

DEVELOPMENT OF FORMAL MODELS OF WORD COMBINATIONS AND NOUN COMBINATIONS IN THE UZBEK LANGUAGE

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Abstract. *The article describes the structure and types of phrases in the Uzbek language, the significance of these phrases in translation, and the characteristics of noun phrases, their place in a sentence, and their formation models.*

Keywords: *computer linguistics, word combination, compound noun, compound construction, formal model.*

Introduction.

The purpose of computer linguistics is to build mathematical models of natural languages, to develop computer programs that solve linguistic problems. It consists of constructing formal and axiomatic models of natural language to solve these problems. Based on these models, it will be possible to create computer programs for text editing, computer translation, computer dictionaries, native and foreign language teaching, and knowledge assessment. The mathematical model of language rules is built on the basis of formal and axiomatic theories of mathematical logic.

Research methodology and literature analysis.

This work is focused on compound noun constructions of the Uzbek language. Compound constructions are studied in the syntax section of the language, and the word combination is the constituent of the sentence. In the syntax of word combinations, the formation of word combinations, the means of their formation, the methods of combining word combinations, their types according to their structure, and their differences from other language units are studied.

Computer linguistics began to develop in the 50s of the XX century. Computational linguistics can now be considered as a theoretical and applied science. The work of many foreign scientists can be taken as an example, such as Danish scientist Elmslev, American scientists N. Chomsky, K. Shenon, etc., have great services in this field.

Of course, work on computer linguistics has also been done in our country. Apparently, the work of scientists such as S. Mukhamedov and R.G. Piotrovsky¹, A.K. Polatov, and S. Rizayev should be highlighted. A. Polatov's book "Computer Linguistics" contains information about formal models of grammar of the Uzbek language, mathematical linguistics and algorithms. In the article "Creating a morphological and syntactic tagged corpus for the Uzbek language" by M. Sharipov, a new part of speech (POS) and a syntactic tagset were developed to create a syntactic and morphological tagged corpus of the Uzbek language.

H. Madadov's article entitled "Automatic detection of stop words for texts in the Uzbek language" focuses on automatic analysis and detection of stop words in Uzbek language texts. Due to the limitations of automatic search methods for stop words in Uzbek texts, we analyzed the recently prepared corpus. In this work, the "school corpus" consisting of 731156 Uzbek words was

studied. The bigram analysis method was applied to the corpus. We proposed the collocation method of corpus stop words detection, automatic detection of stop words of Uzbek texts. It is shown that the collocation method is 6 times better than the bigram method.

Results.

Mathematical models were created based on the developed noun phrase. Abbreviations, punctuation marks and elements of mathematical logic were used and formalized in the process of creating an electronic database. Logically similar constructions are summarized in model building. Each construction was considered separately and constructions that are not used in practice were removed from the database.

Discussion.

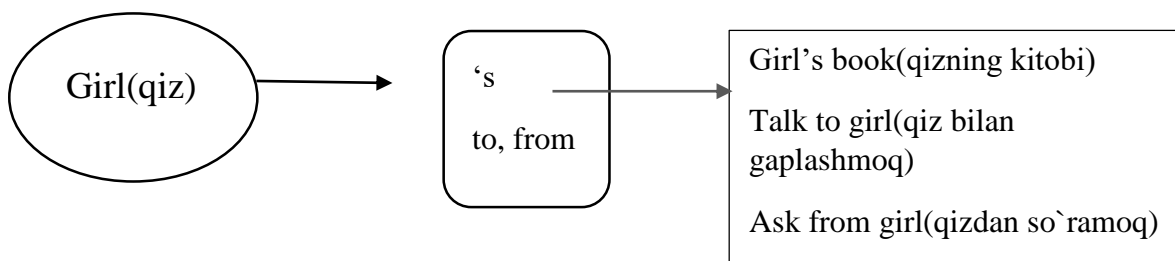
Phrases are an important part of the speech flow, which always consists of two parts. One part of the phrase reveals the nature of another part. In the compound, the first word (subordinate part) is connected to the word that comes after it (dominant part) and explains it. It can be seen that the main meaning is expressed by the word at the end of the compound. Any combination of words is based on the rule of Subordinate part and Dominant part. The combination of words in the sentence is made by following these conditions:

1. It should consist of at least two independent words:

- | | |
|--------------------|--------------------|
| Pushti + gul | Pick +the flower |
| Go`zal + qiz | Beautiful+girl |
| Mustaqil + shaxs | Independent+person |
| Iqtidorli + talaba | Talented+student |

In these examples, both parts of the word combinations are independent words.

2. To be suitable in terms of meaning:



Possessives, adverbs and auxiliary words involved in the combination of the subordinate and the dominant part should acquire their full meaning.

3. Additional and auxiliary words connect independent words:

- | | |
|---------------------|--------------------|
| Akamning kitobi | brother's notebook |
| Bolalarning olmasi | child's apple |
| Talabaning sovg`asi | student’s gift |

Independent words in the subordinate and dominant parts are suitable.

- | | |
|-----------------------|-------------------|
| Uyda qolmoq | Stay to house |
| Onaga bermoq | Give to mother |
| O`qtuvchidan so`ramoq | Ask to teacher |
| Do`st haqida gapirmoq | Speak from friend |

Such combinations are not used in speech, they have no meaning.

The use of combinations of words in our speech helps to describe various objects, things, processes without leaving room for excessive interpretation. In addition, word combinations can be a material for studying the interrelationship of the words involved in the speech. It is recommended to highlight the following features for word combinations and take them into account when analyzing them:

1. Taking into account the grammatical features
2. Coordination, analyzing the rules of subordinate relationship in the connection of words.
3. Functionality, that is, the expression of a single but separate concept of objects, features, actions.
4. A building unit that can express certain relationships between words.
5. That the phrase is the main part of the sentence.

The word combination comes naturally in connection with the concept of words and sentences. Combining these two concepts, the features of phrases are listed:

1. A word combination is considered as a part of a sentence.
2. It does not have a predicate meaning. Represents the intonation of the message
3. Participation of the language as a nominative means defines objects, their signs, actions.
4. Has the characteristic of being changeable.

Formulas for making word combinations in different languages of the world are different. However, the mutual proportionality of combining words can be seen as a common feature in them. There are given some English and Uzbek phrases below:

- | | | | |
|----|---|--------------------------|--|
| 1. | adverb + adjective: | ravish + sifat | |
| | Completely easy | Butkul oson | |
| 2. | adjective + noun: | sifat + ot | |
| | modern houses | Zamonaviy uylar | |
| 3. | noun + noun: | ot + ot | |
| | Importance of the task | Topshiriqning muhimligi | |
| 4. | verb + noun: | ot + fe`l | |
| | Teach students | Talabalarni o`qitmoq | |
| 5. | verb + expression with a preposition by its side: | Fe`l + fe`l | |
| | Burst into tears | Yig`lab yubormoq | |
| 6. | verb + adverb: | sifat + fe`l | |
| | Increase rapidly | Tezlik bilan ko`tarilmoq | |

As it is mentioned above, word combinations are divided into two parts, subordinate and dominant. According to the group of words used to form the compound, the word combination is divided into two types. If the main part consists of noun, adjective, number, pronoun, modal, exclamation and imitation words, then such a word combination is called a noun combination. As an exception, it should be mentioned that this combination is a noun combination even if the dominant part is in the form of an adjective, pronoun, and adverb.

For example: qizlarning sarasi(the best of girls), talabalarning beshtasi(five of students), tilaklarimning barchasi(all my wishes), ishlarning ko`pi(lots of work).

The ability of a word to combine with other words and the form of this ability not only depends on the grammatical rules of words (first of all, the word belongs to one or another part of speech), but also on its lexical meaning. It is necessary to distinguish between compounds and complex words formed as a result of joining two or more words. Below, the compound words in English and their literal translations are compared in Uzbek:

1. Basketball → (savat to`pi) basketbal
2. Toothbrush → tish cho`tkasi
3. Underground → (yer osti) metro
4. Waterfall → (suv tushishi/yiqilishi) sharshara
5. Earphone → (quloq telefoni) naushnik
6. Football → (oyoq to`pi) futbol
7. Seafood → dengiz ovqati, dengiz taomi
8. Hairbrush → (soch cho`tkasi) taroq
9. Grasshopper → (maysa sakrovchisi) chigirtka
10. Checkpoint → tekshiruv punkti

It seems that literal translation takes away from the words used in colloquial speech. This reduces the quality of the translation material. Of course, separate analysis of compound words and combinations, distinguishing their structure, meaning and use in speech will make the process of automatic translation from other languages into Uzbek more effective. Because literal translation does not give good results in any language. The main goal of translation is to make the content of the information in one language into a second language that can be understood by a person. Compounds with nouns in the Uzbek language play an important role in the construction of sentences. As we mentioned above, when using compounds, there is no need to explain the object in question. As an example, there are given the sentences in which the compound noun is used and not:

1. I drink water(sentence) → men suv ichaman(gap)
I drink *hot water(combination)* → men *issiq suv* ichaman(*so`z birikma*)
2. She wears a dress (sentence) → u kiyim kiyadi(gap)
She wears a *new dress(combination)* → u *yangi kiyim* kiyadi (*so`z birikma*)

In word combinations, the subordinate word is connected to the dominant word by the following three methods:

k.ol- personal pronoun, *s.ol* – interrogative pronoun, *oz.ol* – reflexive pronoun, *t.kq* – objective case, *q.kq* - possessive case, *n.ot* -objective noun, *sh.ot* – personal noun, *x.sif* – attribute status quality, *m.sif* – taste adjective, *r.sif* – adjective denoting color, *eg* -possessive suffix, ‘ : ‘ - join the word , ‘ + ‘ – a combination of two words, *k_s* – auxiliary word.

1. Agreement method

Subordinate(q.kq) + Dominant(eg)

For example: my mother → *mening onam*, *Salim's bag* → *Salimning sumkasi*, brother's wife → *akamning ayoli*

Construction suitable for this method:

- 1) **Ot(sh, n, fj):k(q) + son(s, t, tq, j, k):eg** *Bolalarning beshtasi(five children)*
- 2) **Ol(k, oz, kr):k(q) + ot(n, sh, oj):eg** *Uning sumkasi(her bag)*

2. Anagement method

Subordinate+k_s+Dominant(egalik qo`shimchasi)

Subordinate +Dominant(eg)

Construction suitable for this method:

- 1) **Ol(k, oz, kr):k(q) + ot(n, sh, oj):eg** *O`zini akasi(He is his brother)*
- 2) **Ot(sh, n, fj):k(q) + son(s, t, tq, j, k):eg** *Darsni birinchisi (The lesson is the first)*
- 3) **Sif(x, r, m, h, v, z) + k_sz + ot(n)** *Yoshlik haqida hikoya (A story about youth)*

4) **Ot(n):eg +s_sz + sif(x)**

Kasbi orqali mashhur (Famous by profession)

3. Adjunction method

Subordinate+Dominant

Construction suitable for this method:

1) **Sif(x, r, m, v, h, z) + ot(n, sh):eg**

Qizil kuylagim(my red dress)

2) **Sif(x, r, m, v, h, z) + ot(n, sh)**

Nordon olma(sour apple)

Conclusions and suggestions.

Formal models of combinations can be developed based on the methods of joining words. The main attention is focused on their construction. Of course, content counts. The construction of the word combination is extremely large, but finite. Because the types of word groups and suffixes are also limited. Its number can be calculated by combinatorics in mathematics. Despite the fact that the number of combined constructions is theoretically extremely large, the number of constructions used is much reduced. Because each type of theoretical word group is combined with the type of each word group and may not be used in practice. Of course, a lot of attention is paid to this in the development of the vocabulary base. In addition, attention has been paid to additions that are added to words when they are combined.

The purpose of developing such a database is to reveal the effectiveness of such a database in analyzing compounds, making compounds, and translating from one language to another. In translation, in many cases, words are translated separately and then they are replaced according to the structure of the language being translated. In fact, the quality increases when the translation is translated as a whole in the form of a compound. Words find their place. When analyzing words in a sentence, it is appropriate to analyze them in the form of a compound. When learning and teaching a language, giving words in the form of a compound is faster, easier and more widely accepted.

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