Metaphor as a Mechanism of Term Formation in Computer Science and Cybernetics (based on the Material of German and Russian Languages)

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Abstract
This article aims to identify the formation and functioning patterns of term units developing on the basis of common vocabulary. Metaphor is the main mechanism of term formation based on commonly used words. The article discusses the units of the terminological system of computer science and cybernetics based on the material of the Russian and German languages. The research methods were descriptive and comparative methods, as well as methods of psycholinguistic experiments and statistical calculations. Metaphorical reinterpretation is based on associations and analogies associated with a specific image, which serves as a motive for the new meaning of the word-term.
Key words: metaphor, common word, term formation, German language

1 Introduction

J. P. Richter said that language is a dictionary of faded metaphors Researchers have been seriously studying metaphor and its meaning for scientific terminology for a long time, having reason to believe that scientific concepts always retain some metaphorical properties despite attempts to define them strictly and that metaphor is compatible with a serious idea. It is known that scientific creativity is impossible without the participation of everyday consciousness and imaginative thinking, that is, without using the base of commonly used words, including their figurative meanings and figurative uses. The proof of this is the whole series of metaphorical, figurative terms (Denisov, 1983). There are attempts to explain attachment to imagery, metaphoricity in term formation. Although in the final form scientific thought is formed in a logical system, the psychology of search, as well as emotionality in the process of transferring thoughts from one interested person to another – all this affects the process of signifying a new concept, which also wants to be presented in an accessible and previously familiar form. In addition, a thought is easier to perceive if it makes a shocking impression and creates intellectual tension. Metaphor, as a special illogical form of thought transmission, is one of the methods of creating such tension.

The role of metaphor in terms of nomination has long been given close attention, and attempts to create a general theory of metaphor have been made not only by linguists but also by philosophers and logicians. The most peculiar theories of metaphor explaining the change of meanings appeared in the 20th century. One of them is Gustav Stern's theory of substitution, according to which substitution is one of the most common forms of semantic change. To understand the metaphor, you need to restore the term that was replaced. Moreover, the metaphor itself does not imply new information (Zhol, 1984). The theory of metaphor, called the theory of interaction, was developed by the American philosopher Max Black (1962). In the work of M. Black, there are presented three views on metaphor, as on: 1) the unit that replaces some equivalents of literary expressions (substitution view); 2) comparative unit, if the metaphor is to represent the underlying analogies or similarities (comparison view) and 3) the interacting unit, when the old and new meanings affect each other (interaction view). The author believes that in a sentence with a metaphorical word, there is a "focus" or so-called center of the metaphor, as well as its context, where the center is the metaphorical word itself, and the rest of the words are the context. A new

context that expands the meaning of the central word appears, thus the interaction of the old and new meanings occurs (Black, 1962). According to V. N. Telia, Black's theory is further developed by N. D. Arutyunova, V. V. Petrov, V. N. Telia, K. K. Zhol (Telia 1986).

E. E. R. MacCormack's work develops the metaphorical tension theory developed by P. Wheelwright, M. Foss, et al. According to this theory, two complementary tendencies are in tension in metaphor – epiphora and diaphora, which receive a new terminological meaning here. According to the author, scientists need a metaphor as a kind of bridge between old and new theories. Only through metaphor can new meanings of terms be developed that are understandable in new theories, since metaphors have a hypothetical nature, that is, a new additional meaning or property "as if" (MacCormac, 1971).

2 Materials and Methods

The object of our research is a group of elements of the terminological system of the subject areas of computer science and cybernetics, the component of the meaning of which goes back to the commonly used nominal lexical units. This group is one of the links of a complex terminological system of these sublanguages. The units of interest to us make up about 2% of the total volume of terms. The set of these units, which have common patterns of education, is an essential component of the system.

The research material comes into contact mainly with a range of concepts related to technology, functioning, and description of specific devices and their parts: computers, industrial robots, perforating devices, with methods and systems for transmitting various information, etc. The "objectivity" of the objects of research determines the search for sources of terms in the system of everyday concepts. The choice of names is also influenced by the connection of the sublanguages themselves with various aspects of society and human life. Apparently, the terms and nomens themselves have different sources of formation on the basis of common vocabulary, but their classification would be very conditional due to the above reasons. Mainly used areas of common vocabulary for terminologization and the formation of special names in this area are primarily thematic groups: "Man", "Artifacts" and "Nature". Moreover, groups that have the germs of the system in themselves are transferred to a special area almost entirely, which is what happened with the terms of kinship.

The studied lexical material was selected from specialized lexicographic sources and scientific texts. With the development of science and technology, there is a need to designate a mass of new phenomena, concepts, devices, and apparatuses, for which stylistically neutral terms are not always enough. A commonly used word attracts specialists with its imagery, emotional coloring. As the living practice of term formation shows, specialists and inventors of terms often prefer emotionally colored units to neutral ones (Black, 1962). Most of the studied elements of the terminosystem are formed by metaphorical reinterpretation. Recently, metaphorization has been considered one of the most relevant types of semantic term formation (Gavrilova, 2019; Kozhina, 1977).

The research methods were descriptive and comparative methods, as well as methods of psycholinguistic experiments and statistical calculations.

3 Literature Review

According to researchers, there is still no sufficiently complete and consistent description of the seminal mechanism of metaphor (Khromykh, 1979). Apparently, in each specific case it will be purely individual, as the ratio of common

and distinct features of the direct and metaphorical meaning of each individual word is individual. Here a lot depends on what kind of image arises from the creator of the metaphor, which analogy will be the basis of the semantic shift. One thing is certain – the presence of common features in both meanings and the appearance of a new component of meaning peculiar to the word that has just been formed as a result of the metaphor. The most legitimate, in our opinion, would be to assume (following D.N. Shmelev) three possible types of relations between direct and metaphorical meanings: 1) a figurative value develops an essential element of the original value; 2) a figurative value has a common and distinct with the original; 3) a figurative value develops a potential sema (Shmelev, 1973). According to J. Lakoff and M. Johnson, the essence of the metaphor is to understand and experience the essence of one thing in terms of the essence of another thing (Lakoff, Johnson, 1987).

Several authors connect the concepts of metaphor and analogy (Nalimov, 1979,; Perelman, Olbrechts-Titeka, 1987; Poltoratsky, 1977; MacCormac, 1971; Bückendorf, 1963), which is difficult to argue with, because a specific feature of analogy is a comparison, even if belonging to different areas, but with similar structures. Modern research in conceptual metaphor confirms that metaphor is a means of constructing a language and communication between common and scientific languages (Kalinina, Kotsyubinskaya, 2019; Tsukanova, 2020; Chudinov, 2013).

Zoopsychologists are now talking about the ability of animals to "think over" the problem that has arisen, calling it "insight" ("insight"), and interpret it as the ability to transfer existing experience or its elements to a new environment and use it to solve the problem that has arisen, that is, the ability to use previously accumulated associations, analogies and conditioned reflexes in a completely different way. unfamiliar surroundings (Sergeev, 1988). Physiologists believe that one of the most important improvements in brain activity is the ability to form associations – a special kind of temporary connections. Apparently, this is the peculiarity of the physiological perception of metaphorical expressions, in contrast to the perception of expressions of direct meaning, in the delay in closing new temporary connections based on excitations coming to the brain from the words of the metaphorical expression. "This delay is due to the initial inconsistency of the metaphorical word with the subject of expression. It favors the irradiation of excitation to a wider range of primary and secondary signal traces until conditions arise for the closure of new temporal connections underlying the understanding of metaphor" (Nikiforova, 1954).

Currently, the understanding of metaphors is being investigated experimentally in the process of their interpretation in ontogenesis, although the processes of metaphorization in children's speech have been studied very little. The results obtained in the linguistics of children's speech indicate that this process is dynamic, that is, it goes through the steps from the subjectivity of the perception of metaphor through its direct meaning to the figurative meaning (Shakhnarovich, Yurieva, 1987). The process of interpreting a metaphor by children makes it possible to trace the path of recreating a metaphor, its subjectively new creation. The peculiarity of the secondary nomination is that the reinterpreted content of the linguistic form always mediates the epistemological image of the reflected extra-linguistic object. It is precisely the subjectivity of rethinking the meaning of a word when denoting a non-linguistic object that explains the complexity of children's perception of a metaphor.

We find the process that underlies children's speech creation and essentially models the fundamental patterns of nomination particularly interesting according to the scheme "a new subject is a ready–made lexical unit". For a child naming an unfamiliar object for the first time, this is a subjectively primary nomination, but for a language it is a secondary one. A. A. Potebnya writes on this topic "I point the child who is just beginning to speak to the round frosted lamp cap and ask what is it. The child has seen this thing many times, but did not notice it. He does not know it,

because the traces of impressions themselves do not constitute knowledge. I want him not to supplement his impressions with new ones, but rather to combine the old ones and bring them into connection with his stock of consciousness and impressions put in order. He answers my question with "watermelon." Here took the cognition by naming, comparing the known with the previously known. The meaning of the answer is as follows: what I see is similar to a watermelon" (Potebnya, 1958). A. A. Potebnya refers to the described case to compare it with the natural mechanism of naming a new class of objects with already known names previously "attached" to another class. A. A. Potebnya writes: "Everything makes one think that in language, as in general, sensory perceptions and their complexes should be recognized as the starting point of thought, therefore, something very concrete compared to the abstraction of the general quality" (Potebnya, 1958). In fact, A. A. Potebnya analyzed in this part all the necessary psycholinguistic conditions for generating a metaphor, for transferring meaning, and for introducing a motivated secondary nomination based on visual-sensory representation.

V. N. Telia believes that two phenomena are essential in the formation of metaphor: 1) the metaphor is given the form of identity, and 2) in the metaphor, two parallel systems of ideas coexist about what is denoted and what was the motive for this nominative accomplishment (Telia, 1986). In other words, the image underlying the metaphorical reinterpretation, its signs, analogies and associations associated with it, are the main motive for the nomination of a new concept. Therefore, the "path from thought to word itself is a complex and step-by-step process of transition from vague images, associations, representations, etc., born in a person's head, from activated at the moment of the need to say something to the processing of these personal meanings, produced for the purpose of further "verbalization" ..." (Kubryakova, 1986). The basis of metaphorization should be analogies and associations associated with a particular image or its features, and contributing to the formation of new temporary connections. If conditioned reflexes are signals of the first signaling system, then associations are not called ordinary reflexes. "They are not used to directly change the behavior of an animal – conditioned reflexes perform this function – but for the internal needs of the brain, for its hidden mental activity. In essence, any thought is a chain of associations developed and accumulated throughout our lives" (Sergeev, 1988).

The growing interest in metaphor in term formation is explained, in particular, by the fact that the scientific language of recent decades is distinguished by metaphoricity (Apresyan, 2020; Zubkova, 2010; Omarova, 2021; Scriabina, 2021; Stoyanova, 2021). This new quality allows researchers (especially psychologists and psycholinguists) to penetrate into the process of scientific thinking, reconstruct the motives of term formation, the motivation of the terminological units themselves (Petrov, 1982). As a kind of secondary nomination, metaphor prevents the "swelling" of the terminological layers of the language, which is its absolute advantage. In order for an ordinary word to become a term, it must go through the path of terminologization, that is, it must acquire and consolidate a special meaning and use. There have long been two main ways of terminologizing vocabulary: borrowing (often using Latin-Greek morphemes) and using the language's own lexical system. It is appropriate to recall that at present there is an ever-increasing interaction, the convergence of special vocabulary with common vocabulary. Researchers believe that terminology cannot but be influenced by common vocabulary, since it is part of a common lexical system. Some researchers even believe that the main layer of all terminologies is a layer of ordinary Russian words. We are interested in how the commonly used unit is terminologized.

According to A.A. Reformatsky, everyday word and term – linguistically this is a whole problem (Reformatsky, 1968).

4 Results and Discussion

Recently, it has been characterized by the massive emergence of new terms, terminological fields, and terminological systems. There are problems associated with the transformation of terminologization into a controlled process: ordering, unification, standardization, internationalization. Therefore, the universal regularities of term system replenishment are of interest, first of all, which is metaphorization as one of the actual types of semantic term formation.

Currently, it is believed that there is still no single, universally recognized definition of the term. But another thing is also true that between lexicologists, "there seems to be no disagreement in the understanding of the term as a word or phrase associated with a concept belonging to any field of knowledge or activity" (Barkhudarov, 1970). Being a member of the general lexical system, the term differs from everyday words by a number of features that meet certain requirements. D.S. Lotte wrote: "Any scientific and technical term, as opposed to an ordinary word (or phrase), should have a limited, firmly fixed content. This content should belong to the term regardless of the context, while the meaning of an ordinary word is clarified only in a certain context with other words" (Lotte, 1961). The same author proposed criteria – the systemic conditionality of the term, its independence from context, absolute and relative unambiguity, accuracy and brevity, which many linguists accept. The question of the stylistic characteristic of the term remains debatable, and most researchers insist on its stylistic neutrality as a relevant feature (Vinokur, 2019; Kapanadze 1965; Reformatsky, 1968, etc.). In contrast to this traditional view, there is an opposite point of view (Petrov, 1982; Piotrovsky, 1952; Prokhorova, 1970), shared by us: the term is not always devoid of emotionally expressive components of meaning.

It is known that scientific creativity is impossible without the participation of everyday consciousness and imaginative thinking, that is, without using the base of commonly used words, including their figurative meanings and figurative uses. The proof of this is the whole series of metaphorical, figurative terms (Denisov, 1983). In our opinion, the problem of the emotional coloring of the term is considered most fully and convincingly by V.N. Prokhorova, who believes that the terms can express the speaker's attitude to the subject of speech and be expressive. She does not agree with the division of terminology into special terminology and professional vocabulary, of which the first is devoid of expressive components, and the second can possess them. In her opinion, foreign language terms are neutral, and those formed from the words of the native language are not always neutral. The author believes that the imagery and emotionality of the terms are felt not only by non-specialists but also by carriers of special terminology (Prokhorova, 1970). V.N. Prokhorova considers metaphorical formation of terms as a type of semantic term formation. At the same time, the possibilities of metaphorical transfer are noted: by similarity of shape (*collar, coal buds*); by similarity of location (*floor wing, box cheeks*); by similarity of functions (*ballast cushion, hydrogeological windows*). It is also possible to transfer by similarity of features, form and function, function and location, etc. Metaphorical transfer in term formation is characteristic primarily for words of a specific vocabulary, that is, words denoting objects and living beings (Prokhorova, 1980). And other researchers consider specific words to be the most imaginative (Arutyunova, 1979; Kolodkina, 1986).

As it turned out as a result of our research, the processes of semantic (namely, metaphorical) reinterpretation are also relevant for the formation of elements of the terminological system of computer science and cybernetics. The diverse nature of the objects of study of new related scientific directions, the penetration into their scientific apparatus of a large number of concepts from different scientific fields, caused the specificity and heterogeneity of the terminological system of these sublanguages. Along with the terms themselves, the special vocabulary of computer science and cybernetics includes nomenclature names and units standing between nomens and terms, the so-called "semi-terms". The presence of these special components is precisely the feature of this term system. In this regard, it seems necessary to investigate the layer of elements of this term system with a subject-shaped component of meaning.

The material under study is interesting in terms of belonging to it various elements of the terminosystem. The nature of the term system of computer science and cybernetics determines a significant number of special names, since along with fundamental scientific problems, these disciplines solve purely technical and applied problems that require attention to material objects. The considered group of elements of the terminological system of the sublanguages of computer science and cybernetics is formed on the basis of lexical units with a subject-figurative component of meaning. At the same time, some of the units under consideration are terms in the full sense of the word, for example, *family / Familie; queue / Warteschlange; field / Feld*, etc., and the other part of the units are not terms themselves. Under the nomens in this subject area, we agree to understand the units in which the denotative function prevails over the significative one and which are essentially the names of objects. These are units like *slider / Läufer, Tongue / Zunge, Needle / Nadel, Cap / Haub*e, etc.

Among the term units of interest to us, we can also distinguish a group of those whose formation occurred as a result of metonymic transfer by function from one subject to another – these are *elektronische Post / e-mail, elektronische Zeitung / electronic newspaper, Briefkasten / mailbox, Menü / menu, Brief / letter, Adresse / address, Bibliothek / library*, etc. Metonymically formed terms are not as numerous as terms formed by metaphorical reinterpretation. This preference is probably connected with the mechanism of metaphor formation itself, which presupposes more freedom for creativity and imagination in the formation of analogies compared to metonymy. The metaphorical way of forming terms gives more vivid and unexpected designations, which are therefore better remembered. Recently, they have been talking about the dependence of the frequency of use of words on their expressiveness, since the speaker prefers words that have more expressiveness (Levitsky, Komarnitskaya, 1983).

The thematic groups of the Russian language include 192 units.

The 1st group is represented by the names of artifacts (85 units in total).

Subgroups:

a) designations of household items: *needle, coil, clock, comb, saddle, key, rocker, (black) box, drum, bottle, wheel, saw, phone book, chain, prosthesis, stuffed animal, float, ball, fan, deck, ring, confetti, sieve, document, passport, barrel, obelisk, palette* (28 units);

b) articles of clothing, articles made of fabric and threads: *flag, ribbon, backpack, net, thread, loop, knot, casing, cap, collar, mask, sleeve, cap, hammock, net, pocket, patch, train* (18 units);

c) structures and their parts: *a dead end, a bridge, a tunnel, a lock, a console, a window, a threshold, a skeleton, a lattice, a brick, a window pane, a curb, a tent* (13 units);

d) transport realities: *semaphore, gateway, bus, port* (4 units);

e) institutions and means of communication: *mail, mailbox, letter, newspaper, telegram, address, package, parcel, envelope, magazine, (glass) teletype* (11 units);

f) names of stationery and educational supplies: *dictionary, folder, tablet, brush, pencil, book, page, bookmark, volume, ink (magnetic), satchel* (11 units).

The 2nd group with the semantic theme "Man" covers 46 units, divided into the following subgroups:

a) kinship terms: *father, parent(s), daughter, son, brother, descendant, ancestor, twin, family* (9 units);

b) designation of profession, occupation: *watchman, runner (ok), librarian, administrator, arbitrator, oracle, traveling salesman, (auto) pilot, garbage collector, painter* (10 units);

c) names of social characteristics: *owner, master, servant, neighbor, follower, predecessor, addressee, sender* (8 units);

d) names of human qualities: *fool, malefactor, demon* (as "humanoid") (3 units);

e) the names of the body and its parts: *body, leg, arm, finger, hand, right hand, head, tongue, skeleton, tooth, shoulder, face, hump, rib, profile, muscles* (16 units).

The 3rd group called "Nature" consists of the following subgroups:

a) designations of living beings, parts of their body and housing: *animal, mouse, turtle, snail, rat, chord, feather, (electronic) fox, (electronic) squirrel, (electronic) dog, tail, nest* (12 units);

b) flora: *forest, tree, trunk, bush, branch, root, leaf, kernel, rose, crown, cactus, boron, chamomile* (13 units);

c) geography and topography:*Monte Carlo, field, wave, stream, path, peak, ravine* (7 units).

The 4th group combines units with the idea of a "set of objects": *a bundle, a set, a heap, a bundle, a queue, a group, a tuple* (7 units).

In the last group we also included units that were not included in the previous ones: *alphabet, labyrinth, rendezvous, menu, library, atom, archive, leapfrog, star, carousel, syntactic sugar, diagnosis, appendix, catalog, volume table of contents, irritation, hole, noise, attenuation, bell, game, jump* (22 units). Several subgroups could also be distinguished in this group, for example, library names such as *library, catalog, volume table of contents*, names of games and entertainment such as *game, leapfrog, carousel*, etc. But this will lead to a fine fragmentation, which will make it difficult to review the thematic groups.

There are 206 units in the thematic groups of the German language.

The 1st group has 83 units of artifact designations. Within this group , the following subgroups are distinguished:

a) household items: *Nadel, Spule, Uhr, Kamm, Sattel, Schlussel, Wippe, Flasche, Kasten (Schwarz), Trommel, Teller, Rad, Säge (Zahnsignal), Telefonbuch, Kette, Wörterbuch, Prothese, Strohmann, Gabel, Hülle, Herd, Flaschenhals, Bügel, Kästchen, Leiter, Stab, Platte, Bündel, Sieb, Ring* (30 units);

b) garments, fabric and thread products: *Fahne, Band, Rucksack, Netz, Faden, Schleife, Knoten, Mantel, Haube, Kragen, Maske, Schlauch, Kappe, Masche, Schleife, Geflecht* (16 units);

c) structures and their parts: *Sackgasse, Brücke, Tunnel, Schloß, Konsole, Fenster, Schwelle, Gerüst, Gatter, Baustein, Treppe, Straße, Haus, Kate, Speicher, Keller, Tor, Bühne, Blende, Schranke, Sprosse, Zelle, Kachel, Säule* (24 units);

d) transport realities: *Semaphor, Schleuse, Anker, Bus* (4 units);

e) institutions and means of communication: *Post, Briefkasten, Brief, Zeitung, Telegram, Adresse, Paket, Banderole, Botschaft* (9 units).

The 2nd group with the general semantics of "Man" includes 57 names. This group is divided into several subgroups:

a) kinship terminology: *Vater, Mutter, Tochter, Sohn, Bruder, Kind, Großvater, Zwilling, Familie, Enkel, Urgroßvater, Schwester, Geschwister, Femiliemitglied, Eltern* (15 units);

b) designation of profession or occupation: *Wächter, Bibliothekar, Administrator, Arbiter, Orakel, Läufer, Trainer, Schwimmer, Handlungsreisende, (Auto)pilot, Kumpel* (11 units);

c) names of social characteristics: *Sklave, Vorgänger, Nachfolger, Nachbar, Dame* (5 units);

d) names of human qualities: *Narr, Laie* (2 units);

e) names of the body and its parts: *Rumpf, Bein, Arm, Finger, Handgelenk, Rechte, Kopf, Zunge, Skelette, Zahn, Schulter, Stirn, Buckel, Profil, Körper, Rücken, Fuß, Hand, Schenkel, Sohle, Bauch, Nabel, Scheitel, Knie* (24 units);

3rd group – "Nature" is represented by the following subgroups:

a) names of living beings, their body parts and products: *Tier, Maus, Schildkröte, Schnecke, Ratte, Sehne, Feder, Schlange, Käfer, Horn, Schnabel, Weiche, Flanke, Gehäuse, Muschel, Perle* (16 units);

b) flora: *Wald, Baum, Stamm, Blatt, Strauch, Zweig, Wurzel, Kern, Rose, Ast, Stumpf, Gebüsch* (12 units);

c) geography and topography: *Monte-Carlo, Feld, Welle, Pfad, Strom, Fluß, Halde, Senke, Insel* (9 units).

The 4th group contains the designations of "many objects": *Menge, Büschel, Warteschlange, Schar, Stapel, Satz* (6 units).

The last group is formed from units not included in the previous ones: *Alphabet, Labyrinth, Rendezvous, Menü, Speisekarte, Atom, Bibliothek, Geräusch, Rauschen, Abklingen, Spiel, Sprung, Reiz, Loch, Klirr, Stoß, Stich, Kerbe, Bruch, Totmanns(knopf), Tanzen, Krabbel(n), Lauf* (23 units).

The large number of coincidences of the elements of the terminological system in the Russian and German languages according to their original semantics allows us to assume that in term formation, the process of metaphorization of commonly used words is carried out in the same way as it takes place in both languages in general. The sources of metaphorical reinterpretation are (in our material) mainly lexical units of the semantic groups "Man" and "Artifacts". Researchers write about the universal nature of metaphor as a kind of secondary nomination (Ullman 1970), according to B.A. Serebrennikov, the common features of the languages of the world are explained by "the physiological community of people and are due to the similar structure of the human brain and the organs of perception that can reflect the world in basically the same way" (Serebrennikov, 1976). As we can see, the process of formation of elements of the studied layer of the terminosystem on the basis of commonly used words has some universal features characteristic of comparable languages functioning in conditions similar in level of civilization. We also note the tendency to prefer using the most expressive, emotional elements, which confirms the observation about the choice of future terms from among the professionalisms. It is believed that professionalism and jargon correspond to concepts for which there are no official terms yet, and are potential candidates for terminologization (Borisova, Donskoy, 1987).

In our material, two ways have been outlined for forming special units of the term system based on common vocabulary. The first way is a direct one, in which the commonly used unit immediately passes into terminology. It is characteristic mainly of words that have certain systemic relationships, for example, for kinship

terms or units of the "Flora" subgroup. The second way – stepwise – is, in most cases, the most expressive and emotional units. From commonly used words, they first turn into professionalisms, which then acquire an official status and are part of a special vocabulary. These elements become terms, but retain the old distribution. Therefore, they form a special layer of the terminosystem. The preservation of the subject-shaped component is not contraindicated to the term at its initial functioning stage.

The analysis of our material indicates the predominant metaphorization of certain thematic groups. This coincides with V.Gak's observations. This is about the fact that "metaphorization is primarily subject to words denoting the most well-known concepts and objects from a person's immediate environment. Both in French and in Russian, these words make up the same lexical groups. These are the names of parts of the human body, kinship ties, animals and plants, materials, garments, household items, luminaries and natural phenomena, food, etc." (Gak, 1977).

Metaphorization is one of the semantic laws common to all languages in all historical epochs. It is important for us that, in the course of our research, universal trends in the development of metaphors have been confirmed. S. Ullman, for example, believed that the associations underlying imaginative reinterpretations are deeply rooted in human experience and largely independent of culture and environment (Ullman, 1970). The trends indicated by him are confirmed in the modern material of our research. Thus, semantic reinterpretation occurs through: 1) metaphors of the anthropomorphic type; 2) metaphors of the type "from the concrete to the abstract"; 3) the "semantic law" of Hans Sperber. The first type of metaphors is represented by elements of the term system under study, correlated with the original theme of "Man". This topic has smaller subtopics: terms of kinship, designations of profession, and social characteristics of a person, names of body parts. Metaphors of the type "from concrete to abstract" are units of the type *field, wave, flow, hole*, etc. This also includes units denoting physical sensations, which are used for the second time to describe abstract phenomena. In this work, units of this kind (combinations of a noun with an adjective) are not included, being elements of another level. Their number is more than 30, these are units such as *white noise, hot/cold redundancy, empty set, blind search*, etc. The meaning of Sperber's "semantic law" is that the subject of interest to us becomes a source of analogies when describing other subjects. Sometimes this method of creating metaphors is called "bush". In our material, this trend is clearly visible on the example of a subgroup of units correlated with the semantics of "Mail". With the advent of the element denoting the concept of *e-mail / elektronische Post*, there were names of related concepts such as *e-mail / elektronischer Brief, parcel / Paket, newspaper / Zeitung, mailbox / Briefkasten*, etc.

A pilot study was conducted to identify the figurative component in the meaning of the units under study and its connection with the idea of denotations of different semantic fields – terminological and "primary". In the experiment, 18 native speakers of Russian and 10 native speakers of German (specialists of the specified subject areas and non-specialists) received a related text. Excerpts from journal articles included 5-8 term units belonging in their original non-terminological meanings to one of the thematic groups (designation of man, flora, artifacts, etc.). After getting acquainted with them, the subjects had to mark the units with the parameters of "imagery", "concreteness", "representability", "emotionality", and "positivity". Russian and German examples of such sentences are given below.

1.1. *Movement through the alphabetical dictionary (AS) occurs using the built-in AS "**menu**" dialog.*

*The work of all participants is carried out according to the principle of a "**guide**" (or "**menu**").*

1.2. *Eine neue Datei wird einmal über ihre Beschreibung in die ZID aufgenommen, die **Menüs** um diese neue Datei ergänzt.*

*Den Benutzer führt allerdings das OSG-eigene **Menü** im Dialog, Bedienerschutz einbegriffen.*
*Zwei Verfahren der Bedienerführung «**Menü**» und «Promt» vereinfachen den Dialog. Am Bildschirm erscheint dann eine Auswahlliste (**Menü**).*
2.1. *The essence of the **semaphore** concept is to record a feature by a special command (closing the **semaphore**) in a program that makes changes to the general data set.*
2.2. *Außer dem Namen des **Semaphors** selbst mußte ein weiterer Parameter, nämlich die Programmnummer des Aufrufers übergehen werden. Jeder **Semaphor** besteht aus 3 Byte: **Semaphor**variable, **Semaphor**warteschlange und **Semaphor**erkennung.*
*Insgesamt ist die synchrone Kommunikation genau so leitungsfähig wie andere bekannte Techniker der Prozeßkommunikation. So kann man etwa **Semaphore** mit synchroner Kommunikation simulieren; umgekehrt läßt sich synchrone Kommunikation mit **Semaphoren** darstellen.*
3.1. *Processor subsystems are connected to each other by asynchronous channels (AC), which are memory structures of the "**queue**" type. «**A queue** is a list in which additions are allowed only at the tail, and deletions are allowed only at the head.*
*3.2. Es soll in diesem Artikel die Bedeutung neurer Entwicklungen der **Warteschlangen**theorie für die Zuverlässigkeitsanalyse fehlertoleranter Rechenanlagen dargelegt werden.*
*Wenn die angeforderten Ressourcen frei sind, kann die **Warteschlange** Befehl für Befehl abgearbeitet werden.*
*Systemanalytiker und Programmierer sind permanent damit beschäftigt, den Datenverkehr in Fluß und die durch **Warteschlangen** bedingten Antwortzeiten in erträglichen Grenzen zu halten.*

The reports of the subjects regarding the units of texts showed:

1. Experts, as a rule, but not always, evaluate the corresponding term units in the text as "ordinary", used in this field. In an isolated form, they are most often attributed to a special concreteness, portability, and emotional coloring, as if distracting from their terminological meaning.
2. Non-specialists pay attention to the same units in the same texts as "unexpected" or "strange", because when reading, there is no setting for waiting for these words, known to ordinary readers only in their commonly used meaning.

A separate survey of specialists showed that when they first encountered as a term any of the units such as *Menü / menu, Semaphor / semaphore, Warteschlange / queue*, etc., they experienced certain emotional states (surprise, pleasure, approval, disapproval, etc.). Then the subjects got used to them, finding advantages in them, namely: a) "linguistic familiarity" (we use a combination of one of the subjects), b) "clarity", "clarity", "visibility", "correspondence to the essence of the matter", "adequacy". Here, it is possible, probably, combining all these characteristics, to talk about psychological (not linguistic!) motivation of these units. Further, the "memorability" attributed to term units of this type is noted as a positive feature. It is logical to assume that the word of the native language is remembered better than the borrowed one, although involuntary synonymous substitutions are sometimes noted in the speech of specialists (according to them). All the expert subjects are unanimous in the opinion that over time the imagery of the term metaphor is erased. However, they note that "there is also a revival of the image", which has yet to be investigated. In any case, the functional affiliation of the text determines the reader's attitude to the text-forming units in terms of their terminology / non-terminology, imagery / non-expressiveness, objectivity / non-objectivity, etc.

Based on the conducted experiment, it can be concluded that there is a preservation of the connection of the figurative component of the term units with the idea of the "primary" and terminological denotations. Being the figurative basis of the

term at the very beginning of its origin, the denotation reflected in the commonly used lexical unit is "obscured" by the new (terminological) meaning, although it does not disappear completely. The presentation of isolated units of this kind leads to the imposition of a new value on the previous one, which cannot be manifested in 100% of cases. In the scientific and technical context, such term units, having become familiar with a new meaning, gradually lose their original imagery.

Metaphorical reinterpretation is based on associations and analogies associated with a specific image, which serves as a motive for the new meaning of the word-term. The experiment found that the connection of the figurative component of the meaning of the term units with the idea of the "primary" denotation is preserved. Being the figurative basis of the term, this denotation determines its occurrence and the initial period of functioning. Subsequently, in the now familiar scientific context, the image of the "primary" denotation is gradually "erased". It is characteristic that for non-specialists, the term units of the type *Maus / mouse, Schildkröte / turtle, Sohn / son, Briefkasten / mailbox*, etc. evoke natural figurative associations. For representatives of this specialty, the situation is different, since a strong imaginative stimulus at first, after numerous presentations, necessarily loses (according to biologists and psychologists) its essential functional properties. Therefore, it is necessary to distinguish in psychological and linguistic terms the moment of nomination, the initial period of functioning of terminological neologism, and the subsequent period of "habituation".

Since the human language ("extraordinary increase" according to I.P. Pavlov) is a second signaling system capable of replacing the directly reflected objective reality in the human psyche, the need for an approach to "the word as a form of image" should be perceived as a scientific fact (Kozhinov, 1964).

5 Conclusions

Metaphorization is a natural language process, in this case, vocabulary replenishment occurs as a result of the development of a new meaning of long–known units. The same way – changing the meaning of a common word through metaphorization – is not contraindicated for special term systems. Metaphorization is one of the semantic laws common to all languages in all historical epochs.

Metaphor is the main mechanism of term formation based on "ordinary" words. The image underlying the metaphorical reinterpretation is the main motive for the nomination of a new concept, namely the term. In the process of terminologizing commonly used units through metaphorical reinterpretation, the same metaphorization mechanism that is inherent in the language as a whole continues to operate. Similarly, the terminologization of commonly used words repeats the mechanism of motivation of words at the dawn of their appearance – motivation goes from the idea of the subject, that is, the image of the object (or a secondary image, for example, a technical detail) to the sign (word). It is no coincidence that one of the principles of this mechanism is that the object used for comparison should always be more specific and familiar than the object being characterized. In the studied units, the preservation of an associative connection with the former meaning was noted, which was, as it were, pushed aside by a new terminological meaning, brought to the fore. Moreover, a large number of the total volume of identified term units (44% Russian and 40% German) have the initial semantic theme "Artifacts". That is, where the signified and signifiers are most familiar and "objective" in the material sense of the word, there is an easier and more frequent process of transformation of an ordinary word into a special one.

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