

Semantic integrity of a word structure and semantic primitives

By

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Abstract

The article attempts to describe the way of storing and functioning of meanings of polysemous words in the linguistic lexicon. To achieve this goal we turned to research of semantic primitives discovered in the course of lexical analysis. Within the framework of the interdisciplinary approach to the problems of words meanings ambiguity, the article justifies the hypothesis that in the process of polysemous words decoding the communicant does not take into account all semantic components of a word. The article aims at confirmation the functioning of a polysemous word meaningful core – lexical invariant, consisting of the clusters of the most essential semantic components. We provide theoretical and practical reasons for semantic integrity of polysemous words meanings on the basis of the invariant theory. Basic methods include invariant analysis of figurative meanings based on cognitive images, and component analysis of dictionary definitions. The invariant cluster as a set of the most essential and stable semantic components is eventually formed in the consciousness of a native speaker in accordance with the intuition of an average native speaker.

1. Introduction

The idea of semantic primitives was taken up and developed in modern studies of A.Wierzbicka, R. Jackendoff, Yu. Apresyan and others. In order to form a conceptual system

they considered necessary to propose the existence of primary concepts, from which others then proceed to form. In the moment of their formation concepts constitute essences that cannot be analyzed or subdivided (i.e. possibly exist as *gestalts*). As they are included and become a part of the conceptual system, concepts are influenced by other concepts and are qualified and modified. Thus, semantic primitives serve as base for the simultaneously unique and universal human conceptual system. In this, concepts are flexible, just like the world surrounding humans is also flexible.

The amount of proposed semantic primitives varies from single digits (seven in Jackendoff [Jackendoff 1983]) to tens [Wierzbicka 1985] and hundreds [Apresyan 1995]). In the last decades the general assemble of society's notions did not significantly change, but their general volume changes with time.

Besides the reduction of components' quantity, they can also be simplified qualitatively. A. Wierzbicka thinks that "reductive analysis", which supposes that all concepts should be defined through an assemble of further indefinable semantic components, can be used in composing dictionary definitions.

She postulates a limited number of "semantic primitives", the various configurations of which determine the meanings of all lexical and grammatical meanings of natural language. If there is a certain number of notional primitives, understood directly, not through other notions, then these primitives can serve as a firm basis for all other notions; an infinity of new notions can be constructed from a small amount of semantic primitives". More than thirty years of intense analysis by A. Wierzbicka and her colleagues have resulted in several tens of notions that can be considered to be semantic primitives. These notions form the basis of thought and communication and are not the same as semantic universals. Language-specific configurations of these primitives reflect the variety of cultures [Wierzbicka 1996: 296–297].

R. Jackendoff also thinks that the possibilities of a conceptual system are determined by its inherent rules of correct formation, and that conceptual systems are connected between each other by the rules of statements and guesses. Each word of a language is associated in consciousness with a certain conceptual primitive, from which more complex conceptual structures can be made. As the linguist vividly noted, concepts are "more like Lego than plasticine" [Jackendoff 2002].

2. Study of the Problem

Wierzbicka's experiments on determining the primary meanings of polysemous words, which even dictionaries often refrain from formulating on the level of common consciousness, are also worthy of note. The level of average language speaker supposes clear and intuitively understandable definitions which use the elementary semantic components that themselves don't require defining.

It needs to be pointed out that the basis for considering these or that semantic units as "primary elements" are dubious, since, according to the general theory of language, on the level of basic language units, competition between various units for the right to be considered such an element and a part of the meta-language is unavoidable. Strictly adhering to the rule of using only the elementary primitives leads to overly complicated semantic descriptions. A. Wierzbicka's definition examples are often difficult to parse, since there're no exact syntactic rules of generating meta-language expressions.

Long before G. Leibnitz thought that in the brain of every newborn there is a certain set of inherent elementary ideas which are latent in the beginning, but develop and activate with the accumulation of life experience. These ideas are so transparent that no explanation can make them even simpler; on the contrary, we use these elementary ideas or meanings to explicate our own experience. Leibnitz called these elementary meanings “the alphabet of human thought” [Leibnitz 1983]. All complex thoughts or meanings are combinations of simple ones, just like words and sentences are combinations of alphabet letters. Different languages can codify different complex meanings in specific words differently, since each of them can choose an unique special word to designate this combination of simple ideas. But the simple ideas themselves form the basis for human speech and thought and are, according to Leibnitz, the same for every human on the planet.

Leibnitz viewed the task of discovering these “atoms of meaning” to be difficult and time-consuming, but possible. He thought that they can be found out by trial and error, i.e. by systematically identifying the meanings of as many words as possible, and then, with the help of said empirical base, determine the elementary notions which serve as material for all these words’ meanings. The main direction of this investigation was defined by the demand of the multitude of simple ideas consisting only of the “building blocks” that are truly necessary for formation of complex ideas. That which can be explained is conceptually complex and needs to be explained; that which can’t be explained without falling into circular reasoning or lack of clarity, is elementary and shouldn’t be explained. There is no other way to search for the alphabet of thought.

The process of assembling meanings from various configurations of semantic components occurs instantly and automatically, so that a person is not aware of this process. Consciousness instantly fixes the state “I know” and explicitly controls the process only in the case of production or perception of complex and incomprehensible concepts.

As an example, we will cite the definition of the lexemes belonging to the “human body” lexico-semantic field, although this category is one of the most difficult to explain by semantic primitives, since their definitions often fall prey to circular reasoning. This happens because it is unclear, which base is semantically preferable: physiology or anatomy, form or function (e.g., for the notions of *eyes* and *ears*). After multiple experiments with semantic primitives, the linguist decided on the following “semantic invariant” definitions of these words [Wierzbicka 1980: 80]:

X ‘s eyes = parts of X ‘s body in the upper part of X ‘s face which can open and close and which can tell X something about the world;

X ‘s face = front part of X ‘s head, which can tell one about X.

As we can see, the specificity of the *eyes* concept in relation to the concept of *face* lies only in the functional components of opening and closing and the grammatical category of plural number.

Although the list of semantic primitives is characteristic of neutral, deeply-rooted words (e.g. “to know”, “to want” etc.), it brings its own semantic cost due to polysemy and various associations. In general, the lexicographical value of “universal meta-language” is rather dubious from determining word meanings point of view, although this author does think that word meanings can be described with a “laser-like preciseness”. In actual speech language users use and perceive words very freely, since the language as a system gives them this possibility.

According to D. Geeraerts, Wierzbicka's analysis is too long and unwieldy: long definitions are not functional from the lexicographical practice's point of view. But from the theoretical point of view, Wierzbicka is mostly correct: prototypical concepts are encyclopedic formations that should be thoroughly described in all their aspects [Geeraerts 1985].

Talking about A. Wierzbicka's contribution to lexical semantics it needs to be pointed out that her work is exemplary as a model of lexical semantics' epistemology. Developing her own methodology, she substantiated the necessity of introspective method and the ways of perfecting it; her works are of great value as examples of reflection on reflection, of transforming unobvious, implicit knowledge to implicit one. Wierzbicka's investigations at the junction between cognitology, ethnopsychology and culturology show us how psychologic-linguistic analysis can transcend the boundaries of "pure" linguistics and start interacting with national mentality and culture. Doubtlessly, using semantic primitives brings linguists closer to the minimal content meanings that explain the essence of the way the lexicon functions. At the same time, linguists only begin discovering the elementary hidden attributes that are necessary in order to determine meanings of words.

Similar units form the base of definitions in the works of Yu. D. Apresyan. He defines the main concepts (meta-language and semantic primitives) in this way: the meta-language vocabulary is cut by several degrees, leaving only two types of words: the semantic primitives, i.e. indefinable words that semantically can't be reduced further, and more complex words that are reduced to primitives through one or several steps. "Words of the natural language that are considered to be primitives are always the 'forefront' words, the most deeply rooted in language and culture. They serve the most pragmatic situations". The true primitives are, in a sense, semantic quarks – really existing meanings that never materialize in natural language, for instance, 1) physical perceptions (hearing, vision, etc.) – "to perceive"; 2) physiological states (thirst, hunger, etc.) – "to feel"; 3) physical activities and actions (work, rest, etc.) – "to do", etc. [Apresyan 1995: 468–481].

The semantic space of the category "human body" is associated with anthropomorphic reflection of reality as a distinctive feature of one of the most significant segments of the conceptual and linguistic world image [Kostina, Zerkina, Pesina 2015; Pesina et.al 2021; Pesina 2021]. In general, such knowledge consists in accumulating environmental knowledge and ideas accepted in the linguistic community, registered in the structure of words designating both the human body and objects that make up the immediate surrounding of a person. Since a large proportion of the vocabulary of the category "human body" is polysemous words, we will focus primarily on numerous figurative meanings of polysemous words and their functioning as anthropomorphic units. That is, the search for the system-forming principle of figurative and emotional-perceptual anthropomorphic principle in the content organization of linguistic lexemes has led us to a semantic analysis of vocabulary.

This is of concern to cognitive linguistics, since the point of issue will be structuring, processing and storage of entire layers of information along with the corresponding cognitive mechanisms to provide access to one or another meaning in the process of using them.

3. Hypothesis

This approach makes a systemic view of the meaning of words as the cornerstone, which is considered as a reflex of the sum of knowledge comprehended in the corresponding cognitive structure. The search for the very system-forming principle of the naive figurative anthropomorphic principle in content organization of language serves as a stimulus to an invariant semantic analysis of vocabulary.

Lexical invariant as the quintessence of content plane of the entire lexeme and the result of manifestation of embodied perception, solves another important problem related to the semantic identity of a polysemantic word. The resulting lexical invariant answers the question of what exactly holds all the meanings of a word together, preventing it from falling into homonyms. The functioning of beyond context invariant meaning of a general character, formed on the basis word's functioning at the level of the language system, is opposed to speech contextual realizations of individual meanings.

It is proposed to underscore the anthropomorphic picture of the world as a fragment of an integral linguistic world image, which can be described and represented via metaphors, metonymies and phraseological units as the main types of tropes. Having found oneself in the linguocultural environment of a particular language within the corresponding linguistic content, assimilating the corresponding realities, the individual finds himself/herself in a synergistically developing cultural and linguistic space.

Within the scope of this paper, using specific semantic structures of words, we will demonstrate the fact that vital aspects of our existence and interaction with the environment are projected onto our body (on its structure and functioning). The description and functioning of the human body are also reflected in abstract concepts, which are often difficult to thoroughly understand.

4. Main Body

The presence of “human principle” in the world picture is its main characteristic, revealing the anthropocentric essence of the process of human cognition of the real world. The anthropocentric approach implies using language in close connection with the beingness of a person, when it is a person who becomes a center of the linguistic and conceptual worldview and a measure of spiritual and material values. Considering themselves the center of reality, the individual perceives everything around as a reflection of their existence.

The term of “anthropocentrism”, dating from Ancient Greece, is an umbrella term in relation to the concept of “anthropomorphism” associated directly with the functioning of linguistic units that name the human body and its emotional and mental sphere. One of the subdivisions of anthropomorphism in linguistics is “anthropomorphic semantics” that also highlights the task of modeling the image of a person in language. From its end, anthropomorphic semantics intersect with one of the key concepts of cognitive linguistics – the concept of corporeality or “embodiment”. Thus, the terms “anthropocentrism”, “anthropomorphism” and “anthropomorphic semantics” are associated with the concept “embodiment” in language.

The notion of anthropomorphism is also umbrella, but already in relation to the allied phenomena of the secondary nomination – *personification, animism, animatism, hylozoism*. All these concepts intersect in contexts, designating close or identical phenomena. At the same time, the concept of anthropomorphism is much broader, since it assumes that various (almost any) properties of a person – physical, physiological, mental – are extrapolated to objects and phenomena of the real world, while in the case of animatism and animism, for example, we are only talking about animation (animatism) or ensoulment (animism) nature. In any case, we believe that these concepts are included as constituent parts in anthropomorphism.

In physiological sense, the term “embodiment” refers to the evolutionary changes that an organism undergoes in the course of its genetic history. It is associated with the changes in development that the organism undergoes via transforming from a zygote to a fetus or from a

child to an adult. In neurophysiological sense, the term “embodiment” refers us to certain neural structures and areas that correlate with patterns of activity at the conceptual and psychological levels of processing.

Embodiment also has a phenomenological meaning associated with the acts of a person’s mental reflection on various areas of their bodily experience. In this sense, R. Descartes’s standpoint against the idea of knowledge embodiment is logical, therefore “embodiment” is also used as an abbreviated term for the Cartesian philosophical relationship between mind and body [Descartes 1989]. Using the example of R. Descartes’s interpretation of the meaning of the term “triangle”, E. Husserl comes to the conclusion that knowledge is ethereal, that is, it does not fundamentally depend on any specific bodily sensation [Husserl 1960].

Finally, the term “embodiment of cognition” is currently in a widespread use in robotics. The embodiment of schematic images is often associated with projects of humanoid robots, in particular, with those cases when the work performed by robots depends on the specific morphological characteristics of the robot’s body (morphology is used here in a biological, not linguistic sense).

These ideas have led to some confusion as to what “embodiment” means in cognitive linguistics. So, some scholars argue that this term is associated with the linguocultural theory of embodiment, research in the field of schematic mental processes, while other scientific schools insist on attempts to link embodiment with the study of physiological and nervous sensations of a person.

So, in the initial interpretation of the hypothesis of J. Lakoff and M. Johnson regarding structural metaphors, the authors argue that we, according to certain algorithms, project figurative and schematic models of knowledge from a more embodied source domain onto a less understandable target domain with the purpose of better understanding. Each mapping between source elements and target elements is one-way: the scheme of mapping is projected from source to target, and not from target to source. They wrote that “advocates of the disembodied mind will, of course, say that conceptual structure must have a neural *realization* in the brain, which just *happens* to reside in a body. But they deny that anything about the body is essential for characterizing what concepts are”. And further, “the very properties of concepts *are created* as a result of the way the brain and body are structured and the way they function in interpersonal relations and in the physical world” [Lakoff, Johnson 1990].

We absolutely agree that the physical embodiment of a person is of the essence for the study of their conceptual structures. Research in cognitive science confirms the interdependence of conceptual and perceptual processes, on the one hand, and physiological and neurophysiological ones, on the other hand. At the neurophysiological level, the most important argument in favor of the hypothesis of embodiment is the fact that the same neural mechanisms responsible for lower-level activity, such as perception and movement, are considered to be essential for the development of higher-level cognitive abilities, namely, causation of our actions, inferences and conceptualization in general.

From the perspective of cognitive linguistics, theories of anthropomorphism and embodiment can contribute to more successful decoding of so-called “embodied metaphors”, which are perceived intuitively, are used without much effort and are automatic. They are part of synesthetic, orientation, structural and ontological metaphorical models. Their logical abstract essence is understood as part of the physical world, reflecting objects of varying importance.

The proposed approach is a synthesis of a systematic approach to the study of nominative processes and the corresponding semiosis in the field of meanings and the identification of nationally distinctive features of the anthropomorphic picture of the world of native speakers.

Our task is to find and reconstruct an integral, albeit somewhat common and naive, view of the world inherent in language. This is a kind of collective philosophy, which is imposed, being obligatory for all native speakers. At the same time, the emphasis is put on the anthropomorphic linguistic world image.

This requires an analysis of lexical units with anthropomorphic reinterpretations. The search for a system-forming naive figurative anthropomorphic beginning in the content language organization also served as a stimulus for an invariant semantic analysis of vocabulary. To interpret the meaning of the word that we consider as the realization of a lexical invariant, concentrated in a cluster of dominant most stable features of the word, a systematic principle is needed.

By means of invariant-component analysis, we are to determine the semantic cluster that includes the configuration of necessary semantic components, formed in the mind of the native speaker, based on the requirements of the surrounding context. At the same time, the context only signals the necessary configuration of features (integral, differential or identifying, functional, etc.), but in no case appears as a self-sufficient entity that lives its own life and is capable of changing text or discourse content without a reflective or communicating consciousness. This proposition is very important for subsequent analysis, for it is this interpretation of the meaning that the emphasis will be put on.

For instance, similar to the human head, the beginning of the human body, the “head” of a ship is the beginning of the ship. Similar to the human head, the most important part of the body; the head of fire is the top of the flame, the hottest and most active part of it. The head of a stick, roll paper, violin bow, cigar, arrow, spear, axe, etc. are all oriented in space the way the head versus the rest of the body. It means it can be located on the top position and be the beginning of the object depending on its vertical or horizontal position in space.

The “head” of a table, grave, bed is not just a beginning; it is the most important part. The head of a stream/river, i.e. the source, is compared with the human head in the sense of the origin (comparison in terms of space orientation). It means that actualization of one or another meaning of the word “head” is based on one or several components of abstract nature or the whole lexical invariant.

Each separate meaning refers to some regulative structure and points to a general rule governing the processes of categorizations and conceptualization of a social realm which are possible within the frames of some preliminary defined tunica. The lexical invariant, meeting the principle of economy, enables actualization of all existing word meanings with least possible cognitive efforts. It ensures semantic ties between the meanings of the word, keeping the polysemantic word from splitting into homonyms (Pesina, Zimareva, Baklykova 2019; Solonchak, Pesina 1914)

The discovered abstract semantic core helps with comprehension of the most complicated lexical semantic invariants “remote” from the original meaning: head of beer, head of milk, head of the bridge, etc. If the basis is the same invariant – something on the top, something important and the beginning of something – these meanings can be easily understood and explained: they are the foam, cream and start of the bridge, respectively.

5. Conclusion

The revealed abstract schematic construct makes it possible to fix person's stereotypical anthropomorphic reflection of objects and phenomena corresponding to both naive and scientific (*arm of angles in maths*) pictures of the world, a refracted human reflection of reality as a certain stage in the development of their consciousness. In this regard, our thinking is quite predictable and, according to certain algorithms, projects figurative and schematic models of knowledge from a more embodied source domain onto a less understandable target domain in order to better operate with concepts.

Lexical invariant as the quintessence of content plane of the entire lexeme and the result of manifestation of embodied perception, solves another important problem related to the semantic identity of a polysemous word. The resulting lexical invariant answers the question of what exactly holds all the meanings of a word together, preventing it from falling into homonyms. The functioning of beyond context invariant meaning of a general character, formed on the basis word's functioning at the level of the language system, is opposed to speech contextual realizations of individual meanings [Pesina et al, 2021; Pesina et al, 2022].

This approach makes a systemic view of the meaning of words as the cornerstone, which is considered as a reflex of the sum of knowledge comprehended in the corresponding cognitive structure. The search for the very system-forming principle of the naive figurative anthropomorphic principle in content organization of language serves as a stimulus to an invariant semantic analysis of vocabulary.

Thus, within the framework of this paper, we have demonstrated on the basis of specific semantic structure of the word that our body (more precisely, its structure and functioning) predetermines the vital aspects of our thinking, verbalization and existence in general. The above fragment of the analysis of frequency lexical units of an anthropomorphic nature has demonstrated our view of the world through the prism of embodied perception. The description of the functioning of the human body is absolutely projected both onto the objects around us, and onto abstract concepts that are often difficult to understand. At the same time, cognizable reality is largely based on the nature of our unique human embodiment. It is safe to say that language does not directly reflect the real world: it reflects our unique human interpretation of understanding the world. In this regard, we view our world through the lens of our own embodiment.

Conflict of Interests

The authors confirm that the presented data does not contain any conflicts of interest.

Acknowledgment

Russian Science Foundation, сокращенное наименование – RSF. Ссылка на информацию о проекте: <https://rscf.ru/en/project/22-18-20022/>

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