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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**FIGURATIVE EXPRESSIONS AS PART OF INFORMATICS
TERMS OF LANGUAGES WITH DIFFERENT SYSTEMS
(on the material of Azerbaijani and French languages)**

Speciality: 5714.01-comparative-historical and comparative
typological linguistics

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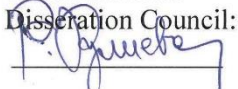


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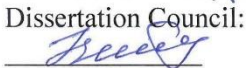
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GENERAL CHARACTERISTICS OF THE WORK

Relevance of the topic. In modern society all areas of life undergo fundamental changes. The basis of these changes are science and technology that are developing at an accelerated pace and have an increasing impact on the life of society. As a result, new words and expressions including great number of terms appear in the language, semantic processes are activated, means of expressiveness making perception and understanding of lexical units of this category more accessible are used widely. Now the emergence of terms has become so widespread that experts talk about a "terminological explosion". According to Y.A.Barsukova, this "explosion" manifests itself in the emergence of a large number of new terms within the framework of existing terminologies, as well as in the formation of terminologies related to the new fields of knowledge¹. Such processes apply in particular to informatics terms and determine the relevance of study of the figurative expressions in their composition.

On the other hand, the relevance of the dissertation topic is related to evaluation of the human factor, human thinking and cognitive processes in the emerging information society according to the new social conditions. The field of informatics which was created as a product of deep human intelligence and is currently developing rapidly is an important component of scientific and technical progress. The specificity of this field is that it constitutes a science and a practical activity interfering in almost all aspects of human life. Within this scientific and practical activity new concepts of informatics are created and develop. The human factor also manifests itself in the joint activity of logical and figurative thinking.

The scientific concepts that arise as a result of the activity of both forms of thinking are perceived more quickly and become knowledge by being engraved in the memory.

The research object of the dissertation are informatics terms of the

¹ Барсукова, Е.А. Научный термин в общем и терминологическом толковых словарях русского и английского языков: на материале медицинской и компьютерной терминологий: / автореферат диссертации на соискание учёной степени кандидата филологических наук / – Москва, – 2004. – с. 3

Azerbaijani and French languages.

The subject are figurative expressions in the composition of informatics terms of the Azerbaijani and French languages.

Research purpose and objectives. The purpose of the research is to identify figurative expressions in the composition of informatics terms of the Azerbaijani and French languages, analyse them on the basis of types of tropes, perform a comparative study of the ways of their formation and stylistic features. In this regard the following objectives have been set:

- to characterize the fact that figurative expressions are present in the composition of terms by investigating conceptual and linguistic essence of categories of imagery and terms and based on the unity of onomasiological, cognitive and semasiological aspects of terms;
- to contrast and compare the ways of formation of informatics terms of the Azerbaijani and French languages by involving the materials of source and intermediary languages;
- to explore figurative means of expression;
- to identify figurative expressions in the composition of informatics terms of the Azerbaijani and French languages, to analyse them based on the types of tropes, to give a definition of the concept of figurative expressions in connection with informatics terms;
- to give stylistic characterization of research material.

Research methods. The research methodology of the dissertation topic is directly related to the objectives and includes both general scientific and special methods. This includes descriptive method applied on the basis of observation, comparison, interpretation, classification; etymological method used in order to specify the role and sources of borrowings in the formation of informatics terminology of the Azerbaijani and French languages; comparative-contrasting method aimed at revealing the general and specific features of the studied terms in the languages involved in the comparison; method of lexical-semantic analysis that allows to clarify the meaning of terms.

Defence provisions:

- 1) Figurativeness is the property that constitutes the main essence of scientific terms.

2) Figurativeness and figurative expressions are related but different categories: figurativeness is a property characteristic of lexical units in general and indicates that they carry a certain image, while the concept of figurative expressions arises in connection with the function of expressiveness of words and word combinations, including terms, but does not cover all lexical units. All figurative expressions carry the feature of figurativeness while figurativeness is present in both figurative and stylistically neutral expressions.

3) From the point of view of its genesis as in the case with informatics terminology as a whole, figurative expressions first appeared on the basis of English language as a result of the joint activity of logical and figurative thinking. They serve to name the objects of the relevant field more clearly and are used in the Azerbaijani and French languages as borrowings from the source language, mainly as lexical calques. They form in these languages interlingual equivalents related to different language levels.

4) Figurative expressions found in the composition of informatics terms of the Azerbaijani and French languages are formed on the basis of various types of tropes; they help to visualize and perceive more clearly the objects denoted by the terms and, consequently, to better understand the meaning of the terms.

Scientific novelty of the research. For the first time, in the dissertation work the informatics terms of the Azerbaijani and French languages and figurative expressions in their composition have become the object of comparative study. Two principles have been applied in the work - the principle of interrelation of categories of imagery and terms and the one of the unity of onomasiological, semasiological and cognitive aspects of terminological units.

The relations of the terms with other types of special lexicon – nomens, professional-oriented lexical units and professional jargons have been determined. The research material has been characterized stylistically. Stylistic variability of the studied material has been illustrated with the examples of informatics terms of the Azerbaijani and French languages.

In connection with the formation of informatics terms of the Azerbaijani and French languages the concept of metalanguages has

been applied and languages belonging to this category such as source language, national languages, compared languages, intermediary language, donor language, language of special significance from etymological point of view, languages serving as etymological basis for modern scientific languages have been determined and interpreted.

Also, the problem of equivalence of informatics terms of the Azerbaijani and French languages has been studied. The analysis has been carried out at the level of lexical composition, phonetic and morphological form of the terms of the compared languages.

The figurative expressions in the composition of informatics terms of the Azerbaijani and French languages have been identified and analysed based on the types of tropes. A definition of concept of the figurative expressions related to informatics terms has been provided.

Theoretical and practical relevance of the dissertation. The material of the research may be useful for future investigation on informatics terms in languages with different systems. The obtained results can be used when exploring other terminological fields in the Azerbaijani and French languages.

Due to the interdisciplinary character of the problem chosen for the investigation, the material of dissertation may be used in solving the tasks facing a number of linguistic fields – lexicology, terminology, stylistics, cognitive linguistics.

Practically, the research material of the dissertation and the obtained results can serve as material at lectures and seminars on linguistic subjects at the undergraduate and graduate levels of the university, as well as in the preparation of textbooks, guidelines, dictionaries.

Sources of the research. While conducting the research scientific literature on lexicology, semasiology, terminology, stylistics was analyzed. We referred to the scientific works of well-known linguists as A.M.Gurbanov, A.M.Demirchizade, A.A.Potebnya, V.S.Vinoqradoy, V.Humboldt, E.Sepir, B.Whorf, J.Lakoff, M.Jonson, D.Kenni and others.

Approbation of the research. The material of dissertation was presented at 8 national and international conferences. The provisions

of the dissertation are reflected in 10 articles published in relevant scientific journals in the Azerbaijan Republic and abroad.

The name of the institution where the dissertation work has been performed. The dissertation work has been performed at the Department of General Linguistics of Baku State University

The structure and general volume of dissertation work. The dissertation consists of an introduction (13.770 characters), three chapters, a conclusion, a list of references and an appendix. The first chapter (115.990 ch.) contains three paragraphs, in turn the second paragraph has three subsections. The second chapter (66.971 ch.) includes four paragraphs. The third chapter (76.147 ch.) contains three paragraphs. In the Conclusion the obtained results are summarised. The size of this part is 6.055 characters. The list of references includes the names of 188 scientific sources. In the Appendix 716 informatics terms of the Azerbaijani and French languages (358 in each) used in the dissertation as examples are presented with their synonyms, the indication of page or pages of dissertation were they are found, as well as the lexicographic source from which they have been taken. More than a thousand examples of equivalents of these terms are reflected in the study. The total volume of the dissertation is 278.920 characters.

MAIN CONTENT OF THE DISSERTATION

In the “Introduction” the relevance of the topic is justified, the purpose and objectives of the research, the object, the subject, the scientific novelty, theoretical and practical significance, the methods, defense provisions and other issues are considered.

The first chapter of the dissertation is named **“Issues of the investigation of figurative expressions in the composition of informatics terms”**. It contains the revision of works performed in the field of research of the topic of dissertation, study of the conceptual and linguistic essence of categories of imagery and terms, characterisation of the conceptual field of informatics and of directions of development of the informatics terminology.

The first paragraph is named "**Works carried out in the field of research of informatics terminology**" and provides information about the study of the terminology in question.

In comparison with the terminology of other fields of science the history of formation and research of informatics terminology is relatively young. At first, informatics terms were studied as part of scientific and technical terminology. Starting from the second half of the 20th century, terminological dictionaries on informatics were published and the equivalents of the terms in different languages were defined. Gradually, the number of languages in which the research is held increases. This list includes also the languages compared in the dissertation – the Azerbaijani and French.

Regarding the study of informatics terms of the Azerbaijani language, the research of S.F.Israfilova (2003, 2006), M.M.Mammadova (2012, 2018), J.Kh.Muradov (2013, 2014, 2017), Z.B.Məmmədova and Z.İ. Avilova (2019), as well as published terminological dictionaries should be noted.

On the material of the French language the research works of Ch. Horne (1986), C. De Schaetzen (1990), J. Humbley (2005), I Oliveira (2005), J. Ourfahli (2007), I. Gonthier and A. Desrochers (2009); M.-C. L'Homme and A. San Martin (2016), D. Jamet and A. Terry (2019), etc. were published

Russian researchers P.V.Likholtov (1997), T.V. Akulinina (2003), N.N. Koshkarova (2004), Q.Q. Babalova (2009), M.A. Lobanova (2009), A.A. Molnar (2012), A.E. Buzheninov (2015) and others have contributed greatly to the investigation of this field.

In these studies such problems as the role of the English as the source of formation of informatics terms occurring continuously in many languages, assimilation of borrowed terms and other issues are considered. Confirming the fact that the English is the source language J. Ourfahli also raises the problem that many words and expressions used as informatics terms in English were formed on the basis of lexical-semantic elements that have passed from the French language².

² Ourfahli, J. Analyse comparée des emprunts informatiques dans la langue arabe et française: [Ressource électronique] / - HAL archives-ouvertes, novembre 2007. – 107 p. URL: <https://tel.archives-ouvertes.fr/tel-00412048/document>. – p. 26

Examining the role of borrowings in the development of languages, M. Malherbe points out its inevitability. He expresses his opinion as follows: "*All languages resort to borrowings at different periods of their development, and the process of word borrowing occurs as a result of the meeting of cultures; a pure language that is free from acquisition does not exist, and has never existed*"³. (Translation is made by the author).

In this paragraph the work done in the practical direction – publication of dictionaries is considered. In the dissertation, the most referenced dictionaries are the dictionary published in 1996 by A.M.Rustamov and E.M.Husseyinov, its new edition extended and improved by A.M.Rustamov and republished in 2011 – "*Azerbaijani-Russian-English glossary of informatics terms*" and "*English-Russian-Turkish-Azerbaijani dictionary of informatics terms*" elaborated by I.Jallalı and published in 2017.

A wide variety of dictionaries of informatics terms are also available in the French language. The most referenced are *Glossaire des termes informatiques* (Explanatory dictionary of computer science terms) elaborated by Didier Fourt (2009), constantly updated electronic dictionary *Reverso Dictionnaire anglais-français* (Reverso English-French dictionary" and its version *Reverso Dictionnaire français-anglais* (French - English Reverso dictionary).

The dissertation focuses on the issue of presentation of informatics terms in dictionaries in several languages. In the process of formation of the terms of the Azerbaijani language, over a period of more than half a century the Russian language acted as an intermediary language, what was related to the historical and political development of Azerbaijan in 19-20th centuries. However, after the Republic of Azerbaijan regained political independence, direct borrowings from the English language started prevailing. In the dictionaries of informatics terms of the Azerbaijani language, the Turkish language is often presented too. This can be explained by the fact that today the Republic of Türkiye has a modern education system and developed technology that meet the world standards. At the same time, the

³ Malherbe, M. Les Langages de l'humanité / M.Malherbe. – Paris: Seghers, – 1983. – p. 13

Azerbaijani language and the Turkish language of Türkiye have the same roots.

Informatics terms passed from the English to French without an intermediary language. As mentioned, currently most informatics terms come into the Azerbaijani language directly from the source language.

The paragraph 2 of the chapter – **“Conceptual and linguistic essence of categories of imagery and terms”** is divided into three subsections. Here, the main properties of the scientific-philosophical categories of image and imagery are presented; the analysis of the category of imagery from the linguistic point of view is carried out; characteristic of the main features of the category of terms is given. The terms "image" and "imagery" are included in the terminological system of many fields of knowledge. Images can be created in the human mind as a result of reflecting both material and ideal objects. However, in any case, the basis of images are the objects of material reality. Thus, the image is a derivative phenomenon related to the reflected object - although the image is objective by the nature of its source, it is subjective by the form of embodiment. Imagery is created by expressiveness, vividness, clarity and influence of the image. So, the imagery acts as a form of expression of the image and is embodied by special means of expression. It should be noted that imagery, regardless of its stylistic qualities, is characteristic of all lexical units and refers to the images expressed by those units. In certain cases, imagery is expressed implicitly rather than openly. M.I.Adilov, Z.N.Verdiyeva and F.M.Aghayeva note that there are an obvious and potential types of imagery⁴. At the same time in the vocabulary there are lexical units which express imagery through functional stylistic features – expressiveness, emotionality, intensity, appraisal transmitted through various tropes. This category of lexical units is called imagery expressions. Researches in this direction were conducted by G.N.Sklyarevskaya (1988), G.Ch.Kazimov (1989), M.E.Ruth (1992), X.M.Jabbarov (1993), T.A.Efendieva (2001), O.I.Blinova and E.A.Yurina (2008), K.S.Huseynov (2009) and others.

⁴ Adilov, M.İ. İzahlı dilçilik terminləri (soruğu lüğəti) // M.İ.Adilov, Z.N.Verdiyeva, F.M.Ağayeva; – Bakı: Maarif, – 1989. – s. 203-204. – s. 203-204

In the dissertation, based on the opinions of the researchers such as B.S.Meylakh (1971), V.P.Bulychova (2008), A.R.Mukhtarullina (2012), N.K.Dimitrova (2014), V.A. Shalneva (2017) and others, who state that the category of imagery performs a cognitive function in scientific style, the problem of the interrelationship of the categories of imagery and terms raised, as well as the characterization of terminological units in terms of the unity of onomasiological, cognitive and semasiological aspects is provided.

Since terminological units make the object of the dissertation research special attention is paid to the investigation of their main features. Defining the concept of the term, experts note a number of its properties. O.S. Akhmanova (1966), V.P. Danilenko (1977), A.V. Superanskaya, N.V. Podolskaya (2004), M.-C. L'Homme (2004,2016), V. M. Leychik (2009), A. Finkel (2017) and others consider that terms are special words belonging to certain field of knowledge, having systemic character, unambiguous within a field of science, free from the feature of expressiveness and possessing stylistic neutrality; but at the same time they may become polysemic within the framework of common language and various terminological systems.

The studies also note the constant exchange between common lexicon and terms: common words become terms and, on the contrary, terms losing their special meaning become a part of words and expressions used in everyday communication. The Azerbaijani linguists as A.A.Orujov (1969); M.Sh.Gasimov (1973); H. Mammadli (1997), S.A. Sadygova (1998, 2010, 2014) and others have researched different aspects of terminological units.

The processes of terminization and loss of term characteristics lead to the change of referential relations and of the volume of semantic meaning of words and expressions. In this sense, it constitutes the research object of semasiology. The meaning of the word is also related to the processes occurring in the human psyche, the perception of the surrounding world by individuals. At this point, the unity of the onomasiological, cognitive and semasiological aspects of lexical units manifests itself. Thus, the external form of the word is associated with generally accepted ideas about the concept it transfers, and this leads

to the formation of the complex relations between the external form of the lexical unit and its meaning; the word, in many cases, has several meanings. V. von Humboldt, A. A. Potebnya associate the process of emergence of the meaning of the word with the categories of image, imagery and, as a result, define the concept of "internal form of the word". This form is presented as a kind of movement, the activity of the soul. V. von Humboldt states that words are formed as a result of the perception of things, where things are not only mechanically reflected in the mind of a person, but also create images in the soul of a person. Although objective perception and subjective perception complement each other, different individuals perceive the world differently. Based on this reasoning, W. von Humboldt comes to the idea that language plays an exceptional role in the human understanding of the surrounding world⁵.

A.A. Potebnya also notes that the internal form of the word coincides with the imagination; he claims that the language gains its creative character precisely as a result of the internal form of the word, he considers that a word possessing a living internal form is figurative word^{6,7,8}.

In the dissertation the relationship of terms with other types of special lexicon - nomens, professionally oriented lexical units (POLU), as well as professional jargons (PJ) is also examined. This is due to the existence of close relations between the constituent parts of the special lexicon and the fact that imagery is typical for each of the mentioned subgroups. Terms as the main component of special lexicon are recognized as official names of concepts related to the field of science, knowledge, and specialization. They are developed by experts and are based on logical foundations. Each term provides

⁵ Гумбольдт, В. О различии строения человеческих языков и его влиянии на духовное развитие человечества / В. фон Гумбольдт. – Избранные труды по языкознанию. – Москва: Прогресс, – 1984. – с.80

⁶ Потебня А.А. Теоретическая поэтика / А.А.Потебня. – Москва: Высшая школа, - 1990. – с. 14

⁷ Потебня, А.А. Из записок по теории словесности / А.А.Потебня. – Харьков, – 1905. – с. 19

⁸ Потебня А.А., Мысль и язык / А.А.Потебня: Эстетика и поэтика. – Москва: Искусство, - 1976. – с. 175

precise and concise information about the field referent. Nomens are also lexical units belonging to a certain field of science, knowledge, and profession, created by experts in the field. However, unlike terms, nomens do not represent abstract concepts, but concrete objects related to one or another field as well as the names of products of a series. The main feature that allows such names to be attributed to terms is their inclusion in the list of officially accepted names, but nomens, unlike terms, are temporary: when the corresponding objects go out of use or their production stops, such names become obsolete and leave the active lexicon.

As for the concepts of POLU and PJ, they are lexical units used by representatives of a field or specialty in their daily professional life, as a result of the habit formed in speech along with officially accepted names. POLU and PJ carry an expressive, emotional character, and the main difference between POLU and PJ is that PJ are more vernacular. In general, the POLU and PJ categories constitute stylistic variations of officially accepted terms.

One of the results obtained in the first chapter can be expressed as follows: since each of the terminological units carries a certain image, they have the feature of imagery; it is easier to determine imagery in terms with transparent semantics and such terms are attributed to figurative expressions. Thus, two types of imagery based on the relevant knowledge and outlook of the users of terms - implicit and explicit imagery - are distinguished, although this difference is relative.

Paragraph 3 of Chapter I is entitled "**The main directions of the development of the conceptual field of informatics and of the terminology of informatics**". Researches related to the development of the mentioned field show that in recent decades, the innovations implemented regularly both in the field of informatics and in other fields of science and knowledge by applying new information technologies have led to the diversification of the science of informatics. Today, this field of science, which has a wide scope, continues to develop toward improvement of its internal system and integration with other sciences such as psychology, biology, economics, social sciences, etc. This process, which started in the

middle of the 20th century, continued during the last period of the 2000s by the emergence of a large number of applied programs on artificial intelligence, creation of opportunities of modeling of thinking, paving the way for inventions of the latest technological engineering etc.

On the other hand, the methods of formation and analysis of terminologies are undergoing fundamental changes. The field of terminography dealing with the collection and systematization of terms already operates on the basis of computer programs, a new concept of “terminotics” - processing of terms by means of computer programs is being developed regarding the description of terms. Computer equipment and programs make it easier to process large texts, define the semantics of terminological units, enter and systematize terms in dictionaries. The use of informatics techniques and methods also allows studying the semantic and syntactic scope of terms. So, as it can be seen, today the development of various sciences is carried out mainly through the application of computer technologies, and in this regard, informatics has a very wide scope. The constant development of this science, as well as the formation of common fields with other sciences, leads to the enrichment of the terminology of informatics.

The mentioned conceptual field, as well as the terminology serving this field, is built on the basis of the principle of systematicity and has its own internal structure. The approach based on this principle is used in many studies, including E. Aito and Ch. Igwe (2011), I. L. Komleva (2006), E. A. Yukhmina (2009) and others. According to what was said, the issue of developing, systematizing and regulating informatics terminology in compared languages remains relevant and is of national importance. The institutions such as Terminology Commission under the Cabinet of Ministers of the Republic of Azerbaijan, Azerbaijan National Academy of Sciences, etc. regulate terminological issues based on state level decrees and orders.

Chapter II of the dissertation is named "**Linguistic analysis of informatics terms of the Azerbaijani and French languages**". The linguistic analysis of the object of the dissertation research includes the description of the lexical-semantic, phonological, morphological

and syntactic structures associated with the formation of appropriate terminologies.

The first paragraph of the chapter is entitled "**Study of ways of formation of informatics terminology of the Azerbaijani and French languages at the level of metalanguages**". Here, language categories with different statuses are considered.

One of such categories is the **source language** category. As mentioned above, the source language of informatics terminology is the English. As E.A. Telyatnikova⁹, M.A. Lobanova¹⁰ said, English terms in the field of computer terminology are primary, computer terminologies of all other world languages are derived from them. This fact also applies to the Azerbaijani and French languages.

Under the category of **national languages**, we mean the languages of different peoples who have adopted the terms from the English language and assimilated them. Currently, given the great importance of computer science on a global scale and the application of information and communication technologies in all developed countries, the language of each of those countries can be classified as a national language.

The Azerbaijani and French languages appear in the research as **compared languages**. Here, it is question of languages with different systems, which are both genetically and structurally different. The Azerbaijani language belongs to the branch of Turkic languages of the Altaic language family. It belongs to the group of agglutinative languages. The French language belongs to the group of Romance languages of the Indo-European language family, it was formed on the basis of vernacular Latin language and represents analytic languages.

The category of **intermediate language** is used in connection with the borrowings from the source language, which, due to various historical-political or social and cultural reasons, have not been direct

⁹ Телятникова, Е. А. Статика и динамика терминологии языка французского интерфейса: / автореферат диссертации на соискание учёной степени кандидата филологических наук / – Санкт-Петербург, – 2001. – с. 3

¹⁰ Лобанова, М.А. Структурно-семантические особенности современной компьютерной терминологии (на материале испанского языка): / автореферат диссертации на соискание учёной степени кандидата филологических наук / – Екатеринбург, – 2009. – с. 4

but mediated through an intermediate language, authoritative and influential for national language in one sense or another. In the research this category is considered in connection with the formation of the informatics terminology of the Azerbaijani language.

The concept of **donor language** refers to the direct transfer of terms from one language to another. Thus, regarding the terms of informatics the Russian can be considered a donor language for the Azerbaijani language and the English for the French language. But in terms of the development of the English lexicon, the French language itself acted as a donor to the English language for three centuries, starting from the 11th century, and currently about 1/3 of the English vocabulary is considered to be borrowed from the French language. Later, in connection with the political, economic and technical development of England, the English language gained the status of the main international language, and the invention of the computer in the United States as well as the creation of computer technologies and software by various American companies created the conditions for the mass dissemination of informatics terms in other languages. Accordingly, as a result of the application of the lexical units of the English common language in a special field, a part of the words of French origin have become terms and spread in different countries. Therefore, the lexical units of the French language returned to this language again, but already in a new status - term status. Here, for the same lexical units in the process of borrowings, at first the French language acted as a donor and after the transformation into terms, the English language performed the function of the donor.

Regarding the issue of donation, the number of cases of direct transfer of informatics terms from English to Azerbaijani is increasing.

The French language, which played an important role in the establishment of the English language, belongs to the category of **language of particular significance from the etymological point of view**. In view of the formation of informatics terminology partly on the basis of the French language and the transfer of the terms of this field from the source language to different languages of the world, the lexical units of the French language can be considered as the

etymological basis not only for the corresponding terms of the English language, but also for different national languages.

Another part of English informatics terms is formed on the basis of lexical units which evolved into terms based on roots of ancient Germanic and other languages.

The Latin and Greek languages are the **etymological bases for modern scientific languages**. These languages, primarily Latin, played an important role in the formation of scientific terminologies, including informatics terminology, in many languages including both compared ones. The Latin language also played the role of the foundation language in the formation of the French language as an independent one: it is known that the French language was formed on the basis of the Latin language, and the Latin language, in turn, benefited significantly from the elements of the Greek language. Even in the 14th and 15th centuries, Latin was used as an official and business language in France. However, in later historical periods, especially in the 16th and 17th centuries, the French language also turned to both classical languages and borrowed a large number of words and morphemes in order to enrich its vocabulary and develop scientific terminologies.

As for the etymological evaluation of the informatics terminology of the Azerbaijani language, the presence of a large number of words of Turkish, Arabic and Persian origin in the vocabulary of this language raises the issue of the etymological significance of the mentioned eastern languages for the informatics terms of the Azerbaijani language, formed by the transfer of semantic meaning.

The second paragraph of the second chapter is named "**The role of borrowings in the formation of informatics terminology in the compared languages**" and the next one is entitled "**Derivational means involved in the formation of informatics terms of the Azerbaijani and French languages**". Borrowings are lexical units used for naming new concepts (when there are no special words to name in the language) taken from the native language reality in which they appear. Since it is question of the same concept, the meaning of the borrowed lexical unit and this of basic word is the same. The transfer of the lexical form occurs in different ways: 1) pronunciation

of the terms as it is in the source language with adaptation of the spelling to the receiving language - application of the transcription method (minor phonetic changes are inevitable in many cases): Eng. lang. *algorithm* [ˈalgəˈrɪθm] / Az. lang. *algorithm* [algaˈritm] / Fr. lang. *l'algorithme* [algəˈritm]; 2) preservation of the spelling of the terminological units as it is in source language, but adaptation of the pronunciation to the orthoepic rules of the receiving language - applying the transliteration method: Eng. lang. *CD* [sidi] / Az. lang. *CD* [sidi] / Fr. lang. *le CD* [sede]; Eng. lang. *whatsApp* [wɒtsʌp] / Az. lang. *whatsApp* [watsap] / Fr. lang. *whatsApp* [wɒtsʌp]; 3) when borrowing the lexical form, preservation of its root and replacing other morphemes by the equivalent forms of the receiving language: Eng. lang. *segmentation* / Az. lang. *segmentləmə* / Fr. lang. *segmentation*; 4) making calques - replacing the lexical form of the word as a whole, and the lexeme composition of the word combination with equivalent lexical units of the receiving language: Eng. lang. *namespace* / Az. lang. *ad fəzası* / Fr. lang. *espace de nom*; 5) translation: Eng. lang. *offset* / Az. lang. *sürüşmə* / Fr. lang. *décalage*. The calques method can be considered more favorable in terms of saving language resources, because during translation an increase in the language code is often observed: Eng. lang. *display* / Az. lang. *display* / Fr. lang. *affichage, écran* – this term is translated from English to Azerbaijani as "computer visual output device".

Other methods involved in the formation of informatics terms in the Azerbaijani and French languages include formation of semantically derived terms through word-forming morphemes, compound words, symbols, abbreviations, as well as syntactical way.

In the last paragraph named "**Study of the equivalence of the informatics terms of the Azerbaijani and French languages**" the equivalence of the informatics terms of the compared languages is researched based on the syntactic, phonetic and morphological forms. Equivalence observed at different language levels is justified by the fact that the corresponding terminologies are formed on the basis of the same source.

Chapter III is entitled "**Comparative analysis of tropes creating figurative expressions in the composition of informatics terms of**

the Azerbaijani and French languages". In the first paragraph named "The stylistic qualities of the category of imagery and the characterization of means creating imagery in language" imagery tools consisting of stylistic figures and tropes are presented. They express connotations of psycho-associative meanings of language units and are formed on the potential basis of language.

The second paragraph is named "Types of tropes involved in the formation of figurative expressions in the composition of informatics terms of the Azerbaijani and French languages". Here, the terminological units that stand out for their expressiveness are examined and the possibilities of naming them figurative expressions are justified.

Epithet: is a type of definition used to create a certain image, to strengthen the meaning of the word in the text, to bring to attention any aspect of the object more prominently: Az. lang. *gizli yol* / Fr. lang. *la porte dérobée / la porte de service [de sécurité]* – these expressions are equivalents of the English expression “back door”- a program created by software developers and determining the way to hack into a system. Designation of the referent by the words of colloquial language “door” (Eng., Fr.), “way” (Az.) helps to imagine the object and understand the meaning of the expression more clearly. In all three languages the imagery is obvious.

Comparison means that an object is similar to another object because of a shared property. This trope arises as a result of comparing two things. In this case, the goal is to determine a new, important feature of the compared object: Az. lang. *sot şabəkəsi* / Fr. lang. *le réseau cellulaire* – “cell network” - radiotelephone network called “cell” technology. In this example the defining words used in the equivalent word combinations “*sot*”/ “*cellulaire*” (cell) in the colloquial language is associated with the meaning “bee hive” (in the Azerbaijani language the word “*sot*” is a borrowing from the Russian and, on the whole, the terminological unit can be considered as bearer of implicit imagery); in turn, the defined words “*şabəkə*” / “*réseau*” (network) means “a group or system of interconnected things” – the joint use of these two words figuratively expresses the shape of the referent “network” and allows to better imagine it. As for the source

language, in the French language this expression bears the explicit imagery. The comparison is usually used in word combinations.

Metaphor is the transfer of the name of one object to another object by analogy. Here, the similar feature(s) between the two objects are detected by the comparison. But the main property of the metaphor is that the name of the object of comparison is not used but only implied. In this sense, metaphor differs from comparison. The second aspect that distinguishes metaphor from comparison is that it can be expressed not only in combinations, but also through single words: Az. lang. *elektron poçt körpüsü* / Fr. lang. *le pont de courrier* – “mail bridge” – a program for transmitting email between electronic systems; Az. lang. *govluq* / Fr. lang. *le dossier* – “folder” – a place where programs and files are stored; Az. lang. *mühit* / Fr. lang. *l'environnement* – “environment” – material on which data is recorded and stored ; Az. lang. *tələ* / Fr. lang *le pot de miel* - “honey pot” – resource that allows to identify and neutralize potential intruders in computer system. In all presented examples through appropriate images the meanings of the terminological units become clearer.

Emphasizing that metaphor plays an exceptional role in the process of human understanding of the surrounding world, American scholars and experts in the field of cognitive linguistics J. Lakoff and M. Johnson believe that human thinking is metaphorical in nature, that metaphor is the basis of human contact with the world, it is a tool that structures the perception of individuals, their thinking and actions. With the help of metaphor, people acquire new knowledge, create imaginations, and thinking processes characteristic of a person also take place within the framework of the system of concepts acquired by him in everyday life¹¹.

Metonymy is the naming of an object or event by the name of another object or event based on contact relationships. Contact relationships are of different nature: time, space, cause, quantity, subsequence, internal logical connection, etc. A word used as a metonymy has a figurative meaning and serves to reinforce an idea and remember information. The following examples of metonymy in

¹¹ Lakoff, J. *Metaphors by which we live* / J. Lakoff, M. Johnson. – Moscow: Editorial, - 2004. - c. 25

the composition of informatics terms in the compared languages can be noted: Az. lang. *Ada* / Fr. lang. *Ada* – “Ada” – programming language / the author of the first computer program - the case of using a proper name as a common name; Az.lang. *kəsişmə* / fr. lang. *l'intersection* - “collision” – a set composed of elements belonging to both sets / the process of formation of such set - a case where the name of the process or of the done work and the name of its result can replace each other; Az.lang. *operator* / Fr. lang. *l'opérateur* - “operator” – sentence in a high-level programming language / operator of an electronic calculator (a specialist who creates operators and works with them) - the name of the work performed or its result and the name of the corresponding profession are the same; Az. lang. *Java* / Fr. lang. *Java* – “Java” - interpreted object-oriented programming language / the name of Internet programs created in this language - transferring the name of one object to another based on a quantitative sign.

Personification refers to the attribution of characteristics of humans or other living beings to inanimate objects and natural phenomena. Depending on the concepts expressed by informatics terms, the following types of embodiments are distinguished: terms referring to the language and mental abilities of a person: Az. lang. *algoritmik dil*/ Fr. lang. *le langage algorithmique*; terms denoting the names of different types of professions and activities belonging to a person: Az. lang. *gözətçilər* / Fr. language *le chien de garde / de contrôle / de surveillance* – “ watchdog ” - a program designed to find infected files; terms denoting human actions: Az. lang. *çağırın program* / Fr. lang. *le program d'appel* – “calling program” – a program that transfers control to the called program. The following examples can be attributed to terms represented by animal names: Az. lang. *maus* (ARI-2011) / *siçan* (IRTA) / Fr. lang. *la souris* - “mouse” – coordinating device of computer; Az. lang. *Troya atı* / Fr. lang. *le cheval de Troie* – “Trojan Horse” – a virus program.

Except for the last example, in all the rest the imagery is explicit. The latter, although it is a well-known expression in a historical sense, can be appreciated as a carrier of hidden imagery and requiring a broader outlook and general knowledge of users.

Periphrasis is a type of tropes that gives descriptive presentation of the name of an object or event. The terms expressed through periphrasis in most cases convey the features of the referent expressively: Az. lang. *zəhlətökən proqram təminatı* / Fr. lang. *le logiciel gratuit, le logiciel public* – “annoyware”, “freeware” – a program that reminds you to register a constantly used program. In this example the term expressed in the source language laconically in one word in the Azerbaijani language is given as a periphrasis and may be more characteristic of vernacular. This example may be attributed to professional jargons. In the French language this term is stylistically neutral.

Repetition consists in the repetition of the same sound, syllable, word, group of words or phrase. As a trope, repetition refers to means of expression that increase the emotional impact of the idea and strengthen its meaning.

While researching the dissertation material, the following types of repetition were found: terms formed by repetition of sounds, mostly consonants: Az. lang. *çığqıltı, çığqıldatmaq* / Fr. lang. *le clic, faire un clic* – “a clic” – the act of pressing and releasing computer mouse button; terms formed as a result of repetition of syllables or parts of words: Az. lang. *kör-koranə axtarış* / Fr. lang. *la recherche aveugle* – “blind search” – searching for data you do not know the place or sequence; Az. lang. *tapmaq və dimdikləmək* / Fr. lang. - “hunt and peck” - work on the keyboard with one or two fingers; terms formed by repetition of words: Az. lang. *addım-addım* / Fr. lang. *petit à petit, pas à pas* – “single step” – execution of the program in one command. These examples may be attributed to the cases of direct borrowings of terms by the Azerbaijani language from the source language.

The expressiveness of the terms created through repetition is also due to the fact that they often take the character of imitative words and use elements of colloquial and even vernacular language. This factor gives reason to consider some examples of repetition as professional jargon.

Hyperbola serves to intentionally express any sign of an object or event more strongly than it actually is. The purpose of using hyperbola is making the idea more expressive and emotional: Az. lang. *şişman*

müştəri (its opposite – *arıq müştəri*) / Fr. lang. *le client épais (le client mince)* – “fat client” / “thin client” - an account of a network computer defined depending on its resources; Az. lang. *pocketbook* / Fr. lang. *le portefeuille* – “notebook” - a personal computer of small dimensions, carried by hand, weighing no more than 3-5 kg. Based on the definition of the term and matching the referent with a “pocket” we can consider this term as an exaggeration. On the basis of these examples we can observe the possibility of parallel expression of explicit imagery in the respective three languages.

Phraseological units. Another type of tropes - phraseological units - are also found in the composition of informatics terms of compared languages. In fact, the combinations of words related to other tropes - epithet, comparison, metaphor, personification, as well as some repetitions, periphrasis in most cases belong to phraseological units. Among such terms, there are idiomatic expressions taken from the colloquial language: Az. lang. "*bir dəri bir sümük*" sistemi / Fr. lang. *le barebone* – “barebone system” - a system consisting only of a case and a motherboard; Az. lang. *tay-tuşlar rabitəsi* / Fr. lang. *la communication d'égal à égal* – “peer-to-peer communications” - interconnection of devices at the same level. The expressiveness of many phraseological combinations also increases due to the repetition of words and sounds.

On the basis of the research material a definition of the concept of figurative expressions that are the subject of this study is proposed: **figurative expressions are tropes which consist of words or word combinations creating expressiveness at the language or speech level, ensuring easy perception, understanding and memorization of scientific concepts related to the relevant field, thereby fulfilling a cognitive function.**

In the last paragraph named "**Interrelationships of tropes used in the composition of informatics terms of the Azerbaijani and French languages**" attention is paid to the fact that the relevant tropes are in center-periphery relations with each other, and in some cases the same terms simultaneously refer to several tropes. The main conclusion is that the system of tropes is primarily formed around the metaphor. Epithet, comparison, personification, hyperbola,

phraseological combination, periphrasis, repetition are located in the position close to the center. Since metonymy is based more on objective than subjective relations it occupies the most peripheral position in the system of tropes.

In the part called **Conclusion** the main results of the dissertation are summarized as follows:

1. Today, different fields of science, including the field of informatics, are developing at a high speed and have a great impact on the life of society. However, among various sciences, the science of informatics, which has been developing for more than 80 years, occupies a special place, because all the innovations and achievements of both traditional and new fields of science in most cases occur as a result of the application of information and communication technologies, and in turn, the science of informatics is constantly enriched by new related branches. The application of information technology influence also the state-building activity, and relevant measures are taken at the state level. The existing extralinguistic conditions accelerate the word-formation processes in the language and contribute to an increase in the number of new lexical units at the expense of terms.

2. Formation, development, regulation and standardization of scientific terminologies in the Azerbaijani language is one of the problems in the focus of attention of the government of Azerbaijan and the President of the Republic. In this regard, development of scientific language, creation of dictionaries of terms and other important measures are being taken.

3. The research conducted in the dissertation leads to the conclusion that the comprehensive study of informatics terms of the Azerbaijani language, including the comparative study based on the materials of languages with different systems, is one of the actual problems of both general and comparative linguistics.

4. One of the studied categories - imagery - is a feature that generally characterizes lexical units and indicates their formation on the basis of certain image(s), thus it constitutes the main essence of terms. The terms formed by using the language's own lexical-grammatical structures, in most cases, rely on the immediately

identifiable images, while the images underlying various terms taken from foreign languages as well as from other terminologies become clear as a result of more detailed linguistic research. So, the kinds of obvious imagery and implicit imagery differ from each other.

5. Due to the origin and development of computer technologies and equipment initially in the United States, informatics terms were first formed in English. This language acts as a source language for informatics terminology of other national languages. Accordingly, the main part of the informatics terms of various national languages, including Azerbaijani and French languages, has derived from English terms.

6. As a whole, two methods - transfer of semantic meaning and borrowings - played an important role in the creation of informatics terminology. The informatics terminology of the source language was first formed by transferring semantic meaning of words of common English and of other related terminologies. Later, national languages adopted terms from English in different ways and assimilated them.

7. The formation of terms by transferring the lexical meanings of words of common language ensures that they are understood not only by specialists, but also by a wide range of users; this accelerates the gradual inclusion of a part of terminological units in the vocabulary of common language and leads to the popularization of scientific knowledge.

8. The Azerbaijani and French languages borrowed informatics terms from the source and intermediary language in diverse ways: translation, semantic calques, transliteration, phonetic calques accompanied by appropriate adaptations of sound composition, adaptation of morphological elements, etc.

9. Massive borrowing of informatics terms from the same source inevitably leads to the emergence of interlingual equivalents in national languages; these equivalents are determined at different (lexical, phonetic, morphological) linguistic levels. As for the images underlying the formation of the terms, they are mainly the same in the compared languages, although cases of differentiation are also found.

10. While studying the role of borrowings in the formation of informatics terms of the Azerbaijani and French languages, the

categories of languages with different statuses, called metalanguages, were determined in the dissertation. These are the categories of source language, national language, compared languages, intermediate language, donor language, language of special etymological significance for international informatics terminology, languages that act as etymological bases for modern scientific languages.

11. The informatics terminology of the Azerbaijani language was formed partly due to direct borrowings from the English language (they mostly occur in recent times), and mainly due to the borrowings made through the Russian language, which has been for many years the All-Union common language and has the status of an international language. After gaining independence, there are also cases of participation of the Turkish language (Türkiye Turkish) in the formation of informatics terms of the Azerbaijani language.

12. The French language informatics terminology was formed on the basis of direct borrowings from the English language. However, due to the historical relations of the French language with the English language and the role of the French language in the formation of an important part of the English language vocabulary the French language acts as a language of special significance for information terminology from the etymological point of view and indirectly influences the establishment of the mentioned terminology of national languages.

13. As in the formation of modern scientific languages, the lexical and grammatical elements of Latin and Greek languages played an active role in the formation of informatics terminology of both source and compared languages.

14. Familiarization with the materials of relevant languages (including English, Russian, Turkish languages) revealed that the number of professional jargons, professional lexical units, figurative expressions presented along with official terms is increasing, most of them are included in terminological dictionaries and act as stylistic means of creating of expressiveness.

15. There are different types of tropes acting as figurative expressions in the composition of informatics terms of the Azerbaijani and French languages. Examples of epithets, comparisons, metaphors,

metonymies, personifications, hyperbola, repetitions, periphrasis and phraseological combinations are recorded among such tropes. Figurative expressions like these ones help to understand the meanings of terms, memorize them, realize informatics concepts more easily. Thus, figurative expressions perform a cognitive function.

List of published scientific works on the content of the dissertation work

1. Investigation of the interlinguistic equivalence of French and Russian informatics terms at the level of the material exponent // - Dnepropetrovsk: Bulletin of the Dnipropetrovsk University named after Alfred Nobel, series Philological science, - 2017. No. 1 (13), - p.167-172.

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17. Models of the formation of a new vocabulary of informatics in the Azerbaijani language // III International scientific and practical conference "Modern trends in language development: experience, problems, perspectives", - Arzamas: branch of the NNSU, March 29, - 2021, - p.277-285 .

18. On the concept of donor-language in application to the vocabulary of informatics // - Budapest: "The scientific heritage". Scientific specialized journal, - 2022. №96 (96), – p. 48-56.

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