The Epistemological Meaning of Luhmann’s Critique of Classical Ontology

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Abstract: This paper is a discussion of the sustainability of a concept of World compatible with the “operative constructivism” and the operative conception of observation of the Theory of Systems, according to Niklas Luhmann. The paper scrutinizes the concepts of observation of H. von Foerster, H. Maturana, G. Günther and N. Luhmann providing the general framework of the “operative constructivism”. Particularly, the paper will focus on N. Luhmann’s understanding of the role of observation in the constitution of the self-reference of the social systems of the Modern Society. The case of the “System of Art” will be briefly inspected. What place shall we concede to the idea of an “objective” world, according to the Theory of Systems? Are Systems “objective”? According to N. Luhmann, for the description of systems only operations are “objective”. However, an operation is not an entity, which means that we need to depict a new kind of “ob-jects”, very different from the “thing-objectivity” of the ancient Metaphysics and different from the Cartesian concept of “res”. What means objectivity according to the Theory of Systems? This question was at stake in the formulation of N. Luhmann’s Die Gesellschaft der Gesellschaft: Society is “weder Subjekt noch Objekt”. This paper attempts to address this formula.

Keywords: Theory of Systems; Phenomenology; Constructivism; Semiotics; Meaning; Communication; Psychic Systems; Second Order Observation; H. von Foerster; G. Günther; N. Luhmann

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1 The General Argument

Modern and contemporary Philosophy show a steady penchant to modify the ancient concept of world as a multiplicity of occupied places, with its resulting perspective of movement as provisional displacement between loci, towards the notion of world as the hypothetical sum of "what happens". The modern concept describes the world as contingency or a provisional result of movement or events.

In a variety of texts, but particularly in Die Gesellschaft der Gesellschaft Niklas Luhmann did recognize this semantic transformation, especially by identifying the concept of the world of the "Old European tradition" with the idea of a universitas rerum.

What is representative of the old tradition is the concept of thing, the correspondent Thing Metaphysics and the general privilege conceded to the idea of an independent order, "taken for granted".

In Ancient Philosophy, such worldview had consequences on the conception of the social world, as a stable universum, a cosmos, based on expectable occurrences regulated by a moral order and virtues (personal and politic).

As a semantic result of the modern Society functionally differentiated and modern Science, modern and contemporary Philosophy went to three different directions.

1. Modern Philosophy, especially some germinal ideas of the "German Idealism" and G. W. F. Hegel's Philosophy, more in particular, insisted upon the internal self-reflection of the Real, conceiving the living beings and the so-called "Objective Spirit" as an intelligent evolutionary, subjective-objective, realm. I'll call this orientation the world as historical self-reflection.

2. Continuing some aspects of the vitalism and Schopenhauer, F. Nietzsche's conceptions of truth and force were decisive in the formation of an idea of world centered in the singularity and contingency of events. The event, then, may be identified as the minimal unit in the world. I will call this proposal the world as event.

3. With C. S. Peirce, in the authors committed to the "Pragmatism" and in M. Heidegger's hermeneutical transformation of E. Husserl's concept of the world of the "natural attitude" one can find the concept of the real as an evolutionary result of symbols, actions and interpretations. I will call this orientation the world as interpretative result of meaning.

The systemic thinking after Heinz von Foerster's proposal of a "second order Cybernetics" (von Foerster, 1993), Gotthard Günther's description of "transjunctional operations" and "Morphogrammatic" (Günther, 1976), Humberto Maturana's "Ontology of Observing" (Maturana, 1990) and Francisco Varela's "Embodied Mind" (Varela, 1991) led to many directions in the field of the "cognitive sciences". The new contributions were unanimous in the rejection of the naive picture of the cognitive process consequential to the XVII century understanding of the object of science and Descartes's metaphysical dualism. Relativity-Theory and Quantum Mechanics, on the other hand, are incompatible with the metaphysical realism of the object of Science.

Synthetically, we can say that the contemporary epistemological outlook is very close to the epistemological attitude of the American Pragmatism. In both cases the shift is from the acceptance of an uncovered object and objectivity to the description of the cognitive strategies of the observers self-included in the observation domain.

But the contemporary worldview struggles against a complex and persistent historical background.

The phenomenological concept of horizon and Edmund Husserl's notion of world as an ideal limit of acts of reference structured by meaning alongside the differential actuality / potentiality, noesis-noema, Heinz von Foerster's "second order Cybernetics" and its
contribution for the concept of an “internal environment” of systems, Gotthard Günther’s “Morphogrammatic Logic” and polycontexturality, following his essay of an insightful restatement of Hegel’s Logic and later George Spencer Brown’s “Logic of Form” can be seen as the four major underpinnings of the use of the concepts of Welt and Umwelt in N. Luhmann’s Theory of Systems.

According to N. Luhmann’s Die Gesellschaft der Gesellschaft, the idea of world as “universitas rerum” is an image of an historical world, a “closed world” conceived as a replica of a natural independent order (see also Luhmann, 1990, p. 43; Luhmann, 1995, p. 149). This description of the world as a realm where all things appear under an order coincides with Ancient and Medieval Philosophy. The conceptual and semantic view of the Classic worldview reproduced the models of differentiation of the Society typical of the segmentary or stratificatory societies of the Antiquity.

Modern Society generates new conditions for “self-descriptions” of the Society different from the Metaphysics of the objective ordered universe. This insight leads to the central thesis, which asserts that the worldviews belong to particular forms in the evolution of Society.

N. Luhmann’s evolutionary theory of social differentiation, distinguishing between segmentary, stratificatory and the functional differentiation of the Society, agrees with the main methodological premises of the “radical constructivism” according to this general idea: the conceptual and semantic worldviews of the Classic Philosophy, “Ontology” or the “Semantics of Old Europe” are evolutionary dimensions of the social construction of the worldviews of specific types of the Society’s self-differentiation (Luhmann, 1997, pp. 893, 898-899).

Through a sharp formula he characterized the modern Society, functionally differentiated, as a “self-generated uncertainty” (selbsterzeugter Ungewissenheit). This represents a social model at the opposite of the ancient societies and its well-ordered universe. The modern uncertainty refers to the expansion of complexity and complexity is a function of systemic autonomy, above all of the autonomy of psychic and social systems in the generation of meaning.

In this paper, I’ll explain how N. Luhmann’s concept of social systems entails the destruction of the metaphysical realism of a unique universe, well ordered, built on continuous psychosocial contents correlated with “objective” counterparts. His concept of Society refers to a weder Subjekt noch Objekt that is intentionally paradoxical (Luhmann, 1997, p. 868).

He planned the investigation of meaning systems, and particularly of systems based on communication, beyond the classical opposition of subject and object of the Cartesian Epistemology. Instead of the dualism object-subject the main category is now meaning. The observer must be included among meaning operations.

However, along the development of his work the notion of meaning was not directly identified with a linguistic category and communication was not reduced to linguistic interaction. This relative independence of meaning regarding the linguistic expression of meaning is one of the aspects of the divergence between Jürgen Habermas’s project and N. Luhmann’s endeavour.

In this paper, I’ll begin with the analysis of the concepts of meaning and observation of meaning sequences according to N. Luhmann (parts II and III).

Additionally, I’ll try to explain if it is appropriate to apply to this systemic approach the concept of a semiotic structure encompassing the observed domain and the observation in social systems (parts III and IV). At the end, I’ll propose a re-description of systemic borders as individuation processes and semiotic events (part IV).
2 Niklas Luhmann’s concept of Meaning

Before the systematization in *Soziale Systeme* (1984) in his initial writings N. Luhmann paid special attention to the problem of the sociological use of the concept of meaning (*Sinn*). In the earlier writings such as *Vertrauen* or the essay on “Meaning” in *Theorie der Gesellschaft oder Sozialtechnologie*, he was aware of the challenges concerning the constitution of the world in the immanence of meaning structures, continuing important aspects of Edmund Husserl’s Phenomenology and the “noesis-noema” cognitive structure. From E. Husserl arose the definition of meaning as the difference of actuality / potentiality in intentionality or more generally in consciousness or “psychic systems” (Luhmann, 1997, pp. 44-55).

The focus on meaning connections and associations for the definition of consciousness and the development of the theme of the “objective transcendence” of the world through the immanence of intentionality and through the intentional acts of consciousness (“noesis-noema”) are some characteristics of the phenomenological method. N. Luhmann adopted this *transcendence through immanence* methodological approach for his own purpose concerning the establishing of the distinction line between a system and its environment in social systems (based on communicative elements), leading to an *environment through system* approach and to the development of the concept of self-reference. The application of the concept of meaning to the description of important aspects of social interaction in the case of the analysis of Trust reveals that very soon he conceived meaning as a category to be applied to psychic and to social systems.

On the other hand, the idea of the articulation of meaning within a “system of differences” was a general theoretical principle of the modern Linguistics (Ferdinand de Saussure, Roman Jakobson, Louis Hjelmslev), of the so-called post-structuralist “Sciences Humaines” (with Claude Levi-Strauss and the “Structural Anthropology”) and is till today an inspiration for the connectivist orientation in the “Cognitive Sciences” (Varela, 1991).

The permutation and mutual complement of these methodological preferences justifies the *constructivist*, system-centred approach, and the *connectionist* position regarding the articulation of elements in meaning systems.

The young Niklas Luhmann treated meaning in association with difference and difference was initially identified with modal distinctions, especially with the aforementioned distinction between actuality and potentiality in consciousness recognized by E. Husserl’s Phenomenology.

The formation of an environment and the establishment of the reference to the world of a system are due to the evolutionary acquisition of an *actual*, closed unit, which is “self-catalytic” regarding the connection of its elements, whenever its elements are connectively related as elements concurring for the same operations, alongside the background of the virtualized, non-actual or potential possibilities of the world. Therefore, the world represents the horizon of the potential contents of the consciousness’ acts. The environment (*Umwelt*) and “the world” (*Welt*) are markers for the designation of latency, potentiality or excess. The difference between Experience (*Erlebnis*) and Action that was central in the initial writings was also associated with the temporal and modal binary of actuality / potentiality.

It is a very interesting coincidence and a source of rich theoretical consequences that such use of the binary actuality / potentiality reflects a proximity between E. Husserl’s Phenomenology of Consciousness and the concept of Information of the “Mathematical Theory of Communication” (Ralph Vinton L. Hartley and Claude E. Shannon).

The system doesn’t know time. In it every connected element is *actual*. The distinction between simultaneity and time (or succession) comes from the reference to what is latent in
the environment. It comes from the distinction. The modal distinction actuality / potentiality is also the basic difference for the production of meaning and it applies to psychic as well as to communicative processing of (meaning) elements.

In N. Luhmann’s contributions to the volume *Theorie der Gesellschaft oder Sozialtechnologie* (with J. Habermas) meaning was already identified with effects of operations, especially with the operation called “selection”. Selection is regarded as a temporal and / or historical processing of modal differences such as the distinction of actuality and potentiality. From the beginning of his theoretical career the author of *Soziale Systeme* gave to distinctions and to selection a generative power, responding to the demands of the “Mathematical Theory of Communication” and to Phenomenology. In his *Rechtssoziology* selection and negation were important dimensions for the explanation of social expectations.

Two important ideas shall be emphasized. i) The structure of meaning generation, embracing selection and distinction, discloses operations but not “things”. Selection and distinction are dimensions without the ontological density of things, objects or entities, since it is not possible to identify selections and distinctions with being or existential predicates of beings. ii) In order to define meaning under these premises we need concepts that don’t have a linguistic predominance, because meaning is not primarily articulated with language or with the use of signs in definite linguistic systems.

Accordingly, meaning is not primarily dependent on the psychic representation of reality with the correlate linguistic expression, as presented in interaction.

In the case of systems based on meaning (psychic and communicative systems), the elements circularly connected can’t be defined without the frame of distinctions, or organization, where they are included as elements.

By selection one means a move that displaces relevancies through negations, exclusions and inclusions, creating new meaning but also producing new conditions for additional selection. The concept of a “history of selections” and the idea of the world as effect of meaning selections along a history is now evident. Through negation, selection is a modal operator responsible for the distinction of actuality and latency, between elements directly taken for the processing of meaning and all that it is not directly at stake, generating a horizon.

In the 1980’s, due to the appropriation of the notion of autopoiesis N. Luhmann conceived the generative power of selection, affirmation and negation, inside a circular self-generative and self-referent unit.

The circular self-generation of connected distinctions along a defined history of selection is what defines a closed system of meaning.

We are assuming that there is nothing “in the world” strange to the circularity of meaning processing. Meaning is organized by recursive orientation to itself.

But what really constitutes the meaning of meaning? Does meaning have a substantiality of its own?

We shall say that meaning itself is defined by the permanent instability between the operative closure and the cognitive openness in systems based on meaning. This view is the systemic rethinking of the distinction actual / potential.

Through a definition deliberately circular N. Luhmann described a meaning effect as the outcome resulting from prior and subsequent circular connections of other elements characterized as meaning elements. To be connected to other meaning effects is essential to generate and reproduce meaning structures and meaning units. For a system processing meaning (psychic or communicative) a meaning unit must emerge from the basal cross-
reference of cognitive distinctions and code distinctions for the connection of elements in the system.

Exemplifying, in the system of law of modern Society this general feature of the cognition through code conditioning is noticeable in the structural cross-reference of *quid facti* and *quid juris* at the base of interpretations and decisions in cases and controversies.

N. Luhmann started from this de-substantialized, connective, concept of meaning and shows that by “meaning systems” one is able to identify two categories: *consciousness* and *communication or psychic and social systems*.

Since Ralph V. L. Hartley’s paper “Transmission of Information” (1927) the “Mathematical Theory of Communication” has also established a de-substantialized relation between information, transmission and meaning (de)codification. Accordingly, *Soziale Systeme* defined meaning in communicative systems as a set of selections across information, message / transmission and understanding (*Information, Mitteilung, Verstehen*).

The internal differentiation of meaning processing systems, firstly between psychic and social systems, means that no direct access to an already existing world made of such and such qualities and relations is possible.

The reference to the world is not possible outside the self-referential connection of meaning elements. Psychic systems and social systems are both self-referential, co-evolutionary adapted, but autonomous. They are closed autopoietic units regarding each other. The relative autonomy between psychic and social systems under evolutionary conditions led to separate *autopoiesis*.

The idea that Society is only made up by communication and communicative connections is a foundational thesis of N. Luhmann’s theory of systems. Consequently, there is no such thing as a uniform, homogeneous, common environment of psychic and social systems. Psychic and social systems are also structurally coupled in a variety of forms, but they are not facing a common, immediate and directly accessible environment, which someone could call the “world”.

Complexity and uncertainty resulting from co-evolution of systems emerge instead of a realist picture of a stable, independent reality. Complexity and uncertainty are also the resulting signs referring the relative independence of the histories of selection along psychic and social systems. But this description rejects the old tradition that promoted the principle of a stable link from persons to Society, from psychic to social systems, from morals to politics, from virtue to the principles of law. It is also clear on the other hand that the crisis of the objectivist description is the result of the evolution of modern Society’s self-differentiation.

After *Soziale Systeme*, along the 1990’s N. Luhmann made an intensive adaptation of Gotthard Günther’s polycontextural Logic, Humberto Maturana’s and Francisco Varela’s *autopoiesis* and especially G. Spencer Brown’s “Logic of Form” to his own objectives regarding a Theory of Social Systems. The consequence of the rethinking of these contributions was a radical de-“ontologizing” of the concept of world.

In *Das Recht der Gesellschaft* (1993) is a detailed examination of the notion of a circular, self-referential connection of meaning elements concerning the system of law. But this book develops also another important idea about the “reference to the world”. I’m referring to the double formula of the *operative closure* and the *cognitive openness* of meaning systems.

The system of law produces meaning associated to “law” through the structural difference of cognitive *openness* and operative *closure* (Luhmann, 1993, pp. 44 and 77). We can generalize this blended structure to all meaning systems. The blended structure entails an asymmetric disposition of its terms. This asymmetry shall be recognized in the formula:
cognitive openness supposes operative closure; without operative closure there is no reference to the world.

If Society as a functionally differentiated system of partial systems is not able to define a special field inside itself consecrated to “law issues” provided with a specific code to deal with cases and controversies, there is no juridical meaning, as such, and nothing in the environment can be identified as a “case” to be submitted for juridical interpretation and decisions. Nothing “legal” would follow.

In the case of the evolution of the System of Art we have to infer analogous consequences from the semantic issues related to the formation of the modern and contemporary observation of Art and also from the transformations in the morphology of the “artistic” objects of modern Society (Balsemão Pires, 2006). The System of Science reveals similar features.

Law, Art and Science are Social Systems based on the recursion and reflection of meaning elements that determine the communicative relevancies concerning “facts” or “objects” in the respective environments.

Such characterization of the systemic understanding of the concept of environment (Umwelt), as the reflective niche of the systems, and the world (Welt) as the more general horizon of possibilities of the system entails a re-evaluation of the constructivist Epistemology from the point of view of a prevalence of operations regarding entities.

The epistemological novelty of the “operative constructivism” (Luhmann, 1993, p. 41) in many disciplines lies on this: the “real” is a product of operations, which don’t have any other further status beyond the operation itself. G. Spencer Brown’s instruction “Draw a distinction!” illustrates the absence of ontological density of the operation of observation but also the absence of a subject or the Spirit’s narrative. What a distinction as operation discloses depends on the history of its selections, negations and affirmations.

In the “calculus of form”, “what is” emerges as a provisional result of the structure of the form of the distinction itself through its both sides, the marked and the unmarked. A discourse about “what is”, the so-called reference to the “real”, is only possible on the ground of distinctions and on the ground of the operative “connectedness” of the marked side of the distinctions. We easily recognize also the internal dynamic of this connectedness.

The appearance of a form is something like an individuation event resulting from an operation. In the place of “things” we have now transient effects of distinctions, observations of distinctions and re-entering of distinctions across individuation processes.

3 Observation of meaning connections

As an operation, observation is not an exclusive predicate of psychic systems, of consciousness or psychic “perception”, but it is a general evolutionaryst achievement of living and meaning systems, an outcome of a general “self-awareness” that can be formalized and implemented also in machines. The ascription of observation mechanisms to living, psychic, social and artificial systems is easily explainable by the cybernetic underpinnings of this operative concept.

Observation, then, represents the treatment of information regarding the scheme of a distinction that returns upon itself. It entails reflection.

In order to include the observation in a wider frame N. Luhmann proposed to investigate observation as an operation of a special kind. Thus, what one describes as “to observe” is not a mental predicate, but a special kind of activity, a reflective operation that
has defined characteristics despite its qualification as "living", "mental" or "communicative" activity. In Die Kunst der Gesellschaft after referring G. Spencer-Brown's notion of distinction (Spencer-Brown, 1997; Luhmann, 1995, pp. 97-98) the author states that observation is an operation that supposes the unity of the difference between difference (Unterscheidung) and indication (Bezeichnung).

With the category of "resonance" introduced in his book on Ecological Communication (1990) N. Luhmann explained why Society is never "in touch" with "reality", "nature", "natural environment" or "world", but communicative systems treat information always by mediation of previous borders of social systems and environments, which involves a complex history of the formation of borders, environments, systemic enclosures that are responsible for the channelling effect called "resonance".

In agreement with the phenomenological style, N. Luhmann stated that the environment is the general horizon for the information processing of the system and its hetero-reference. But in Ökologische Kommunikation, continuing his earlier analysis of actuality and potentiality he explicitly declared: Nur sehr weniges kann jeweils aktuell im Zentrum der Aufmerksamkeit stehen bzw. ein aktuell behandelter Thema der Kommunikation sein; alles übrige und schließlich die Welt im ganzen wird durch Verweisungen heranassoziert und ist dann nur sequentiell und nur sektiv zugänglich(...) In diesem Sinne hat Husserl die Welt als Horizont aktueller Intentionen beschrieben; sie wird nur als Horizon und nicht als universitas rerum aktuell (Luhmann, 1990, p. 43).

The environment is evolutionary changeable and consequently, as a dependent variable of an indefinite number of other systemic variables, it is unpredictable. It is expandable, because the treatment of the possibilities and the distinction between possibility and actuality is related to systemic achievements, to the closed operative circular movement carried by its operations, and not a fixed difference. This is what is meant by the notion of Umwelt. Umwelt is not a collection of things, but a provisional result of a set of operations in observing systems. Since Jakob von Uexküll's biologic "theory of meaning" this idea was acknowledged.

This approach gives a new weight to the duality of "operative closure" and "cognitive openness" developed by N. Luhmann with particular detail in Das Recht der Gesellschaft.

In the book on the Art of the Society the explanation of the reference to the world entails the mediation of the reference to the environment and this one is only possible through the circular self-reference of the operations of the system in their self-enchainment. Here, it is possible to find the operation of observing operations. An equivalent of recursive functions and "eigen-values" is here at stake.

One shall say that the ecological resonance effects in modern Society are reverberations of the "natural" environment in "Society" throughout selective meaning connections of social systems and not through a direct "contact". The theme of resonance is at the crossing point of the observation of social evolution, self-closure of systemic operations and the drawing of systemic boundaries. Therefore, social "resonance" of so called "ecological risks" is a communicative construction, and not a thing in itself. Moreover, in order to become object of observation, whatever the case may be, there must be a distinction line, a border. This border is itself a meaning effect, selection, and not a "fact", or something "taken for granted". Through borders and distinctions something can receive the label of "positive fact" and in order to process communication about facts one shall distinguish between categories of facts, or "facts" from another "facts". According to the book on Ökologische Kommunikation it is the communicative treatment of "facts" that ensures "resonance" and not an extra-mental objectivity of the objects situated "in the world".
Continuing G. Spencer-Brown, in chapter 2 of his book on *The Art of the Society* N. Luhmann came to the same idea about the correspondence between observation and the drawing of a distinction: *Alles Beobachten ist das Einsetzen einer Unterscheidung in einen unmarkiert bleibenden Raum, aus dem heraus der Beobachter das Unterscheiden vollzieht. Der Beobachter muß also eine Unterscheidung verwenden, um diesen Unterschied zwischen unmarkiertem und markiertem Raum und zwischen sich selbst und dem, was er bezeichnet, zu erzeugen* (Luhmann, 1995, p. 92).

After M. Duchamp, the movement so-called “conceptual art”, J. Kosuth’s essay *Art after Philosophy* (1969) and others suggested that contemporary art’s morphology is not isolated from the provocative questioning concerning the defining rules of “artistic” objects. The question “what is art” is coupled with the morphology of the object of art itself. M. Duchamp’s challenging objects reflected the communicative problem about the definition of art. Threatening traditional codes of art, contemporary artistic objects show that what they are (as “artistic”) is always dependent on communicative certifications of a communicative system that is structured in order to answer that precise question about the meaning of “art”. Through a circular inclusion of the code of art in the material tokens of the code (the “artistic” objects) but under unpredictable, ironic or deceptive morphological conditions, the identification of the code is exposed to many communicative irritations due to new proposals of solutions or enigmas about “art” (ex: is “this” art? What are the rules for the acknowledgment of “this” as a product of art?). Contemporary art’s morphology is a recursive function of the System of Art itself, a recursive function of the communication on art. Under such communicative settings the System of Art can’t be prearranged. Inversely, it is always in self-construction.

Contemporary art shows clearly, and J. Kosuth explained this point very well (Kosuth, 1999), that an object of “contemporary art” never reveals itself, in its own material form, alone, without the question concerning the defining rule of art or the question “what is art” through the form of the object of art itself. Threatening traditional codes of art, contemporary “artistic” objects show that what they are is dependent on communicative warrants of a communicative system that is structured in order to answer this precise question.

The contemporary art of the functionally differentiated modern Society exemplifies this characteristic of self-referential systems: *what in the environment is object of “art” exhibits an interpretative (communicative) method to deal with the question concerning the definition of the predicate “art”*. Recent philosophers of art, Arthur Danto and Nelson Goodman for example, realized this feature of the contemporary “artistic” objects and discussed the contemporary function of art and the cognitive structure of artistic communication based on this recognition.

In N. Goodman’s book *Languages of Art* one can read a constructivist essay in order to identify the inconsistencies of the mimetic theory of the artistic representation and the need for a theory of meaning adapted to the goal of the understanding of contemporary art (Goodman, 1976).

Throughout the mentioned examples of art’s self-referential morphology, the orientation of the System of Law through its self-referential code towards “cases and controversies” and the interpretation of the ecologic troubles under the category of resonance, we can generalize a principle that asserts that grounded on the conditions of the modern Society, functionally differentiated, in Social Systems self-reference enables hetero-reference. Hetero-reference (or the “objectivity” of the classical Epistemology) is an evolutionary product of reflection and of the double conditioning of the operative closure and the cognitive openness in social systems.
From the point of view of the traditional epistemological realism this entails a paradoxical situation. But the systemic concept of hetero-reference and the distinction between operative closure and cognitive openness accepts the costs of such productive paradox.

In the last N. Luhmann’s book, Die Gesellschaft der Gesellschaft, this idea was clearly expressed when the author wrote that; die Welt nicht mehr als Prinzip, sondern nur noch als paradox behauptet werden kann (Luhmann, 1997, p. 1144).

The concept of observation entails recursive functions and the operative closure of the meaning systems twice: firstly, as a result of a simple reflection; secondly, through the formation of a double environment, the so-called „internal“ and „external“ environment, according to G. Günther’s explanation of the transjunctural operations and Heinz von Foerster’s “second order Cybernetics”.

The immediacy of the initial distinction between system and world only disappears if the difference itself is further appropriated and re-marked in another distinction, explaining in this way the “second order” observation.

The description of the formation of internal environments shows that through the system itself it is possible to deal with the blended structure of operative closure and cognitive openness and, consequently, the system itself constantly reconstructs the limit between what qualifies itself and the „world“, by creating an operative internal reflection of the world, structured in such a way that through it the system conceives and manages its own sensitiveness and cognitive conditions regarding „what is“.

However, the formation of internal environments of communicative systems may disturb the former systemic borders and the “objects”, which were initially identified within the semantics of the system. N. Luhmann’s description of the evolution of the System of Art shows that the communicative formation of objects labelled with the predicate “artistic” is coupled to the semantics of the communication about art. This “autological” correlation makes the systemic border of the System of Art of the modern Society especially sensitive to the communication about “art” exemplified through artistic “objects”. Meta-Language becomes inextricable from Object-Language.

This also reveals that semantics is an essential aspect of the formation and evolution of systemic boundaries in meaning systems.

From my theoretical perspective, the concept of a double environment is able to explain how one arrives to the designation of individuals “in the world”. This is only possible across a re-entry of an initial blind distinction inside of itself, by remarking the modal space where it was initially displayed. This re-marked space has very different significations, depending on the meaning system used as reference.

The philosophical discussion about so called modal realism, modal anti-realism, potentiality and actuality, time and simultaneity gains new depth with the constructivist turn, because from the systemic perspective described above one is able to learn a new operative understanding of dynamis as the ground for the permanent transformation of possibilities in actuality, a conception of indirect systemic pressures concerning a multiplicity of environments, based on discontextural and contextual relations (Günther, 1973).

Classical ontological theories of reality would be unable to help us in the understanding of theoretical and practical questions arising in contemporary art and ecology, because such problems are, correspondingly, second order paradoxes or “resonance problems”. There is no such realm of direct objects or parallel experiences that justify the saying “here is the thing in itself.”
4 Semantics, \textit{semeiosis} and systemic borders

4.1 The “four axes model” and the individuation of social systems - general remarks

The distinction between trivial machines and non-trivial machines is decisive to fully understand two kinds of observation. In trivial machines the observation is directly included in the form of the system and it is not subjected to further descriptions. The observation is not visible or thematic. In non-trivial machines the observation becomes a theme for the system’s self-observation and self-description. Non-trivial machines are sensitive and responsive to the temporal observation of the states of the system both internal and external. Thus, observation and re-entries of observations are aspects of the system’s functioning and must be treated as special variables in the description of the states of the system. Along the evolution of the system emerge special conditions for the reflection of the system on itself.

H. von Foerster’s “second-order Cybernetics” describes the processing of information in non-trivial machines, such as living beings, where the self-inclusion of observation and the re-entries of observations influence the change of the system’s states (von Foerster, 1993). Many evolutionary emergent properties of systems shall be understood from the perspective of such reflective implements.

Considering the advancements in the explanation of the operation of observing in non-trivial machines it is now important to emphasize the following ideas: i) there is no self-observation without recursion of the system in itself, including the reflection of the systemic borders; ii) there is no recursion without semiotic interpretation of the evolution of the systemic borders, the relation of the system to the global environment and the structural couplings with another partial systems, and iii) there is no self-observation without individuation of the system through a modal restructuring of its frame of references.

For the understanding of this last aspect (iii), I’ll propose the adoption of a framework with four axes: simplicity $\leftrightarrow$ multiplicity; time $\leftrightarrow$ simultaneity; reality $\leftrightarrow$ virtuality; actuality $\leftrightarrow$ potentiality. This structure is dynamical and entails movement across the axes. I’ll call my scheme the “four axes model of systemic individuation”. This model makes clear the paths leading to the increasing of complexity in reflective processes in a system’s observation of its own operations and borders.

The following scheme intends to illustrate how a system individuates itself by creating its own borders through the operation of observation. The emergence of the second order observation in particular systems originates a reinforcement of the border between the system and environment, generating the particular forms of the internal environments. Such internal environments are evolutionary acquisitions. Only evolution can explain the consolidation of self-reflection in systems, generally speaking.

As indicated above, social systems are particular systems based on meaning. The borders with their environments are the product of the evolution of meaning connections. The borders of meaning systems are reinforced by the self-reflection of meaning, through observations and second-order observations. The social evolution articulates its meaning for social systems again with meaning. Deep historical changes in social structure reflect in the change of the form of the structural couplings, in the orientation of the systems to interaction and also in the observation of the relevance of the physical and biological environments for the self-reproduction of Society. The modal structure of the systemic selections, the main
distinction between the possible and the actual, for instance, is affected by the evolution of meaning, which is observed in the semantic evolution.

In the following scheme I’ll clarify the modal configuration of this self-reflection or the modal arrangement of the re-entry of the border of a system. The structure entails four modal axes. As already said the axes are dynamical and subject to the evolution of the elements connected through the systems’ drive.

Within the scheme, at the middle, is the self-observation of the system (observation’s re-entry). The expansion of the self-observation is responsible for the modal reconfiguration of the system itself, the modal meaning reassigned to its borders and the change in modal categorizations, such as the possible and the actual, the virtual and the real, the representation of simplicity and multiplicity or the reference to simultaneous or temporal processes.

In social systems the modal changes or the modification in modal categorizations are always changes in meaning chains and meaning connections.

The modal shifts in meaning processing related to the reconceiving of the frontiers of the systems are expressed by the creation of new meaning with a specific semiotic value. Partially, N. Luhmann developed this idea with his concepts of the “Semantic Evolution” or “Socio-Cultural Evolution”. With the aid of the “four axes scheme” I’ll suggest a new semiotic interpretation to the semantic evolution and its consequences in systemic borders.

Figure 1: Adapted from Balsemão Pires, 2007, p. 224.
4.2 Modelling the evolution of systemic borders with a semiotic framework

What I wish to emphasize now is that the modal reconfiguration of the systemic borders of social systems throughout social evolution is due to the observation, recognition and the descriptions of the semiotic indexes of the semantic evolution.

In the following, I’ll suggest the general theoretical conditions for the agreement between Theory of Systems and Semiotics in the case of social systems.

After a period of hesitation many authors tend today to agree in the need for convergence between “second order cybernetics”, the use of the notion of information in living systems and the tradition of Semiotics inspired by Charles Sanders Peirce (Hoffmeyer, 1991, 1997, 2009). This recent agreement will lead to a prosperous revision of some systemic categories with the help of a semiotic understanding of information and meaning, including the modal changes resulting from the evolutionary modifications in systemic boundaries.

The main objection to a complete agreement between C. S. Peirce’s Semiotics and “second order cybernetics” was the impression that C. S. Peirce’s Semiotics was based on a strong belief in “realism” and shared with the traditional Philosophy of Language and Logic a model of sign relying on representations of things or mental ideas. A recent study on Peirce’s pragmatist writings dealing with the pragmatist concept of representation (Balsemão Pires, 2011) confirmed that the classical notion of representation is not adequate to depict C. S. Peirce’s intentions with his concept of *semiosis*.

This last view is evident in the text quoted from Survey of Pragmatism, where C. S. Peirce defined his own concept of “semiosis”.

*By semiosis I mean... an action, or influence, which is, or involves, a cooperation of three subjects, such as a sign, its object, and its interpretant this three-relative influence not being in any way resolvable into actions between pairs* (C. S. Peirce, 1965. 5.484).

Here, C. S. Peirce is referring to effects of meaning that are not reducible to mental acts, intentionality of speakers, the truth of a self-imposed objectivity or other reductionist views about meaning connections.

*Semiosis* is a process built of sign internal references or R-O-I relations (linking the Representamen - R, an Object - O and the Interpretant – I of the signs), implicit rules for cognitive stability at the level of the interpretants of the signs (the category called “Thirdness” - Interpretant); the dimension of real processes at the level of the objects (the category called “Secondness” - Object) and the aspect of the “sign-vehicles” or material supports or signifiers (the category called “Firstness” - Representamen). Such connective approach to meaning prevents the reduction of the semiotic effects of the use of signs to the intentionality of speakers or linguistic agents. A message is a communicative effect of a sequence of meaning elements, which are independent from the mental actions associated to its semantic content by particular speakers. This makes C. S. Peirce’s semiotic theories attractive for the study of meaning in Social Systems, particularly when the research faces the formation of systemic boundaries or structural couplings between partial systems as an evolution embedded in semantic trends. In the case of N. Luhmann’s notion of meaning (Soziale Systeme discriminated in the concept of meaning the selections information, message and understanding) a reconsideration of the concept of message from a semiotic outlook would be theoretically convincing and very advantageous.

 Processes or events in the environment of a system are seen as relevant for the system if the system is conceived as having sufficient interpretants for that processes or as containing possible interpretants for them in its own elements or code. The crucial value that
C. S. Peirce gave to the *interpretants* in the evolutionary fixation of meaning turns the semiotic connection of signs into a reflective and adaptive cycle of transmission of information. Undeniably, this involves self-reflection and second order observation. Semiotics and “second order cybernetics” are complementary.

More generally, the description of the function of the *interpretants* in the fixation of meaning represents the semiotic understanding of self-reference, the formation of the internal environment of the system and the individuation of borders through semiotic processes. Processes or events can be of physical, biological, psychic or of communicative nature, varying with the system of reference and the mobilized sign-types and sign-paths. J. Hoffmeyer applied such premises to the study of biological systems. Additionally, the semiotic aspects of boundary formation in systems can be described according to the “four axes model” illustrating a process of individuation.

But in the case of systems based on meaning connections, in the sense of N. Luhmann’s systems, semiotics is useful to recognize the connections between systemic operations and systemic selections on one hand, semantics and meaning articulated through discourses and texts, on the other. Here, the “discursive” level corresponds to an elaboration of N. Luhmann’s concept of semantics under a more confined focus. In N. Luhmann’s “Social Systems”, semantics refers to the general forms according to which self-descriptions of Society can be accomplished. In N. Luhmann’s essays in the series of writings under the title “Structure of Society and Semantics” many examples of such “general forms” emerging from the structural evolution of modern Society were scrutinized: Culture / Nature, State and “Reason of State”, Individualism, etc. The essays were focused on a main question - the understanding of the evolutionary expression of systemic selections belonging to the structural evolution of Society in semantic indexes, concepts, terminology and more articulated descriptions.

This means that N. Luhmann was attentive to the fact that semantic evolution of social systems is always noticed in specific terminology, texts and discourses and formulates its shifting trends confronting the evolutionary variability of the systemic borders, structural and loose couplings and the emergence of particular communicative forms of the functionally differentiated systems of modern Society. In the social evolution of the systemic borders some meaning effects are used as certification criteria of modal changes, especially those connected to the formation of internal environments of partial systems.

On the other hand, the study of the structural relations between the evolution of the differentiation of Society and the emergence and adaptation of the “symbolic means of communication” is a semantic investigation that must include also a semiotic scrutiny.

The identification by the social systems of their elements depends on how the systems design their borders. The distinction between actuality and potentiality can be a duplication of the border system / environment and the stability of the former distinction can induce the reproduction of the later. From a semiotic point of view such stability is a habit. In the pragmatic and semiotic perspective, habits are mechanisms for the reduction of complexity and tools for the conservation of self-reference in systems. Transformations in the extent of the distinction actuality / potentiality of the scheme of the four axes imply changes in the reach of the other three binary distinctions. The distinction virtual / real depends on the evolutionary conservation of self-reference, on the generalization of second-order observations and on the maturity of the internal environments of the systems. This also means the consolidation of the *interpretants* and habits along the various mechanisms supporting the self-reproduction of the systems. The higher the capacity of self-reflection in systems settled by the generalization of intra-systemic self-observation mechanisms, the
better will be the capacity of the systems to perform the conservation of self-reference and express this feature in symbols apt for symbolic communication.

Semiotics will assist in the understanding and description of the change of selective / systemic sequences in semantic expressions, avoiding at the same time the reduction of meaning to verbal language or complex communicative systems to interaction between agents. Thus, Semiotics and the semiotic exemplification of the “four axes model” is the nexus needed for the mediation between the operative level of the circularity of the recursion of elements in social systems and the semantic evolution along its emergent paths through the description of specific terminology, texts and discourses.

4.3 Conditional Evolution

Aspects of the description of autopoietic systems can closely resemble the description of *semeiosis*, as I said before.

Both are dependent on the force of the connective link between the previous and the following elements of the chains. In *semeiosis*, the elements of meaning depend on the *interpretants* and the capacity they have to assign a meaning to the connections of the significant elements of a sequence of signs.

The evolution means in both models the ability to reproduce the sequence of the elements and its structure, the preservation and consolidation of the identity of the elements through the reproduction of the sequence itself and by integrating novelty.

The reproduction of autopoietic cycles and the conservation of the sequences of signs through their relation to their *interpretants* can’t escape the contingency and entail the cognitive openness to the world as the horizon of possibilities. This implies modal considerations.

A necessary correlation of elements in autopoiesis and *semeiosis* does not match a necessary event in the world. The modal arrangement of the system’s elements is not the same as the relation of the same elements to what happens in the world. Thus, again, from a possibility in the system does not follow a possibility in the world. What is endowed with meaning in a defined semiotic sequence may not have the same meaning in another sequence with other combining meaning factors.

The cognitive openness to the world means in both cases the source of the elasticity of the modal distinction actual / potential and explains its mobility. This distinction is systemic dependent. It develops from the border system / environment. There is no equivalent distinction in the world, as such. To the extent that a modification of the modal orientation of the system affects the difference actual / potential, it is a change in meaning and produces signals.

What I mean is that evolution implies the crossing of the distinction actual / potential through the observation of events that may dislodge the values attributed to the distinction itself. The mobility in this modal distinction proves the crossing. Thus, contingency affects the orientation of the system by affecting its modal structure, not directly. The shift of the values of the distinction is a meaning effect suggesting a semiotic phenomenon.

The notion that evolution is an inference in a description of an observer is not sufficient if we don’t add that the description of the observer is an outcome of semiotic events and has semiotic consequences in the modal consistency of the system.
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