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TERMINOLOGICAL METAPHORIZATION AND ITS MAIN TYPES

Suyarova Nargiza Yuldoshevna

Associate Professor, PhD, Department of English Linguistics

Karshi state university

E-mail: suyarovanargiza567@gmail.com

Eshankulova Charos Najmiddinovna

Turon university

E-mail: eshankulovacharos666@gmail.com

Contact:91.458.81.00.

Abstract

Metaphors in terminology operate through specific cognitive models. The theory of “mapping” proposed by George Lakoff and Mark Johnson demonstrates that structures of thought are transferred from one experiential domain to another.

“Within terminological nomination, the process of metaphorization enriches the vocabulary by assigning new meanings to already existing linguistic units. This method plays a crucial role in transferring words from everyday language into the scientific and technical sphere.”¹

Ontological metaphors emerge when abstract phenomena are conceptualized as physical objects, containers, or substances. For instance, in economics, expressions such as “cash flow” or “market fever” compare complex economic processes to liquids or living organisms, enabling individuals to comprehend abstract mechanisms through concrete experience.

¹ Madrahimov, Sh. O‘zbek tili terminologiyasi va uning taraqqiyot bosqichlari. Tashkent: 2017. Mumtoz so‘z, p. 112.



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Structural metaphors involve the transfer of the entire structure of one concept onto another. The metaphor “Argument is war” is one of the most frequently cited examples. In politics, terms such as “election campaign,” “strategic attack,” and “victory” originate from the military domain and are metaphorically extended into political discourse.

External form and structural similarity, commonly referred to as visual metaphor, represent the cognitive process through which the human mind associates unfamiliar objects with familiar shapes. Whenever people encounter a new object, they instinctively attempt to connect it with forms already stored in memory. If a new object—such as a mechanical detail or an architectural element—resembles a familiar image, the existing lexical item naturally evolves into a technical term within the new field. In mechanical engineering, terms such as *shponka* or *vtulka* are based on formal resemblance. Likewise, the term *shayba*, derived from the German word *Scheibe* (“disk” or “circle”), entered various technical fields due to its circular shape.

This phenomenon is also evident in architecture. The upper part of a building is often referred to as the “head” or capital, derived from the Latin *caput* (“head”). Similarly, the lower sections of columns are commonly described as the “foot” or “base.” Such terminological patterns occur across many languages and cultures, where architectural structures are interpreted through analogies with the human body.

In botany and anatomy, the term “eyeball” represents another example of metaphorical naming, as the anatomical structure is associated with the round shape of an apple. Objects are thus named according to the way they visually appear.

Spatial or orientational metaphors are likewise pervasive in terminology. Linguistic expressions such as “high income,” “low indicators,” or “the core of



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the system” reveal the influence of human spatial perception. In such cases, vertical orientation functions as a means of expressing qualitative and quantitative distinctions.

Functional and dynamic similarity, or functional equivalence, is interpreted somewhat differently. This type of metaphor is more closely associated with functionality and semantic purpose, since objects may differ externally while performing similar functions. Such metaphors are particularly common in information technology. For example, the term “window” does not visually resemble an actual architectural window; however, its function—allowing access to information “inside” or “outside”—strengthens the metaphorical association. Similarly, terms such as “bin” or “recycle bin” designate a location for unnecessary files. Here, the metaphor transfers the everyday function of a waste container into the virtual environment, where semantic functionality rather than physical appearance becomes central.

In economics, metaphorization is equally productive. The term “inflation,” derived from the Latin *inflatio* (“swelling”), metaphorically compares rising prices to an expanding balloon, implicitly suggesting the danger of collapse. Likewise, “frozen accounts” do not literally involve freezing money; instead, the metaphor transfers the notion of immobility associated with low temperature into banking practices, where all financial activity is suspended.

Anthropomorphic and zoomorphic metaphors reflect the tendency of humans to transfer knowledge of their own bodies or the animal world into technical and scientific domains. Such metaphors humanize science and introduce familiarity into otherwise abstract disciplines. In mathematics, terms referring to the “numerator” and “denominator” metaphorically relate to upper and lower bodily positions. In geography, expressions such as “river regime,” “river throat,” and



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“mountain foot” are likewise connected to parts of the human body, thereby attributing human-like qualities to natural formations.

Zoomorphism, or comparison with animals, is especially common in military terminology. The “Katyusha” rocket system or tanks named after animals, such as the German “Tiger” tank, symbolically evoke qualities such as strength, aggression, and speed through animal imagery. In construction terminology, the “goose-neck crane” derives its name from the resemblance between the crane’s curved structure and the neck of a goose. Through such metaphorical associations, terminology in technology, architecture, and science acquires additional expressive depth, effectively creating a conceptual bridge between language and human imagination.

The Formation and Widespread Use of Metaphorical Terms The formation of metaphorical terms and their stabilization within scientific discourse involve several complex and multi-layered stages. This process concerns not merely the creation of new lexical units, but also the extent to which a new term becomes established, accepted, and transformed from an expressive image into a precise scientific designation. Such developments do not occur spontaneously or instantaneously. Metaphorical terms initially emerge as vivid conceptual images; gradually, however, they lose their emotional and artistic coloring and become integrated into the rigid framework of scientific terminology. This represents a lengthy and evolutionary process. The first stage is legitimization— that is, the recognition of a metaphor by specialists and the scientific community as an officially accepted term. Initially, expressions such as “black hole” in astrophysics or “shock therapy” in economics function as highly figurative images within human imagination². Over time, however, such terms gradually lose much of their emotional resonance and evolve into fully established scientific

² Лотте, Д. С. Основы построения научно-технической терминологии. С. 143. 1961.



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concepts. At this stage, transparency becomes a decisive factor. The crucial question is whether the metaphor genuinely reveals the essence of the new concept or distances it from scientific accuracy. If the metaphorical basis proves inadequate, the term eventually loses its explanatory effectiveness. The second stage involves determinologization and lexicalization. During this phase, the word becomes detached from its original figurative meaning and functions exclusively within a terminological framework. In linguistics, such expressions are often referred to as “dead metaphors”³. For example, when people use the term “computer mouse,” they no longer associate it with the actual animal. The term now exclusively denotes a technical device and carries no alternative interpretation. In this way, the term abandons polysemy and becomes a precise scientific sign representing only one specialized meaning. Such precision is essential in terminology, where scientific concepts must be expressed clearly and unambiguously⁴.

Another noteworthy fact is that many metaphor-based terms have become internationally universalized. Across different languages, similar metaphors are frequently employed to represent the same scientific concepts. These phenomena are often described as cognitive universals. In telecommunications, for example, terms such as “cloud,” “firewall,” and “web” demonstrate shared metaphorical foundations. Likewise, in medicine, expressions such as “spinal column” or “eye socket” occur in many linguistic traditions. This indicates that human cognition, culture, and scientific understanding possess certain universal characteristics. Through metaphors, not only terminology but entire systems of worldview and human perception are expressed, revealing their broader international and universal foundations.

³ Арутюнова, Н. Д. Метафора и дискурс. С. 208. 1990.

⁴ Madrahimov, Sh. O‘zbek tili terminologiyasi. Tashkent: 2017. Mumtoz so‘z. 2017.



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The Importance of Metaphor in Term Formation

Metaphorization performs three principal functions within the terminological system:

Table 1.

Function	Main Purpose	Result
Nominative	Assigning names to new objects.	Lexical economy (eliminates the need to create entirely new words)
Cognitive	Simplifying complex concepts.	Easier dissemination and comprehension of scientific knowledge.
Creative	Generating new scientific hypotheses.	The emergence of new directions and models in science.

Nominative Function -within the nominative function, an existing word acquires a new meaning in order to represent a newly emerging concept. For example, the term “cloud computing” is based on the characteristics traditionally associated with physical clouds, such as distance, invisibility, and uncertainty. The essence of the nominative function lies in the ability of language to enrich its vocabulary without endlessly creating entirely new lexical units. Instead, existing words are semantically expanded and adapted to new scientific and technological realities. The example of “cloud computing” clearly illustrates this phenomenon. In this case, the metaphor derives from the fact that physical clouds are distant and conceal their internal processes from human observation. Similarly, the operations occurring within cloud technologies remain largely invisible and abstract to ordinary users. This hidden and indefinite nature becomes the conceptual basis for the metaphor. In such a way, language broadens the semantic scope of traditional words and enables them to express the latest technological developments. The interaction of semantic transfer, metaphor, and analogy



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guarantees the vitality and continuous evolution of language. As D. S. Lotte notes, “In terminological nomination, metaphor serves as a bridge that transforms the linguistic picture of the world into a scientific one.”⁵

Cognitive Function – metaphor also performs an important cognitive function in explaining new scientific concepts. In information technology, for instance, terms such as “window,” “mouse,” and “folder” express complex software processes through familiar and everyday images. The cognitive function effectively “democratizes” the language of science by making it understandable to a broader audience. Although this idea may appear simple, it is extremely important in the context of modern technology. A practical example can be observed in computer science. Without metaphorical terms such as “window,” “mouse,” or “trash bin,” ordinary users would be forced to interact with software exclusively through abstract codes and complicated commands. In such circumstances, understanding the real function of technological processes would become significantly more difficult.

Here, metaphor transforms complex algorithms into visible, accessible, and easily understandable images. For example, opening a “window” on a computer appears to be a simple action; users are not required to understand programming languages, algorithmic structures, or system requests in order to perform it. Metaphor therefore functions as a cognitive mediator between technological complexity and human understanding.

Creative Function- scientists frequently introduce new metaphorical images into scientific discourse, such as the concept of the “tree of life” in genetics. When researchers attempt to understand highly abstract and complex processes, they often compare them to familiar life-based images. Through this process, they begin to visualize new ideas and conceptual relationships more clearly. In

⁵ Лотте, Д. С. Основы построения научно-технической терминологии. Москва: 1961. Наука. С. 72.



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cognitive psychology, this phenomenon is referred to as “analogical transfer,” meaning the transfer of knowledge through perceived similarity. Creative metaphor serves as one of the most important instruments for overcoming scientific abstraction. Whenever a new metaphor emerges, scientists begin to conceptualize entire processes differently. An illustrative example can be found in quantum physics, where the metaphor of “strings” is used to explain the smallest particles of the universe. The term “string” is not merely a lexical choice; it becomes part of a mathematical model and creates a concrete visual representation⁶.

Through such metaphors, complex scientific concepts are transformed into forms that appear more vivid, accessible, and closely connected to human experience. Metaphor functions as a bridge within scientific thinking, converting abstract knowledge into concrete imagery through linguistic analogy. As the prominent linguist Viktor Gak emphasizes, metaphor in science acts as a “scout of knowledge.” Before a new concept becomes a fully established scientific term, metaphor temporarily provides it with a conceptual “name.”⁷ Initially, metaphorical terms possess vivid figurative qualities. Over time, however, they gradually transform into what linguists call “dead metaphors.” George Lakoff and Mark Johnson describe such phenomena as “conventional metaphors.” In this process, the term acquires a specialized scientific meaning, loses its original imagery, and becomes monosemantic. For example, in physics, the term “wave” no longer evokes the image of the sea; instead, it exclusively refers to oscillatory motion. In order for a metaphorical expression to function as a scientific term, it must abandon its figurative associations and evolve into a precise conceptual unit.

⁶ Madrahimov, Sh. O‘zbek tili terminologiyasi. Tashkent: 2017. Mumtoz so‘z, p. 98.

⁷. Гак, В. Г.. Языковые преобразования. Москва: 1998. Языки русской культуры. С.



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In conclusion, terminology and metaphorization should not be regarded merely as linguistic phenomena, but rather as products of human cognition itself. The studies conducted by George Lakoff and Mark Johnson clearly demonstrate that even the most rigorous scientific disciplines cannot function without metaphorical structures. Metaphorical terms facilitate scientific communication, clarify vague and abstract concepts, and organize knowledge through vivid conceptual imagery. As technology and neurolinguistics continue to develop, the emergence of new cognitive metaphors in the near future appears inevitable.

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