

Bazan, A. (2002). The unconscious is affect sticking to phonology. Considerations on the role of articulation. *Psychoanalytische Perspectieven*, 20(4), 579-590.

## **THE UNCONSCIOUS AS AFFECT STICKING TO PHONOLOGY** **Considerations on the role of articulation**

Ariane Bazan

### *Introduction and problem presentation*

In this article the typical human unconscious is presented as a product of evolution not as something in the first instance purposeful, but rather as an artifact or a pay-off for language. The title of this paper could therefore also have been: "the unconscious as the price humans have to pay for language". While there may be some debate about the particular kind of process involved (*e.g.*, whether automatic or implicit), the unconscious to be debated in this contribution is restricted explicitly to the Lacanian unconscious as it presents itself in productions such as symptoms or dreams. It is the unconscious that Lacan (1977) considers to be structured as a language. Operationally, this unconscious is the origin of signifier-mediated affective "mismatches".

The dynamics of this unconscious are illustrated in two examples. In the first example of a phobia, a person incomprehensibly fears *ice*, whether icy weather or as ice cubes. On analysis, this seems to be related to an original problem with the person's *eyes*. In the second example a woman dreams that she is sitting in front of her therapist and that their feet are touching. The meaning of the dream becomes clear when she formulates its content as "we sat sole to sole".

The initial problem therefore is operationalised as follows. First, it seems that language does not exclusively make sense via semantics, but that phonology (which is the same for "ice" and "eyes" or for "sole" and "soul") is also a carrier of sense, not of semantic, but rather of affective sense. Moreover, semantic and affective processing appear to be relatively independent. For example, in the sentence "je te montrerai les sommets de la merveille", the person has clearly understood the message but nevertheless is bothered by the phonology of "la mère veille" ("mother is watching"). She then falsely connects this unease to the semantics of the

message, namely, that someone is going to show her the top of the record (Declerq, 1995).

Clinical data therefore suggest that semantic and affective processing of language happen relatively independently of each other. Whereas one might think that this rarely results in conflict, presenting symptomatology could however be seen as the result of those occasions where important conflict arises between both pathways. It is this approach to the human unconscious as a constant tension between two neurodynamic pathways, processing the same input material in two different, and sometimes conflicting ways, which will be articulated here. In doing so, I will first analyze the determinants of the above stated proposition, namely, the neurophysiological nature of the input material we call language and of the affective sense carried by this linguistic material.

In conclusion, an approach to the unconscious as affect sticking to phonology will be discussed as well as the particular importance of articulation in the processing of affect. First, I will defend the idea that phonology is an unambiguous carrier of affect, to be conceived as a conditioning mechanism at the level of the reptilian limbic system, whereas semantic meaning is assigned after a disambiguation process at the analytical, modern neocortical level. We *feel* the phonology, but we *understand* the semantics and the possible field of tension between both experiences can be conceived as the human unconscious. This is why the unconscious can be considered the price humans have to pay for language. Second, I will defend the idea that articulation can be conceived as the scansion process that cuts the massive affective charge into a sequentially fragmented motor output and that the psychological gain in this translation process is to be seen in terms of controllability, organization and representation.

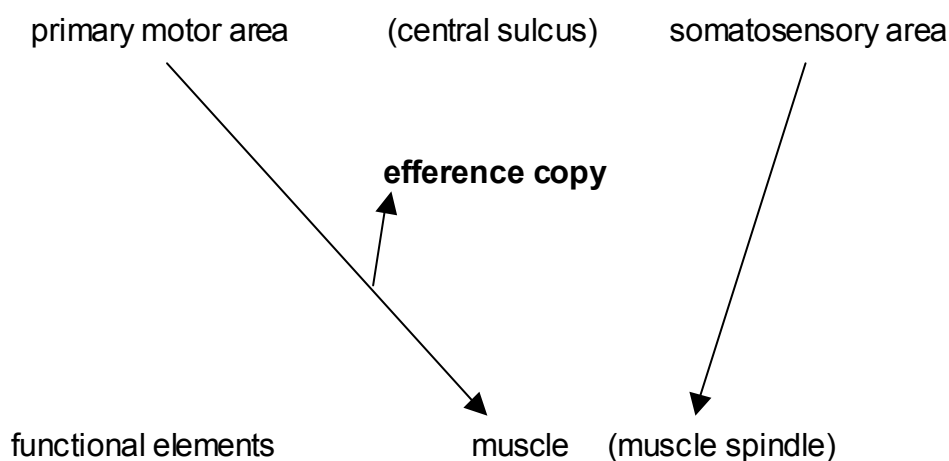
### *The neurophysiological nature of linguistic material*

To address this issue, rather than detail various aspects of language processing in the brain, I will focus on the "raw" material capable of activating the linguistic circuitry in the brain and ask what is the input signal?

In the "Project" Freud (1950a: 331) writes that something can be understood (or *grasped*) by memory work. That is, he says, "[it] can be traced back to information from [the subject's] own body". A few paragraphs further, he writes that "Cognitive or judging thought seeks an identity with a bodily cathexis [...]. As regards judging, there is further to be remarked that its basis is obviously the presence of bodily experiences,

sensations *and motor images of one's own*. So long as these are absent, the variable portion of the perceptual complex remains understood [...]" (*Ibid.*: 332-333).

There is something quite logical in Freud's schematization. To know something is to be able to put causes and effects or antecedents and consequences together via access to the connecting pathways between both. In the brain, this is only realized *through the feedback registration of a self-initiated movement*: indeed, when moving the brain has at its disposal both the message commanding the onset of the movement and the message feeding back from the perception of the movement in the body. Schematically:



When a movement is initiated in the motor cortex, a descending pyramidal pathway travels the message to the target muscles. Activation of the target muscle leads to contraction. This contraction is registered by receptor systems (organized in muscle spindles) called proprioceptive or kinesthetic systems. When activated, these receptors pass back messages to the brain, to the somatosensory area and give feedback on the effectively realized contraction. In addition, another feedback system exists, one which does not pass back information on the effectively realized movement but which registers *the movement intention*. It is called the efference copy (Van Holst, 1954).

When self-initiating a movement, the brain therefore has two types of message at its disposal: 1. a feed-back message informing the brain that a motor command has effectively left the primary motor area; and 2. a feed-back message informing the brain that this motor command has effectively arrived at its target and its effect on this target.

One important aspect of this organization is that both the leaving and the arriving commands are at the level of the neocortex, *i.e.*, the structure of the brain which permits a high level of organization of messages. Both the motor commands and the somatosensory receipts are organized topographically, *i.e.*, they have constant relative positions towards each other, constituting in their totality a body map, called homunculus (which moreover does not fundamentally differ between the motor and the somatosensory version).

Another quote from the "Project" (Freud, 1950a: 333-334) stipulates: "While one is perceiving the perception, one copies the movement oneself – that is, one innervates so strongly the motor image of one's own which is aroused towards coinciding [with the perception], that the movement is carried out. Hence one can speak of a perception having an *imitation-value*. [...] Thus judging, which is later a means for the *cognition* of an object that may possibly be of practical importance, is originally an associative process between cathexes coming from outside and arising from one's own body – an *identification of information or cathexes from  $\Phi$  [the perception] and from within*". Therefore, we can suppose that *external stimulation only makes sense for the brain if reprocessed into something self-initiated*.

One of the most exciting findings in neurophysiology of the past two decades has been the discovery of the so-called "mirror system" in the brain, reported mainly by Rizzolatti's team (Rizzolatti & Arbib, 1998). It appears that in monkeys a part of the premotor cortex (F5) contains neurons that discharge both when the monkey grasps or manipulates objects and when it observes another organism making similar actions. Recent studies suggest that a similar system exists in humans. Fadiga *et al.* (1995) reported evidence for motor activation when human subjects merely observed an action, and the muscles activated were those that would have been used had they performed the action themselves.

It is therefore not so difficult to get an idea of the nature of this body message in language. Actually, Freud (1891b: 91-92) himself in his study on aphasia, had already suggested the key element: "Understanding of spoken words is probably not to be regarded as simple transmission from the acoustic elements to the object association; it rather seems that in listening to speech for understanding, the function of verbal association is stimulated from the acoustic elements at the same time, so that *we more or less repeat ourselves the words heard*, thus supporting *our understanding with the help of kinaesthetic impressions*. A higher measure of attention in listening will entail a higher degree of transmission of speech heard on to

the tract serving the motor execution of language", he states. The motor pathway in language, of course, is the articulatory pathway.

This was also proposed by Liberman and colleagues (Liberman, Cooper, Shankweiler & Studdert-Kennedy, 1967; Liberman & Mattingly, 1985) in their "Motor Theory of Speech Perception". This theory, resulting from phonological research, holds that the basis of speech perception is not the actual sounds of speech but rather the phonetic "gestures" made by the speaker. It argues that listeners identify spoken words by using that information to access their own speech motor system. This is supported by the finding that the speech phones, the smallest units we can hear in words, link to articulatory, and not to auditory-related, invariants. Phoneticians classify and characterize phones nearly entirely in terms of how they are articulated, not in terms of how they sound.

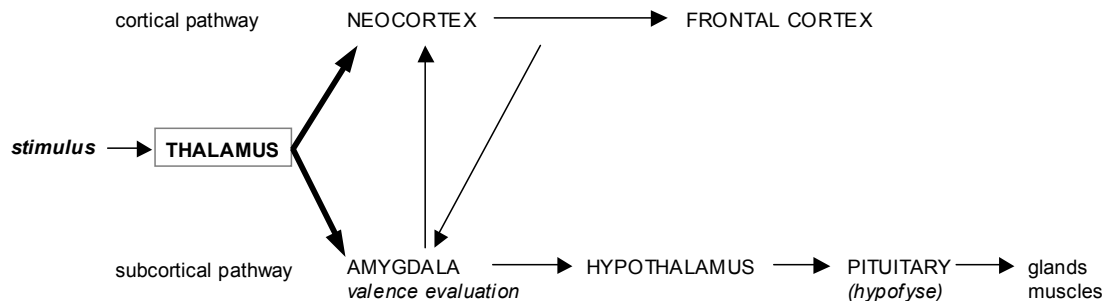
Rizzolatti and Arbib (1998) also show that there are neurons in F5 in the monkey that respond both when the animal makes lipsmacking movements and when it observes them in others. Of particular importance is the fact that these authors note that area F5 in the monkey is the probable homologue of Broca's area in humans. The Broca area is the prefrontal human neocortical area, responsible for speech production and for preparing articulatory patterns. There is a parallel argument, originating in particular with Corballis (1999), which holds that the origins of human language might be situated in manual gesture rather than in vocalization. Rizzolatti and Arbib (1998) therefore propose that the development of the human speech circuit is a consequence of the fact that the precursor of Broca's area was endowed, before speech appearance, with a mechanism for recognizing actions made by others.

#### *The neurophysiological nature of affect*

Further major progress in the nineties came with the work of Joseph Ledoux. He presented a new neurophysiological route for emotional processing schematized in the following diagram (Ledoux, 1993; 1994):

Almost all perceived external stimuli that enter the body through the special senses travel to one central structure in the brain, called the thalamus. The thalamus is like a central postal system: it receives everything and redistributes it further away. The crucial element of the scheme is the wedge. This wedge indicates that the same stimulus is processed by two different pathways, a subcortical and a cortical one. The subcortical pathway is a phylogenetically old system the so-called limbic system or reptilian brain, and it processes the affective valence of the

stimuli. It is also an ontogenetically early system: it is mature and functioning from birth onwards.



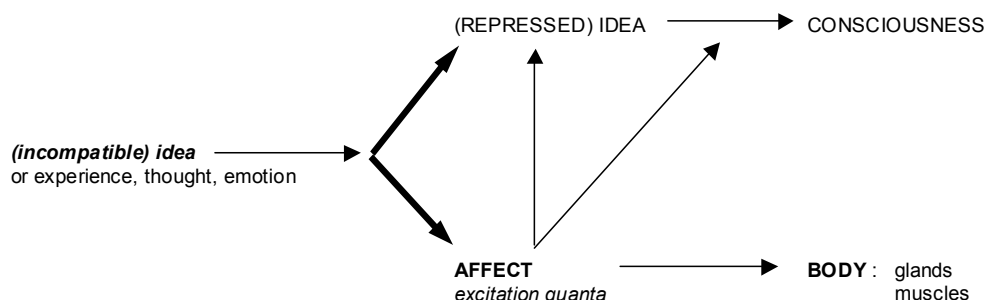
Processing at this level is fast and rudimentary. The cortical pathway is a phylogenetically modern system, it is typically mammalian and, with respect to the frontal cortex, even typically human. It processes the narrative, scenic content of stimuli. It is an ontogenetically late system: it is mature and fully functioning only from the age of about six years. Processing at this level is slow and fine-grained. Both pathways are also connected to a proper output system, a proper motor system for output. I will return to that later.

The crucial epistemological difference highlighted by Ledoux (1993; 1994) is the possible independence of the cortical and the subcortical pathways, the relative autonomy of affective valence on the one hand and scenic content on the other. While there are actually many interactive influences operating between both pathways, this does not alter the categorical difference that Ledoux (1993) proposed between affect and scene.

In "The Neuro-Psychoses of Defence" Freud (1894a: 51-52) states: "If someone with a disposition [to neurosis] lacks the aptitude for conversion, but if, nevertheless, in order to fend off an incompatible idea, he sets about separating it from its affect, then that affect is obliged to remain in the psychical sphere. The idea, now weakened, is still left in consciousness, separated from all association. But its affect, which has become free, attaches itself to other ideas which are not in themselves incompatible; and thanks to this 'false connection', those ideas turn into obsessional ideas".

In this paragraph the notion of "splitting of consciousness" as a splitting of an idea or experience into its content on the one hand and its affect (or excitation sum) on the other is clearly implied. The sum of excitation will be invested in body innervations, in conversion hysteria, or in other ideas, in obsession. The principle, however, remains the same: one and the same

experience can psychologically be conceived as a "complex" of separable elements, with different dynamic characteristics, different fates and different output systems, which, without being completely independent from each other, nevertheless possess a relative autonomy. The basic principle presented by Freud (1894a) can therefore be conceived as essentially similar to the dynamics of emotion processing as proposed by Ledoux (1993; 1994):



Both Ledoux (1994) and Freud (and others) essentially conceive affect as the feedback of a set of motor events. Ledoux (1994) states that "emotions or feelings are conscious products of unconscious processes". In Lecture XXV of the *Introductory Lectures* Freud (1916-1917) outlines what an affect is "in the dynamic sense": "An affect includes in the first place particular motor innervations or discharges and secondly certain feelings; the latter are of two kinds – perceptions of the motor actions that have occurred and the direct feelings of pleasure and unpleasure which, as we say, give the affect its key-note". In the paper on "Repression" (Freud, 1915d: 152) he writes that the quota of affect "corresponds to the instinct in so far as the latter has become detached from the idea and finds expression, proportionate to its quantity, which are sensed as affects".

What is the nature of the motor event from which feedback gives rise to an experience of affect? If we take up Ledoux' scheme (1993) again, we note that the amygdala produces an output through an effector pathway which involves the hypothalamus and the pituitary gland. Activation of this pathway produces a stereotypic pattern of responses, including secretion of a number of hormones (epinephrine, norepinephrine, stress hormone), an increase in heart rate, vasodilatation of blood vessels in the brain, the kidneys, the heart, the lungs and the limb muscles, vasoconstriction in skin and intestinal tract and increased sweating (the so-called galvanic skin response). The activation of this response set is not an all-or-nothing affair. Some parameters are very sensitive to the slightest activation of the hypothalamus-pituitary-pathway, like the galvanic skin

response. Neurophysiologically, at the level of the body output, the response system seems rather stereotypic, giving the same parameter changes for all kinds of excitations, positive or negative. Only the extent of activation changes. It seems that it is at the neocortical level of interpretation that the particular emotional color is attributed to the body feeling.

### *Conclusion*

The idea of the unconscious as affect sticking to phonology now implies the idea that raw linguistic material, whether heard or simply internally rehearsed (thinking), is reprocessed or presents itself as articulatory patterns. I propose that this input material is then processed via two pathways which are mutually relatively independent. In the first pathway, at the subcortical level, the processing occurs on raw, not further analyzed, material. For this pathway "ice" or "eyes"/"sole" or "soul", *e.g.*, have exactly the same input value, they are in no way distinct. As Ledoux (1993; 1994) shows, there is an emotional memory system at the level of the amygdala, which is in connection with the hippocampus. This system is functional from birth on, well before semantic fields have matured in the neocortex. So from a very young age, probably even in utero, an emotional conditioning process connecting perceived phoneme sequences with levels of excitation or anxiety takes place and thereby establishes a "linguistic" emotional memory. In the second pathway, at the cortical level, the processing is more complex. Reprocessing of the heard linguistic material, or processing of the thought linguistic material, occurs at the level of the articulatory loop of the working memory in the prefrontal cortex, *i.e.*, in the area of Broca (*e.g.*, Burton, 2001). In the space of 90 ms, a time lapse of about 3 syllables, a variety of different semantic domains are activated on the basis of ambiguous linguistic material, *e.g.*, for "ice" both the visual organ and frozen water (*e.g.*, Onifer & Swinney, 1981; Seidenberg *et al.*, 1982). Then, before 100 ms have elapsed, there is a prefrontally mediated active selection mechanism (Poldrack *et al.*, 1999). This is most likely working in a probabilistic way on the basis of information coming from the pragmatic, syntactical and lexical contexts. Once the relevant meaning has been selected, alternative domains are *actively inhibited* and new material is loaded in the articulatory loop (Thompson-Schill *et al.*, 1997). This prefrontally mediated inhibition mechanism, however, is unable to inhibit the emotional response already activated at a different, subcortical level in the limbic system of the brain. Therefore, a certain level of excitation or



arousal, possibly originating from alternative semantic meanings, is experienced together with the relevant semantic meaning. The origin of the excitation or anxiety therefore is not grasped, or, frequently, is falsely if rationally connected to the active semantic meaning. These are the so-called Freudian false connections (Freud, 1950a). It could be said therefore that we feel the phonology, but understand the semantics and that the possible field of tension between both experiences might be conceived of as the human unconscious.

In both language and affect, a motor event is the central process. In *language*, access to meaning (both semantic and affective) is mediated by a phonological motor event (articulation). It is not illogical to think that the central mediating element in this process is the proprioceptive feedback of the articulation muscles and joints. The characteristics of this motor and receptive circuitry therefore are as follows (Amaral, 2000; Krakauer & Ghez, 2000):

- the motor output is completely realized by the muscles of the articulatory system which are striated, voluntary muscles under control of pyramidal tracts;
- the motor output is planned in the premotor cortex as a complex sequence of short fast changing contractions, which can be initiated and stopped abruptly;
- the motor output control system in the brain in the prefrontal motor cortex is topographically organized, *i.e.*, there is a constant configuration of the motor neurons in the brain and the effector systems in the body;
- the receptor system for the registration of the motor output consists of a well organized system of proprioceptive tracts starting from the muscle spindles, which systematically register induced movements;
- the proprioceptive brain area where these messages are gathered is also topographically organized;
- the topographical organization in primary motor and somatosensory areas is quite similar.

In *affect* the basic experience is also the feedback of a particular set of motor events in the body. The characteristics of this motor and receptive circuitry are as follows:

- the motor output is realized by a number of glands, involuntary smooth muscles and voluntary striated muscles over the body, concerning mainly so-called vegetative systems (blood pressure, respiration, perspiration, digestion);
- the motor output does not have to be planned: it is a stereotypic, archaic, steady, innate set of effector actions; it can be initiated abruptly but once

initiated, its downstream actions can not be stopped abruptly by decision; it can therefore be said to be "massive";

- the output control system in the brain relies on the subcortical hypothalamus-pituitary axis, which is not topographically organized in the way cortical pathways are organized;
- the receptor system for the registration of the motor output consists of a distributed receptor system in the vegetative systems of the body, which feed back to the brain stem; it is a distributed and diverse, rather than a comprehensive, system.

In other words affect is the distributed, non-representational feedback of a stereotypic, massive, poorly controllable and non-representational motor output.

In conclusion, for all these reasons, it is tempting to propose that articulation can be conceived as the scansion process that cuts the unordered, massive, motor output of the unsaid, affective charge into the topographically ordered, sequentially fragmented, linguistic motor output, and that the psychical gain of the spoken articulation of the conflict, as observed clinically, has some neurophysiological counterparts in terms of this motor fragmentation, organisation and representation. This process, while probably resulting in important psychological gains (in terms of stability at a lower level of energy), is however not to be conceived as exhaustive since it is probable that not all affect can be caught linguistically.

**Ariane Bazan**  
Fonteineplein 33  
B-9000 Gent  
Tel.: 09 225.7124  
Ariane.Bazan@UGent.be

## Summary

### *The unconscious as affect sticking to phonology. Considerations on the role of articulation*

In this article a sound neurodynamic framework is proposed for the Freudo-Lacanian linguistically structured unconscious in terms of 'affect sticking to phonology' as well as for the particular importance of articulation in the processing of affect. First, the idea is defended that the phonological structure of language can act as a 'carrier' of affect, independent from its associated semantics. The affect-phonology linking can be considered as a conditioning mechanism at the level of the reptilian limbic system, whereas semantics is accorded after a disambiguation process at the level of the analytical, modern neocortex. While in this disambiguation alternative semantic contents, which are irrelevant in the given context, are inhibited, the affective arousal associated with these alternatives, is not. The origin of the excitation or anxiety is therefore not grasped, or is falsely and rationally attributed to the active semantics. These are the so-called Freudian false connections. Second, the idea is defended that articulation act as a scansion process that cuts the massive affective charge into a sequentially fragmented motor output and that the psychological gain in this translation is understood in terms of controllability, organisation and (topographical) representation.

## Bibliography

- D.G. Amaral (2000), "The functional organization of perception and movement", in E.R. Kandel, J.H. Schwartz & M. Jessel (eds.), *Principles of Neural Science*, London, McGraw-Hill, chapter 18.
- M.W. Burton (2001), "The role of inferior frontal cortex in phonological processing", *Cognitive Science*, no. 25, pp. 695-709.
- M.C. Corballis (1999), "The gestural origins of language", *American Scientist*, no. 87, pp. 138-145.
- F. Declerq (1995), "De paranoïde logica van de betekenis: psychoanalyse en communicatie", *Psychoanalytische Perspektieven*, no. 27, pp. 87-101.
- L. Fadiga, L. Fogassi, G. Pavesi & G. Rizzolatti (1995), "Motor facilitation during action observation: a magnetic stimulation study", *Journal of Neurophysiology*, no. 73, pp. 2608-2611.
- S. Freud (1891b), *On Aphasia, a Critical Study*, (transl. E. Stengel), New York, International Universities Press, 1953.
- S. Freud (1894a). "The neuro-psychoses of defence", *S.E.*, III, 1961, pp. 51-52///.
- S. Freud (1915d), "Repression", *S.E.*, XIV, 1957, pp. 141-158.
- S. Freud (1916-1917), *Introductory Lectures on Psycho-Analysis*, *S.E.*, XV & XVI, 1961.
- S. Freud (1950a [1895]), "A Project for a Scientific Psychology", *S.E.*, I, 1995, pp. 281-397.
- J. Krakauer & C. Ghez (2000), "Voluntary Movement", in E.R. Kandel, J.H. Schwartz & M. Jessel (eds.), *Principles of Neural Science*, London, McGraw-Hill, chapter 38.
- J. Lacan (1977 [1957]), "The agency of the letter in the unconscious or reason since Freud", (trans. A. Sheridan), *Écrits. A selection*, New York, W. W. Norton & Company Inc., pp. 146-178.
- J.E. Ledoux (1993), "Emotional memory systems in the brain", *Behavioural Brain Research*, no. 58, pp. 69-79.
- J.E. Ledoux (1994), "Emotion, memory and the brain", *Scientific American*, no. 6, pp. 32-39.
- A.M. Liberman, F.S. Cooper, D.P. Shankweiler & M. Studdert-Kennedy (1967), "Perception of the speech code", *Psychological Review*, no. 74, pp. 431-461.
- A.M. Liberman & I.G. Mattingly (1985), "The motor theory of speech perception revised", *Cognition*, no. 21, pp. 1-36.

- W. Onifer, D.A. Swinney (1981), "Accessing lexical ambiguities during sentence comprehension: Effects of frequency of meaning and contextual bias", *Memory & Cognition*, no. 9, pp. 225-236.
- R.A. Poldrack, A.D. Wagner, M.W. Prull, J.E. Desmond, G.H. Glover, J.D. Gabrieli (1999), "Functional specialization for semantic and phonological processing in the left inferior prefrontal cortex", *Neuro Image*, no. 10, pp. 15-35.
- G. Rizzolatti & M.A. Arbib (1998), "Language within our grasp", *Trends in Neuroscience*, no. 21, pp. 188-194.
- M.S. Seidenberg, M.K. Tanenhaus, J.M. Leiman, M. Bienkowski (1982), "Automatic access of the meanings of ambiguous words in context: Some limitations of knowledge-based processing", *Cognitive Psychology*, no. 14, pp. 489-537.
- S.L. Thompson-Schill, M. D'Esposito, G.K. Aguirre, M.J. Farah (1997), "Role of left inferior cortex in retrieval of semantic knowledge: a reevaluation", *Proceedings of the National Academy of Sciences of the USA*, no. 94, p. 14797.
- E. Van Holst (1954), "Relations between the central nervous system and the peripheral organs", *The British Journal of Animal Behavior*, no. 2, pp. 89-94.

**Key words**

Linguistic Unconscious, Signifier, Affect, Articulation, False Connection.