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FUNCTIONING OF LEXIC PARALLELS IN THE TECHNICAL DISCOURSE TEXTS (ON THE MATERIAL OF THE TEXT CORPUS "ELECTRICAL ENGINEERING")

Summary. The article considers the terminologization of adjectives with common (general scientific) meanings occurred in the texts of technical discourse, i.e. the units that function simultaneously in both common (general scientific) meanings and terminological ones. They are included in several lexical layers of the studied list of adjectives. As the material one of the areas of technical discourse – "Electrical Engineering" – has been chosen. The text corpus is based on scientific articles taken from the journals Electrical Engineering, IEEE Transactions on Power Apparatus and Systems and other foreign English-language publications on the subject "Electrical Engineering". They were processed by the method of continuous sampling. The total volume of the text corpus is 200 thousand tokens. On the basis of this corpus a probabilistic-statistical model of this technical sublanguage was formed from which the list of adjectives analyzed in the work was extracted. When distinguishing the lexical layers in the corpus of adjectives, the specific features of this part of speech are taken into account whose meaning is largely determined by the semantics of the noun combined with it. The regularity of the combination of adjective and nouns is the presence of a common "seme" in both components of the combination. First of all, this concerns such meanings as abstractness/concreteness. The cases were noted when the semantic and functional dependence of adjectives on nouns combined with them is realized in the form of parallel units found in different lexical layers. For example, the cases have been distinguished when adjectives are used as units with a common (general scientific) meaning joining only nouns with a common (general scientific) meaning, and simultaneously they join the noun-terms, forming combinations, in which their basic (primary) meaning is transformed (terminologized) and they become terms. In the latter case the common "seme" disappears, and the whole combination acquired a more abstract meaning. It should be noted that when forming the inventory list of adjectives, lexemes that are used in the text corpus "Electrical Engineering" simultaneously in common (general scientific) and terminological meanings, both meanings were taken into account. This was especially important when calculating the percentage of units of different lexical layers.

Key words: frequency dictionary, lexical layer, seme, statistical method, term, parallel lexemes.

Problem Statement

It is known that the lexis of the language of science has a feature that significantly differs it from the one of other types of discourse, for example, fiction, documentation, etc. It consists in a certain heterogeneity, stratification of the lexical composition which has been distinguished by many theoretical linguists [1; 2; 3; 4]. This parameter follows, first of all, from the specifics of this style, which is characterized by the authors' desire for a generalized abstract presentation of the material, for the accurate definition of concepts, phenomena and processes in production [5; 3]. The accuracy and objectivity of scientific estimations and definitions are achieved by the correct selection of lexical characteristic inherent exclusively to scientific-technical discourse.

Quite recently in the works of linguists the corpus of lexemes was divided into two stratification layers – terminological which usually includes words denoting scientific concepts of a certain technical specialty, and common. However, the emergence of specific frequency dictionaries (belonging to some industrial or technical field), analysis and comparison of their lexical structures and contents promoted the identification of one more layer – the general scientific one. It includes units common to all scientific and technical texts and can be found in almost any scientific work. The research has demonstrated that this lexical layer contains the units common for the text corpora of almost all specialties, they are first of all terms referred to base subjects – mathematics, physics and chemistry.

In linguistics the development of methods for lexical stratification of frequency dictionary lists is carried out in two directions: 1) based on the choice of a lexical-semantic variant from the semantic structure of a word which is dictated by the context; 2) based on statistical methods.

One of the methods of linguistic statistics – the rank correlation method compares several frequency dictionaries in order to determine the difference in ranks, the other compares the statistics of the distribution of text units over microsamples with the normal distribution or Poisson's law. The usage of statistical methods in linguistics provides the lexical layers with other units except for terms mentioned above which are also common for texts of practically all fields of science.

However, it seems that the most productive way of lexical characteristics of a word which makes it possible to attribute it to a particular layer is to study its (word) semantic structure and its implementation in text corpus, to identify the degree

of polysemanticity of a word. A further description of the presented problem will show that the choice of this exact method turned out to be the most appropriate for stratification of the list of lexemes.

The latest research analysis

The stratification of the content of specific frequency dictionaries into lexical layers has received wide recognition among linguistic researchers, and is used in almost any work that is carried out on the material of such frequency lists [6; 7; 8; 9]. In most of them, lexical layers are distinguished using linguistic-statistical methods, for example, according to the formula used for rank correlation. Usually a correlation is made between the analyzed technical sublanguage and a dictionary based on units from works of fiction. Such kind of dictionary is usually the dictionary by E. Thorndike and J. Lorge [10]. The difference in ranks can affect the assignment of a word to a particular lexical layer. Often, and in especially difficult cases, linguists resort to the opinion of specialists in the researched areas of technology that are reflected in text corpora, using the method of expert assessment [7; 11].

The study of stratification layers gradually led to the discovery of such a phenomenon as the functioning of the same units in different lexical layers or in other words – terminologization of commonly used (general scientific) lexemes and the determinologization of terms. This was noticed by many linguists [12; 13; 14;16]. However, if some of them describe this phenomenon as existing in the English language in general [12; 14; 15] then for others the basis of analysis is specific linguistic objects in the form of text corpora of certain areas of scientific or newspaper-journalistic discourses [13; 16; 17].

Despite a fairly detailed study of the problem some issues have not yet received their development. These include the lack of more detailed studies that relate to exact parts of speech.

The present paper aims to fill this gap by offering a description of such kind of research.

Goal of the article

The goal of the article is to consider the results of the process of terminologization of adjectives with common (general scientific) meanings used in the texts of technical discourse, i.e. the units that function in the text corpus simultaneously in both common (general scientific) and terminological meanings and are included in several lexical layers of the studied list of adjectives.

Basic results of the research

The main reason why adjectives have been chosen as an object of research in this article was the special ability of units of this part of speech for lexical transformation, which they possess to a much greater extent than any other part of speech, due, first of all, to their lack of independence, and semantic dependence on nouns combined with them.

The analysis of adjective-terms has been carried out at the lexical level, i.e. identification of the initial lexical layer to which the terminological adjective belongs was performed.

Since linguists note that "neither in the form nor in the content can we find a significant difference between the word of common, nonspecific vocabulary and the word of terminological vocabulary" [18], for differentiating a term and a non-term, the most significant parameter is the sphere of the use of words, i.e. not a logical but a purely functional criterion".

As the material one of the areas of technical discourse – "Electrical Engineering" – has been chosen. The text corpus is based on scientific articles taken from the journals Electrical Engineering, IEEE Transactions on Power Apparatus and Systems and other foreign English-language publications on the subject "Electrical Engineering". They were processed by the method of continuous sampling. The total volume of the text corpus is 200 thousand tokens. Such a volume is quite representative according to the standards of linguistic statistics. On the basis of this corpus a probabilistic-statistical model of this technical sublanguage was formed from which the list of adjectives analyzed in this work was extracted.

When distinguishing the lexical layers in the corpus of adjectives, the specific features of this part of speech are taken into account whose meaning is largely determined by the semantics of the noun combined with it. The regularity of the combination of adjective and nouns is the presence of a common "seme" in both components of the combination. First of all, this concerns such meanings as abstractness/concreteness, condition, etc.

For example, if the adjective *short*, denoting size, is combined with a noun denoting an object that can be characterized from the side of size, for example, *wire*, then it (adjective) retains its basic, commonly used meaning. Wherein as can be seen from the example such lexemes possessing common meanings can be combined with nouns having the "seme" common with them, regardless of which lexical layer this noun may be referred to.

If the same adjective is combined with a noun denoting an object that cannot be characterized from the side of size, then in this case the seme "size" is eliminated, the adjective is rethought and acquires a more abstract meaning. Thus a combination is often created that has a terminological characteristic since it has become a concept denoting some electrical phenomenon and so is included in the terminology system of the scientific field "Electrical Engineering", for example, *short circuit*.

The cases should be noted when the semantic and functional dependence of adjectives on nouns combined with them is realized in the form of parallel units found in different lexical layers. So the cases have been distinguished when adjectives are used as units with a common (general scientific) meaning joining only nouns with a common (general scientific) meaning. And simultaneously they join the noun-terms, forming combinations in which their basic (primary) meaning is transformed (terminologized) and they become terms. In the latter case, as already mentioned, the common "seme" disappears, and the whole combination acquired a more abstract meaning. Here are some examples.

1. *characteristic*

Common meaning: *Characteristic data are given in the Table 1*.

Terminological meaning: *This may be done by considering characteristic impedance, or more easily, by checking capacitive reactance as described above.*

characteristic impedance is an impedance, the very value of which determines (characterizes) the properties of a quadrupole or a line, i.e. the adjective *characteristic* in combination with the term *impedance* certainly realizes its terminological meaning.

2. *transient*

Common meaning: *Excluding magnetising inrush effect of transformers and failures within the HV DC convertors themselves, most transient events in HV DC system … .*

Terminological meaning: *To avoid this operation during transient resistance protection is designed so that it only operates…*

transient resistance denotes the ratio of the voltage at the input of the circuit to its current in the transient mode (the resistance value is determined by the ratio of voltage to current). Has the dimension

of resistance, which explains this name. In this electrical concept, there is no direct indication of resistance, but only the ratio of voltage to current, as a result of which a sharply increasing active resistance is obtained. That is, one adjective-term *transient* denotes a whole electrical process for the formation of an electrical concept of resistance of a certain type. In this combination it is the adjective that contribute to the formation of scientific concept included in the system of concepts of Electrical Engineering, because they point to hidden, implicit processes or objects.

3. *practical*

Common meaning: *However, more practical considerations impose more severe restrictions on the length of the rod.*

Terminological meaning: *As the circuit in which the high frequency current flows at reignition, that is, the cable at both ends of the vacuum switch, capacitor and source inductance, are important for the 3-phase simultaneous interruption, it was thought that if the study is made by making them contrast with the practical circuit…*

practical circuit (real circuit) – actually existing, "real" circuit as opposed to "ideal" circuit, which contains "idealized" elements necessary to simplify the analysis, i.e. in this adjective, attached to the noun-term, the synonymous meaning is realized, taken into account in its (adjective) semantic structure.

4. *critical*

Common meaning: *It can be seen that under the most critical conditions of heavy contaminations and rain the power frequency withstand voltage of the new semiconductive insulator.*

Terminological meaning: *The critical flashover voltage is usually measured on typical power gaps.*

critical flashover (voltage) is the maximum possible voltage for a circuit, above which, as a rule, something burns out in the circuit, thus the general categorical-lexical seme "condition" is preserved.

5. *short*

Common meaning: *Some of the results can be seen to have application to other conditions and longer lines but the main emphasis has been on short lines length, typically up to 8 km.*

Terminological meaning: *From a circuit-breaker viewpoint, the effect of semiconductors touching due to attraction under short circuit shown to be significant, since it increases the rate of rise of transient recovery voltage.*

Although the adjective *short* is used both in everyday speech and in terminological combinations (*short circuit*) its terminological meaning does not seem to be so one-sided. The fact is that the phenomenon of short circuit (known to everyone for its destructive properties) is explained by electricians as a rather complex process in which the adjective *short* carries the main semantic load. It (adjective) denotes a short path for the action of the current, i.e. in the event of a short circuit, the current flows along the shortest path through the least resistance, which is dictated by physical laws. Thus, it is the adjective-term that includes the entire explanation of this electrical phenomenon.

From the examples given one can see that adjectives have a terminological meaning only if they are combined with noun-terms, for example, *impedance, current, circuit, voltage*, etc. By joining units that are parts of the commonly used or general scientific layers, such as *data, event, consideration, condition*, etc., they retain their basic commonly used meaning.

Here it is obvious that the dependent nature of adjectives predetermines their functioning in parallel in two or more lexical layers, which is demonstrated by the examples.

It should be noted that when forming the inventory list of adjectives, lexemes that are used in the text corpus "Electrical Engineering" simultaneously in common (general scientific) and terminological meanings, both meanings were taken into account. This is especially important when calculating the percentage of units of different lexical layers.

Conclusions.

All of the above allows us to draw the following conclusions.

1. The results of the study of the text corpus of the technical specialty "Electrical Engineering" have showed that in the texts of this specialty there are adjectives capable of simultaneously realizing their meanings of both common (general scientific) and terminological nature.

2. The process of terminologization of an adjective depends, first of all, on the presence or absence of a common "seme" in both elements of the combination "adjective + noun". If such a "seme" exists then the adjective does not become a term, even if it is attached to a terminological unit.

3. At the same time there are cases when the attribution of adjectives to a particular lexical layer depends on the lexical layer, which the nouns, with which they (adjectives) are combined to form a combination, belong to. If the noun belongs to the commonly used (general scientific) layer of the dictionary, then in this case the adjective realizes its commonly used (general scientific) meaning and creates a combination with the commonly used (general scientific) meaning. If the adjective is attached to the term, then in this case the adjective acquires a terminological meaning and creates a combination that is included in the terminology system of the specialty "Electrical Engineering".

4. When creating lexical layers of adjectives and calculating the frequency of their occurrence in the text corpus the facts are taken into account when the same adjective can be both a term and a commonly used (general scientific) lexeme.

Further research involves the study of other text corpora related to technical discourse in order to find similar lexical units and study the nature of their occurrence and usage. The presence of several text corpora of such kind will make it possible to compare the characteristics of the terminologization process in lexemes that are usually implemented in texts of different types of discourses with a commonly used (general scientific) meanings.

References:

1. Щерба Л.В. О трояком аспекте языковых явлений и об эксперименте в языкознании. *Языковая система и речевая деятельность: сборник.* Ленинград, 1974. С. 313–318.
2. Гальперин И.Р. Очерки по стилистике английского языка. Москва, 1958. 458 с.
3. Даниленко В.П. Лексико-семантические и грамматические особенности слов-терминов. *Исследования по русской терминологии.* Москва, 1971. С. 53–57.
4. Митрофанова О.Д. Язык научно технической литературы. Москва, 1973.147 с.
5. Глушко М.М. Стратификация лексики языка научной литературы. Функциональный стиль общенаучного языка и методы его исследования. Москва, 1974. С. 77–93.
6. Tsinovaya M.V. The interaction between grammatical and lexical features of the constituents of modal constructions with the verb c a n (on the material of sublanguages of scientific-technical discourse). *Молодий вчений*. 2015. № 2 (17). ч. V. С. 132–136.
7. Трофимова Г.С., Дьяченко Г.Ф., Циновая М.В. Взаимосвязь статистического, лексического и морфологического аспектов двухкомпонентных атрибутивных конструкций в судебно-

процессуальном дискурсе. *Одеський лінгвістичний вісник*. 2014. № 4. С. 269–272.
8. Dyachenko G.F., Mykhailiuk S.L., Duvanskaya I.F, Ershova Yu. A. Types of verbs-terms in the texts of scientific technical discourse (on the basis of text corpus "Acoustics and ultrasonic technique"). *Закарпатські філологічні студії*. Ужгород, 2019. № 7. С. 78–83.
9. Почтарук Г.Я., Лебедева Е.В., Гвоздь О.В. Семантическая структура существительного temperature в текстовых корпусах научно-технического дискурса. *Закарпатські філологічні студії*. Ужгород, 2018. Вип. 5. С. 101–105.
10. The Teacher's Word Book of 30 000 words / E. Thorndike, J. Lordge. New York: Columbia University Teacher's college press, 1968. 274 p.
11. Tsinova M.V. Lexical component of the second constituent of modal verb constructions in the texts of scientific-technical communication. *Вісник Харківського національного університету ім В.Н. Каразіна. Серія "Романо-германська філологія. Методика викладання іноземних мов*. 2014. № 1102. С. 155–159.
12. Лубожева Л.Н. Процессы терминологизации и детерминологизации специальной лексики. Челябинский гос.Ун-т. URL: http://www.rusnauka.com (дата звернення: 19.03.2015)
13. Мартемьянова М.А. Особенности формирования современных научных технических терминологических систем (на примере терминов нанотехнологий): автореф. дис. … канд. филол. наук: 10.02.04. Ижевск, 2011. 22 с.
14. Милетова Е.В. Англоязычный искусствоведческий дискурс: природа и лексическое наполнение. *Филологические науки. Вопросы теории и практики*. Тамбов, 2013. № 4. Ч. 2. С. 114–119.
15. Чистюхина С. Н. Межотраслевая полисемия в терминологической системе современного английского языка: автореф. дис. … канд. филол. наук: 10.02.04. Москва, 2011. 22 с.
16. Худинша Е.А. Особенности становления и развития английских базовых терминов в подъязыке экономики: автореф. дис. … канд. филол. наук: 10.02.04. Омск, 2011. 22 с.
17. Мистюк Т.Л. Особенности современной терминологизации в языке газетной публицистики. *Филологические науки. Вопросы теории и практики. Научно-теоретический и прикладной журнал*. 2013. N 12. Ч. 2. С. 127–130.
18. Рожнова И. А. Неологизмы в английской терминологии полиграфического производства: автореф. дис. …канд. филол. наук: 10.02.04. Омск, 2005. 24 с.

Томасевич Н., Шапа Л. Функціонування лексичних паралелей у текстах технічного дискурсу (за матеріалом текстового корпусу «Електротехніка»)

Анотація. У статті розглянуто термінологізацію прикметників із загальновживаними (загальнонауковими) значеннями, які зустрічаються у текстах технічного дискурсу, тобто одиниць, які функціонують одночасно як у загальновживаних (загальнонаукових) значеннях, так і в термінологічних. Вони включені до кількох лексичних шарів досліджуваного переліку прикметники. У якості матеріалу обрано один із напрямів технічного дискурсу – «Електротехніка». Текстовий корпус базується на наукових статтях, взятих із журналів Electrical Engineering, IEEE Transactions on Power Apparatus and Systems та інших іноземних англомовних публікацій на тему «Electrical Engineering». Вони були оброблені методом безперервної вибірки. Загальний обсяг текстового корпусу становить 200 тис. лексем. На основі цього корпусу була сформована імовірнісно-статистична модель цієї технічної підмови, з якої витягнуто перелік аналізованих у роботі прикметників. При розмежуванні лексичних шарів у корпусі прикметників враховуються специфічні особливості цієї частини мови, значення якої багато в чому визначається семантикою іменника, якій поєднується з ним. Закономірність сполучення прикметника та іменника полягає у наявності спільної «семи» в обох компонентах сполучення. Насамперед це стосується таких значень, як абстрактність/конкретність. Відзначено випадки, коли семантична та функціональна залежність прикметників від поєднаних з ними іменників реалізується у вигляді паралельних одиниць, що зустрічаються в різних лексичних шарах. Наприклад, виділено випадки, коли прикметники вживаються як одиниці загальновживаного (загальнонаукового) значення, які приєднуються лише до іменників з загальновживаним (загальнонаукового) значенням, і водночас вони приєднуються до термінів-іменників, утворюючи сполучення, в яких їх основні (первинні) значення трансформується (термінологізується) і вони стають термінами. В останньому випадку загальна «сема» зникає, а все сполучення набуває більш абстрактного значення. Слід зазначити, що під час формування інвентарного переліку прикметників, лексеми, які вживаються в текстовому корпусі «Електротехніка» одночасно в загальнонауковому та термінологічному значеннях, враховувалися обидва значення. Це було особливо важливо під час обчислення відсотка одиниць різних лексичних шарів.

Ключові слова: частотний словник, лексичний шар, сема, статистичний метод, термін, паралельні лексеми.