could lead, besides, to an epistemological model for discussing the theoretical and conceptual fragmentation that characterizes the field. We believe that the key lies in the evolutionist stance, based on the biological theses of modern Darwinism, because it offers a possible explanation of communication, in general, as a fact of life, and those that communicate are living beings. Understood in this way, communication could be considered as something that takes place within the universe of the natural and/or social–cultural ecosystems of living things, specifically as an expressive type of behavior.

This approach is broad enough to include the considerable research and academic thought in communications studies up to today; however, because these studies are generally fragmented into specialized cultural-symbolic areas (political, educational, organizational, intercultural, development-based, media, interpersonal communication, and others), we must understand what has been done and considered so far as only a part of what communication can and should study, because as an expressive behavior, communication has a lot to say in many different social and cultural realities and about many of life's phenomena. Most important, it takes on different forms and content depending on the agent who does the communicating, that transcends the human sphere. Therefore, we believe it is more effective to explain what it is that we seek to understand from a communications standpoint when we do research on communication. As unfortunate as it may seem, this has not been answered clearly, and we believe it begs an answer. There is a need to give an epistemic meaning to the fragmentation, so that it involves a concrete space rather

than the differing, often contradicting world visions that have been seen in our academic field since it emerged and became institutionalized.

Even today, there is no clear concept of communication that allows us to discuss the plurality of existing *approaches*, and not just of traditions from which communication has been studied. Scholarly work on communication has become specialized, or sometimes even hyper-specialized, with no strong epistemic base from which to describe this specialization for what it is: restricted, limited, or even profound areas of study covering a specific topic, but not connected to other areas. For instance, the communication epistemological approaches inside the communication studies is nor taken to account by applied researches. It has undoubtedly diminished the heuristic potential of communication as an academic field, especially, but not exclusively, if we consider that our field has turned the branch into the trunk, most notably by making mass media the core of most research and discussion on communication. Even though, fortunately, this situation has changed over the last two decades, the change has been minimal, and the same explanation for specialization is still generally given, with no comprehensive nodal epistemic trunk, which represents a bigger problem because the academic communication field continues without having a clear study object.

In this epigraph, we attempt to overcome this omission by recurring precisely to an explanation of communication as a phenomenon, which will allow us to include the discussion about its conceptualization in considering communication as an expressive behavior and act. Because communication is a phenomenon (an act that takes place within each organism's life experience) we can value it as part of a vital act from which sense or meaning is displayed and used, necessary for the maintenance of live. To make our hypothesis clear, we divide the epigraph into three sections. The first section is centered on the main hypotheses of modern evolutionary biology, with special emphasis on three relevant aspects of this Darwin-based line of thought: the agency, efficiency, and reach of natural selection, the main theoretical backbone of evolutionary theory. We hope to prompt a reflection on the role of perceptive experience in the development processes of organic life, based on ideas within the phenomenology of perception and supported analytically by enactivism, biosemiotics, and neurobiology, which will be our focus in section two, highlighting the logical link to the evolutionary theses.

In the third section, we develop a proposal of communication as an expressive behavior and act, basing our analysis on the theories presented in the first two sections. This third part allows us to outline how these behaviors work and how they shape expressive acts in different living organisms. This is a short epigraph with huge aspirations; the task of pairing communication and evolution reaches far beyond these pages. Still, our goal is to offer general conceptual guidelines for the creation of a comprehensive epistemological approach for considering an object of study in communication, something not specified thus far. An analysis of society through dissimilar types of communication has mistakenly been established as an object of academic communication studies at both the national and international levels. This object has been the focus of most, if not all, scientific production in our field. As we know, it is an object that has been taken over—mainly by

sociology—and that has not been able to explain sufficiently how communication works, even in the sociocultural environments where it has been studied and perfected. For this reason, we feel that this epigraph offers an important analysis.

16.4 The Main Basis Behind Evolutionary Biology

Evolutionary biology is a branch of biology that explains how life works in nature from a Darwinian, evolutionary perspective. Natural selection takes on the main role as a mechanism of the origin of life, and selection is the main point of focus of evolutionary changes. It is not the only factor that influences evolution, but in Darwinian terms, it is the most-decisive, because natural selection explains the organism's fight for survival, which makes competition for life the main factor in understanding its bases, creative and adaptive evolutionary changes (Gould 2010). One of the most-important aspects of Darwinian natural selection is adaptation, understood as the driving force behind the variation and diversity of organisms and species. Adaptation was determined as the cause for natural selection (p. 150) because of how it worked in response to the ongoing changes in the surroundings or environments where the organisms went through their life cycles. It made adaptation to the main scenario in which selection took place a slow, constant transformation where the fittest took the place of the least fit, increasing their possibilities for survival and for the survival of their descendants that inherited the favored evolutionary traits that had come out of the adaptation.

As it can be seen, the idea of adaptation as the driving force behind survival implies a functional conception of the maximization progress of life. Darwin's viewpoint is accepted completely today: species evolve and become fitter to survive in environments whose conditions change more-or-less constantly, leading to new, stronger, fitter species than the predecessors, and organisms that do not adapt die out. Although this idea of evolutionary progress would appear to be linear, Darwin instead explained the randomness of selection, which he based mainly on two factors: environmental variability (slow or fast changes to conditions), and the vital needs of the organisms he observed, in which the ability to adapt takes place. It is known as biological functionalism, which favors a conclusive explanation of how nature works, and especially of the origin of life. Darwin's biological functionalism strengthened his evolutionary theory with the formula "form follows function." It means that each morphological trait of an organism had a specific function, which developed precisely based on adaptation and survival in the environment's changing conditions, and, taking into consideration—as Darwin did—the slow evolutionary geological time flow, meant that an organism's morphology was the result of adaptive mutations that affected directly the creation of different species over thousands and thousands of generations. The outside influence of the environment's transformation on organisms and species was noted in the main explanation of evolutionary

theory[3] and was later tweaked by other theories, which added that an internal structural driving force in the cellular and genetic chemistry also influenced evolution.

Darwin's theory grew little by little, especially with the development of genetics—which was completely unknown when *On the Origin of Species* was written—and underwent many not essential changes over more than two centuries. Gould (2010) claims that, despite these transformations and addendums, the theory of natural selection is still the clearest, most-solid explanation for evolutionary biology so far. Gould (2010, p. 37), a renowned evolutionary paleontologist, notes three aspects of Darwinism that he believes are the cornerstones of all evolutionary thought today: the agency, efficiency, and reach of natural selection. He believes that, based on Darwin, agency has to do with organisms' ability to act based on their fight for survival and the fight of their descendants; efficiency means the ability of organisms to adapt; and reach is the extrapolation of these changes in the descendants, to create new forms of life (Gould 2010, p. 83).

From this perspective, a communication act precise agency and ability, and then it can be extrapolated to others because communication act is expression of living beings that can be conceptualized as a practice, even, socially, as a praxis. Through this expression, living beings project their existence by means of saying, in such a way that the saying, the expression, is a way of taking out the meanings that they construct throughout the length and breadth of their existence in their inevitable relation with the environment. These meanings are the primary material of communication and implicit in them is the way in which they live, feel or think the life experience that this relationship with the environment provides them, either consciously or unconsciously. This last will depend on the organism in question, because as we aim at a communication concept that transcends the human and conceives all living beings as communicating beings, be the communicative act conscious or not, even intentional or not, just because as we will see later, it depends basically on the living being that communicates, in addition to the very circumstances of the act of expression it self.

Applied to communication, the three central aspects of evolution that Gould rescues from Darwin's evolution theory, can be derived conceptually as follows: agency is organisms' possibility to act communicatively in order to adapt and survive in their environment, with communicative agency understood as an expressive practice, a way of being in the world through which the organisms express themselves. According to evolutionary theory, this ability to act communicatively to survive must be understood broadly, as related to all expressive acts used in at least one process of adapting to the environment. The best example is when babies and toddlers learn social language so they can insert themselves in the social and cultural world where they will develop much of their life cycles. If they do not learn this language, they cannot express themselves, which diminishes their insertion into that

[3] From evolutionary-theory point of view, it is translated to the Darwinian motto: The environment suggests, natural selection makes it happen. However, it is argued that when the environment changes more quickly than organisms can adapt to it, organisms also make it happen through their capacity for agency. For more information, see Gould, in the bibliography of this epigraph.

world. Regarding efficiency, the ability for expressive adaptation can take place in how able we are to "say" something. It has to do first with each individual's organic capacities, because that is where they get their ability to act expressively, considering also their abilities and competencies to do so. An example would be a human baby whose brain is not yet mature, which means he has difficulties in expressing himself verbally, so his verbal skills are stifled, as are his competencies. Also, given the cultural conditions in today's globalized world, knowing a foreign language is a favorable adaptive factor, because not speaking English, for example, might put someone at a disadvantage.

Reach can be understood in communication as using a "way of speaking" that leads to new forms of communication, which then leads to other forms and sparks the creative attribute of selection. That is, the practice of communication is able to create new forms and contents of communication. An example would be what humans call politically-correct language, concerning gender, race, the elderly, or the disabled. Feminists seek linguistic equality by using the two genders without privileging the masculine one, as Spanish-speakers continue to do; or people use the term "of African descent" when talking about black people. Another example is the use of "elderly" for those over 60 (when they used to be called simply "old people"), and "physically challenged" to talk about people who used to be called handicapped, or, before that, lame or crippled.

In this sense, although explaining communication from the evolutionary perspective might seem determinist in biological terms, it certainly is not so. The insertion of human beings into the world is determined by rules and conditionings that go beyond biological aspects, because they cannot escape the sociocultural environment. Therefore, even though we base our premise on the biological functionalism of evolutionism (as Darwin based his theory on Adam Smith's economic theory), transferring it to communication should not be understood as deterministic.

It is worth clarifying that we do not understand communication only as a sociocultural phenomenon. Rather we understand communication as a phenomenon of life, specifically as a phenomenon of the experience of living beings by the mere fact of existing, in the manner of a being-being in the world. This, as we have already pointed out, transcends the human sphere, where communication is also given, from the social point of view, within the sociocultural and symbolic frameworks of this human environment. In this sense, we refer to the communicative phenomenon exerted and experienced by all living beings, each one in the different environments in which their life cycle occurs. Human beings, unlike other living organisms that also communicate, are biopsychosocial beings with symbolic, articulate language inserted in the culture, a unique situation that implies at least three surroundings or environments: the natural or physical world, the social world, and the cultural-symbolic world. Therefore, agency, efficiency, and reach must be explained from these worlds, and none must be superior to the others, unless the context of the expressive act requires it. Organisms whose life cycle develops in only one natural environment, or in only one social environment, would have to act in similar ways.

This, as can you see, places semiotic cognition and communication as a basic sort of reality. But in difference with Brier, this communication proposal is an hypothesis which can explain how communication takes place in different living organisms. This is relevant to describe the relationship that communicative acts have with the communicating subject and their own corporeality, as well as the way in which from that corporality -invested as much of sensations, emotions and affections as of rationality- is the instance of experience First person Regarding the intersubjectivity of communication in social life, as we shall see later, this can also be explained from these bases taking into account that the presence of intersubjectivity in communicative situations of social order is also forged from these corporalities.

This emphasis on different environments organisms face in their life cycle is what allows us to avoid the biological determination behind the theory of evolution. For this reason, and because we are not interested mainly in explaining the origin of expressive acts in each species but rather their functionality and workings with respect to the environment in which they act, instead of choosing the term "natural selection," we prefer "adaptation," as a bridge between empirical and conceptual ways of understanding communication from an evolutionary perspective. We shall focus on organisms' ability for agency in acting expressively, which will help us understand how they work (which is mainly what we will cover in this epigraph), sidestepping from the beginning the efficiency and reach of expressive acts. Doing so should bring about a bio-historic analysis of the species that allows us to see this aspect for the moment. It requires a cross-disciplinary approach that we must provide between biological and communication sciences, as proposed from Cybersemiotics. Before accounting for how the expressive acts of different living organisms work from an agency perspective, we must summarize some conceptual premises we will use to get the needed indicators. We shall use references from phenomenology of perception, neurobiology, biosemiotics, and enactivism. Below, we list briefly the main hypotheses and how they become basic premises to make up conceptually and epistemically the link between communication and evolution.

16.5 Epistemic-conceptual Framework for Studying Communication from the Biological-evolutionary Perspective

This section covers the main postulates of the epistemological sources we believe can be used to consider communication from the evolutionary perspective, besides Cybersemiotics. Some of these epistemological sources are also part of the Cibsersemiótica proposal, and in general we agree on this. However, as we pointed out at the beginning of this text, we do not agree with the idea of information that is handled in this proposal, since we understand it necessarily linked to experience and meaning. This conceptual notion about information is related to the postulates of the New Cognitive Science, which although part of the paradigm of the autopoiesis of

Maturana and Varela, by putting cognitive activity in the center of attention, refers to the agency of individuals as a central element of cognition. This agency is given through the mechanism of the "sense-making", as a vital impulse for survival. In that sense, although organisms are understood as an auopoetically closed system, the New Cognitive Science opens the empirically proven possibility of understanding cognition as a practice of the existence of any living being.

As a literature review, first we attempt to show that communication is a phenomenon, part of organisms' perceptive experience, caused by the creation of meaning in any experience. When we refer to organism's ability for agency in acting expressively, we speak rather from it, because it is these meanings that serve as the raw material for communication. Which ones? Next, we support our argumentation on the bases of enactivism (or New Cognitive Science) and neurobiology to offer a phenomenological explanation of communication, to explain how experiences are made up of acts or processes of construction of meanings, which are also acts or processes of knowledge building. Here, for us, is the mayor difference we have with Cybersemiotic, because we understand knowledge processes equivalent to meaning-making processes. Finally, based on biosemiotics and its main postulate about the vital link between living systems and semiotic systems, we offer a proposal for communication as a behavior. Let us begin.

In the words of Merleau-Ponty (1985, 2008), phenomenology of perception states that every experience is a situated perceptive experience, meaning that it is hooked to the body, embodied. In this sense, perception is an experience because it is felt, lived. Thus, the experience has a meaning, but it is a subjective, individualized meaning. Under these circumstances, communication understood as a phenomenon emerges from the experience of being (Romeu 2016, p. 19), from where meaning is construed. That is why we claim that an experience signifies cognitive activity (p. 20). All living organisms have cognitive activity (Di Paolo 2015), so it follows that all living organisms build information or knowledge based on the perceptive experience they display in their vital interaction with their surroundings. The information that each living organism builds depends on this interaction, which is also inescapable because it is a requirement for existence. We can make an important conclusion that comes from enactism[4]: information is not given (Varela 2005) but rather is built, which leads us to believe that information varies not only from experience to experience but also from individual to individual and species to species.

[4] Enactism or enactivism is part of the so-called New Cognitive Science. It suggests different levels of cognitive activity for all living organisms. Enactism emerged in the 1970s, but gained strength over the next two decades, and defends the ideal that knowledge is not the conceptual product of judgement-like representational connections or associations but rather of conscious or unconscious neuronal connections turned on in an organism's mind thanks to its link to the body. In opposition to the ideas from old cognitive theories, enactists note that knowledge does not come from processing information but from building it. They say that cognition is an ongoing activity that happens through self-organized processes of active participation in the world, and through the experience and self-affection of the animated body. See Varela and Di Paolo's work cited in the references.

In the information-building process, the act of attention to/selection of stimuli is only the first step, and individuals add to the experience by giving meaning to each stimulus that comes about. Understood in this way, perception transforms the fact/stimulus into information when we interpret it subjectively based on our own experience that unfolds in the interaction with it, leading to what we call a phenomenon. Heidegger notes that a phenomenon is something that is shown or that we let be seen when we have an encounter (cited in de Lara, 2009, p. 381). It is how something appears to us through experience. However, we must understand that this emergence does not classify or discriminate objects, because it does not note the quality of something but rather gives a situated interpretation of our relationship with whatever has caught our attention. Up to that point, as you can see, it coincides with the Peircean approach, only where Peirce sees signs, we see stimuli, importance, relevance.

As does Heidegger, we can state that phenomena have a way of being there in front of and because of the being or individual who experiences them, so that the individual's life, and eventually the individual's feeling and thinking are affected, and a meaningful relationship that is essentially representational is born, although subjective.

Enactivist theories (name with which the New Cognitive Science is also known) about knowledge suggest that reality is what we build based on regular cognitive patterns that we incorporate into our neuronal network, so that what is noncognoscible is formulated not intellectually, but sensorially and even chemically, at a metabolic level, as well as neuro-physiologically. The perceptive acts derived from these levels make up a knowledge structure that is nothing more than a meaning structure with strong neural foundations. These theses are proven through research in neurobiology that sustains that the mind is a functional relationship between the individual and his or her environment (Damasio 2016) that makes possible a knowledge structure going from very basic (based on sensations) to very complex, associated with rational thought,[5] which in the case of human beings, is linked to the construction of subjectivity. Furthermore, Varela's (2005, p. 102) theoretical revelation about the structure of knowledge that emerges from cognitive activity suggests a codetermination between what an individual may know and what he or she really does know, which means that cognitive activity is not only formed from the experience of being but is intersected by it, and therefore represents mostly the building of meanings that emerge from a conceivable, subjective activity. When enactivists define thinking and perceiving as categories of living (Di Paolo 2015), it becomes clear that living organisms participate in the world by building information about it (and sometimes from it, regarding information about themselves, as with humans and some upper mammals) that helps them survive. Consequently,

[5] We should clarify that Damasio, a renowned neurobiologist and the pioneer in this research, creates his theses based on the human brain, but as the enactivists interpret them specifically, it is possible to extrapolate his claims to all organisms with a brain, although the enactivist theory does not distinguish phenomonologically between organisms without brains and all organisms.

cognitive activity is crucial to adaptation and survival, two key functions in evolutionary biology.

This idea was developed in a branch of theoretical biology known as biosemiotics (Santilli 2004),[6] which states basically that the evolution of life is linked closely to semiotic or interpretative processes that act as part of the natural biological mechanisms of selection and adaptation. It suggests that living organisms must interpret the environment and act accordingly; if the interpretations are successful, the acts will be successful and, through inheritance, will be developed by descendants, forging optimal adaptive and survival processes. If they are not successful, as the Darwinian theory suggests, they will die, with no possibility for future survival. In that sence, as Hoffmeyer (1997) point out, biosemiotics is based on the recognition that life is fundamentally grounded in semiotic processes, following Sebeok's idea that life and semiosis are coextensive).

A semiotics-based evolutionary explanation is offered where not only the environment follows this process, as Darwin thought, but also the organisms, as Gould suggests with his hierarchy theory of evolution. These suggestions are backed by Sebeok's (2001) idea of semiosis as a mechanism that life uses in nature and in culture, so this author—perhaps inadvertently—places interpretation at the center of the debate (semiosis). We do not go so far, but it is obvious that here we close the phenomenological circle that we described earlier, where knowledge is made up of living organisms acting in their environment based on their vital experience in or with it. Understood in this way, semiosis, information, and experience are two sides of the same coin: one cannot be without the others. Based on biosemiotic theories, as we can see, this idea is key to every act and process of adaptation and survival, which allows us to infer the role of organisms' behavior.

Piaget (1986) notes that behavior is the combination of actions for using or transforming the environment and for conserving or increasing the faculties that organisms have over it, although behaviors are not only the result of evolution but also determine it Therefore, the origin of behaviors is not in exogenous factors, or at least not exclusively, but is also in processes of experience where there are other organic factors linked to the organisms in question. It leads us to believe that behavior can be explained both by the biological component and by other components, including psychological and mental (Tamayo 2009, p. 289), obeying both casual structural factors and dispositional factors (p. 290). Notwithstanding this theory, the definition of behavior we use is from Galarsi et al. (2011), who indicates that behaviors are actions led by feeling; that is why experience is so important to explaining how it works. Galarsi et al. note that they are activities that all living beings use to

[6] Biosemiotics is based on the pioneer work by Jakob von Uexküll and later, by Thomas Sebeok, and all organisms, but it was Jesper Hoffmeyer who named this line of thought where it is understood that natural selection is activated by the ability to adapt to the environment due to living organisms that interpret it correctly or adequately, which brings about a series of beneficial effects for the organisms, allowing them to "understand" the immense variety of signs in the environment and to "choose" those most-favorable to their vital development. For more information, see the work by Santilli, Sebeok, and Hoffmeyer, in the references.

maintain and develop their lives as related to their environment, responding to it and [when it is the case][7] modifying it (Galarsi et al. 2011, p. 99). In this sense, communication understood as behavior must not only be differentiated from others, but must also have a structure that explains its functioning. Here are some keys to this.

16.6 Communication as an Act and Expressive Behavior

What differentiates communication behavior from other types of behavior is the expressive action it entails. This action takes place through "saying," understood as any action that points out, shows, notes, or indicates something. However, this "saying" should not be reduced to simple words, because we "say" through other expressions: spaces, colors, silences, sounds, distances, objects, practices, feelings, movements, and more. This wide spectrum of "saying" makes up a range of possibilities to express something, or the means and content by which an individual "says" something, where communication related to some king of intentionality. According with the Ferrater Mora Dictionary (1964) expression is a subjective form that "saying" that is defining it as a subjective form that takes on content (p. 626) as the result of an experience (p. 647). All individuals have experiences resulting from situations they have lived, and based on these life situations, they give their world meaning—and in the case of thinking organisms (self-aware or not)—give *themselves* meaning; all individuals can express (themselves), even if the expression is different from others in reach, efficacy, and degree of complexity.

Thus, we note that any individual's expression develops from three central aspects or dimensions: its expressive capacities, abilities, and competencies, which are also related to its perceptive-cognitive capacities, abilities, and competencies, because the content that is expressed is nothing more than the result of the expressive use of the information that was previously built during its process of life experiences. We can conclude that communication in all living beings understood as an expressive behavior must guarantee an explanation of the central aspects that we have mentioned. Behavior is not the same thing as action. Expressive behavior describes the act of expressing (oneself), which in our terms is nothing more than an individual's acting through "saying," whereas an action is the concrete result of said behavior, or the specific acting out of the behavior based only on its form and content. Herein lies the key to analyze an expressive action; to analyze behavior, besides knowing who is carrying it out, why, and to what end, we must also find out what led to and is causing it.

We must note that all behavior is understood as the response to a stimulus, so this stimulus must be understood as what triggers a behavior or makes it possible. Still, a stimulus must not be understood as something outside of the individual, as

[7] We have added the emphasis, because the quote is part of a section that refers only to human beings, which have a somewhat-good ability to modify their surroundings through their behavior.

traditional behaviorists posit, but rather as that which questions the individual from its own rational, chemical and/or sensorial structure. A stimulus seen in this way means a moment of questioning for the individual and can come either from the outside or from within. By "outside," we mean the surroundings, whether physical-natural, social, or cultural-symbolic, depending on the type of organism, and by "within," we mean the organism's own mental structure that "informs" it of its organic state and, when possible, of its subjective state. This because we understand the mental structure as a relation between living beings and the enviroment. Thus, allow us say that the mental structure is present in all living beings with conscious or not, implied in the "sense-making" that enactivism mentioned (see Di Paolo 2015). Cognition for enactivism –and for us- is "a continuous activity shaped by self-organized processes of active participation in the world and by the experience and self-affection of the animated body. The living body creates a world of meanings in its being and its action (in English this is the meaning of the verb to enact) and does not passively receive neutral information from an environment to which it then has to "add" a meaning" (Di Paolo 2015, p. 2). Both stimuli can be perceived both consciously and unconsciously, so behaviors take on these same attributes depending on how they are perceived. Furthermore, behaviors tend to be classified as voluntary or involuntary, individual or social, habitual or unusual, intentional or not (Galarsi et al. 2011).

Based on this reflection, a generic definition of communication as an expressive behavior prompts necessarily an action that may be conscious or not, intentional or unintentional, habitual or creative, individual or social, voluntary or involuntary. Of course, it will depend on the response to the stimulus, but also on the capacities, abilities, and competencies of the organisms in action. For this reason, because any behavior (even expressive behavior) implies an action that is a response to a stimulus, it is important to analyze the stimulus. As we have noted, a stimulus is a moment of interpretation for the organism, that is, is a sign. This means that the stimulus cannot be disconnected from the attention/selection process in all cognitive activity. Organisms have only two options: they accept the stimulus or they ignore it; some animals also have ability for discernment. The interest in or motivation from each organism regarding the stimulus plays an essential role. The interests may be somehow avoidable, such as when a dog does not respond to its owner's call, or they may be unavoidable, such as what happens with most primitive or inferior organisms whose life process depends on the stimulus, for example plants searching for sunlight and water.

As it can be seen, it does not depend on the stimulus but rather on the organism that is forced to face it. In both cases, the perception of a stimulus refers to organisms' cognitive activity, such that if it is very rudimentary—for example, what takes place at a metabolic level in bacteria when they are next to a sugar molecule—the behavior will be stifled by its limited possibilities for action. Bacteria can only respond to the sugar molecule by approaching. The behavior is very primitive, and the expressive action is very limited, because bacteria can only "say" something like this in one way: "It matters, it is essential to me, so I get closer." If there is slightly more-sophisticated cognitive activity, such as occurs generally in mammals, mainly

in superior mammals, the range of communicative behaviors might be wider, because unlike bacteria and plants, these animals have a central nervous system that allows them to feel, so their cognitive activity does not take place merely metabolically but also sensorially, which allows them to express (themselves) in more diverse ways, widening their possibilities to "say" something. For example, when a bird is nervous, it shows it by scratching its feathers, whereas a pig whines shrilly. In both cases, a stimulus has been perceived and the organism has responded to it based on its own cognitive and expressive capacities, abilities, and competencies. An ant or a bee does not have much ability to escape from a predator, but apes do, which means that the actions of each are also affected directly by the way they perceive the stimulus. Ants simply do not perceive the predator from a dangerous stimulating perspective, whereas apes "know" that they have to run away to the treetops if they perceive the presence of a tiger and have even developed a social language for warning, which they can use to express things not only to themselves but also to the rest of their herd.

Human beings are an emblematic and apparently unique case. First, it is the only species—at least as far as we know—that uses the three processes of cognitive activity: metabolic, sensorial, and intellectual, the latter particularly efficiently, because humans are able to think about themselves, a talent fostered not only by their use of articulate verbal language but also, very importantly, by the vast development of the prefrontal cortex, and their huge ability for memory and for what is known as extended or external memory, called culture. It helps with and fosters long-term learning and even the ability to make plans.[8] Without a doubt, these human abilities play an important role not only in choosing stimuli but also in responding to them, including expressive responses. We humans have a huge range of expressive possibilities, because our cognitive activity is very broad and allows us to use expressively different types of information, not only for our own organic or biological benefit but also for the benefit of our relationship with others in social networks that we take on and submit ourselves to all the time, overlapped with cultural scenarios where values, customs, moral and social norms, and so on, are set.

Understood in this way, because communicative behavior is necessarily different among different species and individuals, expressive actions are also different in function of each being's expressive possibilities and resources. From this perspective, the wide range of communicative behaviors responds to the wide range of responses that an individual activates when facing any given stimulus, based on the

[8] Ayala (1980) say that a human being's biological makeup determines the presence of three conditions of his behavior: the ability to anticipate the consequences of his own actions, the ability to make value judgments, and the ability to choose between different possible actions. Meanwhile, Mora (2005) notes that human beings can have several perspectives of the same problem, we are able to understand another's point of view, we have a huge ability to empathize, we take part in and transform consciously the world around us, and we go beyond our own biology from within our mind. Furthermore, Wilson (1978) argues that the predisposition to religiosity and the strong ethical basis underlying it makes up an irradicable part of human nature. For more information, see the work by these three authors.

way in which he or she receives it and the expressive type and content used and/or chosen to face it, by way of significance.

But as we can deduce, what happens between the organism and the stimulus through the expressive behavior is the establishment of a relationship. We have called this relationship one of sociality,[9] which is relevant for the organism that expresses (itself), and not necessarily for another organism, strictly speaking, as current communications theories posit. It is not a relativist argument, nor much less a solipsist one. The phenomenological position we use conceives communication as an expressive behavior that can happen both at an individual and a collective level, meaning that it can be explained both subjectively and intersubjectively. We have already covered the subjective point of view; the intersubjective one takes place through communicative interaction, which we do not conceive as something exact, as connectionist, dialogical, or understanding-based positions about communication do, but rather as the result of a dual subjective implication that configures the intersubjective nature of our social communication. In other words, communicative or expressive interaction takes place when an individual is involved expressively with another in such a way that the other's expression acts as a stimulus.

Communicative interactions are converging sequences of the expressive actions and behaviors of different individuals that are used in response to the stimuli each perceives from the other's expressive actions. In this sense, we reiterate that communicative action is not valuable because of the understanding or common perception of information but because of the sociality relationship of involvement that occurs between expressive individuals. It is what allows us to define communicative interaction as an act of expressive convergence, where there may or may not be understanding. With this definition, we take a step forward to oppose the idea that communication necessarily indicates or points out something to another—which is the thesis developed by Martín-Serrano (2007) in his paleontological theory of communication—to focus on a clearer, more-objective theory: we indicate something *to* or *for* the other—which is nothing more than what has stimulated the individual—, based on the significant relevance that we give the stimulus in terms of our interests or motivations in the relationship of sociality.

This relationship of sociality that is established between the organism and its environment makes us think that the environment (whether the other, the self, nature, social, culture or symbolic world) always appears as a threshold of alterity that makes possible potentially the unfolding of the expression, since the expression thus seen is constituted in the way in which the individual acts expressively for the purpose of survival and adaptation to what has motivated him significantly and

[9] We have adapted the concept of sociality from Georg Simmel's (2002, 2014) concept of sociability, where this German sociologist recognizes the existence of social relations carried out through what he calls types of socialization. These types of socialization oscillate between those that are ruled by power and those that are not. Because Simmel uses the term sociability to refer to the latter, to avoid confusion, we propose using Simmel's concept as a basis to refer to sociality as a much-more generic term, since it covers all types of social relations that are set up between individuals through forms of socialization.

significantly. Herein lies the vital character of expressive involvement. If one does not get involved with the other-environment through what one is, it does not survive in terms of "saying," and if it does not survive, it is because it has not handled adequately its expression for/to the other. Expressing oneself is nothing more than a way of living one's own existence. For this reason, communication must be seen as an expressive response of the individual itself in its vital experience that takes place—depending on the individual's capacities, abilities, and competencies—through the expressive use of information that one builds as part of its processes of adaptation and survival in dealing with life. If the individual is able to express itself of its own will, as is the case with human beings and mammals in general, the expression is also intentional and makes possible the production of expressive acts of intervention that lead inherently to the emergence of involvement behaviors. On the other hand, with individuals that are not able to express (themselves) through their own will, the expressive act becomes unintentional and leads to significant behaviors that are simple performative acts. In neither case do expressive acts lose or cancel their nature of involvement, because, as with any behavior, it depends on the individual's interests as related to survival and adaptation and is not due to the presence or not of intentions or wills. As we can see, we take a step toward a conceptualization of communication that is not merely a symbolic scenario, or even a question of social language,[10] and can much less be explained by both.

By accepting this perspective, this epigraph shows that communication is possible—at least at its lowest threshold—thanks to simple expressive acts that are already a type of relationship/involvement with the other-environment that acts as a stimulus, because otherwise it would not take place. At its highest threshold, at least with the information we have so far, communication takes place as a type of involvement through the display, intentional if there are more signs, of an individual's involvement agency. Next, we summarize schematically the characteristics of "saying" in living individuals, breaking them down according to their capacities. We have used as criteria whether they possess a brain or not, which also allows us to separate feeling and non-feeling individuals, and then whether they have intentionality, which depends mainly on the degree of consciousness.

16.7 Communication Thresholds: Minimum, Middle, and Maximum

The conceptualization of communication that we have been working on suggests that it is not an exclusively human behavior. As we can see other living beings also communicate, although it's communication is different from human. The human

[10] When talking about a symbolic scenario, we mean the platform of values, meanings, customs, and traditions that make up culture. By social language, we mean a system of representations built on the conventional, arbitrary, collective relationship through which an event or object is given meaning within a specific culture.

communication may be symbolic and not symbolic, but in other organism the communication only can be not symbolic. This basically depends on the organic capacities of each organism, whether it has a brain or only a nervous plexus, or whether it is capable of feeling or not, among other factors. For organisms without a brain, and therefore without consciousness, communication can only be stereotyped and rudimentary, as in the case of bacteria and perhaps also plants. In more developed organisms, the communication is usually symbolic to some degree, as happens to ants, rats, dogs and in general to higher mammals. These animals, by the way, have a symbolic life, but reduced, and because of their low memory capacity do not create culture and their communication, although more sophisticated than that of bacteria, is less extensive than that of the human being. The case of the human being is different because it has a large internal memory (brain) and external (culture), also has a highly developed prefrontal cortex through which, unlike other animals, can integrate their perceptions and even imagine scenarios in the future, a capacity known as anticipatory thinking and this impacts the ways in which it is expressed or communicated, expanding the range of forms and contents of human communication.

Since behaviors are activities that any living being can carry out to maintain and develop its life in relation to its environment, responding to it and [in some cases][11] modifying it (Galarsi et al. 2011, p. 99), any response to a stimulus leads to behaviors, which can be innate (stereotyped, rigid, and predetermined, since they lack external feedback) or learned (based on habits, association, and social influence).[12] Expressive behavior, which is what we are discussing, is differentiated internally depending on the mental and adaptive capabilities of each of the species and individuals related to how they respond and, in some cases, modify their environment. Thus, besides the well-known basic difference between behaviors (whether public or private, conscious or unconscious, voluntary or involuntary, usual or unusual, social or individual), the use that any given individual gives to the information that it manages to build through experience and interpretation based on its capacities, abilities, and competencies is also an important factor in its expressive action. As you can see any kind of expressive behavior is considered to be a communicative phenomena. This because expression is already communication. In non-social organisms, the expression acquires no social or interaction tints; but in social organisms it is possible to speak of social communication, although between the different species is given through different supports and forms, even contents, according to

[11] We have added the emphasis, because the quote is part of a section that refers only to human beings, which have a somewhat good ability to modify their surroundings through their behavior.

[12] We borrowed this classification from the work of Galarsi et al. (2011, pp. 95–97), who show that behaviors are organized by their degree of complexity. In general terms, habits allow organisms to learn to ignore a repeated stimulus, making them insensitive to it; next is association, where learning is done through experience, through trial and error (it also includes learning through filial influence, which has a mark of belonging), and finally, the most-complex is behavior comes about through social influence, where an individual outside of the family manages to influence the other's learning.

the capacities, abilities and cognitive and expressive competences of the organism in question.

It makes us think that communication has several levels or thresholds, which are not shown with the criteria ratings used in the field of communications studies (interpersonal, group, organizational, social, and media level) but rather are based on the degree of complexity of the expressive act itself, conceived from the expressive use of the information built by the individual in its inescapable interaction with the environment throughout its life, and thus of an obvious evolutionary nature. This proposal can make sense in terms of the third, fourth and fifth level since we understand the communication in every living being that through its vital behavior (what the designers call "the search for meaning") are expressed, communicated, before the stimuli of the environment. This implies, of course, a non-conscious reaction, but a reaction to the end that "says" the organism in question, even when there is no conscious intention to say anything. In this regard it is necessary to emphasize that from understanding communication as an act and expressive behavior, we also assume it as an expression that occurs before/through the environment, the other, the self, and not necessarily with the other. For us, communication is not a matter of dialogue or understanding, much less of intention (not intentionality) and consciousness. The communication understood as an expression is essentially a practice of saying that is motivated by the type of involvement that through saying said living beings establish with the stimulus that they construct, as a sign, as part of their life existence.

For example, when ants and bees exchange information, it is biosocial, unlike other more-psychosocial species like some birds and mammals, or other undoubtedly symbolic exchanges between some superior mammals, developed most especially in human beings. The exchange of biosocial information is that which occurs between beings that are biologically social (that is, between beings that need the other for the daily management of their life: reproduce, eat, hunt, etc.). Its function, then, is directly linked to physical, biological survival. Psychosocial behavior, on the other hand, is typical of organisms that affectively need the other to manage their individual lives. The human being is a being both biosocial and psychosocial, but not all species bear this last attribute.

The difference in these types of communicative behaviors (in Romeu 2018, we haved called symbolic and not symbolic communication) resides in the mental capability of these individuals. We talk about two big different types of communication based not on different form of expressive behavior, rather on different type of expression, according to organism, its cognitive and expressive abilities, capabilities and competence. The dividing line between symbolic and non-symbolic communication is precisely and fundamentally in the degree of consciousness and/or unconsciousness of the communicating individuals. A cell, for example, is an unconscious living organism and therefore its communication, that is, its communicative behavior can only be of a non-symbolic type. But a chicken, a frog, an elk or an elephant have symbolic communication behaviors because not only are they, in principle, psychosocial beings, that is, affectively and mentally dependent on the other, specifically the recognition of the other individual as another, but this

recognition provides them with some degree of awareness that allows them to "read" the world (and all that it means in terms of recognizing the existence of others and the other, the difference) as alien and different from themselves. Hence, these animals have a social language certainly rudimentary – if compared to human social language – through which they can communicate with each other symbolically.

Ants do not have a large brain (they have a few neurons and very few synapses), so their cognitive activity tends to be programmed neurally and genetically, meaning that it is determined and based on mostly innate, instinctive behavioral patterns. Still, because ants are a social species, their expressive actions are limited to a series of stereotyped reactions that other ants of the same species can "understand" (so they have a social language, primitive as it may be). The same does not occur with solitary individuals (fungi or bacteria, for example) whose expressive actions are not only unintentional (not based on their will) but are also not completely stereotyped; they are individual, not shared.

It is known that rodent mammals such as rats do not have a large brain, but they are quite intelligent animals, so their cognitive activity both uses their innate resources and obtains other types of resources through learning. Their psychosocial development allows them to incorporate new resources that enhance their life experience and, therefore, their range of behaviors. However, the rat's small memory makes it impossible for it to hold on to this learning, so even though it can have non-stereotypical, or creative, expressive actions, what we know so far affirms that it must call upon these actions on each occasion. Dogs are a special case, as are most superior mammals and other domesticated animals, which, like rats, can learn new things, but are able to remember a much greater amount of information and share a rather efficient social language that allows them to deal with life collectively and even with other species. The symbolic nature of behaviors attributed mainly to human beings (although there is evidence of it in some superior mammals) means that the brain capacity is greater and houses a larger memory (according to Sagan 2016, the human brain appears to be superior by several million bytes). Therefore, bio- and psychosocial behaviors that the species mentioned above also have join forces with the symbolic behavior derived from the way in which representations of reality are created apart from the sensations and feelings linked to them and operate expressively through a much-richer, much-broader and much-more-abstract social language, in that it does not need a reference point in the moment.

Symbolic behavior, as the symbolic expression, also includes the faculty of reason which, as we have noted, also comes in different degrees. One of these degrees is undoubtedly the presence of verbal language articulated in the human species. As it is known, the human being is the rational animal par excellence in that it is the species that has most used its rationality, accumulating these types of cognitive or intellective experiences into what we know as culture, which also acts as an external memory drive that fills with continuous learning. The different scales of degrees that we have attempted to show through these three examples suggest that individuals' behavior has an evolutionary nature in function of the individual's capacities and the challenges that he or she must face using his or her abilities or competencies. It may

or may not lead to new capacities, or to the partial modification of one, which would also possibly affect the individual's expression, because the transformation of capacities is always related evolutionarily to a transformation of abilities and competencies, which also implies a transformation in an individual's cognitive activity.

According to enactivism (Di Paolo 2015), there are three great means or ways by which an individual's cognitive activity works, or the activity used to build information or knowledge about one's surroundings, or, in some cases, about oneself. It is the metabolic means through which information is built without the intervention of complex cognitive operations, because the individual acts cognitively as if programmed based on its basic vital needs (the example of the bacteria helps show that these organisms have a physiological feature that allows them to detect and react to the presence of sugar molecules on which they feed); there is also a sensorial means, where knowledge or information is built from sensorial organs that are linked to the sensations and emotions activated mentally by the individual (for example, when a dog sniffs tasty food, its mouth waters), and a rational or intellective means through which mainly humans build information about the world using concepts to create and transmit knowledge of it.

This simple division by levels or means through which cognitive activity works allows us to divide in two the information that can be built from it—symbolic-type information (working cognitively through intellective means), and non-symbolic (working through metabolic and sensory means). We can say that communication in both symbolic and non-symbolic terms can be split into two large groups to be studied: non-symbolic communication and symbolic communication, respectively. By non-symbolic communication, we mean communication that happens through expressive actions that do not involve social or symbolic language and can therefore be placed in the lower communication threshold, which has expressive limitations for the individual in that it cannot use common or social language, since it does not possess such. We have called this non-social language or individual language, understanding language not as communication instrument, rather as cognitive, meaning an individual's own system of mental representation, derived from its experiences (some predetermined and others, learned) that are not structured socially, such that it is tied to the mental structures of each organism, leading to individual, or not-shared, mental representations. According to enactivism, all living organisms possess this type of language, and as their capacities, abilities, and competencies allow (as in the case of a baby and even of some domesticated animals such as dogs and cats), individuals can adopt and learn social language, which is useful in principle for organisms that must navigate their lives as parts of groups or societies.

Thus, without social language, it has no possibility of being understood by others of its own or another species, and involvement in the expressive sense is prevented. Non-symbolic communication is typical, but not exclusive to, so-called individual individuals, that is, individuals that can't be social, which are organisms that do not need others to survive because they take care of their own food and reproduction (plants, fungi, bacteria, protists, and some animals like sponges and coral). Because they do not need social or symbolic language, they manage their life and their

expressive acts based on their mental structure, such that their interaction with the environment is programmed, predetermined, or stereotyped and not intentional, and their expressive activity is for self-management.

Another sub-type of non-symbolic communication is characterized by the sensorial way in which information is built. We have called it sense-based communication, and it is present in sentient living organisms with some level of consciousness in that they have a central nervous system. Based on their nervous activity and brain capacity, they show a mental structure whose sensory relations are activated by the sensory conditions provided by the sensory apparatus.[13] These sensory conditions oscillate on a range of feelings that go from pleasure to displeasure, in that these extremes are the minimum of sensory ability possible in sensory actions. Like what happens with programmed communication, with non-symbolic sensory communication (later we shall see that there is also symbolic sensory communication), the expressive use of information is linked to the satisfaction of an organisms' biological needs. It is therefore not a reflexive or linguistic use, which eliminates immediately the possibility of talking about expressive support and matter as a medium and message, respectively, and especially about expressive intention or understanding. Non-symbolic communication and its two sub-types (programmed and sensory) are intentional communications, meaning that they are derived from the individual's display of intentionality as a life impulse, or, if we prefer, of an organic and/or sensory reaction (depending on whether it is programmed or sensory) to the physical-natural and/or social environment where the organism in question lives.

Unlike programmed communication, sensory communication produces a performance-existential type of expressive act that is different from a programmed action in that it is not determined genetically or metabolically by organized physical-chemical processes to stay alive; a performative-existential expressive act happens as a sensory reaction to the environment. Sensory communication thus allows for the emergence of an expressive act that accounts for the organism's sensory state at a given moment, as an expressive response to a stimulus. It is possible because sensations act as experiences in organisms with some level of consciousness.[14] We can define sensory communication in these organisms as a subtype of non-symbolic communication carried out by feeling individuals equipped with different sensory mechanisms and sensory resources, and different degrees of awareness to shape their expressive acts at the medium-communication threshold. If an individual has a high level of awareness, it probably uses sensory communication from both a non-symbolic perspective (autonomy) and a symbolic one (heteronomy). Therefore, symbolic sensory communication is shaped by one of the uses the human species

[13] For example, insects and some mammals have a very developed sense of smell, whereas fish have a sharper sense of hearing. In human beings and primates in general, the most-important sense is sight, while in bats, hearing and touch are the most-predominant. Of course, a species may also have other senses.

[14] Insects are not generally feeling beings; they react to bothersome stimuli, but they do not feel pain. For example, a lizard does not feel pain when its tail is cut off, but a dog or bird does, due to the different levels of awareness in these animals.

gives it, mainly through sports, art, and social norms, because in human societies, feelings tend to be regulated in terms of cultural meaning. We can also talk about symbolic sensory communication, although it must be balanced based on the social, rational nature of all symbolic communication.

Symbolic communication differs from non-symbolic communication mainly in the type of language used (social language or not social language). Whereas non-symbolic communication is used with a language or an ad hoc system of representation built by the organism as an individual mental structure, which results in a non-intentional or non-intentioned expressive behavior, symbolic communication—attributed unquestioningly to the human species (although there is scientific evidence to the contrary, or that at least questions it)—takes place through social language, and in human beings and superior mammals, also through a symbolic language that merits an intentional expressive display. Here, we find the highest communication threshold, even though it is normally reserved for humans. Because intentionality and intent make up two behavioral aspects of living organisms whose difference lies precisely in the presence or not of volitive interests in expressive acts, in symbolic communication, the presence or not of volitive motivation (built around an achievement and an end established previously and consciously from a mental standpoint) is a natural attribute of symbolic communication at its highest level, which marks clearly a difference with non-symbolic communication that, based on the absence of will, results in a performative-existential, if not programmed, expressive act.

Intent does not work the same way in all organisms. In fact, based on capacities, abilities, and competencies, intent can be split in two: a specific, exact one, which can also be called instrumental, focused on solving specific problems that are limited to the factual reality that provokes it; and an abstract or speculative intent (usually yet illogically attributed only to humans), which above all is linked not only to the organic characteristics of the human brain but also to its huge ability to remember, and to the presence of verbal language.[15] The latter is what makes it possible to articulate not only intent but also complex mental representations, which take place through abstract processes that happen through the joining of ideas, the source of

[15] Verbal language allows us to describe and explain other languages and ourselves, so it makes possible the emergence of a system (or even group) of representations and references articulated/structured together, from which the connections between the different aspects of different languages that foster the appearance of a more-complex thinking are amplified, in that it no longer has to be for immediate situations for the sake of past, and especially, future situations. The ability to name events beyond the present scenario is exclusive to verbal language (which is not unimportant when we realize that human beings have also created technology that allows us to transmit this language culturally, besides the fact that it is immediate), and although it may turn out to be the basis for many other languages (for deaf-mutes, for example), animals—even the most-intelligent of them—lack the brain capacity to think about the long-term future, so their language is reduced to naming and understanding the world as they perceive it, and to that sparse link between signs and representations. Therefore, their speculative intent would be reduced—if they can even activate it—to exploring the present world.

imagination through the very developed sense that humans have of future expectations.[16]

Based on this information, expressive acts within symbolic communication work like intervention, or with the conscious intent of modifying the other-environment. Of course, it is not only to human beings, but humans would appear to be the most efficient at it. Linked to the group or system of representations that give a specific, socially shared meaning and reference to the reality of things in the material, social, and imagined world, the speculative world of the human individual is more far-reaching and complex than that of individuals of other species in manipulating will through agency.[17]

Different degrees of intellectuality or rationality (depending on the organic traits of their brains and the degree of expressive capacity, ability, and competencies) have different degrees of complexity in the expressive act of involvement. From this maximum threshold of communication there are complex expressive acts, especially those that tend to influence/involve the other-environment. In this way, the degree of complexity of communicative acts can be calculated based on the degree of awareness of the effects of individuals' expressive acts on the other-environment, and it is even worth analyzing efficacy, because to the extent that this effect manages to last longer, meaning to the extent that it tends to change or transform more-or-less permanently the state of aspects of a reality through conscious acts, there is undoubtedly an expressive act taking place that could manage to make a significant difference in the expressive acts of an individual or species.

This point and this point alone is what allows us to understand how transcendental communication is in human beings' personal, social and/or cultural life, and in that of other species, which forces us to look beyond our anthropomorphic noses. Perhaps, even technologically, it is where we should focus our efforts as researchers and professionals in communication from a biological and evolutionary standpoint, because only then can communication be seen fully: as nothing more and nothing less than an expressive-type behavior. Understanding the above leads then to take a different view on communication, which, without doubt, allows a greater scope. If the object of study of communication, as proposed here, is the expressive use of information constructed in the inevitable interaction of the living individual with his surroundings that results in expressive behaviors and acts by means of which an individual " says, "the causes and consequences of said saying will not be alien to this object, not only in the socio-historical level (in the case of human beings), but

[16] Will or intent, when tied to what is immediate and sensory-emotional-affective, is displayed specifically, and its instrumental nature means it is instinctive or determined. However, when will is linked to what is mediate (non-present situation) and conceptual (simply thinking: idea-idea association), it is a speculative intent because of its abstract or conceptual nature, in that it is always linked to an organism's system of symbolic representations that it stores in its memory, to be activated at specific times throughout its life.

[17] We are not using this term here in Gould's biological sense, but as Bourdieu and Deleuze's theory of agency describe it. They say that agency is the action that social actors develop consciously. We have extended and adapted the concept to all species with volition.

also its impact on the vital ecosystem in which it is inserted, be social, cultural, personal and/or natural. The potential impact of any expressive act on individuals and on their place in the real world could also surely be considered as a legitimate object of study in the field of communication studies; herein lies the basis for introducing it and setting it up as a field, because communication crisscrosses the entire vital spectrum of living individuals.

16.8 Conclusions

As we have seen thus far, the concept of communication as a behavior and expressive act is conceived from an evolutionary standpoint, understood as part of the vital acts of all living organisms as they are mediated by the expression that they are able to utter based on their different capacities, abilities, and competencies, and different interests or motivations. This, as can be seen, is far from the concept of communication in Luhmann's systems theory and also from its maxim that only communication communicates. For us, against this position, communication is only possible through living organisms, so we move away from the systemic positions that imply not only outside the scope of life, but also outside the processes of construction and information processing.

Taking this stance as a backdrop, we can state that it is the perceptive-cognitive activity of living individuals, as essentially interpretative activity, that makes up the raw material of communication, which is the information that the individual builds perceptively through its life experience. In this sense, our position is defined mainly phenomenologically; and for the biological substrate on which it rests, we have named it as biophenomenological. The criteria we use to define how communication works as a behavior and expressive act are in line with these positions. We believe there are three basic criteria in the conceptualization of communication from an evolutionary standpoint: (1) individuals' perceptive-cognitive capacity, ability, and competency in that the perception of the stimulus that requires an expressive response from the individual is based on it, (2) the expressive capacities, abilities, and competencies where the personal and social expressive resources to communicate are activated, and (3) the individual's motivations and interests when perceiving the stimulus and using the information built through it to express (itself).

Based on these criteria, we propose that the link between communication and evolution must be understood according to three basic ideas. They are: information, the expressive use of information, and interest/motivation what generates such use. These three ideas are also the levels of analysis for all behavior and expressive acts. We have defined this concept of information as knowledge, in that it is the result of individuals' perceptive-cognitive activity in their unavoidable interaction with the environment or the surroundings in which they live. In this sense, we accentuate the discordance that exists in this regard with the concept of information from which the Cybersemiotics program starts, from which information is separated from its meaning, that is, knowledge information.

For the other hand, the expressive use of information—which is what we call communication—implies using information as the raw material for expression. This also differs from the concept of communication proposed by Cybersemiotics from the postulates of Luhmann. For us, communication is a phenomenon of life, not a structure that articulates relationships and nodes of information. From our point of view, communication has an individual and a social dimension. In the individual communication occurs as performative-existential behavior, without intention, without a regulatory code of meaning and without orientation to the understanding with the other, because as a basic expressive behavior, the resulting expressive act is nothing more than Thévenot (2016) it calls modes of involvement, in which subjectivity is implied. For the program of cybersemotics, it is precisely this that makes it possible to draw the bridge between unconscious and conscious acts, because communication thus serves as a mortar between one and another state of the life system, because communication here is defined, from its bases, as a expressive act before or by the environment (with regard to the stimulus that configures it), and never with it.

Regarding the social dimension of communication, which is how it is mostly understood to this day, here is the communication thanks to its intervention attribute, that is, the potential it has to modify/transform the environment, the other or the self generates relations of sociality with the environment and not only before or by him. This distinction between the individual and social dimension of communication can be explanatory – albeit partially – of how the processing of information in unconscious organisms gives way to the emergence of meaningful communicative acts, although this sense is meaningful only to them. In the case of social communication, meaning is shared to the extent that it is collectively constructed through socialization.

Finally, the third level of analysis is the interest or motivation, understood as that conscious or unconscious will, respectively, that organisms deploy when responding expressively to the stimulus that summons said expression. This distinction between interest and motivation, which is articulated within the phenomenological discussion between intention and intentionality, respectively, it seems may also be useful to understand the interrelation between the different ontological levels of reality and the breakdown/articulation between the unconscious world and the conscious. Obviously, as we conceive rather the ontological criteria inserted in a specific epistemological perspective (which for lack of a better name we have called ontoepistemology for the moment to demonstrate the cognitive relationship that we establish with reality and from which we ontologize, especially via the language), that is why we refer to the beginning of this work that what Cybersemiotics understands as levels of reality, or different domains of reality, we think, as Maturana (2015) does, as explanatory domains of that reality, is say, cognitive domains.

Reality, as we think it, is one, although the way we approach it is to dissect it. The cybersemiotic bet to build a comprehensive theory about it, it seems to us, should not reproduce this separation and is, according to our point of view, what it does when looking for an ontological theory of information since the science itself from which it is intended to erect constitutes, as a human activity, a second order approach to that reality. Producing this difference artificially (even through logical

thinking), this is what can be configured ontologically as information, but we must not lose sight of the fact that it is a construction of reality, that is, an observation of the observation that although it produces knowledge it is in any case a knowledge that is crossed by our own human subjectivities, as well as scientific, and in any case, always, it is approximate; at least from the Perennial pansemiotic perspective with which we identify ourselves.

Based on the epistemic-conceptual framework developed here, not only we urge the academic field of communication studies to broaden its range of analysis and research to areas of study that have not even been considered, or perhaps force it to refute what we have sustained, although we are aware that this proposal is lacking a more-profound explanation. But it can also help to explain the interconnection between the last explanatory levels of reality that Brier places in living systems. This is relevant for the academic field because today it is focused only in human communication and because our communication proposal builds a framework to understand communication beyond the human, and beyond understood as a process of sending and forwarding messages. Understanding communication as an expression, in its two dimensions, individual and social, also makes it possible to refer to it as a phenomenon of life, specifically as a behavior that can be read in an evolutionary key. This would insert the academic field of communication into a quite different panorama, urging it to open up to interdisciplinarity, and inserting the communicative phenomenon into a transdisciplinary paradigm.

Still, we think the most-important contribution of this epigraph is that it outlines a path forward between communication and evolution that gives form to how communication has been a part of species' long, complex evolutionary processes. We do not suggest that communication is the factor that explains this evolution. Nothing is further from our intention than that, but rather we propose to understand communication as a phenomenon of life as part of an evolutionary explanation of living systems. In the framework of a successful articulation between communication and evolution it is possible to recreate scenarios of scientific reflexivity that strategically, even allow us to think about communication, specifically human, under a teleological approach that would link it, at its base, with the emergence of culture; In that sense, that for what of the communication that keeps going around without finding a place yet from where to draw from an ethical and socially responsible perspective the projection of our future expressive actions, would thus configure an ultimate sense of human life conscious of where it would emerge, perhaps, a possible explanation of its role in the regulation and management of collective life in human beings.

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