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The impact of an embodied theory of meaning on the epistemology of semiotics

Abstract: Cognitive semiotics has an experiential basis: its thesis is that the origin of meaning – a problem that classical semiotics usually glosses over – lies in the sense system. This paper will outline the mechanisms that make possible such meaning construction, but its main focus will be the impact of the cognitive perspective on the epistemology of semiotics. It implies a process of naturalization of the humanities and the social sciences. This naturalization has triggered harsh criticism: its arguments are supposed to be circular; these are secretly founded on a postulate of innateness; it is at the service of an individualistic ideology in tune with a neoliberal society.... The paper will examine these pieces of criticism, which lead us to oppose and challenge both neural autonomism and the culturalist autonomism inherent in classical European semiotics. The conclusion is a plea for a continuum between nature and culture.

Keywords: the senses, epistemology, typology of signs, autonomism, naturalization

1 How does meaning emerge from experience? Two answers

This paper is the synthesis of certain aspects of a collective research conducted within the interdisciplinary team known as Groupe μ (2015a, 2015b). It aims to demonstrate (1) that meaning is always the output of a subject's sensory experience and is fed back to the world via action; (2) that the mechanisms governing meaning formation are very limited in number: they consist essentially in contrast detection and the clustering; and (3) that even if the world of meaning includes the most complex human symbolism, it is also the semiotic niche of living beings. This synthesis allows us to develop a coherent, organizing framework for such apparently different phenomena as languages, text processing,

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animal communication, the invention of tools, and so on and so forth. The focus of the paper is the impact that this cognitive perspective has on the epistemology of semiotics.

1.1 Why is there meaning rather than nothing?

Although there are many theories of meaning, most of them are descriptive. While they describe meaning at length, they shirk addressing the question, "how and why was meaning born?" To paraphrase Leibniz's famous phrase, they do not wonder "why is there meaning rather than nothing?"

Indeed, most of the time, semiotics – especially structuralist semiotics – is based on the axiom of conventionality: people assume an agreement before any communication and the existence of a system outside individual consciousness that would enforce itself onto them in a compelling way. This is the axiom that Saussure develops through the concept of "langue."

Nevertheless, the theory of conventionality leaves in the dark the stages that precede the convention. This problem can be reformulated as follows: how does meaning emerge from experience? This is an aggravating issue. Indeed, it addresses the connection between a meaning that does not seem to have any physical foundations and the physical stimuli coming from the external world, stimuli which, as such, do not seem to carry any meaning.

By and large, semiotic schools give two types of answers to this question. On the one hand, there are rationalist schools that belong to the tradition epitomized by Saussure and later by Hjelmslev and Greimas. On the other hand, there is the pragmatic approach illustrated by Peirce.

1.2 The structuralist answer

For the representatives of the first approach, the essential principle is that internal consistency is enough for the description of language to be appropriate to its object. Thus, in this semiotic theory, signs are completely independent of the world. This conception has resulted in the concept of the arbitrariness of the sign, which has often been turned into a dogma insofar as it leads to eschew the question of the contact point between the world and the signs. The quality reached in the description of the internal logic of the system is therefore dearly paid for: we condemn ourselves not to know what use we can make of the signs.

Indeed nothing indicates how we could reach the adequacy we seek. On the contrary, the doctrine is still based on an abstract and "disembodied" rationality.

Indeed, European semiotics is definitely concerned about the purity of its patterns, and wants to protect them from any "referential contamination." In fact, for some of its representatives, looking for the principles structuring the semiotic systems from the outside – for instance from perception, psychology, formal logic, or even in social and anthropological data – is a huge mistake. To them, "structure is the mode of existence of meaning" (Greimas 1966: 28). Structuralism stands up for the idea – which might at first seem paradoxical – that "any structuring of a field presupposes a structuring principle which is itself non-structurable" (Nef 1976: 17). In that type of semiotics, we have such a basic structuring principle: namely the concept of opposition. The value of an element depends on its distinguishing feature or trait, which is simply the relations it maintains with other elements. Thus, this value is primarily negative: the element defines itself by what is not itself. But what is the origin of this negativity? We do not know.

I intend to show that this structuring principle is to be found in contemporary cognitive sciences and that perception is not "external" to structure. Contemporary cognitive science challenges the positions of traditional European semiotics, which is implicitly based on a spiritualist and dualist conception where the soul is posited as independent from the body. This is because its rationalism – which is also to be found in Fodor's modular conception, where the sensible and the intelligible are clearly separated – goes along well with a certain spiritualism, as demonstrated by Doroszewki in a famous paper on Saussure's thinking (1933).

It is true that the post-Greimasian stream has made a considerable turn, taking into consideration the sense system, the modalities of action, and the so-called "life forms." But for many representatives of the Paris school of semiotics, the senses are more often than not a kind of postulate, and there is some denial – as in the work of Umberto Eco – of the import of the physiological mechanism of the senses that determines the operations of the semiogenesis: physiology remains a "black box." Post-Greimasian semiotics is opposed to cognitive semiotics in two further respects:

(a) Its intent to conflate sense data and logical structure, or rather to determine the former in terms of the latter (see, for example, Fontanille 1995, where physical data are described by means of the "semiotic square").

(b) The persisting distrust of reference (in a recent paper, Bordron (2010) writes that the referent will always remain unreachable).

1.3 The answer of pragmatism

Pragmatism offers a different answer to the question about the relation between signs and the world. Peirce dedicates a significant amount of space

to the notion of "hypothesis," which is not only crucial for the functioning of abduction, but also is the type of inference that is the most likely to modify our knowledge of the world. This particular inference, like all the others, always works thanks to data provided by experience. Experience thus plays an important role in Peirce's theory, a part denied by post-Saussurian semiotics.

However, Peirce's understanding of the relation between signs and the world isn't any more satisfactory than Greimas'. According to him, objects are "real." That is to say independent from the idea that we have of them. As they impose themselves on us, they trigger the process of semiosis. But if these objects already have meaning, semiosis would exist before the process of semiotization of the data the world. If one defines semiotics as the discipline studying the *production* of meaning, it appears as superfluous.

Of course, such a position is debatable. Peirce clearly saw the issue caused by the relation between the perceived object and perception, and he tried to produce a model of that perception. But he says nothing about the mechanism used to interpret the data, which are by definition perceived as incomplete (since they always lead to inferences). What are the forces that drive this mechanism of interpretation? Here, Peirce seems to point to the existence of some semiotic force connatural with Man: "the sign used by Man is Man himself." This suggests a psychological conception that deserved to be questioned: on the one hand, it is not exempt from some heavy ideological presuppositions because it saves semiosis for humans only; on the other hand, it is somewhat circular: claiming that there is a semiosis because there is a *virtus semiotica* is not very useful.

2 A cognitive semiotic program

The cognitive semiotics proposed by Groupe μ (2011, 2015a, 2015b; see also Klinkenberg 2014) challenges the structuralist "purist" or "fundamentalist" conception and makes it possible to go beyond the aporia of pragmatism. Its thesis is that semiotics and cognition are closely linked, and more particularly that elementary semiotic structure is an exact reflection of our perceptual activity and processing of data from the world. This will be summed up in this formula: sense proceeds from the senses. The originality of cognitive semiotics is to emphasize the corporeality and materiality of signs.

Let us focus on this activity, using visual perception (cf. Groupe μ 1992) as an example.

2.1 Translocal quality and entity

Let's take any physical fact on which our visual perception is focused. In its simplest form, this activity consists of detecting a quality in the visual field. Nonetheless, our perceptive organs and the central nervous system that centralizes information provided by them are equipped to detect invariants. In that case, the retina does not just spot multiple juxtaposed dots: if they all have the same luminance and the same color, they are grouped and perceived as a single spot. Therefore, the perceived quality may be called translocal. There is a double outcome of this: an equalization of stimuli, but also a differentiation of stimuli from the rest of the field. And it is due to the two mechanisms of lateral inhibition and lateral excitation (the ability of an excited neuron to reduce or increase the activity of its neighbors). Its advantage is obvious: it represents a significant economy. Instead of dealing with several distinct pieces of information, all we have to do is focus on one single data and process it.

Detecting a quality in a visual field makes it possible to distinguish an entity, endowed with this quality, and to distinguish it from its environment: on this white piece of paper, we discern a blue (quality) spot (entity); just as in the air we perceive a high-pitched and powerful (quality) siren howling (entity). Somehow, we might say that the entity is a quality that has become a thing thanks to our perceptual activity.

2.2 Differentiation and thresholding

It is crucial to point out that the quality can only be identified through a process of differentiation: the perceived shape detached from a perceptual background. Because the entity is separated, it gets involved in a relation with other entities, since it displays a translocal quality which is distinct from the first one: the paper on which there is a blue spot is an entity which has this quality. Therefore, we see that the notion of entity itself presupposes the notion of interaction: indeed, we can only distinguish entities thanks to a contrasting relation between two qualities.

The most important aspect in this mechanism of differentiation is thresholding. By that, we mean that variations of stimuli below certain degree of intensity, called threshold, are not taken into consideration: they are all smooth, and the qualities that would have been discernable are reduced to being one single translocal quality. Inversely, the ones that get beyond that threshold of intensity will constitute another quality. We must emphasize that these thresholds do not exist as such in nature, but come from the dialectic relation between stimuli and the receptive organism.

This is the perceptive origin of knowledge – human knowledge of course, but the property of knowledge can also be attributed to all living beings. Indeed, the conjunction of these three data – quality and entity, characterized by an interaction – does make for elementary knowledge.

2.3 Complexifications

But this conjunction cannot fully play its role without two complexifications: its stabilization in time and the stabilization in objects or coordination.

First complexification: elementary knowledge can be stored in memory. The latter makes it indeed possible to compare qualities with other qualities, and therefore entities, beyond immediate experience. But the comparative effect of memory has no interest without a second complexification: coordination. The experience of qualities in time can conjure up regular coordinations. This is where the notion of object intervenes, which is only an organized bundle of qualities and endowed with a certain constancy in time. For instance, we can repeatedly experience coordinated qualities – such as "red," "spherical," "smooth" – and therefore stabilize their coordinations through the well-known binding-process. So we create an object. In this case, the object, made of associated qualities, will possibly be placed in the class "tomato." This binding-process allows some flexibility in assigning an object to a category: I recognize a tomato even if it is green, or ever if it has the size of a grape, because the neurones corresponding to the perception of the quality "red" still run in the absence of red stimuli, thanks to the coordination.

Little by little, we are getting closer to the notion of category. Indeed, emphasizing storing and coordinating qualities makes it possible to develop categories, and therefore to integrate entities in these classes. Starting with the most elementary perception we have therefore come to the most complex encyclopedias.

We should remember that the kind of categorizing operation that is essential for survival is not the exclusive hallmark of human beings: a trout does not need to know the name of each and every fly but since it is capable of abstraction it eats everything that corresponds with the pattern of the category "fly."

This enables us to give an answer to the question "why is there meaning?" Our finitude, confronted to an infinite world, forces us – us: humans, trout, and flies – to make this world finite so we can handle and manipulate it. And this simplification of experience is meaning, which is somehow the price we must pay to simplify the world. In Darwinian terms, we can say that categorization has great survival value.

2.4 Basic cognitive structure and semiotics

All the thoughts above are about perception. But they also match the instruments used to express this perceptual knowledge, namely semiotics.

Despite of Peirce's claims to the contrary, the sign is not essential to define meaning, but it is an instrument that stabilizes categorizations and encyclopedias while giving them a social character. If the sign is that instrument, we might expect to find the basic structure of perception – qualities, entities, interactions – in all semiotic systems, such as the verbal language of course, but also the language of visual images, chemical symbols, etc.

A semiotic system can certainly not be reduced to perceptive knowledge. For semiosis to exist, we need more than the act of discrimination: we need to relate a level of content and a level of expression in order to constitute a sign. But what we have established so far already suggests that we will be able to compare unity (semiotic unity) with entity (perceptive entity) and value (semiotic value) with quality (perceptive quality). Indeed, everything takes place as if the sign systems could only work by developing jointly a list of entities and a group of rules governing their interactions. This basic structure will be found in whatever language with their unities, including their values and their syntactic rules, but also in whatever form of knowledge: the physicist looks for the elementary particles – entities – and describes their interactions; mechanics describes the "movements" – interaction – of the "bodies" – entities; ecology describes the "balance" of "species," and so on and so forth.

This is about the structures of the semiotic systems. But this congruence between the elementary knowledge and these structures do not explain another problem: the origin of the signs as substitutes.

Our hypothesis is that the origin of signs lies in the fact that we have an inferential mechanism – namely the binding-process – which, on the basis of perceived qualities of an object, can mobilize other qualities not at hand in a given situation: as demonstrated, it is possible to integrate an object into the category of "tomato" even if it is green. In this last case, the inferred quality has a sensory status. But the inference can be made with other all sorts of qualities, including the non-sensory qualities: from a color, I can infer the edible or non-edible nature of the object, but also its pleasant or funny character. So we are obtaining a general coupling model: a perceived quality and an inferred quality. This coupling is the embryo of the sign function, with its binomial expression level/content level.

Obviously, there are different modalities of coupling. In my example, the inference is made from a quality of an object to another quality of the same object. But memory, which allows to store different objects into categories,

makes it possible to make inferences from the quality of an object A to the same quality when present in another object B. This is the source of similarity that characterizes the icon. And if it is possible to make inferences between different qualities in one and the same object and between the same qualities in different objects, it is also automatically possible to make inferences between different qualities in distinct objects, which leads us to the symbol. This is shown in Table 1, where "uniqualitativity" refers to an inferential relationship between a given quality and a similar quality, "interqualitativity" to a relationship between different qualities, "intraobjectality" to a relationship of qualities within the same object, and "interobjectality" to a relationship of qualities between different objects.

Table 1: Typology of semiotic couplings.

Relations between		Quality(ies)	
		unic	**different**
Object(s)	unic	(uniqualitativity + intraobjectality)	interqualitativity + intraobjectality
	different	uniqualitativity + interobjectality	interqualitativity + interobjectality

The first box does not refer to the sign, because it contains the basic meaning arising from the perceptual encounter with the world.

In the second box, we have the simplest binomial: the one that associates, by inference, different qualities of the same object. This is the case of the index (taken in its broadest sense), based on the relationship interqualitativity + intraobjectality. One example of this type of relationship was just been given above: from the spherical quality of the tomato, one can infer to its color or edibility. The spherical shape is thus the form of the plane of the expression, and edibility the form of the content plane of this sign.

If the binomial interqualitativity + intraobjectality establishes a relationship between several aspects of the same object, the second one sets a relationship between different objects considered under the same aspect, and the formula is here: uniqualitativity + interobjectality. This is the example of the picture of a lemon, identifiable by the quality "yellow" (or "green," according to the culture where the inference occurred). In the same way that we trust in the

perception of the surface of an object to reach another non-superficial feature of this object, we give to the image (visual, tactile, etc.) of an object authority to refer to a perceptual property of this object.

Logically, from the existence of the binomials interqualitativity + intraobjectality and uniqualitativity + interobjectality can be concluded the possibility of a combination interqualitativity + interobjectality. This configuration is that of the arbitrariness: a sound referring to a concept, a color to a nationality, etc. We have here a noticeable qualitative jump, since the sensory factor playing a role in the previous binomials disappears. Nevertheless, the inferential mechanism allowing one to associate a form of expression and a form of content has been made possible by sensory correlations discussed above. The immense field of the semiotic systems known as the most sophisticated opens here…

As one moves from the top left corner to the lower right corner of the table – from uniqualitativity to interqualitativity, and from intraobjectality to interobjectality – the distance between the units put into the relationship of inference increases. This is explains the standard semiotic wisdom, namely that the symbol is a more elaborate sign than other sign types and that the index appears to be the crudest of them all.

3 Cognitive semiotics on trial

3.1 The specter of naturalizing the humanities

The perspectives opened by cognitive semiotics necessarily participate in a big debate in our disciplines: the debate about the naturalization of the humanities. I mean this great movement nurtured by the conviction that everything must and can, eventually, be led back to the natural world. It is, to use Paul Valéry's words, a question about finding "the spirit at the tip of the scalpel."

Over the last years, naturalization (long since addressed, by the way: just think of ideas such as "natural law") has been marshaled by the cognitive sciences and particularly by the neurosciences. Since the invention of non-intrusive techniques that make it possible to capture human brain activity, theoretical claims about the mind – pertaining to the realm of hypotheses – can from now on be related to an observable physiologic activity. This holds true for thinking, computing, consciousness, emotion, or even phenomena of empathy and the sense of the sacred.

Such breakthroughs have attracted criticism that I will briefly group in three categories:

1) Reductionism. The neurosciences is said to underestimate the complexity of the phenomena they deal with; they therefore underestimate the difference of scale between their discipline and the phenomena that so far have belonged to other scientific fields such as psychology, anthropology....

2) Methodological criticism. The use of medical imaging as a tool for interpretation of human behavior sparks off certain skepticism, because this process is likely to make us mistake cause for effect (the excitation of an organ might be the physiologic result of a decision, not its cause). Therefore, circularity looms large, which is exactly why some people reproach the Darwinian approach: saying that a structure or a property involves a reproductive or adaptive advantage is defining an advantage by the fact that it is advantageous. This, of course, has no explanatory power.

3) Ideological criticism. Situating the source of symbolic behavior in the structure of the living organism and especially in the genome amounts to burying inside the individual the source of its determinations and to denying any interaction with what is external to individual – particularly social interactions. Thus, neurosciences would be particularly well in sync with neoliberal individualism.

Furthermore, it can be estimated that these breakthroughs call free will into question, and this may possibly justify political restrictions of rights. We also know that Darwinian expressions such as "struggle for life" or "survival of the fittest" have been misused to disastrous ideological ends.

3.2 Naturalist autonomism

It is not the place here to evaluate and minutely account for all these criticisms: a whole book would probably not be enough.

But I will point out an argument that is present in the debate and has to do with both the argument of circularity and that of individualism.

Claiming that the genome would be the only decisive factor amounts to saying that it constitutes a self-contained system that produces its effects independently from any determination external to itself. And it is this position that leads to circularity. I will call this conception "autonomizing" or "immanentist." Indeed, this designation can apply to all the descriptive systems that decide to ignore the interactions between the structures of the system under description

and what is external to it, whether the object of these descriptive systems is meaning or the organism. Among those who have been studying the nervous system, it is doubtlessly Humberto Maturana and Francisco Varela (1980) who expressed this solipsistic autonomism most radically with the concept of autopoiesis. For Varela (1979), the system is entirely enclosed in itself: there is no input, no output – and no intrinsic characteristic of its organization allows it to distinguish, through the dynamic of its changes of states, the internal or external origin of these changes.

I fully subscribe to the criticism of this autonomism, for reasons explained in Groupe μ (2010). However, this moderate criticism is used by some people to formulate another criticism, with a stronger and more general import: such scholars use the critique of autonomism as a springboard for the rejection of any biological origin of meaning. This is, in turn, an objection with which I fully disagree: the conclusion goes beyond the premises, because it is possible, as I have shown to develop a genuine theory of the interaction between the organism and the environment.[1]

Therefore, the wayward trends in the naturalization of human sciences do not come from the principle of naturalization itself but from radical autonomism that underlies some formulations of this principle of naturalization.

3.3 Culturalist autonomism

However, there is a second autonomism, to which I briefly alluded. It is the autonomism of "culturalism:" when they oppose the infinite variation and complexity of cultural phenomena to the cognitivists' simplifications, the culturalists also make a reduction.

Indeed they take what might be called the cultural device – our systems of signs and values – to be a postulate. By considering that this device is exclusively governed by rules that are specific to it, they also produce autonomism. It is with European structuralists that this autonomism is pushed to the brink. An example could be François Rastier who claims that the concept of reference is unusable, because it would be "the product of the millennia-old realism in philosophy of language, which intends to wage signs on a world's order" (1991: 238). Thus, the question of reference is at best undecidable. At worst, in the extreme version of these culturalist theories, referencing the sign to things is only a meaning effect, and is therefore better designated as a "referential illusion." And symmetrically, in the case of enunciation, culturalism

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1 Here, we are closer to Maturana and Valera when developing the concept of enaction (1992).

also posits an "enunciative illusion" (Greimas et Courtés 1979: 120, art. "Embrayage"). Solipsism leads here to the elimination of the subject, for the benefit of its utterances.

There is no reason to let orthodox cognitivism bear alone the responsibility of functionalist dualism which idealistic semioticians are also responsible. These positions are obviously not the only options on the market.

4 The double nature-culture continuum

To resolve these issues, we must stop opposing the "natural sciences" to the "humanities." In fact, this opposition does not go without saying. On the contrary, a more sensible claim would be that the natural sciences and the humanities are located on a continuum, and that this even holds true for nature and culture as such. Or, to be more accurate, there exists a double continuum: an objective continuum and a discursive one.

4.1 The objective continuum

What which we call "nature" is not a divine object that has come from out of nowhere: it has changed throughout its history. Along with the diachronic variation of nature, its synchronic variety must also be taken into account: there is not one, but many natures. It is Jacob Johann von Uexküll who developed the *Umwelt* notion: each living species has an ecological niche, which is its specific, significant universe (the trout gives meaning to its environment, a meaning which is not the one we give to ours). Yet, if the living being is subjected to the constraints of that space, this being, in turn, also affects its environment so that the *Umwelt* bears the imprint of its action. This double influence is definitely constituent of a culture.

Therefore, neither nature nor culture must be given any primacy or considered as autonomous. They should rather be seen in their inextricable relation. Indeed, what is culture but the name we use for an adaptation to a complex environment, to a system through which the activities of a collectivity are organized? Such an adaptive system could be considered as universal among living beings: indeed, it is the case for the red worm and the trout as well as for the human being. And if, for instance, that culture can be described like the tireless quest for the fly, the question that arises is "where did the trout find that tropism towards adaptation?" We must assume that its origin lies in the

interaction between models and an environment. And that could only be done through the perceptual apparatus.

4.2 The discursive continuum

Furthermore, the concept of nature, and *a fortiori* the concept of history of nature, can itself be considered as a cultural fact.

To the question of "how do living beings organize their survival," our answer is firmly naturalist: it consists of considering that the mind and its functioning are linked to the physical state of the world to which the subject belongs.

We acknowledge that such a thesis obviously pertains to scientific discourse. But this description does not prevent us from admitting that in the functioning of the systems of human thinking too we can observe a continuum in which scientific discourse is but a pole. For some people, observation and experimentation prevail and any discourse should meet these requirements – other discourses being discredited as irrelevant. Others might be called culturalists: in their view, the discourse of culture (or of art, of faith) also has an explanatory import. For them, observation and experimentation only play a minor role. Between these epistemic positions, there is no opposition but a continuum along an axis. On one side we have the cultural part of the axis, where we find the arts, myths and various forms of symbolism: here, observation and experimentation which lead to verification play a very limited role (but it exists: indeed, it is on the basis of several facts that we develop a system which is likely to further an understanding of the world). On the other side, we have a scientific part, where these principles are considered incontrovertible.

And any type discourse might be found anywhere between these two poles. For some people, the physical world is almost inexistent; instead, there are beautiful stories. For others, the universe offers itself to the rational mind and is run by forces that we can seek to explain. In either case, we encounter a claim to the effect that a system can be produced in which everything can be explained and everything can be assigned its proper place.

Cognitive semiotics, connected to both the humanities and the natural sciences through the cognitive sciences, shows that they may both share the same finality: namely, to lay down the conditions of the elaboration of meaning, a meaning of which knowledge and action are genuine parts.

Launching such dialogue is not only giving a new youth to the discipline that was created a century ago: semiotics. It is also endowing it with the solid epistemology that it needs.

Biography

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