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A Mathematical Model That Semantically Analyzes Polysemantic Words

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Annotation: The world experience of semantic analysis of polysemous words has been studied. The ways of formation of polysemantic words in Uzbek language are described. The differences between ambiguous and ambiguous words and the classification of polysemous words within word groups are given. An example of a polysemantic eye word is the architecture of semantic analysis. Based on the given architecture, a mathematical model that semantically analyzes polysemantic words is recommended. The result of this mathematical model is examined in context

Key words: Polysemy, semantic analyzer, polysemous word, semantic analysis, mathematical model, hierarchy.

"Polysemy is important in any language. Linguistic richness is measured not only by words and phrases, but also by the lexical meanings of words, ”said linguist M. Mirtojiev. In polysemous words, there are ways to transfer meaning. The most widely spoken language in the world is Chinese. This language is also full of polysemantic words. 14% of Chinese dictionaries are polysemous words, which are the most frequently used words. Forty-two percent of the information in the Chinese language corpus is polysemantic words. Polysemous words have their meanings in all the natural languages of the world.

Analytical factors and mathematical models are needed to create a system of semantic analysis of polysemantic words. Polysemantic and homonymous words are closely related. Therefore, the study of homonymy and polysemy has not lost its relevance. One of their minor differences is that ammonia is a narrow concept and polysemy is a broad concept. Linguists point out that there are 8 aspects of distinguishing homonymous and polysemantic words in Uzbek language.

Feature	**Polysemantic words**	**My good words**
Semantic difference	In context	By meaning and etymology
Role in context	Important	It may not matter

The table shows that differentiation of polysemantic words can be done on a contextual basis. According to world experience, polysemous words are semantically analyzed based on statistical calculations and probability theory over a large amount of contextual data. Experts also need to work hard to differentiate by context. Dividing polysemous words into hyponomic groups is more effective in developing models that differentiate contextual words. The specifics of the groups will be explored. Rules will be developed based on the features studied. Polysemantic words are classified as follows.

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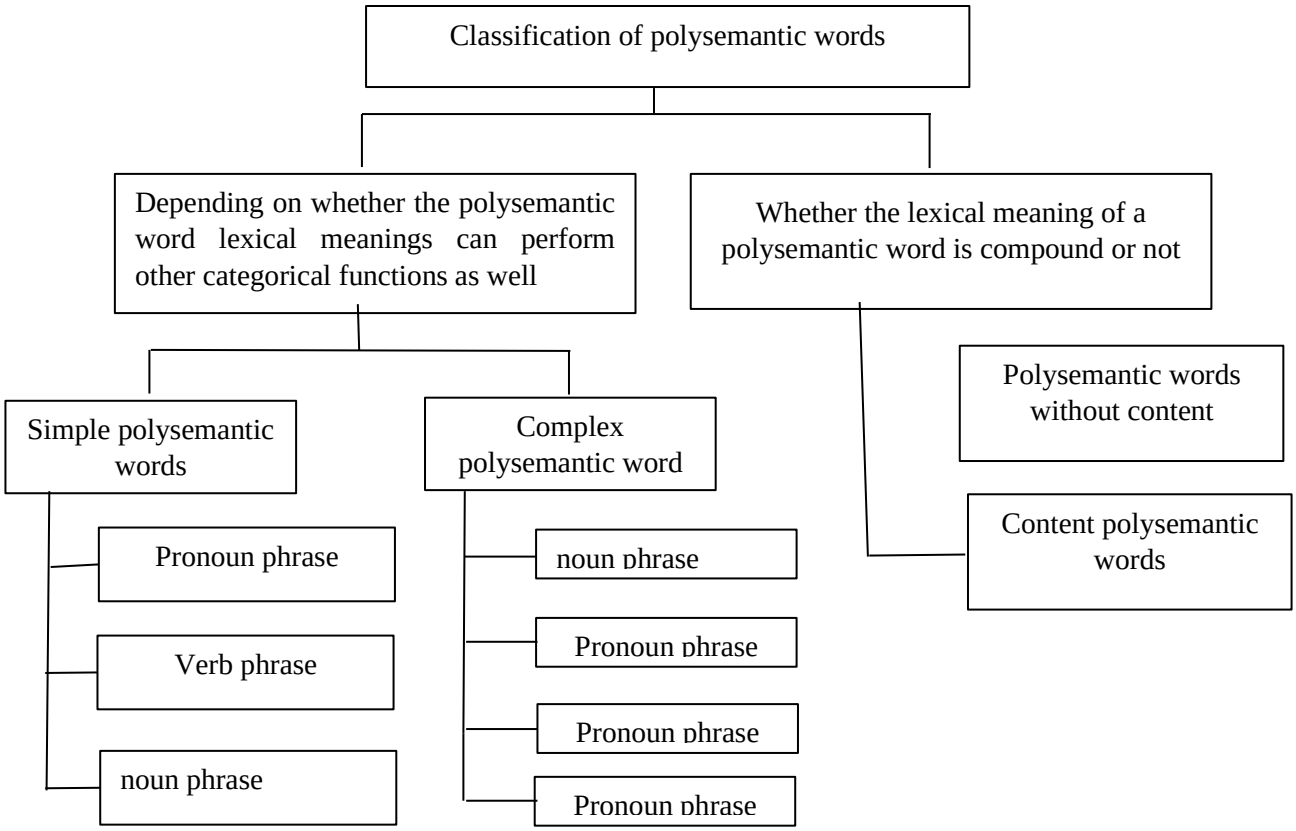

In this article, it is recommended to differentiate polysemantic words into word groups. For example, here is the hierarchy of the word eye.

As can be seen from the hierarchy, for semantic analysis of polysemantic words of a living nature, groups of words that can be combined with these words must be grouped. Comment on the words in the group of living nature in the hierarchy:

Animal:

Laqablar: olapar, bo‘ribosar, mosh, ...
Turlari: It, kuchuk, mushuk, ot, sher,...

Human:

Kasbni ifodalovchi so‘zlar: o‘qituvchi, shifokor, tadbirkor, ...
Insonlarning ismlarini ifodalovchi so‘zlar: Aziza, Shoira, Anvar, ...
Qarindoshlikni ifodalovchi so‘zlar: ota, ona, aka, uka, ...

Polysemantic words such as head, ear, head, foot, and nail can also be semantically analyzed using grouped words. The grouping of word groups described in the hierarchy is not a complete solution to the problem.

Aunt Pomegranate was blindfolded, otherwise she would have gone to school.

In the example, the word plural is combined with the word aunt, but the occurrence of the word touched after the word eye has a figurative meaning. It follows that the right and left conjunctions of a polysemous word should be grouped according to their formation and their figurative meaning.

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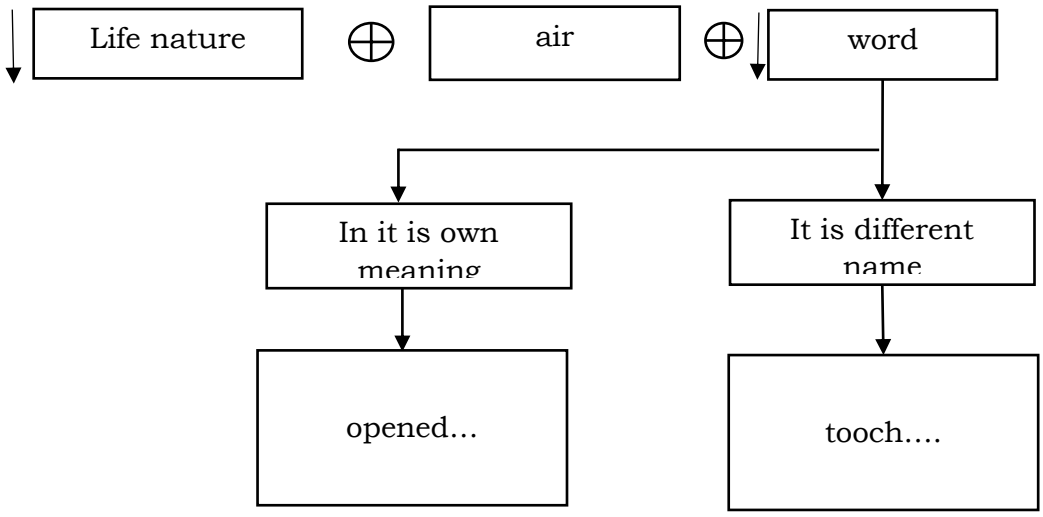

Words should be grouped as shown in the hierarchies that describe the conjunctions that make up the literal and figurative meanings of the word eye. Dividing words into groups by a property is called segmentation. Dividing words into subgroups ensures accurate semantic analysis of polysemous words.

According to foreign experience, the best solution is to use statistical methods in the semantic analysis of polysemous words. Researcher Sh. Gulyamova expressed her views on the semantic analysis of polysemous words in the Uzbek language. [Sh. Gulyamova. Polysemy as a linguistic phenomenon // Online the basis of statistical methods. Let's consider based on the classifications in the example of the word eye above. In the context of the word eye, the following conjunctions occur.

O‘z ma’nosida:	***Ko‘chma ma’nosida:***
*Qushning **ko‘zi** ko‘r edi*	*Ishning **ko‘zini** biladi*
*Go‘dak **ko‘z** ochib*	*Ko‘zing ko‘r bo‘lsa ham qalb **ko‘zing** ko‘r bo‘lmasin*
*bolamning **ko‘ziga** shifo ber*	*Ezgulik arkasiga **ko‘zimiz** tushadi*
*Muhammadning **ko‘zi** ochilibdi.*	*xiyobon **ko‘zni** quvontiradi*
***ko‘zi** ojizlar uchun*	*dunyodan **ko‘z** yumgan*
*tarix insonning **ko‘zini** ochadi*	

In the above examples, we can group the conjunctions of the word eye as follows. Assuming that there are separate sets of connectors, we make the following mathematical statement $W_r^{b_k} +\downarrow aff^{s\_l} \oplus P_k +\downarrow aff^{s_l} \oplus W_l^{a_k} +\downarrow aff^{s_l} = \begin{cases} P_k^s,\ \mathrm{T}(W_r^{b_k}) \vee \mathrm{T}(W_l^{a_k}) = 0 \\ P_k^p,\ \mathrm{T}(W_r^{b_k}) \vee T(W_l^{a_k}) = 1 \end{cases}$ (1)

In here

$\boldsymbol{W_r^{b_k}, W_l^{a_k}}$ **-$\boldsymbol{P_k}$** i;

$\boldsymbol{P_k^s}$ – $\boldsymbol{P_k}$ p (self meaning);

$\boldsymbol{P_k^p}$ – (portable) means;

$\mathbf{T}(\boldsymbol{W_r^{b_k}})$, $\mathbf{T}(\boldsymbol{W_l^{a_k}})$ – $\boldsymbol{W_r^{b_k}, W_l^{a_k}}$ $\boldsymbol{W_i^b, W_j^a}$ Boolean-type values indicating the presence or absence of content;

∨-disjunction (logical addition) is an operation or means.

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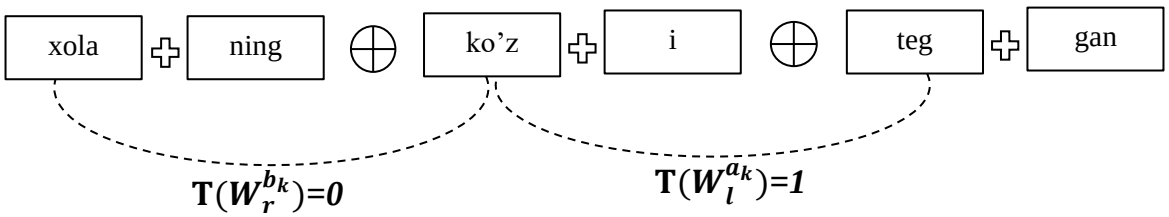
The reason for the use of the ∨-disjunction sign is that the polysemantic word in a sentence has its own (original) meaning or a figurative meaning. It cannot mean both at the same time.

The value of this mathematical model requires a great deal of expertise on the part of many experts. Next, we consider the analysis of a polysemantic word in context using a model (1).

*Anor xolaning **ko‘zi** teggan aslida, aks holda o‘qishga kirgan bo‘lardi*



$$T(xola) \vee T(teg) = 1$$

$$0 \vee 1 = 1$$

The semantic analysis of the word eye (1) in the quote using a mathematical model yielded 100% accurate results. It is true that this model may not fully semantically analyze polysemous words in an arbitrary context, but it is no exaggeration to say that this model is based on the morphological and syntactic features of polysemantic words in Uzbek. .

According to foreign experience, the best solution is to use statistical methods in the semantic analysis of polysemous words. Researcher Sh. Gulyamova expressed her views on the semantic analysis of polysemous words in the Uzbek language. It is also recommended to use Markov's models in the semantic analysis of polysemantic words in Uzbek.

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