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TERMINOLOGICAL METAPHORS IN V. A. BOGORODITSKY'S SCIENTIFIC DISCOURSE

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Abstract

The objective of current research is to analyze the metaphors that function in V.A. Bogoroditsky's scientific text as a means of representation of scientific discourse's linguo-cognitive characteristics. The research draws on such scientific methods as analysis of the linguistic personality proposed by Y.N. Karaulov and George Lakoff's cognitive metaphor theory. The results of the research can be applied in a number of academic courses ("Teacher's professional personality", "Genres of academic discourse", "Problems of terminological nomination", etc.), and they may also be essential in developing continuing education (lifelong) courses for teachings staff specialising in "Mentor's linguistic personality: history and contemporaneity". The theoretical and practical significance of the obtained conclusions is determined by the novelty of the research: V.A. Bogoroditsky's writings have been analyzed in the anthropocentric context for the first time. The prospects for further study is seen in making the comparative analysis of V.A. Bogoroditsky's terminological metaphors and those of his teacher, an outstanding linguist I.A. Baudouin de Courtenay.

Keywords

Metaphor – Terminological metaphor – Scientific discourse – Linguistic personality – Cognition

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Introduction

Scientific discourse is currently one of the major lines in the study of language and speech. The description of linguistic universals and specifics of academic communication is explored on many writings¹, of particular interest are works dealing with the study of metaphoricity, figurativeness of scientific speech². This is important and relevant because metaphor is not just a figurative and expressive trope, but also a major cognitive tool³. Moreover, the revealing of metaphorical features in the discourse of a particular scientist allows us to make his/her speech portrait, to come closer to understanding of his linguistic personality⁴.

The paper will consider terminological metaphors in Vasily Bogoroditsky's scientific discourse, a Russian linguist, one of the founders of Kazan linguistic school of thought. This linguist entered the history of science as an outstanding organizer: he was the founder of the world's first laboratory for phonetic experiment technology. His teacher, Baudouin de Courtenay, called V.A. Bogoroditsky "the true driving force of science."

Goals, methodology, stages of research

There has always been an interest in the personality of outstanding scientists, which is explained by the desire to understand and explain how great scientific ideas are generated, how concepts are formed, and how theories are formulated. This interest has especially increased with the development of such fields as cognitive science, the study of linguistic personality, and metaphorology. However, all these areas of scientific knowledge are developed within the framework of one paradigm – anthropocentric, where the main

¹ O. L. Ariskina y E. A. Dryangina, *The role of the grammarians' linguistic personality in the development of Russian linguistics of the XVI-XVII centuries* (Saransk: Mordovia State University Publ., 2013); M. P. Kotyurova y E. A. Bazhenova, *Culture of scientific speech: text and its proofreading* (Perm: Presstime Publ., 2007) y M. S. Mukij, "Specifics of linguistics personality formation in the process of intercultural communication", *Topical issues of humanities and natural sciences* Vol: 2 num 5 (2017): 29-31.

² N. D. Arutyunova, "Functional types of linguistic metaphors. *Bulletin of USSR Academy of Sciences*", Series: Literature and languages Vol: 37 num 4 (1978): 333-343; S. D. Zlivko, *Figurative component of scientific linguistic texts: based on writings of famous Russian linguists*. Ph.D. thesis. Kazan. 2008; E. V. Pulov, "Comparative analysis of the metaphors of I.A. Baudouin de Courtenay and A. A. Reformaty scientific discourses", *Philological Sciences: Issues of theory and practice* Vol: 10 num 2 (2016): 133-136 y N. V. Sivtsova y O. L. Ariskina, "Linguistic means of expressing knowledge in M.M. Bakhtin lectures", *Scholarly journal of Kuban State Agrarian University* num 91 (2013): 1759-1769.

³ L. V. Balashova, "Cognitive type of metaphor in diachrony (based on the case of perceptive vocabulary of the Russian language)", *Bulletin of Omsk University. Dostoevsky State University Publ.* num 4 (1999): 81-84; A. N. Baranov, *An essay on the cognitive theory of metaphor. Russian political metaphor (materials for the dictionary)* (Moscow: LKI Publ., 1991); G. Lakoff y M. Johnson, *Metaphors We Live By*. University of Chicago Press. The 2003 edition contains an 'Afterword', 2003 y E. V. Pulov, "Comparative analysis of the metaphors of I.A. Baudouin de Courtenay and A. A. Reformaty scientific discourses", *Philological Sciences: Issues of theory and practice* Vol: 10 num 2 (2016): 133-136.

⁴ O. L. Ariskina y E. A. Dryangina, *The role of the grammarians' linguistic personality in the development of Russian linguistics of the XVI-XVII centuries* (Saransk: Mordovia State University Publ., 2013) y N. V. Sivtsova y O. L. Ariskina, "Linguistic means of expressing knowledge in M.M. Bakhtin lectures", *Scholarly journal of Kuban State Agrarian University* num 91 (2013): 1759-1769.

object of study is a human being, an individual, a person and his/her activities (for linguistics first of all, speech and cognitive activities are important).

Thus, the metaphorization of a scholar's language is of some interest both from the speech (verbal) and cognitive perspectives. Largely due to metaphor, the dynamic side of scientific discourse shows itself, which is determined by epistemological tasks of the latter. Metaphors give birth to new nominations, produce terms that function in various sciences. Metaphorical processes can help recreate a person's or a nation's worldview. Metaphors act as a catalyst for the assimilation of new scientific and abstract concepts. According to M. Black's opinion analogy is more likely to appear as a result of an utterance than precedes it as a cause or reason⁵. The above explains the attention to the study of metaphorical processes. The anthropocentric approach allows us to consider metaphor not only as a form of capturing of the cultural and national heritage of people, but also as a cognitive mechanism

The exclusiveness of metaphorical mechanisms in perception, in scientific discourse is caused by the fact that metaphor appears both as a new form and as new knowledge, since at the core of metaphor is either a figurative meaning, or a borrowed term from other sciences. This property (termhood / non-termhood of metaphor components) may serve as a distinguishing characteristic between terminological and non-terminological metaphors in our classification.

Thus far, researchers have studied metaphors in the scientific discourse of medieval grammarians, outstanding scientists-encyclopedists of the XVIII century⁶, as well as world renowned scientists, e.g. M.M. Bakhtin⁷ and I.A. Baudouin de Courtenay⁸. These studies prove that metaphors are one of the major means of representing the linguistic personality of a scholar, so the importance and relevance of their account is beyond doubt. It should be underscored that V.A. Bogoroditsky's scientific works are dealt with in the anthropocentric and cognitive context for the first time (neither his linguistic personality nor the metaphors of his writings have been previously studied), which testifies to the scientific novelty of our research.

The purpose of this article is to analyze the metaphors that emerge in V.A. Bogoroditsky's scientific text as a means of representation of the linguo-cognitive characteristics of the scholar's scientific discourse. However, within the framework of one article, we cannot talk about the entire discourse of the scientist, so we have to narrow down our search to a certain material. For this publication, we have looked upon his book "Introduction to the study of Russian vocalism", published in Warsaw in 1883. This book is one of the fundamental ones in terms of evolvement of Russian linguistics in the first half of the twentieth century.

⁵ M. Black, *Models and Metaphors* (Ithaca: Cornell University Press, 1962).

⁶ O. L. Ariskina y E. A. Dryangina, *The role of the grammarians' linguistic personality in the development of Russian linguistics of the XVI-XVII centuries* (Saransk: Mordovia State University Publ., 2013).

⁷ N. V. Sivtsova y O. L. Ariskina, "Linguistic means of expressing knowledge in M.M. Bakhtin lectures", *Scholarly journal of Kuban State Agrarian University* num 91 (2013): 1759-1769.

⁸ E. V. Pulov, "Comparative analysis of the metaphors of I.A. Baudouin de Courtenay and A. A. Reformatsky scientific discourses", *Philological Sciences: Issues of theory and practice* Vol: 10 num 2 (2016): 133-136 y E. V. Pulov, "Realisation of epistemic strategy in I.A. Baudouin de Courtenay's scientific discourse", *Modern scientist* num 7 (2017): 256-261.

To achieve this goal, the following tasks had to be completed:

1. Analysis of scientific works devoted to the study of the nature of metaphor.
2. Continuous sampling of metaphors from V. A. Bogoroditsky's book.
3. Description and classification of metaphors used by this outstanding linguist in scientific discourse.

Methodologically our research draws on scientific efforts of cognitive linguists⁹, as well as on writings devoted to the description of linguistic and communicative personality¹⁰

⁹ K. Ya. Abbasova, "Cognitive approach and cognitive studies in the light of philosophical reflections", *Bulletin of Dagestan State University. Series 3: Social Sciences* Vol: 34 num 2 (2019): 27-33; N. S. Barebina, "Cognitive anthropocentrism in the conditions of anthropocene epoch (based on the terms of the cognitive approach in linguistics)", *Veles* Vol: 8-2 num 74 (2019): 79-93; F. R. Gasanova, "Cognitive linguistics as part of cognitive science. In Topical issues of modern linguistics, Philology and linguodidactics. Collection of research papers (pp. 20-22). Lipetsk, 2018; I. N. Deryabina, "Characteristics of cognitive evoked potentials in elderly people with impaired cognitive functions", *Advances in gerontology* Vol: 30 num 1 (2017): 103-108; S. V. Ivakin, "On cognitive linguistics as an integral part of cognitive science", *NovalInfo.Ru* num 58 (2017): 340-344; V. I. Karasik, *Linguistic circle: personality, concepts, discourse* (Volgograd: Peremena Publ., 2002); E. S. Kubryakova, *Concise dictionary of cognitive terms* (Moscow: Philological Faculty of Lomonosov Moscow State University Publ., 1997); G. Lakoff y M. Johnson, *Metaphors We Live By*. University of Chicago Press. The 2003 edition contains an 'Afterword', 2003; E. Yu. Malneva, "Cognitive romanticism as a cognitive style and the 'great Chinese dream': in search of a mystical 'sixth sense'", *Social sciences and humanities in the Far East* Vol: 4 num 52 (2016) 139-147; G. N. Manaenko, "Integrative processes in cognitive linguistics", *Topical issues of philology and pedagogical linguistics* num 2 (2019): 188-191; A. G. Podvestovsky, "Criteria of cognitive clarity as a basis for constructing a metaphor for visualization of fuzzy cognitive maps", *Proceedings of the International conference on computer graphics and vision "Graphicon"* num 28 (2018): 158-162; I. A. Sternin y Z. D. Popova, *Semantic and cognitive analysis of language* (Voronezh: Istoki Publ., 2007); L. A. Fours, "Meta-memory, cognitive monitoring and cognitive control", *Issues of cognitive linguistics* num 2 (2019): 21-25; T. Huumo, "The grammar of temporal motion: A Cognitive Grammar account of motion metaphors of time", *Cognitive Linguistics* Vol: 28 num 1 (2017): 1-43; M. B. Isberner y T. Richter, "Society for Text and Discourse Annual Meeting: Introduction to the Special Issue", *Discourse Processes* Vol: 54 num 5-6 (2017); P. Van den Broek y A. Helder, "Cognitive Processes in Discourse Comprehension: Passive Processes, Reader-Initiated Processes, and Evolving Mental Representations", *Discourse Processes* Vol: 54 num 5-6 (2017): 360-372; I. L. Falkum, "The moustache sits down first: On the acquisition of metonymy", *Journal of Child Language* Vol: 44 num 1 (2017): 87-119; R. Pulinx, "Silencing linguistic diversity: the extent, the determinants and consequences of the monolingual beliefs of Flemish teachers", *International Journal of Bilingual Education and Bilingualism* Vol: 20 num 5 (2017): 542-556; L. Ryazanova-Clarke, "From commodification to weaponization: the Russian language as 'pride' and 'profit' in Russia's transnational discourses", *International Journal of Bilingual Education and Bilingualism* Vol: 20 num 4 (2017): 443-456; S. Chahboun, "Can you tell it by the prime? A study of metaphorical priming in high-functioning autism in comparison with matched controls", *International Journal of Language and Communication Disorders* Vol: 52 num 6 (2017): 766-785; L. Byom, "Cognitive task demands and discourse performance after traumatic brain injury", *International Journal of Language and Communication Disorders* Vol: 52 num 4 (2017): 501-513; A. Lo, "Forming capital: Emblematising discourses of mobility in South Korea", *Language in Society* Vol: 46 num 1 (2017): 77-93 y E. J. Johnson, "Exposing Gaps in/Between Discourses of Linguistic Deficits", *International Multilingual Research Journal* Vol: 11 num 1 (2017): 5-22.

¹⁰ O. L. Ariskina y E. A. Dryangina, *The role of the grammarians' linguistic personality in the development of Russian linguistics of the XVI-XVII centuries* (Saransk: Mordovia State University Publ., 2013); T. M. Balykhina, "Linguodidactic study of the content of concepts in the cognitive space

The key ideas that empowered our research theoretically were:

- definitions of discourse and concept proposed by V.I. Karasik (discourse is broader than language; concept is "a quantum of emotionally-charged experience that includes conceptual, figurative and value-based characteristics")¹¹;

- G. Lakoff theory of metaphor¹², which we expanded by adding a terminological metaphor to the scientist's metaphor system as a way to implement new knowledge in scientific discourse;

- definition of the concept proposed by I.A. Sternin¹³ (concept –a discrete mental formation, which is the basic unit of the human mental code);

- Y.A. Karaulov's theory of the structure of linguistic personality¹⁴.

A well-thought-out methodology (use of descriptive, comparison and collation, and classification methods within the framework of anthropocentric paradigm) allows us to clearly mark out research stages that demonstrate a deductive approach to solving a scientific problem. This is expressed in the definition of the scientist's linguistic personality, the selection of material, the search for metaphors, their subsequent description, classification.

of texts produced by a specific linguistic personality", Bulletin of Slavic cultures num 43 (2017): 196-207; O. S. Bogdanova, Discursive competence in the structure of the bicultural linguistic personality of a foreign language teacher. Proceedings of the Vth scientific conference with international participation, dedicated to the 70th anniversary of the Faculty of foreign languages «Theory and methodology of teaching foreign languages in a multicultural society» (pp. 48-55). 2017; N. S. Brem, Multicultural linguistic personality and multicultural personality. Proceedings of the VII International scientific conference differentiation between concepts. Intercultural communication: linguistic aspects (pp. 101-105). 2017; E. S. Grushevskaya, Linguistic personality as a dominant element of discourse and the pivot of written text work. In Interdisciplinary aspects of linguistic research. Collection of scientific papers (pp. 32-37). Krasnodar, 2017; D. I. Ivanov, "Synthetic linguistic personality: the problem of ontology", Symbol of science Vol: 2 num 2 (2017): 160-164; Yu. N. Karaulov, Russian language and linguistic personality (Moscow: Nauka Publ., 1987); O. V. Lutovinova, "Formation of the concept of "linguistic personality": from "language in person" to "person in language", Bulletin of Volgograd State Pedagogical University Vol: 1 num 114 (2017): 82-89; I. A. Mayer, Formation of a multicultural linguistic personality on the basis of written speech activity. Proceedings of the Vth Russian scientific conference with international participation, dedicated to the 70th anniversary of the Faculty of foreign languages «Theory and methodology of teaching foreign languages in a multicultural society» (pp. 171-175). 2017; M. S. Mukij, "Specifics of linguistics personality formation in the process of intercultural communication", Topical issues of humanities and natural sciences Vol: 2 num 5 (2017): 29-31 y V. B. Surkueva, "The theory of text and linguistic personality", Modern trends in the development of science and technology Vol: 2 num 5 (2017): 106-108.

¹¹ V. I. Karasik, Linguistic circle: personality, concepts, discourse. Volgograd: Peremena Publ., 2002, p. 59.

¹² G. Lakoff y M. Johnson, Metaphors We Live By. University of Chicago Press. The 2003 edition contains an 'Afterword', 2003.

¹³ I. A. Sternin y Z. D. Popova. Semantic and cognitive analysis of language (Voronezh: Istoki Publ., 2007).

¹⁴ Yu. N. Karaulov, Russian language and linguistic personality (Moscow: Nauka Publ., 1987).

Results and discussion

Metaphorization considerably bears on the dynamism of scientific discourse, which is determined by ontological and epistemological properties of the human brain. In our opinion, the juxtaposition of the external picture of the surrounding world (ontology) and one's own method of cognition of reality (epistemology/gnosiology) helps to most accurately identify concepts in the scientist's worldview. The hidden comparison of concepts from different fields of science, in our opinion, can be interpreted as a terminological metaphor.

Terminological metaphors in V.A. Bogoroditsky scientific discourse are used during the implementation of the concepts "Mathematics" and "Physics". As known, the linguist resorted to mathematical methods and actively used the terms of this field in linguistics. Let's illustrate this.

Sound approaches/nears (a long consonant G nears a short consonant G)¹⁵.

In this expression, the linguist uses a terminological metaphor that refers to an infinitely small function that goes to zero. Only in acoustic terms, the approaching of a function to infinity means the quantity of sound, and the approaching to zero means the short sound.

The integral of infinitely small shortening of words¹⁶. Integral is the most important concept of mathematical analysis, which occurs when solving problems about finding the area under the curve, the distance covered during irregular motion. Phonetically the scientist meant the distance of spoken words, since the manners of production of sounds are different (from labial to guttural).

One can formulate a new relation of vowel length as the relation of the leg to the hypotenuse¹⁷. In this example, to explain the new relation, derived by the scientist, not a single term is used, but the whole Pythagorean theorem which states that the sum of the squares of the two legs of a right triangle is equal to the square of its hypotenuse". Here we have the relation of sounding of vowels to pronunciation of consonants. The transfer of ready-made formulas to linguistics can be considered a prerequisite for the appearance of mathematical methods in linguistics, for instance, method of analogy.

The desire to use mathematical methods V.A. Bogoroditsky explains himself: "We will now consider the phenomena of each individual pronunciation, and I will have the opportunity to develop my ideas on the application of mathematics to linguistics"¹⁸. Our previous research related to the analysis of scientific discourse in the early twentieth century shows that most of the terminological metaphors of that time were borrowed from exact sciences: "We now see that the change in pronunciation can be measured. This circumstance points to the possibility of applying mathematics to linguistics"¹⁹.

His desire for quantitative methods is indicated by the lexeme "statistics" in the following context: "if we could add shorthand to the exact notation of pronunciation and apply

¹⁵ V. A. Bogoroditsky, Introduction to the study of Russian (Warsaw: M. Zenkiewicz Publ., 1883).

¹⁶ V. A. Bogoroditsky, Introduction to the study of Russian...

¹⁷ V. A. Bogoroditsky, Introduction to the study of Russian...

¹⁸ V. A. Bogoroditsky, Introduction to the study of Russian...

¹⁹ V. A. Bogoroditsky, Introduction to the study of Russian...

statistics, we would be able to determine the change produced by each individual pronunciation²⁰. To interpret this lexeme, let us turn to the dictionary of D.N. Ushakov, since this publication reproduces the lexis of the early twentieth century: "Statistics is the science that studies qualitative changes in the development of human society and the national economy. Quantitative accounting of all kinds of mass cases"²¹.

Below are examples of using metaphors with a term borrowed from physics:

*indifferent position*²². Indifferent = neutral. This term is borrowed from the physical sciences. Under this term V.A. Bogoroditsky understands passive organs of speech;

*state of condensation/concentration*²³. This can describe the moment when a sound meets the first half of obstacles before pronunciation;

*mechanical state*²⁴. The state of the air through which it transfers spoken words;

*state of rest of air particles: a, b, c, ...o...h*²⁵. The state of the air when it is at rest.

State is a concept that denotes a set of stable values of variable parameters of an object. The second elements of the terminological metaphor are borrowed from physical science. Condensation is the process of increased concentration of a substance in space.

Dealing with phonetics and pronunciation problems, comparing church readers and ordinary native speakers, while pointing out the complexity of the Church syllable, the scientist draws an analogy with geometric figures: *Indeed, there are special, certain forms in which phonetics can be presented – a tetrahedron, a pyramid with a square base, ending in an edge at the top. In one of these forms, the cores can fit symmetrically and stably, but they cannot take forms with vertical or steeply inclined face planes*²⁶. Of course, metaphors of such kind in scientific discourse are non-standard, but they support the cognitive abilities of a recipient. This metaphor can be considered terminological, since its interpretation reduced to geometric terms (a tetrahedron, a pyramid with a square base).

Conclusion

The originality of V.A. Bogoroditsky's scientific discourse can be attributed to the following:

1) active use of terminological metaphors that send the recipient to mathematical and physical knowledge; this expands the range of recipients in scientific discourse;

2) transfer of entire mathematical functions to linguistic aspects; borrowing terms from above sciences helps formulate language ideas and concepts more clearly;

²⁰ V. A. Bogoroditsky, Introduction to the study of Russian...

²¹ D. N. Ushakov, Glossary of modern Russian: About 100,000 words (Moscow: Adelant Publ. 2013). Retrieved from: <https://gufo.me/dict/ushakov/статистика>

²² V. A. Bogoroditsky, Introduction to the study of Russian...

²³ V. A. Bogoroditsky, Introduction to the study of Russian...

²⁴ V. A. Bogoroditsky, Introduction to the study of Russian...

²⁵ V. A. Bogoroditsky, Introduction to the study of Russian...

²⁶ V. A. Bogoroditsky, Introduction to the study of Russian...

3) methods of metaphorical translation of new scientific knowledge.

Therefore, the beginning of the twentieth century is a time span characterised by integration of scientific in the Russian linguistic discourse, which is reflected in the terminological metaphors of that time.

We understand that mathematics and physics approaches were very common at the times when V. A. Bogoroditsky worked, so the analogy and metaphor in his linguistic writings are rooted in the exact sciences.

Scientific knowledge, translation of knowledge, communication between scholars are accompanied by metaphorical units, the study of which allows us to largely simulate the cognitive process of the birth of ideas and their perception by the addressee, as well as to fully represent the scholar's linguistic personality, generator of new knowledge, and to reveal and describe the specifics of his scientific discourse.

The prospects for research lie in the comparative analysis of V.A. Bogoroditsky's terminological metaphors and other scientists, his contemporaries, for instance, his teacher, the outstanding linguist I. A. Baudouin de Courtenay.

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