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The vector of polysemy development from the standpoint of antropomorphism and invariant-cluster approach

Abstract

Currently, it is believed impossible to find definite answers to the main questions of linguistics without considering the principles that govern and determine human cognitive activity with a person being the center of this activity. Therefore, it is crucial to investigate how language can help penetrate into the forms of different structures of knowledge, describe the dependence existing between these structures and language as well as model these structures, their content and interrelation. This article presents the methodology for determining an anthropomorphic lexical invariant cluster of a polysemantic word. The methodology includes several stages. First, on the basis of the most frequent components of dictionary definitions, the nominative non-derivative (NN) meaning of a word (the meaning that first emerges in a native speaker's mind when they comprehend the concept of an object) is formulated. Then the analysis of all meanings of a word including figurative ones is performed in terms of their non-trivial semantic components. After that, the anthropomorphic lexical invariant cluster is designed, and it includes the basic semantic components that depending on their configurations underlie all the meanings of a polysemantic word. Finally, the degree of anthropomorphism is determined, i.e. the number of meanings of the secondary nominations based on the similarity to the structure and functioning patterns of a human body. The analysis showed that the metaphorical meanings are formed on the basis of the hidden semantic features uncharacteristic of the primary meaning of a polysemantic word rather than the components of its first NN meaning.

Keywords: anthropomorphic lexical invariant cluster, component-invariant analysis, polysemantic word, cognitive image, word semantic structure, semantic component

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Вектор развития семантики многозначного слова с позиции антропоморфизма и инвариантно-кластерного подхода

Аннотация

В настоящее время невозможно получить однозначные ответы на главные вопросы лингвистики, не затрагивая принципов, регулирующих и определяющих познавательную деятельность человеа, в центре которой находится сам человек. Поэтому важно исследовать то, как с помощью языка удаётся проникнуть в

формы разных структур знания, описать существующую между структурами и языком зависимость, смоделировать данные структуры, их содержание и связи. В рамках настоящего исследования представлена методика определения антропоморфного лексического инвариантного кластера многозначного слова, включающая следующие этапы. Во-первых, на основе наиболее частотных компонентов словарных дефиниций формулируется номинативно-непроизводное (НН) значение (значение, первое приходящее в голову носителю языка при осмыслении понятия об объекте). Затем все значения слова, включая переносные, анализируются по нетривиальным семантическим компонентам. Далее на основе выделенных в каждом лексико-семантическом варианте семантических компонентов формируется антропоморфный лексический инвариантный кластер, включающий ядерные базовые семантические компоненты, которые в какой-либо из конфигураций лежат в основе всех значений слова. После этого определяется степень антропоморфизма, т. е. количество значений со вторичной номинацией, построенной на образе и подобии строения и функционирования тела человека. Предпринятый анализ позволил выявить, что источником образования метафорических значений могут служить не столько компоненты первого НН значения, сколько скрытые признаки, не содержащиеся в главном значении.

Ключевые слова: антропоморфный лексический инвариантный кластер, компонентно-инвариантный анализ, многозначное слово, когнитивный образ, семантическая структура слова, семантический компонент

1. Introduction

Since a person's mind always feels the similarity between the functioning of the body and its structure, as well as the artifacts and natural objects surrounding it, the article aims to contribute to the search for answers to important questions related to the representation of the word meanings in a person's lexicon, the participation of the system of images in the process of actualization of the rethought lexical meanings, the degree of anthropomorphism of human thinking, etc.

At present, it is impossible to get definite answers to the main questions of linguistics without taking into account the principles that govern and determine cognitive activity of a person, with a person being the center of this activity. Therefore, it is important to investigate how language can help penetrate into the forms of different structures of knowledge, to describe the dependence existing between these structures and language as well as to model these structures, their content and interrelations.

In the global sense, the present study demonstrates that a person viewed as a participant of communication, an observer and keeper of experience and knowledge plays the main role in forming linguistic meanings.

This study is based on the academic achievements made by Russian and foreign linguists in the following areas of linguistic science:
– theory of lexical meaning and polysemy in Russian and Germanic philology [Smirnitskiy, 1954 ; Akhmanova, 1957 ; Katsnelson, 1965 ; Vinogradov, 1977 ; Gak, 1977 ; Leshcheva, 1996 ; Pesina, 2005];
– anthropocentrism and anthropomorphism [Shcherba, 1974 ; Boldyrev, 2015 ; Tayupova, 2018];
– linguistic and conceptual view of the world [Davidson, 1978 ; Langacker, 1988 ; Potebnya, 1989 ; Rakhilina, 1998 ; Maslova, 2005 ; Nikitin, 2003].

I hypothesize that the semantics of the language units in terms of their anthropomorphism with the subsequent determination of the lexical invariant clusters on the

basis of component-invariant analysis of English polysemantic nouns can provide deeper understanding of a number of important linguistic issues including the mechanisms explaining the semantic similarity of polysemant structures and the cognitive mechanisms responsible for forming and storing polysemantic words in the mental lexicon.

2. Material and methods

The article presents the componential-invariant analysis of the lexeme *eye* (Lexical thematic group (LTG) "Human Face") from the standpoint of anthropomorphism on the basis of the invariant theory for the purpose of explaining the mechanisms of semiotic processes and determining the reasons for semantic similarity. Further analysis of the lexeme makes use of a non-systematic approach to the interpretation of the lexical-semantic variation (LSV) in an attempt to identify anthropomorphic patterns within the structure of the word taken for analysis. The lexeme *eye* is chosen for the analysis mainly because it is a polysemant with a rich semantic structure.

The following methodology was used to determine the anthropomorphic lexical invariant cluster of a polysemantic word. First, the most frequent components of dictionary definitions were studied and used to formulate the nominative non-derivative meaning of a word (the meaning that first emerges in a native speaker's mind when they comprehend the concept of an object). Then all the meanings of a word including figurative ones were analyzed in terms of non-trivial semantic components. This analysis proposed by Yu. D. Apresyan does not take into account trivial components, for example, signs of animacy, gender, etc. According to Yu. D. Apresyan, the semantic value of a component is inversely proportional to the number of lexical meanings in which it is included. The rarity of a component increases its semantic value, and the presence of a non-trivial part in different meanings is considered obligatory for polysemy [Apresyan, 1995]. After that, the semantic components identified in each lexical-semantic variation (LSV) were used to formulate an anthropomorphic lexical invariant cluster including basic semantic components which depending on their configurations underlie all the meanings of the word. The degree of anthropomorphism was determined by the number of meanings having secondary nomination created in the image and the similarity to the structure and functioning patterns of a human body.

The analysis uses the data from the total of 25 dictionaries. The first meaning of the analyzed polysemantic word was formulated on the basis of 8–10 dictionary definitions.

The analysis makes a wide use of explanatory dictionaries, idiomatic dictionaries and terminological dictionaries. The dictionaries varied in size ranging from 850 words and expressions (DHB) to 470,000 words ("Webster's Third New International Dictionary" (WTNIDIC)) and in publication dates varying from 1961 (WTNIDIC) to 2003 (CADE).

Besides the first meaning, figurative meanings of polysemants were analyzed. During the analysis, all trivial semantic features reduced to pure abstraction were omitted. This enabled to offer an eidetic (pure) "formula" of the whole word.

3. Results and discussion

This study enabled to visualize the development vector of polysemantics revealing the internal semantic connections of a word. Thus, the anthropomorphic lexical invariant cluster of the polysemant eye results from the procedure carried out to establish the averaged principal meaning of the word which is considered to be systemic. Table 1 shows the results of the definition analysis based on 10 dictionaries. It was important to provide more details for the algorithm to be fully visible.

T a b l e 1. **Definitions of the primary meanings of the polysemant eye**

Dictionary	Definition
MWs	a specialized light-sensitive sensory structure of animals that in nearly all vertebrates, most arthropods, and some mollusks is the image-forming organ of sight; especially : the nearly spherical usually paired hollow organ of sight in vertebrates that is filled with a jellylike material, is lined with a photosensitive retina, and is lodged in a bony orbit in the skull
CED	one of the two organs in your face that are used for seeing
MD	one of the two body parts in your face that you use for seeing
AHDEL	an organ of vision or of light sensitivity
All words	an organ that is sensitive to light, which it converts to electrical signals passed to the brain, by which means animals see
The system's light source is invisible to the human eye, thus increasing operator comfort. Malignant melanoma can also affect the choroid of the eye, the layer just under the retina. Glaucoma is a group of diseases that can lead to damage to the eye's optic nerve and result in blindness	
Synonyms	upper limb, forelimb, appendage

The most frequent semantic components of the nominative non-derivative meaning (NN meaning) are presented in the table 2.

T a b l e 2. **Frequent semantic components of the NN meaning of the polysemant eye**

Semantic component	Number of repetitions
organ of sight	5
used for seeing	5
in your face	3
sensitive to light	3
in an orbit of the skull	2

The analysis of the frequency of the presented semantic features provides the basis for establishing an averaged definition of the meaning (the NN meaning includes semes repeated in presented definitions at least three times): *eye (1) – one of the two organs of sight in your face that are sensitive to light and used for seeing*. This definition is similar to the one given by [CED], except for the fact that the semantic component *sensitive to light* mentioned in three dictionaries, is added. The next step to determine the anthropomorphic lexical invariant cluster is the interpretation of the word meanings on the basis of the established NN meaning in order to justify each subsequent member of the semantic structure of the word by the "systemic" NN meaning. It is necessary to determine the mechanism for the formation of derivative tropeic interpretations (metaphorical, metonymic), as well as phraseologically related meanings with the establishment of the underlying semantic components (often potential).

The metonymic meanings of the polysemant eye reflect both the anthropomorphic symbolic features resulting from the NN meaning (e.g., power of vision, direction of a gaze) and the components logically arising from the semantics of the primary meaning but having indirect nature (the ability to understand, perceive somebody's opinion).

The metonymy *eye – an ability to understand and appreciate something seen* [MW] is formed according to the mechanism "human organ – the ability to perceive / understand something through this organ". This is a complex metonymy since the double metonymic

mechanism used here implies not only the ability to see due to the function of the main human organ of vision but also according to the further development of logic the ability to understand what is perceived with the help of the eyes.

Further analysis processes metaphorical meanings where nominative processes continue in the sphere of comparisons. Metaphors reflect various assimilations of objects to the appearance and function of a human eye. This part of the study aims to show how the anthropocentric semantics of the NN meaning is used as the initial basis for forming and functioning of the metaphorical meanings. Below, example analysis is given to demonstrate whether the cognitive image that underlies the main meaning is involved in comprehension of metaphors.

Eye of a needle/ring (7) – the hole through the head of a needle/ring (Use a good thread and make sure the needle eye is large enough for the thread type; Place a length of nylon in the path of the whipping silk so that the loop is facing the eye in the ring) [MD] (synonyms: hole, opening, aperture, eyelet, gap, slit, slot, crevice, chink, crack, perforation, interstice).

This metaphorical meaning is based on the comparison of an oval or round hole of a needle or a ring with a human eye (the language picture of the world characteristic for the native speakers of Russian suggests the nomination of *the **ear** of a needle*). As for the hole in the ring, the Russian language picture does not contain any even remotely similar metaphorical figurative comparison of the "eye or ear of the ring" type. Such a metaphor is one of the non-equivalents and can be translated into Russian in a descriptive way: "a hole inside the ring". Nevertheless, the main semantic components underlying this metaphorical transfer are obvious: *a hole through the head of a needle / ring, used for passing sth through (a thread)*. The performed analysis of the lexical-semantic variations (LSV) of the noun *eye* demonstrates that they are motivated by both the nominative non-derivative meaning and the more abstract and often hidden semantic components identified during the component analysis. Metaphors contain the component *as if* which implies a fairly large range of denotations in relation to the lexeme *eye* since it describes any metaphorical meaning of the noun *eye* ('as if an eye').

The most important anthropomorphic semantic components identified during the analysis and being basic to form the semantic structure of the word help formulate the main semantic features of the anthropomorphic lexical invariant cluster of the analyzed word being part of the content core or lexical invariant of the noun *eye*: *a small central roundish often colored area within some large region or opening, used for passing through / for the insertion of sth, or the most intensive part of a situation / human ability*. If any part of the object falls under this cluster of semantic components, it can be called eye.

Then it appears important to establish whether the identified ALI cluster underlies the phraseological units whose semantics is presented in table 3.

T a b l e 3. **Basic semantic components in phraseological units structure with** *eye*

Phraseological units and speech realizations	Basic semantic components underlying the word eye as a part of a phraseological unit
all eyes/be all eyes (24) (All eyes are on the hot spots of eastern Europe; He looked at the group of people sitting down and soon all eyes were focused on the ground) [ODEn]	used to convey that a particular person or thing is currently the focus of public interest or attention
before (or under) one's (very) eyes (25) (I've been hooked to my TV set over the last ten days, eagerly awaiting the latest developments happening live before my very eyes) [ODEn] Synonyms: in person, before one's eyes, in front of one, before one's very eyes, in one's presence	right in front of one (used for emphasis, especially in the context of sth surprising or unpleasant)
close (or shut) one's eyes to (26) (Then I could so easily close my eyes to all that is happening around me and my family, roll over and fall into a deep sound sleep). [ODEn] Synonyms: disregard, ignore, dismiss, shrug off, pass over, put aside, sweep aside, wave aside	refusal to notice or acknowledge sth unwelcome or unpleasant

If basic semantic components are further reduced to the invariant semantic cluster only, the set of central features of a general character will be the following: *to be an "eye" means 'to be attentive, alert, interesting, evaluative, to follow sth / smb'*.

The performed analysis shows that the structure of the English substantive *eye* is much more complex since it includes a number of metaphoric and metonymic meanings such as *eye of the problem / controversy / attention / action (21), eye of meat, eye of a ship*, etc., as well as a variety of phraseological meanings.

4. Conclusion

The names of the parts of the human body are commonly used to nominate a vast number of referents including various artifacts, plants, natural objects, phenomena, and structures. In the vast majority of speech patterns they are meant to be specific parts of these objects oriented in space in a certain way and performing a separate function.

The existence and functioning of an anthropomorphic lexical invariant word cluster is explained by the fact that an individual understands the statement when they have a generalized conceptual idea of the situation described. In addition, a native speaker cannot possibly enumerate all the existing meanings of the high-frequency words (especially polysemantic ones) because they can have more than 100 lexico-semantic variants with some meanings being usually missed. This does not speak in favor of the list theory of polysemants storage in the lexicon. The representation of a polysemantic word in the form of an invariant complex is dictated by the principle of economy and the tendency for general linguistic efficiency.

The analysis was exemplified by the English polysemantic lexeme *eye* due to the generally recognized fact that English equivalents, as a rule, have a more developed system of figurative meanings, therefore their anthropomorphic lexical invariant cluster can be presented more clearly. However, it is quite obvious that similar semantic and semiotic processes occur in the linguo-cognitive sphere of the Russian language.

The existence of the lexical invariant cluster which is anthropomorphic in its nature and is capable to justify all metaphorical comparisons has been proved by the generalized meanings given by the dictionaries and beginning with the words something that resembles...

Thus, the performed analysis makes it possible to reveal the fact that the hidden semantic features uncharacteristic of the primary meaning rather than the components of the first NN meaning serve as a source to form metaphorical meanings. These potential features have been identified and included in the anthropomorphic lexical invariant cluster of the lexeme eye. The semantics of metonymic and phraseological meanings has been explained on the basis of the NN meaning.

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