_____

The Importance of Aesthetics for the Evolution of Language

Camilla Robuschi
Università di Trento, Dipartimento di Lettere e Filosofia
camilla.robuschi@unitn.it

Abstract This paper aims to investigate how aesthetics can foster the evolution of language. For this purpose, it is first necessary to define the two terms of research and their ecosystemic function from a broader perspective than that of many authors who, in reasoning about the relationship between aesthetics and language, circumscribe them to their symbolic products. We have therefore adopted the perspective of biosemiotics or, more specifically, the Modeling System Theory by Thomas Sebeok and Marcel Danesi. This allows us to state that aesthetics and language are two modeling systems useful for creating models of the surroundings, and they originate in a typically averbal and iconic modeling system: the Primary Modeling System. Assuming that language and aesthetics are not limited to the verbal symbolic sphere, we can advance the hypothesis that aesthetics is a particular modeling system that allows all living beings to grasp meaningful differences and similarities in the Umwelt, then synthesize them into classificatory connections. However, the outcome of such a system can never be taken for granted and often involves trial and error. In the aesthetics-linguistic relationship, these are the variable and chance elements that may (or may not) allow for the emergence of novelty.

0. Introduction

This paper has two research objectives that are strictly related. The first is to show that aesthetics and language are two modeling systems in the sense that they promote the creation of models useful for improving human beings' relationship with their surroundings. To do so, we have adopted the perspective of biosemiotics - more specifically, the theoretical apparatus of Modeling System Theory conceived by Thomas Albert Sebeok and Marcel Danesi (Sebeok and Danesi 2000). In comparison to previous theories on aesthetic modeling – such as Yuri Lotman's (Lotman 1967) – Modeling System Theory considers both the verbal and averbal mode through the formulation of three Modeling Systems, the first of which is essentially averbal and iconic. In the latter, we can identify the origin of both aesthetic and linguistic modeling, thus avoiding the error made by many scholars of limiting research to the symbolic product of aesthetics and language – respectively, the work of art and the linguistic. In particular, aesthetic modeling finds its origin in the Primary Modeling System. It allows all living beings to grasp meaningful differences and similarities in the Umwelt and then synthesize them into classificatory connections.

_____

Assuming that both aesthetics and language are modeling systems, the second goal of this paper is to examine how aesthetics can be a valuable tool in the evolution of language. To make such an assumption, we believe it is necessary to adopt a concept developed in the biosemiotic field: code-duality. This concept details the required presence of two different codes in a system – digital and analogical - that always act reciprocally. It is precisely this interplay between digital and analogical code that makes the emergence of novelty possible. In our specific case, we can consider language the digital code of the system because it allows the permanence of the encoded material in memory. Aesthetics forms the analogical counterpart because it enables the relation with the "here and now." The latter, in other words, represents the most variable part of the relationship, described by biosemiotician Victoria Alexander (Alexander 2011) as a sort of "chance," since the process of synthesizing and classifying the meaningful differences and similarities in the Umwelt could lead to trial and errors. As we will see, given the continuous exchange between the digital and analogic, trial and error can construct a digital piece of the system, which, in turn, enables access to a new and higher level of coding.

1. Histories of aesthetics and language

In the history of human knowledge, aesthetics and language have always developed symbiotically and in parallel, as poetry illustrates most vividly. Testament to this fact are the numerous handbooks on aesthetics[1] which consider aesthetic thought – although not the actual discipline, which is universally attributed to Alexander Gottlieb Baumgarten – to have originated in Aristotle's *Poetics*, which deals mainly with the art of organising, creatively, the set of words and phonemes available to humankind. The most noble expression of art, according to Aristotle, is not sculpture or painting, but poetry, which exemplifies all the other arts because, in a way that they cannot, it expresses the whole of human experience through that very feature which, more than any other, represents the specific nature of humankind: language.

A full investigation of the relationship between aesthetics and linguistics in their respective histories is not the central theme of this article, but it should be remembered how thinking about poetry, mainly conducted along Aristotelian lines, shifted throughout the different historical epochs before it became generally accepted, thanks to the power and originality of the proponent authors, that the connection between aesthetics and language was unquestionable. Among these authors, Giambattista Vico, who dedicated the entire *Book Two* of his *Scienza Nuova* to the consideration of poetry as the origin of language, is a crucial figure. Vico believed that language originated in poetical thought which, free from the rigid formalities of conventional grammar, through comparisons, similarities and metaphors, could reveal the whole universe of the non-verbal which otherwise would never find expression.

Vico's theory, however, remains one of a kind, since the idea that poetry is the most noble aesthetic manifestation because it is expressed through language, and not through material activities such as painting or sculpture, prevailed during the Modern era. One of the best known examples is Hegel's theory of aesthetics, which deemed poetry to be the universal art of the spirit because it, more than any other, elevates itself above the material world.[2]

For a more specific consideration of the relationship between aesthetics and language, and one not limited to poetry, we must look to contemporary thinkers, like the philosopher Benedetto Croce and semioticians such as Charles Morris, Yuri Lotman and Umberto Eco, who have developed the most original and systematic theories on the subject. We will examine the semiotic theories later and turn now to Croce, the importance of whose thought lies in his postulation of a continuity between aesthetics and language. In *Aesthetic: As Science of Expression and General*

_____

[1] See as examples: Plebe (1965), Franzini and Mazzocut-Mis (1996).
[2] «Poetry is the universal art of the spirit which has become free in itself and which is not tied down for its realization to external sensuous material; instead, it launches out exclusively in the inner space and the inner time of ideas and feelings. Yet, precisely, at this highest stage, art now transcends itself» (Hegel 1835: eng. trans. 89).

_____

Linguistic (1902), the Italian philosopher says that the constant evolution of language is due to its relationship with aesthetics, which provides the space necessary for creativity to emerge. In Croce's opinion, the origin of language can only be properly studied if aesthetics is also taken into consideration, since language could not develop, or even exist, without it.

The conclusion might be drawn, from this brief introduction to the history of aesthetics and language, that the connection between the two concepts is not a question that needs any further analysis. However, questions which are presumed to have been answered tend rather often, therefore, never to be subjected to the sort of critical debate necessary to highlight their complexity and importance. For our purposes, what is really missing is a comprehensive definition of aesthetics and language: on the one hand, the former is often confused with art, on the other, language is reduced to a purely linguistic tool, thus hindering any progression of thought around the subject. Since the present contribution, however, aims to investigate how aesthetics can foster the evolution of language, and we do not intend to limit our research to mere art criticism – literary, visual, musical, or other –, we believe that it is useful to adopt the perspective of biosemiotics, the theses of which we consider to permit a deeper understanding of both language and aesthetics, and thus of the relationship between them.

2. Language as modeling system

Before delving into the question of the relationship between aesthetics and language and, indeed, so as not to fall into the errors aforementioned, we will first define the two concepts individually, in light of recent research in the area of biosemiotics. Biosemiotic research into the origin and evolution of language is still in its early stages.[3] That said, some theories in the field point us in very interesting directions of study. Since we aim to define language without focusing solely on its linguistic manifestations, we believe modeling theory – which describes language as a useful tool with which human beings create models of their surroundings – to be the most suitable method to adopt for our investigation. Modeling System Theory was first forwarded by one of the founding fathers of biosemiotics, Thomas Albert Sebeok, and is based on the idea that the ability to create models of the world is a universal characteristic common to all living beings. Sebeok defines a model as «a semiotic production with carefully stated assumptions and rules for biological and logical operations» (Sebeok 1991: 57).

This idea of a model is not entirely new; it arises from the key biosemiotics concept of Umwelt, initially proposed by biologist Jakob von Uexküll.[4] A model is considered to correspond in its function to the *Umwelt*, i.e., the particular universe that every living being creates through the attribution of meaning to its surroundings according to its own, species-specific, sensory organs.

Thus, language did not involve simply as a communication tool, but «as an exceedingly sophisticated modeling device» (*Ivi*: 66) specific to humans as a species, where, according to Sebeok, the Umwelt is the result of a modeling process. In other words, language cannot be reduced to its syntactic, morphological, or phonological forms and must instead be conceived as a distinctively human modeling system. In *A Sign is Just a Sign*, Sebeok clearly states that the human Umwelt presents itself as typically constituted by language, which in turn contributes to the creation of an interface with the environment. The idea that language is not limited to a function of the brain but is a modeling system can be found in most biosemiotic theories, particularly those of Stephen J. Cowley. Cowley interprets the concept of *languaging* coined by Humberto Maturana as «a structural coupling between environment and living beings» where «its basis is embodiment, iconic and indexical that, in our species, is also phenomenological» (Cowley 2015: 124).

_____

[3] The research on language in biosemiotic field is already manifold; among others we mention: Velmezova, Kull, Cowley (2015).
[4] See Brentari (2015).

_____

One of the main characteristics of a linguistic human Umweltis the emergence of the verbal: other animals remain limited to the averbal. According to Sebeok, however – and this is the novel element that distinguishes his analysis from previous perspectives – human beings always hold an averbal modality within their own Umwelt, shared with other living beings. The central point of his argument is that human beings are not characterized solely by the verbal dimension and that they possess both a verbal and averbal one. As Sebeok puts it, the authentic singularity of human beings is that he «alone disposes over a *pair* of communicative codes» because, in addition to «the verbal code, we retain an older system that, for want of a better name, is frequently, contrastively, and hence negatively designated as a human manifestation of a cross-specific averbal code» (Sebeok 1969: 8). In semiotic terms, this means that language is not limited solely to the symbolic but originates, and is rooted in, the iconic and the indexical.

Unlike more "classic" semiotic theories, Sebeok's thesis that both the verbal and the averbal modes should be taken into consideration without creating a rift between the different semiotic and modeling systems reveals what would go on to be the underlying principle of all biosemiotic research – the recognition that not only human beings, but all living beings, have a semiotic capacity.[5]This idea emerges clearly in what is probably Sebeok's most comprehensive work on modeling, *The Forms of Meaning: Modeling System Theory and Semiotic Analysis* (2000), written with Marcel Danesi. The authors aim to formulate an original Modeling System Theory which includes three possible modeling systems, conceived along the lines of Charles Sanders Peirce's Firstness, Secondness, and Thirdness. So conceived, the three modeling systems are not monadic categories of the world isolated from each other. As Sebeok often reminds us, not only are they always related – where the Secondary implies the Primary and the Tertiary implies both the Secondary and Primary – but they are also theoretical macro-categories, in which other specific modeling systems, such as language and aesthetics, interact and fit within. As will be discussed later, Modeling System Theory increases our understanding of complex modeling systems like language and aesthetics and their collocation in a wider systematic universe, taking into account the averbal as well as the verbal.

On the question of where language is situated in the three main modeling systems, it is enough to say that it finds its fullest expression in the Tertiary, or symbolic. However, because it retains an averbal mode, it also roots itself in the Primary – usually iconic – and the Secondary – the indexical. In line with Merlin Donald's theories, Jesper Hoffmeyer states in his book *Signs of Meaning in the Universe* that language originates from mimetic – i.e., iconic – behaviour and «words would gradually emerge from these mimed accounts, crystallizing into standard sound patterns» (Hoffmeyer 1998: 110). This means not only that language is part of an embodiment process but also that it is not limited to the symbolic sphere.

3. Aesthetics as modeling system

Assuming that language is a useful tool with which to build models, in order to investigate the relationship between aesthetics and language and thus to identify how the former is able to foster the evolution of the latter, we must now ask if aesthetics is itself a modeling system and, if so, of what kind.

The idea that aesthetics is a modeling system originated with Lotman, whose theorization has undoubtedly influenced that of biosemiotics. Indeed, Sebeok draws upon the theory of modeling formulated by the Tartu-Moscow School, founded by Lotman,[6] with the important difference that while the latter postulates only two modeling types – both the fruit of language and culture, in other words, of the verbal – Sebeok's model consists of three, since he felt it was necessary to introduce an averbal modeling system (the Primary), phylogenetically and ontogenetically prior to

_____

[5] This principle is indeed called "Sebeok's Thesis" and it states that semiosis and life are coextensive: Sebeok, (1988).
[6] Sebeok is initially very influenced by Lotman, whom he meets personally in Tartu, where he is commissioned to translate his book *O Semiosfere* but the project will not succeed (Sebeok 1998: 30).

_____

the verbal. The key elements of Lotman's theory about artistic modeling are presented in his essay *The Place of Art Among Other Modelling Systems* (1967), the aim of which – as he states in the very first paragraphs – was to demonstrate that, since «a model is an analogue of an object that substitutes it in the process of perception», «art is one of the forms of modeling activity» (Lotman 1967, eng, tr.: 249-250). In brief, Lotman's text first compares artistic modeling with other similar types of modeling, such as playful behaviour, before concluding that the former's distinctive characteristic is its capacity to store information very efficiently.

Although Lotman's perspective is limited to a verbal type of modeling, an extremely important point emerges from it, the idea that art is not an incidental behaviour, but the product of a cognitive process capable of creating useful models for improving human beings' relationship with their surroundings. This aspect is fundamental to Sebeok and Danesi's Modeling System Theory, which it will now be helpful to examine, revisiting the three modeling systems in the light of aesthetic behaviour.

The Primary Modeling System is defined by Sebeok and Danesi as «the innate capacity for simulative modeling, i.e., it is the system that underlies forms produced by the simulation of some sensory property of a referent or a referential domain» (Sebeok and Danesi 2000: 44). So, this is a principally iconic system, in which the iconic must not be understood as the result of a copying act, but of a sense-inference which can pick up on differences in the surroundings. In this sense, the Primary Modeling System can be defined as one which allows simulatory modeling through the grasping of changes in the surrounding environment.

This kind of behaviour is the base of all types of modeling, given that, as Gregory Bateson says, «a "bit" of information is definable as a difference which makes a difference» (Bateson 1972: 315). With this, Bateson – who is seen as another precursor of biosemiotics –[7] wanted to show that the receptive and sense organs react to changes and that everything that we are capable of knowing is, crucially, based on our ability to grasp differences.

The grasping of differences and similarities, however, is a prerequisite not only for all modeling systems but also, and most importantly, for the aesthetic one.[8] That the iconic has a particular connection with aesthetics and art is not a new concept within semiotics,[9] as, for example, in Charles Morris, whose aesthetic theory states that the aesthetic sign is first and foremost iconic (Morris 1965). However, what we want to show here is the way in which this intuition can be put into practice within a broader discourse on aesthetic modeling. In this context, Sebeok's theorizations are again shown to be consonant with the aims of this article: in his *Prefigurements of Art*, published in 1979, he investigates the possibility that the aesthetics might in some way also be of interest to non-human animals, who interact with the world entirely averbally. Sebeok describes certain animal behaviours which would be categorized as artistic (and hence always assumed to be human), such as dancing, making music, painting, and architecture, before making some inferences of particular importance to aesthetic modeling research. Drawing on the ideas of authors like Gerald Manley Hopkins (Hopkins 2006), who as a poet is immersed in aesthetics, and the hypotheses of the British psychologist Nicholas Humphrey (Humphrey 1973), Sebeok deduces that aesthetic modeling is expressed by living beings in their capacity to grasp similarities and differences in their surroundings and then to classify this sense-data in unifying categories. In other words, aesthetic modeling allows them to:

> sort out sensory experience – to identify, with essential economy, good, bad and indifferent forms, or, in semiotic phrasing, to sift out the presence of such forms "endowed with signification" that trigger appropriate long-term releasers (Sebeok 1969: 60).

_____

[7] See Hoffmeyer (2008).
[8] See Wheeler (2014).
[9] «Works of art are constructed by the principle of iconical signs» (Lotman 1967, eng. tr.: 251); see also Morris and Hamilton (1965).

As we can see, aesthetic originates in the Primary Modeling System not only because it fosters the grasping of similarities and differences in our surroundings, but also because it allows the modeling system to extend into what is undoubtedly one of the main functions of all living beings, namely their capacity to classify, which can be translated into the capacity to relate to, or make connection between what is experienced. This connective function of aesthetics was identified by Bateson, who, in *Mind and Nature*, defined it as being «responsive to the *pattern which connects*» (Bateson 1979: 8). This means that within the model of an ecosystem in which the world is a complex whole made up of relational connections to which we have partial access only thanks to interpretative acts of semiosis, the basic function of aesthetic modeling is to facilitate living beings in the creation of meaningful connections.

In the Secondary Modeling System this form of aesthetic modeling is reiterated in accordance with the species-specificity of each living being, where the modeling system is characterized as generically indexical and configured as «the ability to extend primary models both morphologically and connotatively for further representational uses» (Sebeok and Danesi 2000: 82).

Lastly, and like language, aesthetics finds its fullest expression in the Tertiary Modeling System, defined by Sebeok and Danesi as «the capacity to acquire and utilize the symbolic resources of culture-specific abstract system of representation» (*Ivi*: 10). Thanks to this culture-specific symbolic ability to deal with abstractions, the emergence of art is possible; the latter, however, is nothing more than the product of a more complex aesthetic modeling which, as we have just seen, shares its fundamental characteristics with other living beings. Therefore, a study of aesthetics which only takes works of art into account – or, with regard to language, its linguistic products – is very reductive; both language and aesthetic are, in fact, far more complex modeling systems which testify to the continuity of the relationship not only between the three main modeling systems identified by Sebeok and Danesi but also between the verbal and averbal modes. In other words, while on the one hand we can say that art and language are specific products of the human Umwelt, on the other, we have observed that there is an ontogenic continuity in non-human animals, too, which clearly implies that they are capable of what Sebeok has called "the prefigurements of art".

4. The aesthetic modeling system and the evolution of language

Our analysis so far reveals the many characteristics shared by language and aesthetics, significantly, that they are both important modeling tools most fully expressed in the Tertiary (symbolic) Modeling System – in respect to their linguistic products and works of art – while still maintaining a continuity with the Primary and Secondary systems. Now let us turn to the question at the heart of this article: can we establish not only that human beings are capable of two types of cognitively complementary modeling, but that aesthetics, with its capacity to create innovative connections, has been, and is, a useful tool in the evolution of language?

The characteristic that enables this cognitive complementarity is, above all, the ability shared by language and aesthetics to interact with the symbolic; an ability translated into the fact that they are both excellent tools for the act of abstraction. As Bateson pointed out, one of the most important and distinctive characteristics of human activity is the ability to deal with the abstract; to convey a negative message – a "not".[10] According to Bateson, this ability is exclusive to beings who possess both the verbal and the averbal modes and can thus create symbolic models as well as iconic and indexical representations.[11]

---

[10] We find this theory in the Chapter 6.2 of the book *Steps to an Ecology of Mind* (1972) with the title *Redundancy and Coding* but it first appear with the same title in Sebeok (1962).

[11] «No paradox can be generated because in purely analogue or iconic communication there is no signal for "not"» (Bateson 1972: 212).

_____

The centrality of the symbolic dimension for human beings is also dealt with by Terence Deacon, one of the biosemioticians who has devoted the most time to this dimension (Deacon 1997). Deacon bases his theories on the idea that

> our capacity to assume the representational stance […] has been radically transformed by the use of the symbol and also by human adaptations that have come to serve as ancillary supports for making symbolic communication easier over the course of our evolution. (Deacon 2006: 31)

Deacon's intention here is to point out that the symbolic is not innate to human beings but is a specific phenomenon that emerges from the iconic and the indexical where «indexical reference depends upon iconic reference, and symbolic reference depends upon indexical reference» (*Ivi*: 74). According to Deacon, the symbolic and the human brain have coevolved in a highly complex process where the expansion of the brain is a consequence of its use of symbols rather than the other way around. Specifically, Deacon claims that the symbolic emerged through Baldwinian evolution from behavioural adaptations – which later in the article we will call phenotypical or analogic - before genetic ones. Indeed, behavioural adaptations are often more reactive than genetic ones and, as such, can be assumed to have come earlier. Deacon's criticism of the most widespread studies of human evolution is that they focus exclusively on genetic or biological factors, such as the increase in the prefrontal cortex, which therefore fail to address the emergence of phenomena such as the symbolic. On the other hand, he assumes that *Homo symbolicus* appear before *Homo habilis*, i.e., a form of human who, unlike other species, is not only able to use tools but, crucially, is also able to impart this knowledge, which can only come about through the symbolic. Among non-human animals, the passing on of such behavioural adaptations occurs rarely and is often limited to a few generations. In short, according to Deacon,

> the introduction of stone tools and the ecological adaptation they indicate also marks the presence of socio-ecological predicament that demands a symbolic solution. Stone tools and symbols must both, then, be the architects of the Australopithecus-Homo transition, and not its consequences. (Deacon 1997: 348)

The symbolic, Deacon argues, cannot be reduced to a merely arbitrary by-product of human beings' use of linguistic signs but must be considered as resulting from a genuine process of interpretation. In other words, to grasp symbols, it is necessary to develop an interpretative mode, which is much more difficult to do in relation to symbols than it is to the iconic or the indexical. The more complex a sign relationship or a pattern is, the greater the necessary flexibility and ability to explore – and thus interpret – it. This capacity is best defined using the concept of "semiotic freedom," invented by Hoffmeyer, to express living beings' increasing capacity to interpret and communicate signs.[12] In the symbolic, and, more precisely, in aesthetic and linguistic modeling, this increase in "semiotic freedom" is not a linear or automatic process but «must be initially acquired by comparison and trial and error» (Deacon 2006: 37).

Lotman, too, understood that language and art were the products of an interpretative activity that involved comparisons and trial and error when he formulated his concept of "translation." In order to fully understand this concept, we need to assume that Lotman's theoretical structure was based on the idea that each culture produces texts capable of modeling the world, but for this to happen, a comparison must be made between at least two different languages (e.g. verbal and figurative). To verify information, Lotman argues, the system must be (at least) binary, and the elements of the system must be, to some extent, asymmetric. Bateson had already grappled with this question and considered information to be grounded in the meaningful differences that exist

_____

[12] «The most pronounced feature of organic evolution is not the creation of a multiplicity of amazing morphological structures, but the general expansion of "semiotic freedom", that is to say the increase in richness or "depth" of meaning that can be communicated» (Hoffmeyer 1998: 61).

_____

between two or more components of a system. When asymmetric (different) elements are being dealt with, they must be synthesized through an act of translation before they can be grasped. The result of this process, however, can never be taken for granted, and it is precisely in these errors, ambiguities, and misunderstandings of translation that Lotman identifies the possibility for novelty to emerge. In other words, whenever an element of creativity arises within a system, it has done so because at the base of translation «lies not a one-for-one transformation, but an approximative model, a resemblance, a metaphor» (Lotman 1977, eng. tr.: 93).

It is becoming more and more evident that the individuation of similarities from differences, expressed through associative, combinatory exploration, is fundamental to aesthetic modeling; it may or may not result in novelty. Umberto Eco is one of the proponents of this theory, stating in *Opera aperta* (1962) that works of art are always highly ambiguous and "open," thus inducing their audience to test out new hypotheses and/or possible correlations.

It now remains only to ask ourselves how the aesthetic modeling system facilitates the emergence of language. The most robust hypothesis is that the evolution of language is fostered by aesthetic modeling because the latter enables greater semiotic freedom by creating new connections. This supposition is supported by the key biosemiotic concept of "code-duality", first proposed by Hoffmeyer. Code-duality can be defined as the need, in all living processes, for an analogical code – in biological terms the phenotype, the «here and now» the interface with one's surroundings – and a digital one – biologically speaking, the genotype, or arbitrary code of memory (Hoffmeyer and Emmeche 1991). These two codes must always act reciprocally since, if either is missing, the evolution or survival of the entire system will be compromised. Key to Hoffmeyer's concept is the notion that life is based entirely on the interaction of the two types of coding whose dialectic takes place through what the biosemiotician Luis Emilio Bruni calls a «digital-analogical consensus», defined as

> the mediatory action of codes which are formed at different hierarchical levels out of an indefinite number of dyadic causal relations, specific "lock and key" interactions that by their simultaneous occurrence give rise to emergent specificities and triadic relations (Bruni 2007: 384).

This concept is crucial in that it helps us to understand how the two modeling systems interact. Suppose it is a question of a relation between analogic and digital. In that case, we can advance the hypothesis that, in a relational system between aesthetics and language, the first can be identified as a primarily analogical code and the second as its mainly digital counterpart. This is because aesthetic is a tool that facilitates the grasping of similarities and differences in surroundings (the "here and now"), or, in other words, the creation of connections. Comparatively, language, especially in its verbal products such as speech and grammatical forms, is an arbitrary tool that enables memory.[13]

Since there is always an interplay between the digital and analogical code in which neither ever assumes superiority (Hoffmeyer 1998), the functioning of the digital-analogical consensus, as hypothesized by Bruni, is based on the emergence of new analogical signs from an aggregation of digitally coded signs. Thus composed, the signs can then go on to construct a "quasi digital" piece of information which, in turn, enables access to a higher level of coding (Bruni 2007). From this interaction between analogic and digital, something new may (or may not) emerge. When we apply this process to the language-aesthetics system, two conclusions can readily be drawn. The first is that aesthetics and language are cognitively complementary, and their reciprocity is indissoluble. The second, which answers the central question of this article, is that aesthetics plays a significant role in the evolution of language because, by its essentially analogic nature, it enables the connective interface with a being's surroundings through which novelty can emerge.

_____

[13] See Markoš and Faltýnek (2011).

_____

In other words, while language creates constraints, aesthetics represents the chance element of the system in a continuous relational process in which both elements must be present.

The emergence of novelty – creativity – can only occur within systems such as this because, as the biosemiotics scholar Victoria Alexander suggests (Alexander 2011), the new is the product of the combination of chance and constraints, with the latter being, quite simply, the pattern of iteration formed by the natural propensity of all organisms to acquire habits.

5. Conclusions

We began with the idea that aesthetics and language are modeling systems that originate in the Primary Modeling System, essentially characterized by the averbal mode. This conceptualization has allowed us to move away from theories on aesthetics and language (or poetry) that take into account only their symbolical product, namely the works of art and linguistics. Having reached this point, we were able to advance the hypothesis that aesthetics plays a fundamental role in the evolution of language because novelty can only emerge from the particular dialectic between an analogical code – or aesthetics – and a digital code, or language. Aesthetic modeling, as we have seen, is not a linear process; rather, it can lead to trials and errors that may result in the digital (or "quasi-digital) code of the language as novelties,[14] which will then, in turn, become part of the relational system. In conclusion, it is thanks to this "digital-analogical consensus" and to the chance and error-prone nature of aesthetics, that the emergence of novelty within language can occur.

References

Alexander, Victoria N. (2011), *The Biologist's Mistress: Rethinking Self-organization in Art, Literature, and Nature*, Emergent Publications, Litchfield Park.

Bateson, Gregory (1972), *Steps to an Ecology of Mind*, Chandler, San Francisco.

Bateson, Gregory (1979), *Mind and Nature: A Necessary Unity*, E.P. Dutton, New York.

Brentari, Carlo (2015), *Jakob von Uexküll: the Discovery of the Umwelt between Biosemiotics and Theoretical Biology*, Springer, Dordrecht.

Bruni, Luis Emilio (2007), *Cellular Semiotics and Signal Transduction*, in Barbieri, Marcello (ed.), *Introduction to Biosemitics*, Springer, Dordrecht, pp. 365-408.

Cowley, Stephen J. (2015), *Verbal Patterns: Taming Cognitive Biology*, in Velmezova, E., Kull, K. and Cowley, S.J. (eds), *Biosemiotic Perspectives on Language and Linguistics*, Springer, Cham, pp. 123-148.

Croce, Benedetto (1902), *Estetica come scienza dell'espressione e linguistic generale*, Sandron, Palermo (*Aesthetic: As Science of Expression and General Linguistics*, transl. by A. Douglas, Barnes & Noble Digital Library, New York 2011).

_____

[14] Although it is not a specific topic of the paper, it should be noted that in this circumstance it would be better to refer to the concept of exaptationrather than that of evolution. See: Gould and Vrba (1982).

_____

Deacon, Terrence W. (1997), *The Symbolic Species: The Co-Evolution of Language and the Human Brain*, Norton & Company, New York.

Deacon, Terrence W. (2006), *The Aesthetic Faculty*, in Turner, Mark (ed.), *The Artful Mind: Cognitive Science and the Riddle of Human Creativity*, Oxford University Press, New York, pp. 21-53.

Eco, Umberto (1962), *Opera aperta. Forma e indeterminazione nelle poetiche contemporanee*, Bompiani, Milano.

Franzini, Elio and Mazzocut-Mis, Maddalena (1996), *Estetica. I nomi, i concetti, le correnti*, Mondadori, Milano.

Gould, Stephen Jay and Vrba, Elisabeth (1982), «Exaptation: A Missing Term in the Science of Form», in *Paleobiology*, n. 8, pp. 4-15.

Hegel, Georg Wilhelm Friedrich (1835), *Vorlesungen über die Ästhetik* (*Lectures on Aesthetics*, eng. trans. By T.M. Knox, Clarendon Press, Oxford 1979).

Hoffmeyer, Jesper (2008), *A Legacy for Living Systems: Gregory Bateson as Precursor to Biosemiotics*, Springer, Cham.

Hoffmeyer, Jesper (1998), *Signs of Meaning in the Universe*, Indiana University Press, Bloomington.

Hoffmeyer, Jesper and Emmeche, Claus (1991), *Code-Duality and the Semiotics of Nature*, in Anderson, Myrdene and Merrell, Floyd (eds.), *On Semiotic Modeling*, Mouton de Gruyter, New York, pp. 117-166.

Hopkins, Gerard Manley (2006), *On the Origin of Beauty: a Platonic Dialogue*, in Higgins, Lesley (ed.), *The Collected Works of Gerard Manley Hopkins. Volume IV*, Oxford University Press, Oxford, pp. 136-173.

Humphrey, Nicholas Keynes (1973), «The Illusion of Beauty», in *Perception*, vol. 2, pp. 429-439.

Lotman, Yuri (1967), «Искусство в рядумоделирующихсистем», in *Sign Systems Studies*, vol. 3, pp. 130-145 («The Place of Art Among Other Modelling Systems», in *Sign Systems Studies*, vol. 39, n. 3, , 2011, pp. 249-270).

Lotman, Yuri (1977), «*Kul'tura kak intellect i problem iskusstvennogo razuma*», in *Akademijanauk SSSR*, Moskva, pp. 1-18 (*Culture as Collective Intellect and the Problems of Artificial Intelligence*, transl. by, A. Shukman, Oxford 1979).

Markoš, Anton and Faltýnek, Dan (2011), «Language Metaphors of Life», in *Biosemiotics*, vol. 4, pp. 171-200.

Morris, Charles and Hamilton, Daniel J. (1965), «Aesthetics, Signs, and Icons», in *Philosophy and Phenomenological Research*, vol. 25, n. 3, pp. 356-364.

Plebe, Armando (1965), *Estetica*, Firenze, Sansoni.

Sebeok, Thomas Albert (1998), «The Estonian connection», in *Sign System Studies*, vol. 26, pp. 20-41.

_____

Sebeok, Thomas Albert (1962), *Animal Communication: Techniques of Study and Results of Research*, Indiana University Press, Bloomington.

Sebeok, Thomas Albert (1969), «Prefigurements of Art», in *Semiotica*, vol. 27, n. 1, pp. 3-73.

Sebeok, Thomas Albert (1988) *Communication, language and speech: evolutionary considerations*, in M. Herzfeld and L. Melazzo (eds), *Semiotic Theory and Practice: Proceedings of the Third International Congress of the IASS Palermo*, vol. II, Mouton de Gruyter, Berlin, pp. 1083–1091.

Sebeok, Thomas Albert (1991), *A Sign Is Just a Sign*, Indiana University Press, Bloomington and Indianapolis.

Sebeok, Thomas Albert and Danesi, Marcel (2000), *The Forms of Meaning: Modeling Systems Theory and Semiotic Analysis*, De Gruyter Mouton, Berlin and Boston.

Velmezova, Ekaterina, Kull, Kalevi and Cowley, J. Stephen (2015), *Biosemiotic Perspectives on Language and Linguistics*, Springer, Cham.

Wheeler, Wendy (2014)*, Natural Play, Natural Metaphor, and Natural Stories: Biosemiotic Realism*, in Iovino, Serenella and Opperman, Serpil, *Material Ecocriticism*, Indiana University Press, Bloomington, pp. 67-79.