ESSENTIAL PROPERTIES OF LANGUAGE FROM THE POINT OF VIEW OF AUTOPOIESIS

© Alexander V. Kravchenko

Language Center, Baikal National University of Economics and Law

11 Lenin Street, Irkutsk 664003, Russia

sashakr@isea.ru

Abstract

The structuralist heritage in linguistics continues to obscure the essential properties of natural language as an empirical phenomenon. It is argued that the new framework of autopoiesis possesses a greater explanatory power, as it assumes the connotational nature of language. The key notions of representation, sign and signification, interpretation, intentionality and communication, and reciprocal causality, approached from the autopoietic angle, allow for deeper insights into the essence of language which is as a kind of adaptive behavior of an organism involving a system constituted by signs of signs.

1. The Goal

Methodological inadequacies of linguistic semiotics (Kravchenko 2003a) have been to a large degree responsible for lack of any serious progress in the study of natural language as an empirical phenomenon, because whether intentionally or not, the true nature of linguistic signs was obscured by the strong beliefs that signs were artificial, conventional, and arbitrary entities intentionally produced by humans for the purpose of communication. Thus the truly essential properties of language remained ignored. In what follows I will try to outline some of these properties in the framework of the bio-cognitive philosophy of language, or autopoiesis (see Maturana 1978; Maturana and Varela 1980; 1987; Varela, Thompson and Rosch 1991; Kravchenko 2002a; 2002b; 2003b). Although the basic theoretical tenets of this framework have not yet gained noticeable recognition in linguistic circles, particularly, in cognitive linguistics as the new paradigm for the study of language, the unquestionably vast explanatory potential of autopoiesis (Kravchenko 2001) lends it as a methodological stronghold for the effort to find solutions to major linguistic issues that heretofore have evaded more or less consistent and/or comprehensible explanation in the framework of the old (traditional) paradigm.

2. Fundamental Premises

The crucial difference between the traditional and autopoietic views of language is that the latter assumes its connotational, rather than denotational, nature. As Maturana points out,

> denotation is not a primitive operation, it requires agreement consensus for the specification of the denotant and the denoted. If denotation is not a primitive operation, it cannot be a primitive linguistic operation, either. Language must arise as a result of something else that does not require denotation for its establishment, but that gives rise to language with all its implications as a trivial necessary result. This fundamental process is ontogenetic structural coupling which results in the establishment of a consensual domain. ... Linguistic behavior is behavior in a consensual domain.
>
> Maturana (1978: 50)

Correspondingly, the key notion of *representation* proposed by Maturana is also radically different from the traditional one. Representations are relative neuronal activities characterizing the state of an organism's nervous system as a structure-determined system; because of this, the sequence of changing relations of relative neuronal activity (description) that appears to the observer as determining a given behavior, is not determined by any functional or semantic value that the observer may ascribe to such a behavior but is necessarily determined by the structure of the nervous system at the moment at which the behavior is enacted. It follows that adequate behavior is necessarily only the result of a structural matching between an organism (dynamic system) and its medium. This conclusion gives the entire philosophical discussion about the nature of mental representations a genuinely scientific (naturalist) angle and is a giant step toward understanding consciousness and cognitive (mental) processes.

3. Phenomenological Nature of Signs

As a logical consequence from these fundamental premises, the signifying function of linguistic signs does not arise from their direct relation to the external world, it arises from *human experience* as the basis of knowledge; therefore, it cannot be arbitrary in the accepted sense of the word. The essential non-arbitrariness of signs is sustained by the theory of signs developed by Peirce, particularly, by his concept of indexical signs. Peirce used the term *index* for

> a sign, or representation, which refers to its object not so much because of any similarity or analogy with it, nor because it is associated with general characters which that object happens to possess, as because it is in dynamical (including spatial) connection both with the individual object, on the one hand, and with the senses or memory of the person for whom it serves as a sign, on the other hand.
>
> (Peirce 1932: 170).

As may be seen, the emphasis in this definition is laid on the *phenomenological nature of signs* (including linguistic signs), the one aspect that for a long time has been outside

the scope of interest of linguistics. However, even Heraclitus paid attention to the main empirical property of the world (and, by inclusion, of language as part of the world) determined by the phenomenological basis of cognition: remember his famous observation, *Everything is in a flux*. In a sense, he was the founder of metaphysics, for he accepted the idea of the unity of nature. Heraclitus' successor Cratylus from Athens took his idea to its logical completion when he concluded that it is impossible to refer to one and the same thing twice, therefore, it is possible only by indication. As can be seen, in the historical context of generation of ideas even Peirce was not original.

The study of the effects of indexicality as a feature of sign forms at different functional levels in the framework of a unified theory of indexicals (Kravchenko 1992, 1995, 1996) gives solid reasons to believe that indexicality as a feature is characteristic of *any* sign, albeit to a different degree: thus, there are no pure symbols, and, from the point of view of logic, there cannot be any, as Peirce stressed at the time. As Putnam (1986: 234) observes, "indexicality extends beyond the *obviously* indexical words and morphemes (e.g., the tenses of verbs). ...Words like 'water' have an unnoticed indexical component: 'water' is stuff that bears a certain similarity relation to the water *around here*."

4. Sign and Meaning

So we come to realize that signs, if their purpose is to serve as a stable means of storing and transferring information, must, of necessity, be abstract entities (this is, by the way, one of the reasons why signs are often defined as bilateral, or physical-ideal, entities). It would seem that most linguistic signs identified as symbols in the spirit of Saussure (1922), Losev (1991), etc., i.e. as arbitrary signs with conventional meanings, meet this condition. Schematically, the conventionality of meaning is illustrated by the famous semantic triangle of Ogden and Richards (1927: 11) in Figure 1.
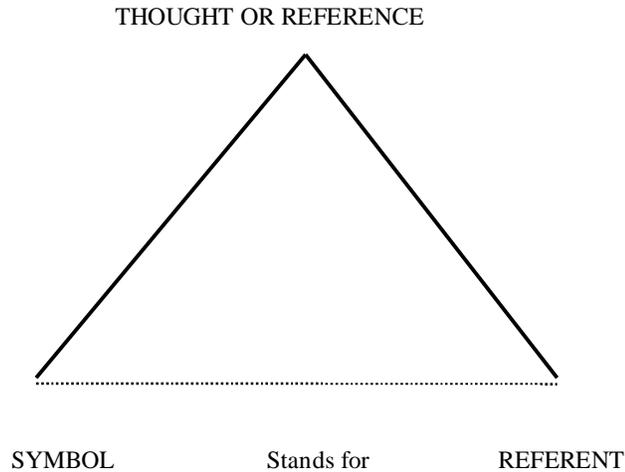
THOUGHT OR REFERENCE

```
                    /\
                   /  \
                  /    \
                 /      \
                /        \
               /          \
              /            \
             /              \
            /                \
           /                  \
          /....................\
```

SYMBOL   Stands for   REFERENT

Figure 1. The semantic triangle

As may be seen from the diagram, between the Symbol and the Thought and between the Thought and the Referent there is a relevant relation, whereas between the Symbol and the Referent "there is no relevant relation other than the indirect one, which consists in its being used by someone to stand for a referent" (*ibid.*). If language is viewed from a structuralist stance, i.e., as an autonomous sign system, such an understanding of linguistic signs does not cause any particular objections. Yet if we reject Saussure's principle of distinguishing between *lange* and *parole* as to a large degree artificial and empirically unjustified, some doubts begin to appear.

1.The word as a typical linguistic sign possesses physical substance at every single moment of its existence (be it in *langue* or *parole*), it stands in a spatio-temporal relation to various other physical entities that shape the context of the word's being, or its environmental medium; it is, therefore, natural that changes in this context should result in changes in the nature and number of relations which a word enters. It follows that the set of associations responsible for the formation of what can be named as "experience of the sign" and, because of that, connected with the information attached to the sign, may vary.

2. The being of the physical entity "sign" in space and time implies its change (in the physical sense): the form of the sign turns out to be not permanent, not given once and for all, it is subject to considerable permutations (which has been more than convincingly shown by historical linguistics). These changes, in their turn, cause qualitative and quantitative changes in the interrelations of the sign and other entities including other signs, and thus cannot but tell on the resulting experience of the sign which the sign user relies on, and on the information which constitutes the content of the sign form.

3. As a consequence, the relationship between the sign vehicle (the signifier) and its content (the signified) at every given moment cannot be characterized as absolutely arbitrary in so far as we cannot describe as arbitrary the nature of the associations which accompany the sign and are determined by the user's experience of the sign.

4. These associations themselves are nothing but concepts prototypically understood as mental structures functioning as operational units of consciousness in the process of acquiring and representing experience. Therefore, the physical nature of sign on the one hand, and the phenomenological source of concepts represented by sign, on the other, do not allow for treating sign as a pure abstraction, and it means that *there are no pure symbols in principle*. If it is indeed the case, then the meaning of any linguistic sign cannot be described completely and exhaustively. Few would query the truth of this assertion today. Does it mean that the problem of linguistic meaning cannot be solved at all? I do not think so.

In cognitively oriented linguistic analysis the meaning of a sign is related to its capacity to activate in the interpreter's mind a concept, or a set of concepts associated with the given specific sign on the same grounds as in the case when the sign user makes a choice in favor of one out of a number of signs potentially available for the representation of the same concept. Adequate interpretation of linguistic sign (understanding, in the trivial sense of the word) is, essentially, a procedure for a more or less exact identification of such grounds. The less exactly these grounds have been identified, the more probable it is

that the input knowledge and the output knowledge will differ (hence, the line drawn between the "meaning" of a sign and its "sense").

5. *Experiential Nature of Interpretation*

The realization of this led to an introduction into linguistic circulation of the term "speaker's meaning" because, as Langacker (1987) pointed out, there are no two speakers using one and the same identical language system. Speaker's meaning has been routinely contrasted with conventional meaning as the one deviating from certain norms and rules for sign interpretation accepted in a given linguistic community. But norms and rules are only a reflection of some common generalized experiences, they are not imperative prescriptions passed down by someone which must be followed to the letter. For example, we know that beer is a light alcoholic beverage made of water, malt, and hops with the use of specific technology, and should we observe someone sprinkling his head with beer from an open bottle, it will not for that reason stop being to us what it is, beer. It is a different question what goal the user in this case is trying to achieve (different users may have very different goals), but if we assume that the person we observe is not insane, we will most probably start looking for a possible reasonable explanation for such unconventional use of beer, trying to relate what we just witnessed to our experience and knowledge — which, in the case of the older generation at least, will tell us that a few decades ago women used to use beer in such an unconventional way when curling their hair.

The case of a deviant use of a sign is very similar in this respect, and if we possess sufficient experience of signs, if we have shared experience with the sender of the sign and experience of the world in which we, the sender, and the sign exist, we can, as a rule, identify (with a certain degree of approximation) the grounds on which the choice has been made in favor of one particular sign rather than any other from all possible signs (cf. Grice's 'conversational implicatures'). In particular, this process underlies such typical natural language phenomena as metonymy and metaphor.

So, signs are not just vehicles for the transfer of knowledge, they also serve to store knowledge; they are forms filled with certain content. Content — and this is important — should not be understood as what may and often is described in philosophy as the grasped essence of a given phenomenon represented in this form, but the mentally processed experience of this phenomenon's relationships with other entities or phenomena in the real world. A red sunset in itself does not necessarily speak of windy weather we may find tomorrow: it can be the effect of a gigantic distant forest or steppen fire, unusual paranormal phenomena in the atmosphere, or the like. It is only the accumulated available experience that allows a human interpreter to find a relatively regular connection between the sunset color and a possible change in weather; and it is this relationship that becomes the attached content. As it were, red sunset becomes a sign in the sense that, on account of available experience, it embodies certain information without being intentionally produced by man.

The sender who intentionally uses a sign, does not extract it from some obscure depository of sign vehicles to which the so-called conventional meanings have been attached (by whom? when?). He uses the sign that has been acquired and mastered by him in the course of gaining individual experiences as an observer of the world in the spatio-temporal, geographical, historical, cultural, etc. medium of which language itself is a part. The various aspects of these diverse experiences are projected on a combination of psychic (mental) associations (= concepts) whose attachment to a given linguistic sign acquires public significance. That is why for every sender every sign is processed in the mind of the observer in the totality of its relationships with very different things and events.

The less prerequisite knowledge of the medium in which the user of the sign functions as *homo sapiens/loquens,* the less the total amount of implications this sign may cause. For example, a red sunset is not indicative of anything to a little child who lacks relevant experience; that is why a red sunset will not be a sign to this child in any acceptable

sense. But just in the same manner, a word spoken by someone will not be a sign to the little child either, on condition that it is new or unknown:

> Not only a child, but even an adult individual unfamiliar with some special language (such as the languages used by professionals in medicine, botany, chemistry, mathematics, etc.) is, in a way, not unlike a semantic aphasiac. Words whose external makeup corresponds well to the words of his native language to him seem hard to combine in meaningful sequences.
>
> (Zhinkin 1998: 66).

In other words, what is, by definition, a produced sign for a given linguistic community, does not necessarily function as such for every single member of this community capable of perceiving this sign. To a human individual, a word becomes a sign only after it has become, as a bonding, mediating component, part of a system of stable associations between things and phenomena in the world, these associations forming a specific mental structure (concept) which, in the long run, forms the basis for what is usually referred to as the meaning of a sign. Words mean nothing of themselves. "It is only when a thinker makes use of them that they stand for anything, or, in one sense, have 'meaning'" (Ogden and Richards 1927: 9 ff.). A system of such associations depends in a very straightforward manner on conditions (in a broad sense) under which the sign is acquired. Therefore, to every single individual a set of jointly encountered entities which causes a certain implication, is uniquely individual. As was noted by Locke (1961), for every human the words he uses express those ideas which he has and which he would like to express by them.

As an example, the utterance by a Russian of the word *kasha* ('hot cereal') will cause in the mind of one individual an association with cream-of-wheat sweetened with sugar, for another the association will be with buckwheat or millet boiled in water, with salt and butter added, for a third one it will be something else, and if the interpreter cannot retrieve these associations from the sign addressed to him, one cannot say that the interpreter has received the full meaning intentionally attached to the sign by the sender. Russell wrote in this connection:

You can learn by a verbal definition that a pentagon is a plane figure with five sides, but a child does not learn in this way the meaning of everyday words such as "rain", "sun", "dinner", or "bed". These are taught by using the appropriate word emphatically while the child is noticing the object concerned. Consequently the meaning that the child comes to attach to the word is a product of his personal experience, and varies according to his circumstances and his sensorium. A child who frequently experiences a mild drizzle will attach a different idea to the word "rain" from that formed by a child who has only experienced tropical torrents. A short-sighted and a long-sighted child will connect different images with the word "bed".

(Russell 1948: 4).

6. Intentionality and Signification

6.1. The Notion of Intentionality

The notion of intentionality in modern science is used at least in three separate areas: linguistic semiotic, philosophy and cognitive psychology, and autopoiesis as a theory of self-organized living systems.

In the first case, intentionality is defined as a necessary constitutive property of sign. A sign is an artifact intentionally produced for the purpose of performing a communicative function, and that is what makes it intentional.

In the second case, in the philosophical theory of knowledge intentionality is understood as a specific psychological category which connects thoughts with things and mind with the world, which is also known as 'Brentano's thesis' (Putnam 1988; Haldane 1989; 1992; Priest 1991). The problem of the definition of intentionality as mental content represented in some way in mental structures and reified through formal semantic structures, became the focus of a lively discussion which ensued in the 1980s - 1990s around knowledge and how and in what form it exists in the human mind (although in the Russian world view, for example, the latter is impossible without the former, it is constituted

by it, for mind/consciousness[1] is the property of man having knowledge, i.e., man *with knowledge*). As Lycan (1996) puts it, "all there is to mind is intentionality."

In the third case, intentionality is viewed as a mode of self-organization of a living system: interacting with the environment (as it appears to an observer and without reference to the autonomous unity), an organism adds the surplus of *signification*, so that it becomes the environment *for* the organism which is defined in the same movement that gave rise to its identity and that only exists in that mutual definition — the system's world (Varela 1992).

Speaking about the intended "producibleness" of linguistic signs, structuralists seem to overlook the essential difference between the spoken and written language. Admittedly, a written word is a *bona fide* artifact, but how justified is inclusion of spoken words in the class of artifacts? Is it just because one out of a number of existing hypotheses about language origins claims man to be its conscious creator? But a hypothesis, no matter how appealing, remains a hypothesis until it has received sufficiently reasonable and convincing proof. As of today, science does not have solid proof that language is the product of man's purposeful activity.

On the contrary, researchers into the origins of language are inclined to think that language is the evolutionary property of man as a biological species: "Language is not a cultural artifact that we learn the way we learn to tell time or how the federal government works. Instead, it is a distinct piece of the biological makeup of our brains" (Pinker 1995: 18). In this case the issue of artificial origins of linguistic sign (the spoken word) is stricken from the agenda altogether. Indeed, it would hardly occur to anyone to speak of artificial origins of laughter, crying, or screams of pain, despite the fact that all of these can be considered as means of communication as they produce orientational influences. Here we are reminded of the inadequacy of the commonly accepted definition of the function of language as one of communication: "Language, in its developed literary and

---

[1] There is no direct correspondence between *mind, consciousness* as they are used in English and their Russian counterparts *razum, soznanije*. Depending on the context, *soznanije* may be translated either as *mind* or *consciousness*, and *razum* may be translated as *mind* or *intelligence*.

scientific functions, is an instrument of thought and of the communication of thought" (Malinowski 1927: 297). Such an understanding of the function of language prevails in contemporary linguistic literature (see Millikan 1984; Carruthers 1996; Van Valen and LaPolla 1997; Carruthers and Boucher 1998; Origgi and Sperber 2000 *inter alia*). Yet this definition does not cover all the essential properties of language. According to Zvegintsev,

> language is an activity that involves all the functions which make humans human. And language is an activity that generates the means for its realization in concord with the diverse functions possessed by language. [...] To limit the study of language to the study of its use as a means of communication and thought is to deliberately narrow the scope of one's research and forsake cognizance of the true nature of language in its entirety.
>
> (Zvegintsev 1996: 50).

Linguistic activity (languaging) constitutes only a subdomain of communicative interactions which can be both of linguistic and non-linguistic nature. At the same time, by contrast with non-linguistic types of communication, the use of language (that is, oral speech) is always associated with intention as an act of volition or a desire to enter communication. But still, all is not as simple as it may seem.

On the one hand, laughter or the sound of crying does not differ in this respect from speech because a man by a similar act of volition (i.e., intentionally) may make himself cry or laugh even when he does not at all feel like crying or laughing, or he can restrain himself from a compelling desire to weep or roll with laughter. On the other hand, a trivial case of linguistic activity is a "non-communicative" speech act when the addressee is either the speaker himself, or an animal without linguistic ability, or an object known to be inanimate, or there may be no addressee as such. The latter case is represented by situations when a man totally absorbed in some activity utters words, phrases, or whole sentences often without even being aware of them. The only thing which distinguishes the sounds produced by a human in such a case from non-linguistic sounds (sighs, groans, and the like) is the meaning associated with them and established as part of the language system, but they often do not have any identifiable *communicative sense*. If we,

however, remember that structuralists consider intentionality in the context of intended *purposefulness* as the property of a sign addressed to a receiver, then the question arises, "Who is the addressee here?"

So, the notion of intentionality in linguistic semiotics is rather indeterminate and fuzzy. And if we relate the notion of intentionality directly with the semiotic process of sign generation, that is, with categorization of objects as meaningful entities interactions with which produce orientational influences on an organism by *in*-forming it in the world, then we are confronted by a necessity to consider intentionality as a biological cognitive function.

Intentionality as a philosophical category has to do with the problem of relation of thought to the world by means of language (Fodor 1987; Carruthers 1996). In this context, representations and intentionality are two sides of the same medal (see Fodor 1998), but no one seems to know (at least, such is the impression) what the medal is made of.

The dead end in which philosophical thought has found itself is the logical outcome of the attempts to solve the problem within the theoretical framework of formal verbal logic in the best Cartesian tradition, whereas everyone seems to understand that a thought and a linguistic expression used for this thought are not one and the same thing. Without going into the specifics of the philosophical discussion of intentionality as mental content, I will refer the reader to an authoritative source in regard to the place of logic in the solution of the problem of mental activity:

> Logic has frequently been defined as the science of the laws of thought. But this definition, although it gives a clue to the nature of logic, is not accurate. In the first place, thinking is one of the processes studied by the psychologists. Logic cannot be 'the' science of the laws of thought, because psychology is also a science which deals with laws of thought (among other things). And logic is not a branch of psychology; it is a separate and distinct field of study.

In the second place, ... all reasoning is thinking, but not all thinking is reasoning. ...

(Copi 1961: 3 ff.).

Johnson-Laird's (1983) doubts about the logical apparatus being part of the human cognitive mechanism seem more than justified, even for the reason that "we learn logic in learning language" (Quine 1970: 100), and not the other way around.

So, whether we like it or not, only one solution to the problem of intentionality seems to be tangible, within the scientific (biological) paradigm, but of course on condition that intentionality is treated as a cognitive phenomenon of the living organism's self-regulation. By and large, the problem of intentionality cannot be separated from the problem of meaning; moreover, it is the key to understanding the genesis of meaning. For if we assume the causal nature of sign relations, we cannot but acknowledge that a causal relation itself (such as the relation between smoke and fire, for example) is already signi-fication brought unto the world by a living (cognitive) system in its movement to *in*-formation in this world through the mutual definition of its identity in the organism's en-vironment created by signification.

6.2. Communication

The essential feature of communication is that one organism produces an orientational influence on another organism as a result of which the behavioral response of the organism to be oriented (the description of his niche) is modified. It must be understood that this influence is orientational mostly because the first organism has an intention to modify the other organism's behavior in a certain way — which, however, does not mean that the second organism's behavior will necessarily be modified. But what is the source of this intention, and of what relevance can modification of the second organism's behavior (that is, the modification of the description of the niche) be to the first organism?

Evidently, the aim of such modification is to change the medium of the first organism (its domain of interactions) of which the second organism with its niche is a part. The

purpose of this change is to optimize the first organism's interactions with the medium, i.e., in the long run, it is determined by the first existential priority of a living system, survival. "For the organism, the environment is a set of processes and components that have to be recognized and manipulated in order to be capable to survive and reproduce" (Moreno, Merelo, Etxeberria 1992: 66).

Modification of the behavior of an organism to be oriented is possible under the following conditions:

(i) a consensual domain of interactions both organisms share,

(ii) the organism to be oriented (the observer) interacts with representations of descriptions (behavioral patterns) of communicative interactions of the orienting organism (its communicative behavior) with representations of first-order descriptions (non-communicative behavior), which presupposes

(iii) an intentional act of bringing signification into the consensual domain of interactions both on the part of the orienting organism and the organism to be oriented; it is this which enables self-regulation of an organism as a living system *informing* in the environment and making it the world filled with signification.

For example, organism *A* and organism *B* share a consensual domain of interactions. Organism *A* interacts with the medium, and its behavior which is an outcome of such interactions is a description of these interactions (a description of the niche, or a first-order description). Interactions of organism *A* (which is an observer of its own interactions) with such descriptions result in specific states of neuronal activity or representations (second-order descriptions). Then, organism *A* enters the domain of non-physical interactions with representations, and its behavior modified by these interactions to organism *B* will be a third-order description, that is, a description of interactions with representations (communicative behavior).

Organism *B*'s observation of the third-order descriptions is none other than interactions with environmental components which result in representations, but this time in or-

ganism *B*'s nervous system. Organism *B*, in its turn, interacting with the medium not unlike it is done by organism *A*, may itself play the role of an observer of its own descriptions. In such a case it finds itself in a situation when interactions with organism *A*'s third-order descriptions cause a representation in the mind of organism *B* whose configuration more or less coincides with the configuration of a representations which already exists as a result of organism *B*'s interactions with its own descriptions. The resulting resonance effect activates the already existing representation interactions with which lead to a modification of organism *B*'s behavior, this modification having been initially caused by organism *A*'s interactions with its own representations.

This is, basically, what communicative interaction is about, and as may be seen, its structure is rather simple. Yet one link in this structural chain remains a mystery — the driving force behind an organism's interactions with representations of its own interactions. What makes an organism enact such interactions?

6.3. Reciprocal Causality

The answer evidently lies in the understanding that representations as specific states of neuronal activity possess signification in the sense that they modify an organism's behavior bearing on interactions with another organism as a component of the world with which the first organism stands in a relation of *reciprocal causality*. Positing reciprocal causality as an ontological given allows us to speak of "various *modes* of self-organization where the local [an organism] and the global [the world] are braided together" (Varela 1992: 6).

The signification of reciprocal causality consists in that a change (as a result of interactions) of one element in the relation effects a change in the other element, modifying the medium which, in turn, exerts a modifying influence on the organism, and so on in recursive order. And here again we are dealing with a circular organization:

$\Rightarrow$ interactions with the medium are described by organism *A*'s behavior

$\Rightarrow$ organism A's own observed behavior is described by representations

$\Rightarrow$ representations are described by organism A's communicative behavior

$\Rightarrow$ organism A's communicative behavior observed by organism B activates representations in organism B which are descriptions of its own behavior analogous to organism A's behavior

$\Rightarrow$ organism B modifies its behavior as if it were interacting with the same medium and in the same manner as organism A; but because the domains of interactions of A and B do not coincide, the modified behavior of B cannot be a complete description of its domain of interactions, it will only describe the domain of communicative interactions changing, at the same time, the state of the world which *in*-forms organism A

$\Rightarrow$ this change effects a modification of organism A's behavior which is a description of its domain of interactions

$\Rightarrow$ the circle closes.

The modification of an organism's behavior specified by the signification of representations is the *biological foundation of intentionality* as a property of a living system. Signification itself arises from the establishment of causal relations between an organism's different interactions (including interactions with representations), that is, from experience.

In particular, it means that there may be no intentionality in the absence of signification, and since signification is a function whose argument is experience, and the amount and content of experience display a direct temporal dependency, the following conclusion is in place:

> *Intentionality is the capacity of a living system to modify its state of reciprocal causality with the world on the basis of experience acquired with time for the purpose of sustaining the ecological system which enables reciprocal causality between the organism and the world*

In other words, intentionality is a cognitive function of an organism as it is understood in autopoiesis:

> the functions that are usually considered cognitive are the result of a specialised subsystem of the organism continuously reconstructing patterns that are functional or referentially correlated with certain changes occurring in the environment. This set of patterns (built up during the existence of each cognitive organism) makes up what we usually call information.
>
> (Moreno, Merelo and Etxeberria 1992: 67).

These continuously reconstructing patterns which correlate with changes in the environment are those specific states of neuronal activity (representations) with which an organism interacts just because they correlate (are in a causal relation) with the changes in the environment; that is, they possess signification. This allows us to make a conclusion relevant not only to semiotic, but to the general theory of knowledge.

7. Conclusion

> *Representations as mental structures borne of experience (and for that reason functioning as a storage facility for knowledge) are sign entities whose biological function is that an organism, by interacting with them, adapts to the medium by managing information*

Thus we return again to the conceptual direction in the evolutionary history of semiotics (see Clarke 1987) set by the ideas of mental states (Aristotle) or mental words (St. Augustine) which are natural signs (Ockham) or private *notae* (Hobbes), and to which

18

the notion of index as a type of sign (Peirce) stands in direct relation. This is just another proof of the truism that anything new is a thoroughly forgotten old.

Besides, this conclusion undermines the whole palace of structuralism constructed around the concept of sign in general and linguistic sign in particular. For truly, if natural (spoken) language is treated as a kind of adaptive behavior of an organism (a description of an organism's interactions with representations which are in a causal relation with the changes in the environment), then linguistic signs appear to be not signs of components of the medium (that is, physical entities or objects) but of representations which themselves are signs by definition. Consequently, *language is a system constituted by signs of signs* (cf. Peirce's "a sign for a sign" principle).

In turn, linguistic signs as a totality of environmental components constitutive of an organism's particular behavior (communicative behavior) as a description of the niche of cognitive interactions are subject to change to the extent that the organism and the medium are in a state of reciprocal causality. This explains, in particular, the historical change of language as its salient feature. In addition, since language is a specific medium (a subdomain of the cognitive domain of interactions), or a part of the world, and at the same time an activity of which this medium is the product, its state is determined, in quite a natural way, by the state (the sum total of specific features) of the world, which helps understand the developmental history of human languages and their diversity.

References.

CARRUTHERS, P. (1996). *Language, Thought and Consciousness. An Essay in Philosophical Psychology.* Cambridge University Press.
CARRUTHERS, P. and J. BOUCHER (eds.) (1998). *Language and Thought.* Cambridge: Cambridge University Press.
CLARKE, D. C. (1987). *Principles of Semiotic.* London & N.Y.: Routledge & Kegan Paul.
COPI, I. M. (1961). *Introduction to Logic.* New York: Macmillan.
FODOR, J. A. (1998). *Concepts: Where Cognitive Science Went Wrong.* Oxford: Clarendon Press.
FODOR, J. A. (1987). *Psychosemantics: The Problem of Meaning in the Philosophy of Mind.* Cambridge, MA.: Bradford Books/The MIT Press.

HALDANE, J. (1989). "Naturalism and the Problem of Intentionality". *Inquiry, 32*. 305-322.

JOHNSON-LAIRD, P. N. (1983). *Towards a Cognitive Science of Language, Inference, and Consciousness.* Cambridge University Press.

KRAVCHENKO, A. V. (2003a). "The ontology of signs as linguistic and non-linguistic entities: a cognitive perspective" *Annual Review of Cognitive Linguistics*, *1,* pp. 183-195.

KRAVCHENKO, A. V. (2003b). *Sign, Meaning, Knowledge. An Essay in the Cognitive Philosophy of Language.* Frankfurt/Main: Peter Lang GmbH, 2003.

KRAVCHENKO, A. V. (2002a)".Toward a bio-cognitive philosophy of language". *Perspectives: Journal for Interdisciplinary Work in the Humanities, 1:5* (http://www.brookes.ac.uk/~ /perspectives).

KRAVCHENKO, A. V. (2002b). "Cognitive Linguistics as a Methodological Paradigm". In B. Lewandowska-Tomaszczyk and K. Turewicz (eds.). *Cognitive Linguistics Today* (pp.41-54). Frankfurt/Main: Peter Lang.

KRAVCHENKO, A. V. (2001). "Kognitivnaja lingvistika i novaja epistemologija". *Izvestiya akademii nauk. Serija literatury i jazyka, 60:5,* pp.3-13. ["Cognitive linguistics and new epistemology"].

KRAVCHENKO, A. V. (1992). *Voprosy teorii ukazatelnosti: Egotsentrichost. Deiktichnost. Indeksalnost.* Izdatelstvo Irkutskogo universiteta [*Issues in the Theory of Indication: Egocentricity. Deixis. Indexicality*].

KRAVCHENKO, A. V. (1995). "Glagolnyj vid i kartina mira". *Izvestija akademii nauk. Serija literatury i jazyka, 54:1.* 49-64 ["Verbal Aspect and the World View"].

KRAVCHENKO, A. V. (1996). *Jazyk i vosprijatije: Kognitivnyje aspekty jazykovoi kategorizatsii.* Izdatelstvo Irkutskogo universiteta [*Language and Perception: Cognitive Aspects of Linguistic Categorization*].

LANGACKER, R. W. (1987). *Foundations of Cognitive Grammar. Vol. 1: Theoretical Prerequisites.* Stanford.

LOCKE, J. (1961). *An Essay Concerning Human Understanding.* London: Dent (original work published 1690).

LOSEV, A. F. (1991). *Filosofia. Mifologia. Kultura.* Moskva: Politizdat [*Philosophy. Mythology. Culture*].

LYCAN, W. (1996). *Consciousness and Experience.* Cambridge, MA: The MIT Press.

MALINOWSKI, B. (1927). "The Problem of Meaning in Primitive Languages". In Ogden, C. K. and I. A. Richards. *The Meaning of Meaning: A Study of the Influence of Language University Presson Thought and of the Science of* Symbolism (pp.296-336). 2nd revised edition (University Press Supplement I). New York: Harcourt, Brace & Company.

MATURANA, H. R. (1978). "Biology of Language: The Epistemology of Reality". In G. Miller and E. Lenneberg (eds.). *Psychology and Biology of Language and* Thought (pp.28-62). NY: Academic Press.

MATURANA, H. & F. VARELA (1980). *Autopoiesis and Cognition: The Realization of the Living.* Boston: D. Reidel.

MATURANA, H. & F. VARELA (1987). *The Tree of Knowledge: The Biological Roots of Human Understanding*. Boston: Shambhala.

MILLIKAN, R. (1984). *Language, Thought and Other Biological Categories*. Cambridge, MA: The MIT Press.

MORENO, A., J. J. MERELO & A. ETXEBERRIA (1992). "Perception, Adaptation and Learning". In B. McMullin and N. Murphy (eds.). *Autopoiesis and Perception: A Workshop with ESPRIT BRA* 3352 (pp.65-70). Dublin.

OGDEN, C. K. & I. A. RICHARDS (1923/1927). *The Meaning of Meaning: A Study of the Influence of Language University Presson Thought and of the Science of Symbolism*. 2nd revised edition. New York: Harcourt, Brace & Company.

ORIGGI, G. and D. SPERBER (2000). "Evolution, Communication and the Proper Function of Language". In P. Carruthers and A. Chamberlain (eds.). *Evolution and the Human Mind: Language, Modularity and Social Cognition*. Cambridge: Cambridge University Press.

PEIRCE, C. S. (1932). "Elements of Logic". In C. Hartshorne and P. Weiss (eds.) *Collected Papers of Charles Sanders Peirce*. Cambridge: Harvard University Press, vol. 2.

PINKER, S. (1995). *The Language Instinct: How the Mind Creates Language*. New York, NY: Harper Perennial.

PRIEST, S. (1991). *Theories of the Mind: A Compelling Investigation into the Ideas of Leading Philosophers on the Nature of the Mind and Its Relation to the Body*. The Penguin Books.

PUTNAM, H. (1975/1986). *Philosophical Papers, vol. 2: Mind, Language and Reality*. Cambridge University Press.

PUTNAM, H. (1988). *Representation and Reality*. Cambridge, MA: The MIT Press.

QUINE, W. V. O. (1970). *Philosophy of Logic*. Englewood Cliffs, NJ: Prentice-Hall.

RUSSELL, B. (1948). *Human Knowledge: Its Scope and Limits*. New York: Simon & Schuster.

SAUSSURE, F. de (1916/1922). *Cours de linguistique générale*. Paris: Payot & Cie.

VAN VALIN, R. D. & R. L. LaPOLLA (1997). *Syntax: Structure, Meaning and Function*. Cambridge University Press.

VARELA, F. J. (1992). "Autopoiesis and a Biology of Intentionality". In B. McMullin and N. Murphy (eds.). *Autopoiesis and Perception: A Workshop with ESPRIT BRA* 3352 (pp.4-14). Dublin.

VARELA, F. J., E. THOMPSON & E. ROSCH (1991). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: The MIT Press.

ZHINKIN, N. I. (1998). *Jazyk. Retch. Tvorchestvo*. Moskva: Labirint [*Language. Speech. Creativity*].

ZVEGINTSEV, V. A. (1996). *Mysli o lingvistike*. Izdatelstvo Moskovskogo Universiteta [*Thoughts about Linguistics*].