

## TOWARDS AN INTERSPECIES SEMIOTICS: PRODUCTION OF MEANING ACCORDING TO BOTO'S THEORY AND PRACTICE OF SEMIOTICS (TPBS)

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### ABSTRACT

This study aims to expand the contemporary semiotic field beyond the human verbal model, applying BOTO's Theory and Practice of Semiotics (TPBS) as a conceptual framework to interrogate the general conditions of signification in living beings. Adopting a qualitative and theoretical approach, we critically analyze literature in semiotics, zoo semiotics, and biosemiotics, as well as works on non-verbal communication and animal interactions in non-human primates. The objective is to question the limits of classical semiotic models and propose that the production of meaning be understood as a distributed process within interactions between organisms and environment. Our results suggest that certain interactions among primates constitute organized configurations of signification, dependent on social and ecological context. TPBS introduces the notion of "semiotic writing" to designate the processes by which living beings produce and interpret signs. In conclusion, this study opens a perspective towards an interspecies semiotics rethinking the boundaries between human and non-human communication, although this theoretical hypothesis requires additional empirical validations.

**Keywords:** Interspecies semiotics, Meaning production, TPBS (BOTO's Theory and Practice of Semiotics), Biosemiotics, Zoo semiotics, Distributed signification, Semiotic writing

### 1.0 INTRODUCTION

Since its origins, semiotics has been constituted as a discipline devoted to the study of sign systems and meaning production processes. In the Saussurean tradition, language is defined as a sign system where the signifier and signified maintain an arbitrary relationship within a structured social ensemble (Saussure, 1916, p. 99). This conception has durably oriented language sciences toward a centrality of the verbal in the analysis of signification phenomena.

However, this orientation has gradually been expanded by Peirce, who introduced a relational conception of signification based on the interaction between the representamen, the object, and the interpretant, opening the way to a general semiotics applicable to different communication systems (Peirce, 1931–1958, p. 228). In this continuity, Eco considers semiotics as a general

theory of culture (Eco, 1976, p. 7), while Barthes extends analysis to cultural, media, and social systems (Barthes, 1964, p. 41).

Research in animal cognition has renewed understanding of the interpretive capacities of non-human species. Works in cognitive primatology show that great apes manifest complex forms of social thought and understanding of others' intentions (Tomasello, 2014; de Waal, 2016). These results suggest an evolutionary continuity of meaning processing capacities (Shettleworth, 2010).

Despite these extensions, semiotics remains marked by methodological anthropocentrism privileging human productions. Zoo semiotics and biosemiotics have proposed a reconfiguration of the field by integrating communication systems of non-human living beings. Sebeok affirms that signification processes are not exclusive to humans but constitute a general property of living beings (Sebeok, 1972, p. 62). Hoffmeyer maintains that life itself is inseparable from semiotic processes (Hoffmeyer, 2008, p. 15).

This article is part of an exploratory reflection aimed at rethinking the foundations of semiotics from BOTO's Theory and Practice of Semiotics (TPBS), an emerging theoretical framework proposing an expanded reading of meaning production in living beings. This approach postulates that communication must be understood as a fundamental process of semiotic inscription involving the entirety of interactions between organisms and environment.

The objective of this study is to propose an analytical framework allowing reconsideration of the relationship between sign, meaning, and life, toward an opening to an interspecies semiotics. The central question is: to what extent can meaning production be understood as a fundamental process of living beings, transcending the boundaries of human language, according to TPBS?

This article adopts a qualitative and theoretical approach structured according to the IMRAD model. It relies on a critical analysis of literature in general semiotics, zoo semiotics, and biosemiotics, to situate TPBS within the contemporary debate on the expansion of the semiotic field.

## **2.0 MATERIAL AND METHODS**

### **2.1 Type and Research Design**

#### **2.1.1 Research Approach**

This study adopts a qualitative approach of theoretical and interpretive nature, pertaining to fundamental research in semiotics. It aims to analyze the general conditions of meaning production in living beings from BOTO's Theory and Practice of Semiotics (TPBS), envisaged as an emerging and hypothetical theoretical model.

#### **2.1.2 Theoretical Grounding**

This design is situated within the tradition of general semiotics, which considers signification phenomena as dynamic processes of interpretation rather than as empirically observable entities directly (Peirce, 1931–1958, p. 228).

## **2.2 Epistemological Positioning**

### **2.1.1 Constructivist Perspective**

The study rests on a constructivist and interpretive perspective according to which meaning is an emergent property of relationships between organisms, environments, and interpretation systems. The sign is thus understood as a relational and contextual process, dependent on interaction conditions.

### **2.2.2 Coherence with Interpretive Semiotics**

This approach is coherent with contemporary models of interpretive semiotics, which envisage signification as a system effect rather than a fixed structure (Eco, 1976, p. 7).

## **2.3 Theoretical Framework**

### **2.3.1 Interdisciplinary Triangulation**

The theoretical framework mobilizes an interdisciplinary triangulation combining structural linguistics, general semiotics, pragmatics, zoo semiotics, and biosemiotics.

### **2.3.2 Expansion to Non-Human Living Beings**

This combination allows expanding analysis of signification phenomena beyond human verbal language, by integrating observable communication forms in non-human living beings. In this perspective, communication is considered as a general property of living systems (Sebeok, 1972, p. 62), while biological processes are interpreted as carriers of integrated semiotic dimensions (Hoffmeyer, 2008, p. 15).

Recent works in biosemiotics also consider that evolutionary and biological processes can be interpreted as signification systems in constant interaction with their environment. In this perspective, life itself is understood as a continuous semiotic process (Kull, 2023; Kull et al., 2023). This approach allows enriching the TPBS framework by situating it within contemporary debates on the interpretative biology of living beings.

Contemporary approaches in cognitive semiotics extend this opening by proposing an analysis of meaning as an embodied and distributed phenomenon. Cognitive semiotics highlights the articulation between perception, cognition, and interpretation in meaning construction (Zlatev, 2012). In the same logic, ecological semiotics insists on the importance of environmental context in the formation of signifying processes (Magnus, 2011). These approaches allow situating TPBS within an expanded theoretical field where signification is envisaged as a dynamic, situated, and evolutionary process (Nöth, 2011).

## **2.4 Corpus and Sources**

#### **2.4.1 Study Duration**

The study was conducted over 4 months and 4 days, from February 1, 2026 to May 5, 2026.

#### **2.4.2 Nature of the Corpus**

The corpus consists exclusively of theoretical secondary sources from the main currents of semiotics and related disciplines. It is a conceptual corpus of 18 texts, mobilized for comparative and interpretive analysis.

#### **2.4.3 Inclusion Criteria**

Texts were retained according to the following criteria:

Texts published in French or English

Scientific articles and academic works in semiotics, zoo semiotics, biosemiotics

Works on non-verbal communication and animal interactions (non-human primates)

Academically recognized publications (foundational works, cited articles)

#### **2.4.4 Exclusion Criteria**

Texts were excluded according to the following criteria:

Non-academic texts (blogs, press articles, unverified sites)

Works outside the field of language sciences or animal cognition

Publications before 1900 (except foundational texts Saussure, Peirce)

#### **2.4.5 Main References**

The main references include:

General semiotics: Saussure (1916); Peirce (1931–1958); Derrida (1967); Eco (1976); Barthes (1964); Searle (1969);

Zoo semiotics/Biosemiotics: Sebeok (1972); Hoffmeyer (2008); Kull (2023); Kull et al. (2023); Zlatev (2012); Magnus (2011); Nöth (2011);

Animal cognition: Tomasello (2014); de Waal (2016); Shettleworth (2010);

Others: Khumalo & Hendlin (2024); Hornborg (2024).

These works are complemented by contributions in zoo semiotics and biosemiotics allowing expansion of the analysis field to non-human living systems.

#### **2.5 Data Analysis Strategy**

### **2.5.1 Interpretive Qualitative Approach**

The data analysis relies on an interpretive qualitative approach structured to organize the treatment of the theoretical corpus according to a progressive logic. It consists in establishing a transition from the critique of existing semiotic models toward the formalization of the TPBS framework, then toward an expanded interpretive reading of communication phenomena in living beings.

### **2.5.2 Interpretation Protocol**

This strategy defines the general interpretation protocol adopted in this study, without constituting an analysis of results in itself. It serves solely as a methodological framework guiding the exploitation of data presented in the results section and their interpretation in the analysis section.

## **3.0 VALIDATION AND METHODOLOGICAL LIMITATIONS**

### **3.1 Theoretical Validation**

The research does not rely on experimental empirical validation, but on theoretical validation based on:

The internal coherence of the TPBS model;

Its explanatory capacity in different semiotic contexts;

Its compatibility with existing theoretical frameworks;

Its interpretive relevance in the study of living beings.

### **3.2 Methodological Limitations**

TPBS is thus considered as an exploratory theoretical model under construction, whose validity depends on its future confrontation with empirical and comparative research. This study does not rely on statistical tests, but on interpretive qualitative analysis of the theoretical corpus.

### **3.3. Results**

#### **3.3.1 Decentering of Verbal Language in Sign Theory**

##### **3.3.1.1 Limitations of the Saussurean Model**

The analysis of the Saussurean model (Saussure, 1916, p. 99) reveals that the relationship between signifier and signified is conceived exclusively for the human linguistic system. This conception does not allow explaining non-verbal signification phenomena.

##### **3.3.1.2 Peircian Extension**

The triadic model of Peirce (1931–1958, p. 228) defines the sign as a relation involving the representamen, the object, and the interpretant. This definition includes non-linguistic forms of signification.

### **3.3.1.3 Culturalist Expansion**

Eco (1976, p. 7) considers semiotics as a general theory of culture and signification systems, transcending the boundaries of verbal language. Barthes (1964, p. 41) shows that cultural, media, and social systems function as signifying structures analogous to language.

## **3.4 Expansion of the Semiotic Field to Non-Human Living Beings**

### **3.4.1 Communication in Primates**

Studies in animal cognition (Clay & Zuberbühler, 2011) show that in primates, vocalizations and gestures function as structured forms of communication adapted to social context, and not as simple instinctive reactions.

### **3.4.2 Information Processing Capacities**

Research in comparative cognition (Shettleworth, 2010) indicates that animals possess information processing capacities allowing flexible adaptation to their environment.

### **3.4.3 Zoo Semiotics and General Property of Living Beings**

Sebeok (1972, p. 62) introduces zoo semiotics by affirming that the capacity to produce and interpret signs constitutes a general property of living beings, not a human specificity.

### **3.4.4 Biosemiotics and Biological Processes**

Hoffmeyer (2008, p. 15) considers that biological processes are structured by signification dynamics, where organisms continuously interpret signals from their environment.

### **3.4.5 Contextual Interpretation of Signals**

Recent works (Slayton & Hendlin, 2023) show that non-human communication forms rely on mechanisms of contextual interpretation of environmental signals, actively interpreted by organisms according to their adaptive needs.

## **3.5 Distributed Conception of Signification**

### **3.5.1 Derrida's Generalized Writing**

Derrida (1967, p. 95) introduces the idea of generalized writing where meaning is always deferred and contextual, not residing in fixed units but in networks of differential relations.

### **3.5.2 Speech Acts and Pragmatics**

Searle (1969, p. 16) shows that signification is inseparable from action and pragmatic context, implying strong dependence on usage situations rather than abstract structures.

**Table 1. Results Summary**

Nº	Model/Approach	Main Contribution	Identified Limitation
01	Saussure (1916)	Linguistic sign = signifier/signified	Exclusively human language
02	Peirce (1931-1958)	Triadic relation (representamen/object/interpretant)	Interpretation = human mental
03	Eco (1976)	General theory of culture	Centered on human culture
04	Sebeok (1972)	Sign = general property of living beings	Need for empirical validation
05	Hoffmeyer (2008)	Biological processes = semiotic dynamics	Theoretical framework under construction
06	Derrida (1967)	Generalized writing, deferred meaning	Deconstructive approach
07	Searle (1969)	Signification = action + pragmatic context	Centered on human speech act

This table highlights the progressive evolution of the semiotic field, from approaches centered on human language to models expanding signification to living beings' processes. It shows that Sebeok's and Hoffmeyer's works constitute important theoretical support points for TPBS, which is situated within a perspective aiming to overcome semiotic anthropocentrism while recognizing the necessity of complementary empirical validations.

**4.0 DISCUSSION**

**4.1 Contributions of TPBS to Contemporary Semiotics**

**4.1.1 Continuity with Peircian Semiotics**

The results show that TPBS is situated within the continuity of attempts to expand semiotics beyond verbal language. By integrating biological, interactional, and environmental dimensions of the sign, it joins the perspectives opened by Peircian semiotics, which already envisages the sign as a relational and dynamic process (Peirce, 1931–1958, p. 228).

**4.1.2 Radical Extension of the Explanatory Framework**

TPBS proposes a more radical extension by explicitly articulating the notions of sign, meaning, and life within the same explanatory framework. This orientation allows bringing together linguistic, cultural, and biological approaches to signification, in agreement with biosemiotics works that consider life as intrinsically semiotic (Hoffmeyer, 2008, p. 15).

**4.2 Continuity and Convergence with Zoo Semiotics and Biosemiotics**

**4.2.1 Convergence with Zoo Semiotics**

TPBS confirms several intuitions already present in zoo semiotics, notably the idea that communication is not a human specificity but a property of living beings (Sebeok, 1972, p. 62).

It also extends biosemiotics works by proposing an integrated reading of biological interactions as meaning production processes.

#### **4.2.2 Unified Approach vs. Specific Approaches**

Where zoo semiotics and biosemiotics focus on specific levels (animal, cellular, biological), TPBS proposes a unified approach, seeking to link these different levels in a global signification model.

#### **4.2.3 Convergence with Contemporary Biosemiotics**

Recent developments in biosemiotics allow situating TPBS within a contemporary theoretical current that overcomes semiotic anthropocentrism. They confirm that signification can be understood as a distributed, emergent, and ecological phenomenon, inscribed in interactions between organisms and environment (Hornborg, 2024; Kull et al., 2023). This convergence reinforces the relevance of the TPBS model while highlighting the necessity of future empirical validations.

### **4.3 Interpretative and Methodological Limitations**

#### **4.3.1 Prudence in Interpreting Animal Behaviors**

Works in animal cognition and contemporary semiotics reinforce the necessity to overcome a strictly anthropocentric conception of meaning. Research by de Waal (2016) shows that cognitive capacities of primates reveal an evolutionary continuity with human forms of social thought. In the same sense, contemporary cognitive semiotics highlights that meaning production is an embodied and contextual process, dependent on interactions between organism and environment (Zlatev, 2012; Nöth, 2011). However, these approaches also recall the prudence necessary in interpreting animal behaviors, to avoid any excessive projection of human categories onto non-human living beings.

#### **4.3.2 Limitation: Absence of Original Empirical Data**

Despite its conceptual interest, TPBS raises several important limitations. The first concerns the interpretative status of mobilized data. In the absence of original empirical data, analysis relies primarily on secondary literature reading, which limits the possibility of direct validation of the model.

#### **4.3.3 Limitation: Risk of Excessive Conceptual Extension**

Furthermore, attributing a unified semiotic structure to living beings' behaviors may introduce a risk of excessive conceptual extension. As highlighted by certain approaches in cognitive sciences and ethology, the distinction between adaptive behavior, intentional communication, and human interpretation remains methodologically delicate.

### **4.4 Scientific Status of TPBS**

#### **4.4.1 Exploratory Theoretical Model**

In its current state, TPBS must be considered as an exploratory theoretical model rather than a stabilized theory. Its main interest lies in its capacity to propose an integrative re-reading of signification phenomena across different disciplines.

**4.4.2 Necessity of Future Empirical Validation**

Its validity therefore depends on its future capacity to be tested, discussed, and potentially operationalized in empirical research in semiotics, cognitive ethology, or biosemiotics.

**5.0 RESEARCH PERSPECTIVES**

**5.1 Empirical Operationalization of TPBS Model**

This study opens several research perspectives. First, an empirical operationalization of the TPBS model could be envisaged in the analysis of animal interactions from rigorous observation protocols.

**5.2 Comparison with Cognitive Ethology**

Second, a comparison with existing frameworks in cognitive ethology would allow evaluating its explanatory value.

**5.3 Extension to Other Forms of Living Beings**

Finally, extending the model to other forms of living beings could contribute to a more general reconfiguration of semiotics as a science of living beings' signification systems, while maintaining methodological vigilance on risks of interpretative anthropomorphism.

**Table 2. TPBS vs. Other Models Comparison**

N°	Model	Approach	Level of Analysis	Convergence/Difference with TPBS
01	Peirce (1931-1958)	Triadic relation	Human and non-human sign	Convergence (relational process)
02	Sebeok (1972)	Zoo semiotics	Non-human living beings	Convergence (property of living beings)
03	Hoffmeyer (2008)	Biosemiotics	Biological processes	Convergence (life = semiotics)
04	Kull et al. (2024)	Contemporary biosemiotics	Biological evolution	Convergence (emergent phenomenon)
05	Hornborg (2023)	Ecological semiotics	Organism-environment	Convergence (distributed phenomenon)
06	Saussure (1916)	Structural language	Human language only	Difference (TPBS expands beyond human)

The comparative analysis reveals that TPBS shares several theoretical foundations with zoo semiotics, biosemiotics, and ecological semiotics, notably the conception of meaning as a relational and distributed phenomenon. However, it distinguishes itself by its willingness to

integrate biological, environmental, and interpretative dimensions of meaning production within the same explanatory framework. This specificity confers to TPBS an integrative vocation capable of contributing to the development of an interspecies semiotics.

## 6.0 CONCLUSION

This study aimed to expand the contemporary semiotic field beyond the human verbal model, applying BOTO's Theory and Practice of Semiotics (TPBS) as a conceptual framework to interrogate the general conditions of signification in living beings. The results show that meaning production can be understood as a distributed process within interactions between organisms and environment, transcending the boundaries of human language. TPBS introduces the notion of "semiotic writing" to designate the processes by which living beings produce and interpret signs, thus contributing to a theoretical reconfiguration of the semiotic field toward an interspecies semiotics. However, this model remains exploratory and requires future empirical validations, particularly in the analysis of animal interactions and comparison with cognitive ethology. This study opens the perspective of a more inclusive semiotics of living beings, while highlighting the necessity of methodological vigilance regarding risks of interpretative anthropomorphism.

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