

УДК 81'373.612.2

Konnova Maria Nikolaevna¹✉, Westerbeek Anika Grite Maria²^{1, 2}Immanuel Kant Baltic Federal University, Kaliningrad, Russia¹mkonnova@kantiana.ru, AuthorID: 622666, ORCID: 0000-0001-8808-6424²anikawesterbeek@gmail.com

METAPHOR RESEARCH: FROM ARISTOTLE TO NEUROSCIENCE

Metaphor, a pervasive and almost unavoidable phenomenon in most fields of human life, has generated long and abiding scientific interest for more than two millennia. A brief overview of metaphor theories is given with a particular emphasis on differences and similarities in their treatment of production and perception of figurative language. We start from Aristotle who, by likening metaphor to an implicit simile, laid the foundations of rhetorical tradition of metaphor interpretation that dominated philosophical and linguistic treatises until early XX century. Leaving aside stylistic handling of metaphor as a pure embellishment of literary, mostly poetic pieces, we proceed with metaphor research of the XX century when scientific attention shifted from superficial linguistic manifestations of figurative thought to its deeper, i.e. cognitive, foundations. This point is illustrated by several influential theories. We discuss I.A. Richards' Interaction Theory of Metaphor and its continuation in M. Black's Substitution View. We go on to examine basic premises of G. Lakoff and M. Johnson's Conceptual Metaphor Theory and its numerous modifications, all united by their emphasis on conceptual system rather than language: the Conceptual Integration Theory (the Blending Theory) by G. Fauconnier and M. Turner, the Primary Metaphor Hypothesis by J. Grady, the Categorization View of the Metaphor presented by S. Glucksberg and B. Keysar, the Career of Metaphor Hypothesis by B.F. Bowdle and D. Gentner, the Deliberate Metaphor Theory by G. Steen. We end our overview with considering the tenets of neurolinguistic approaches to metaphor research, namely the Network Theory and its alternative, the Graded Salience Hypothesis. All of the viewpoints and methodologies discussed, while looking at metaphor from a different perspective, each contribute to a deeper understanding of this ubiquitous yet still inexplicable phenomenon of human language and thought.

Keywords: metaphor theory, conceptual system, language, Aristotle, I.A. Richards, G. Lakoff, neurolinguistics.



Konnova M.N., Westerbeek A.G.M. Metaphor research: from Aristotle to neuroscience. *Language. Communication. Society: Digital scientific journal*. 2023. 3 (3): 27-40.

Коннова Мария Николаевна¹✉, Вестербейк Аника Грите Мария²^{1, 2}Балтийский федеральный университет им. И. Канта, Калининград, Россия¹mkonnova@kantiana.ru, AuthorID: 622666, ORCID: 0000-0001-8808-6424²anikawesterbeek@gmail.com

ТЕОРЕТИЧЕСКИЕ ПОДХОДЫ К ИССЛЕДОВАНИЮ МЕТАФОРЫ: ОТ АРИСТОТЕЛЯ ДО НЕЙРОЛИНГВИСТИКИ

Метафора, как универсальное свойство естественного языка и фундаментальный мыслительный механизм, является традиционным объектом анализа гуманитарных дисциплин. Намечаются истоки научного похода к изучению метафоры, восходящие к трудам Аристотеля и его предшественников. Внимание уделяется исследованиям последнего столетия, когда метафора оказалась в центре не

только гуманитарных, но и естественно-научных, в частности, нейрофизиологических исследований, как явление, постижение природы которого способно пролить свет на сложнейшие процессы функционирования человеческого сознания. Рассматриваются ведущие тенденции когнитивного изучения метафоры, основы которого были заложены философами А. Ричардсом и М. Блэком, и затем углублены и расширены Дж. Лакоффом и М. Джонсоном. Излагаются подходы, возникшие на основе предложенной ими теории концептуальной метафоры: теория концептуальной интеграции Ж. Фоконье и М. Тернера, гипотеза первичной метафоры Дж. Грейди, теория категоризации С. Глюксберга и Б. Кейсара, теория карьеры метафор Б.Ф. Боудла и Д. Гентнера, гипотеза преднамеренной метафоры Дж. Стина. Обзор завершается описанием основных положений нейрональной теории метафоры, теории грубого семантического кодирования, сетевой модели состояний семантической памяти. Представленный в настоящей статье краткий анализ нейролингвистических механизмов обработки и порождения метафорической речи свидетельствует о том, что нейронаука, несомненно, открывает новые перспективы исследования образного мышления и способствует более глубокому уяснению его природы.

Ключевые слова: теория метафоры, концептуальная система, язык и мышление, Аристотель, А. Ричардс, Дж. Лакофф, нейролингвистика.



Коннова М.Н., Вестербейк А.Г.М. Теоретические подходы к исследованию метафоры: от Аристотеля до нейролингвистики // Язык. Коммуникация. Общество: Электронный научный журнал. 2023. № 3 (3). С. 27-40.

Introduction. Metaphorical thinking is ubiquitous in most spheres of human activity, both in day-to-day life, and in various fields of specialized knowledge and practice. Its manifestations can take the shape of physical objects, e.g., calendars as visual representations of special metaphors of time. It is visible in human behaviour, e.g., in the habit of leaning slightly forward when talking about the future and backwards when talking about the past as a physical display of “the future is ahead/ the past is behind” metaphors. It is conveyed by linguistic expressions, e.g., *time flies, passes, flows*. An average native English speaker employs in their speech approximately 5 metaphors per minute, accumulating up to 300 metaphors per hour, and exceeding 1,000 metaphors per day (considering about 4 hours of speaking time a day) [Dong, 2004]. A corpus-based study on metaphor in academic texts, conversation, fiction and news items, too, displays the pervasiveness of metaphor. Every seventh lexical unit shows a relation to metaphor although figuratively employed words are unevenly scattered across registers: academic texts indicate the highest metaphor density with as much as 18.6%, news items come in second with 16.4%, surprisingly followed by fiction with 11.7% and lastly conversation with only 7.7% [Müller et al., 2021; Steen et al., 2010]. Pervasiveness of metaphor allows the latter to generate a considerable and abiding interest which has provided metaphor with a rarely long-standing research record. Our aim in the present paper is to provide a brief overview of metaphor research evolution across time, starting from Aristotle’s description of metaphor as a covert comparison up to the most recent findings in neurolinguistics.

The Comparison View on metaphor. The Greek term *metaphora* literally means “carrying something from one place to another, transference”. The word first occurs in

Isocrates' "Evagoras", where the author claims to banish metaphors from his prose [Kennedy, 2007: 199]. In "Poetics" Aristotle defines metaphor as "a movement [*epiphora*] of an alien [*allogrios*] name either from genus to species or from species to genus or from species to species or by analogy" (Poetics, XXI, 7). In "The Rhetoric" Aristotle equated metaphor to an implicit or condensed simile: "A simile is also a metaphor; for there is little difference: when the poet says, 'He rushed as a lion,' it is a simile, but 'The lion rushed' [with lion referring to a man] would be metaphor; since both are brave, he used a metaphor [i.e., a simile] and spoke of Achilles as a lion. [Similes] should be brought in like metaphors; for they are metaphors, differing in the form of expression" (The Rhetoric, III, 1406b) [Aristotle, 2007: 205]. A metaphor constructed "X is a Y" is perceived as an elliptic comparison of the form "X is like a Y" which is on the basis of common features of the two constituents compared within it. A covert comparison based on analogy, metaphor has as the premise for its application and understanding the perception of the similarities of components [McGlone, 2007; Ashworth, 2007]. On Aristotle's account, both metaphor and simile are figurative comparisons, differing only in their manner of grammatical expression and the degree of conciseness [Fogelin, 2011: 28].

There is a certain discrepancy between metaphor and comparison regarding the extent to which the utterance may be true. Because a comparison is based on similarity, the utterance is about both concepts mentioned and implies full accordance between them. Metaphor, however, only focuses on one concept, be it with the help of the second, and does not require unquestionable agreement between the two. Similarly, metaphor is asymmetric in nature, in contrast to the symmetric nature of comparison or simile. Comparison implies, provided that "X is like a Y", vice versa, Y must be like an X. This principle, by no means, extends to metaphor [Cornell, 1991; for treatment of the Aristotelian theory, see Levin, 1982; Kirby, 1997; Marcos, 1997].

Interaction Theory of Metaphor and the Substitution View. After a long period of quiescence, I.A. Richards brought about a turn in the perception of metaphor. Rather than understanding metaphor on solely a lexical and stylistic level, Richards asserts that "metaphor is the omnipresent principle of language can be shown by mere observation. We cannot get through three sentences of ordinary fluid discourse without it ..." [Richards, 1936: 61]. In "The Philosophy of Rhetoric", Richards denoted the two fundamental constituents of metaphor previously often called "the original idea" and "the borrowed one" as the "tenor" and "vehicle". The tenor is the subject matter, whereas the vehicle is the object, whose elements are assigned to the tenor. The meaning of the metaphor, the shared properties, is denoted as the "ground". So, in the metaphor "leg of the table", the *table* is the tenor, the human *leg* the vehicle. The ground is their common function of carrying something or someone [Richards, 1936; see also West, 2007].

Richards observes metaphor does not necessarily consist of only two parts. He speaks of the secondary vehicle which serves as a sophistication of the tenor by ascribing additional

attributes. Richards remarks the term “ground” needs to be applied with consideration, proceeding from the assumption the ground implies a commonality between the tenor and vehicle. Metaphor, however, does not always exemplify a similarity between its two constituents, as he points out in the example “*daring wound*”. On this ground Richards claims it oftentimes is the difference between the tenor and vehicle that assemble the metaphor, not the similarity [Cornell, 1991].

Elaborating on Richards’ work, M. Black speaks of the Interaction View, which claims metaphor transcends the level of language, and is, in fact, an interaction between two conceptual systems [Black, 1962; Black, 1979]. In support of this theory, Black introduces three new terms: primary subject, subsidiary or secondary subject, and commonplace. The interaction of metaphor takes place between the two subjects. This way associations, inferences and literal meanings of the secondary subject are conveyed onto the primary subject, creating a commonplace. The secondary subject acts as a certain sieve or filter through which the primary subject is understood. It directs the focus and determines the perception, highlighting certain features and overshadowing, or perhaps even completely neglecting, others. Black clarifies “the maker of the metaphorical statement selects, emphasizes, suppresses, and organizes features of the primary subject by applying to it statements isomorphic with the members of the secondary subject’s implicative complex” [Black, 1977]. Thus, the interaction is not a simple binding of two words or phrases based on their similarity, the interaction itself produces, or at least identifies, the common properties between the two concepts and consequently redefines one of them. The new meaning, making of connotations and attributes at the very least, is impossible without this interaction. This notion brings another function of metaphor to light, namely that of creating and allocating new meanings to concepts. The creative function of metaphor is strengthened by its “non-reductionistic” nature that does not allow its interpretation to be reduced to its literal meaning [Surovtsev, Syrov, 2015; Waggoner, 1990; Youguo, 2013].

The Substitution View, initiated by M. Black, assumes metaphor to be a way of saying what could be said literally. Accordingly, the metaphor “He felt on top of the world” may be substituted by “He felt extremely happy”. Approaching metaphor as a mere subject of language, perhaps abundant and atypical language, diverging from the “normal”, literal language, the Substitution View considers metaphor to be purely aesthetical [Boyd, 1998].

This approach, however, does not provide a solution for one of the problems already mentioned with regard to the Comparison View: the ignorance of metaphor’s unique character in its ability to convey meaning additional to or beyond the literal one. As E. Cornell Way puts it: “... metaphors are *generative*; it is difficult to capture the entire web of associations and implications that result from a metaphor in a single literal paraphrase or even a set of literal phrases” [Cornell, 1991: 36]. This gives rise to the question what the actual use of metaphor then is. Considering the same thought can be uttered in a literal, often more clear and concise way, it is illogical to assume speakers would prefer this devious and somewhat inconvenient

way [Trčková, 2014].

Conceptual Metaphor Theory, the foundations of which were laid in Lakoff and Johnson's pioneering book "Metaphors We Live By" (1980), has provided powerful tools to analyze various aspects of figurative language and thought. This theory states that the metaphor an omnipresent phenomenon is in our conceptual system, involving not only language, but also thought and action. The making and understanding of metaphorical language are conveyed by metaphorical similarities that structure our mental representations of complicated concepts. According to G. Lakoff and M. Johnson, "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" [Lakoff, Johnson, 2010: 5].

Conceptual metaphor itself is understood metaphorically – as a "mapping" from a more concrete and better structured source domain (e.g., SPACE) to a more abstract and less experientially grounded target domain (e.g., TIME). The mapping that represents the structural identity between two domains takes the form A (target domain) is B (source domain), e.g., TIME IS A LANDSCAPE WE MOVE THROUGH. Metaphor is thus viewed as a mode of conceptual representation rather than solely a linguistic phenomenon. As Lakoff claims, "The metaphor is not just a matter of language, but of thought and reason. The language is secondary. The mapping is primary, in that it sanctions the use of source domain language and inference patterns for target domain concepts. The mapping is conventional, that is, it is a fixed part of our conceptual system" [Lakoff, 1998: 208]. Viewing metaphors as specific mental mappings across two conceptual domains – a source domain and a target domain – Lakoff and other conceptual metaphor theorists stress that a cross-domain mapping deals in relational structures and inferences and not just single elements. The resulting fixed set of ontological correspondences between entities in two conceptual domains enables speakers to perceive one mental space in terms of another. Another relevant feature of CMT is the systematicity of metaphors. Metaphoric expressions are viewed not as a set of random and disconnected linguistic units but as realizations of a common cognitive scheme. Linguistic metaphors, both novel and conventional, are reflections of underlying conceptual mappings [Lakoff, 1998; Evans, 2005; Kimmel, 2010; Kövecses, 2008].

The **Conceptual Integration Theory**, also known as the Blending Theory, was developed by G. Fauconnier and M. Turner in the 1990s. This theory does not concentrate on metaphor per se, rather, its main focus lays on cognition, of which metaphor and "cross-space mappings" are part [Fauconnier, Turner, 1998]. Far from rejecting Lakoff's and Johnson's "two-domain" model, Fauconnier and Turner view it as a convenient and practical model for the study of traditional conceptual metaphors. Nonetheless, it is considered to belong to a broader, a more generative, model of conceptual projection, namely the "many-space" model. According to Fauconnier and Turner, their model is able to give a more detailed account of cognitive studies and metaphor in particular [Turner, Fauconnier, 1995]. In their argumentation in favour of the Blending Theory, the authors point out the differences with the

Conceptual Metaphor Theory. Where the Conceptual Metaphor Theory makes use of the term “conceptual domain”, the Blending Theory reasons in “mental spaces”. Several conceptual domains usually constitute a mental space. Fauconnier defines “mental space” as “... a (relatively small) conceptual packet built up for purposes of local understanding and action” [Fauconnier, Turner, 1998: 184]. Mental spaces are created and may alter at the moment of speech and thought. The “many-space” model, also referred to as the “conceptual integration network”, presupposes the cooperation of at least four mental spaces. Two “input” spaces, a generic space and a blended space, to be exact. The input spaces may be seen as the equivalent of the source and target domain. The generic space is, as the name suggests, made up out of the features the two input spaces share in common. Finally, the blended space is, conversely, the overlaying of what the inputs do not share, that what is fused, or “blended”, into one space [Fauconnier, Turner, 2003: 62].

Detractors of the Conceptual Integration Theory object to its deficient specification, which hinders empirical testing of the theory and thus undermines its falsifiability. Secondly, there is the issue of computability. It is yet to prove how the “many-space” model may be translated to a computer model that would give results in line with the model. Finally, many cognitive theorists claim the Blending Theory is a theory too complex to explain simple instances of conceptual integration. According to them, the four-space model is round-about for straightforward cases of conceptual integration [Ritchie, 2004].

In an attempt to complete and enhance the Conceptual Metaphor Theory J. Grady introduced the **Primary Metaphor Hypothesis** which identifies plausible motivations which underlie conceptual metaphors. Grady’s hypothesis proceeds from the assumption that metaphor comes into being due to a tight and repeated correlation of (two) bodily experiences. R. Gibbs characterizes primary metaphor as a metaphorical mapping for which there is a direct and experimental basis [cf. Gibbs, 2006; Gibbs, 2019]. The Primary Metaphor Hypothesis refers to the metaphor basis as “primary scene”. An image schema, introduced by Lakoff and Johnson, is considered to be more generic and therefore substantial structure, while a primary scene is viewed as having a very specific structure founded on distinct experiences. The primary scene is a cognitive representation built on shared “schematic structures”. However, according to Grady, this generally does not involve an image of any kind. Considering that in his theory the source concepts are derived from sensory stimuli, and the target concepts are formed by the responses on that sensory input, only the source concepts may have image contents, while the target concepts have a more subjective nature, tethered to internal states. The metaphor basis is an experimental correlation between the primary scenes of both domains, thus based on co-occurrence [Costa Lima, 2006; Cornelissen, Kafouros, 2008].

Furthermore, with his hypothesis Grady presupposes “primary” or “primitive” metaphors lay the basis for conceptual metaphors. They are the building blocks of complex metaphors, which occur through “blending” of the primary ones. Primary metaphors themselves are further indivisible. They can be used as such because they are characterized by

a single interface between the source and target domain. Complex metaphors, on the other hand, are marked by multiple source domains and multiple interfaces. This notion is vividly displayed by the complex metaphor “glass ceiling” which is constituted of two primary metaphors: GOOD IS UP and SEEING IS KNOWING. The combination of the two develop the meaning of the expression “glass ceiling”, namely the limitation of upward motion due to an inconspicuous object [Cornelissen, Kafouros, 2008].

Grady distinguishes between so-called “correlation-based” metaphors and “resemblance” metaphors. The difference between the two types of metaphor lies in the nature of their emergence. The primary metaphor is the minimal unit of the correlation-based metaphor. These metaphors emerge through the concurrence of several sensory-motor experiences during early childhood. Thus, a correlation is developed between two notions through physical experience. This makes for primary metaphor to be automatically acquired and ingrained into the subconscious. At the root of conceptualization lies the process of conceptual blending or, as referred to by the Blending Theory, “counterpart connections”. After all, metaphoric conceptualization is underpinned by a correspondence between two separate conceptual representations [Grady, 2005; Ortiz, 2011].

Though fundamental, primary metaphor cannot provide an explanation for all conceptual metaphors, for some do not find their origin in a physical-experimental basis. Resemblance metaphor occurs on the ground of physical or conceptual common features, shared by the two domains. Grady claims resemblance metaphors are based on the perception of common aspects. A crucial remark Grady makes, is that the resemblance metaphor, by no means, infers a literal comparison between the two domains. There merely exists a metaphorical association based on (the perception of) shared features of the two domains [Grady, 1997: 222].

The Categorization View of the Metaphor presented by S. Glucksberg [Glucksberg, Keysar 1990] suggests that “an entity is assigned to a category that is exemplified by or typical of another entity also belonging to that category” [Kövecses, 2018: 116]. B.F. Bowdle and D. Gentner partly agree with the Categorization View in that they use this particular theory of metaphor as a base, when adopting it to create their **Career of Metaphor Hypothesis**. This hypothesis fuses the Comparison and Categorization View, and states that there exists a recurring contrast between novel and conventional metaphors, due to which they should be treated differently. Novel metaphors consist of “domain-specific” base concepts, not yet affiliated with “domain-general” categories. Simply put, the base concept merely possesses a literal meaning, but no linked figurative (metaphorical) meaning. It is for this reason that novel metaphors are understood as comparisons. Conversely, conventional metaphors are polysemous, since, over time and due to frequent use (i.e., through the process of conventionalization), they have acquired both a literal meaning and a semantically kindred metaphorical meaning. Consequently, conventional metaphors may be understood either as comparisons (horizontal alignment), or as categorization (vertical alignment), when referring

the target concept to a superordinate figurative category, determined by the base concept. This depends on whether the target concept is mapped onto the primary or secondary meaning respectively. Novel and conventional metaphors call for different linguistic realizations and thus mental processes. It is pointed out the former are commonly expressed in the form of simile, i.e., A is like B, while the latter may also be expressed in form customary for metaphor, i.e., A is B. It is important to make the distinction between comparison and categorization because they differ in the specificity of their projection. Comparison projections are very confined in that only the properties related to the aligned system will be reflected onto the target concept. Categorization, by contrast, presupposes a more wholesome projection of the base concept on the target concept, meaning that every single property of the base concept is reflected in the target concept. In other words, in case of comparison the target attributes are projected into the base attributes, after which an overlap is determined between the two. Categorization, on the other hand, implies the target concept is part of the category of the base concept [Bowdle, Gentner, 2005; Gokcesu, 2009].

The Deliberate Metaphor Theory. According to G. Steen, studies on metaphor in language and thought have shown to be contradictory, implying that the bulk of metaphors in language is, in fact, not perceived metaphorically. Such a paradox can easily be fixed by taking into consideration one key feature of the metaphor in communication, namely whether it is produced and received as deliberate or nondeliberate. With his Deliberate Metaphor Theory, Steen proposes a three-dimensional discourse-analytical framework, for “when metaphor is studied as part of actual language use, or events of discourse, it does not only manifest a linguistic form and a conceptual structure, but also a communicative function” [Steen, 2008: 221]. As for the relevance of the deliberate metaphor for this 3D model, Steen claims that both metaphors in language and metaphors in thought can serve as either deliberate or nondeliberate metaphors in communication. Thus, the linguistic and conceptual potential for metaphorical mapping will continue to be constant, whereas their communicative purpose is variable, depending on the presence or absence of the intention to employ a metaphorical expression. Logically, the deliberate metaphor is perceived metaphorically (by comparison), contrary to the nondeliberate metaphor, which is commonly considered not to be perceived metaphorically (by categorization).

Deliberate metaphors are defined as the cross-domain mappings that require the clear usage of another domain, a source domain, to assess the target domain. This has the effect of altering the addressee’s point of view on the tenor, by forcing them to consider it from the perspective of a different domain, functioning as the vehicle or conceptual source. The principal distinction between the two types of metaphor proposed by Steen is the following. The deliberate metaphor is considered to be a conscious and purposeful discourse strategy directed at inducing a communicative, in particular, a rhetorical effect through intentionally changing the perspective from the stance of a different conceptual domain. The nondeliberate metaphor does not have any intentional aim of any kind. Summing up, Steen has identified

three dimensions of metaphor, which are all of equal importance and value. These are “metaphor naming”, “framing” and “changing”. Their interaction and interdependence remain to be determined, but surely provide an excellent starting point for further (empirical) research [Steen, 2008; Steen, 2011; Steen, 2017; Gibbs, 2011].

Metaphor Theories in Neurolinguistics. At present there exists the general belief that the metaphorical system, being based on the conceptual system, has a foundation in neurology. From a neurological vantage point, metaphor can be studied in two ways: how and where in the brain metaphorical language is processed and how (and where) it is produced. A brief overview of both approaches will be given.

The Neural Theory of Metaphor evens the neural circuit to the metaphor, which is substantiated the following way. At the core of the Neural Theory of Metaphor stands the assumption that the (two) areas of the brain, which are responsible for the source and target domains, work concurrently when both the source and the target domain are activated. Paramount to this notion is the “Hebbian principle”. In order to give a neuropsychological explanation of memory and learning in general, psychologist D. Hebb put forward the idea that if neighboring neurons are located closely enough to one another for one neuron to excite the other and if this is done frequently and consistently, the efficiency of the first one is increased because of their connection. Thus, one neuron needs to fire the other neuron for a(n) (efficient) connection to be established. Though somewhat inaccurately, this principle is often reduced to the mnemonic phrase “Neurons that fire together, wire together”. Consequently, the neural mapping circuits, which connect the two domains, comprise the metaphor mapping and thus the metaphor itself [Lakoff, 2008; Keysers, Gazzola, 2014].

With regard to the exact areas of the brain in charge of metaphor comprehension, multiple studies have been carried out yielding different results. These studies are generally comparative studies executed by means of functional magnetic resonance imaging (fMRI) and performed on both healthy adults and adults with brain activity diverging from the norm, such as patients suffering from schizophrenia, autism disorder, Alzheimer’s disease, or brain injury. The vast majority of the studies concentrate on the opposition of literal and figural language in connection to hemispheric specialization [Coulson, Lai, 2016].

The brain regions involved in figurative language processing are thought to handle different aspects of this process. Taking into account the fact that metaphorical language is intelligible in its literal form, it is necessary to deduce its figurative meaning in order to understand the utterance. It is commonly accepted within the field of metaphor comprehension that the literal meaning needs to be processed and rejected first, so as to give rise to the identification and processing of the figurative meaning. The Parallel Hypothesis, however, states that both the literal and figural meanings are processed simultaneously [Benedek, 2014].

Conventionally, literal and figural language are thought to be processed qualitatively differently, hence the intrinsic difference between literal and figural language. In this context, the exact contribution of the right cerebral hemisphere is paramount. For a long time, it has

namely been commonly accepted that the right hemisphere of the brain plays a distinctive, though not exclusive, role in non-literal language comprehension. This led to the emergence of the Right Hemisphere Theory. More and more research on the topic based on neuroimaging has been unable to provide consistent evidence to support this theory. The brain regions, which are activated during figurative speech processing, have principally been identified in the frontal, temporal and parietal lobes of the left cerebral hemisphere through fMRI scanning. To be precise, these are the left inferior frontal gyrus, the left middle and superior temporal gyri, the left inferior parietal cortex, and the parahippocampal gyri.

Some research does show involvement of the right hemisphere during metaphor comprehension. This involvement, however, is generally attributed to “meaning salience”, entailing differentiation in familiarity and difficulty, rather than the figurativeness of metaphorical language. The Coarse Semantic Coding Theory developed by M. Beeman, supposes a difference in the specialization of laterality in connection to semantic processing [Beeman, 1998; Kounios, Beeman, 2014]. The theory puts forward the idea that the left cerebral hemisphere is exclusively responsible for the processing of “fine” or close semantic relationships, whereas the right cerebral hemisphere has no particular specialization and takes on the processing of both “fine” and “coarse” or remote semantic relationships. Consequently, the right hemisphere can be said to be concerned with the processing of metaphors as these usually entail remote semantic relationships. The following example is provided in support of this theory. In the literal sentence “All his money is from the lottery” the words “money” and “lottery” have many semantic attributes in common with each other. The words “respect” and “gem”, on the other hand, in the metaphorical sentence “Respect is a precious gem”, do not possess as many common semantic attributes [Schmidt, Seger, 2009].

Apart from figurativeness, another possible explanation for the involvement of the right hemisphere in metaphor processing according to the Coarse Semantic Coding Theory can be the degree to which one is familiar with a metaphor. It has been proposed familiar metaphors are inclined to show close semantic relationships between its constituent nouns, as opposed to unfamiliar metaphors. The speaker’s experience and frame of reference might account for this observation, for they might have previously formed associations between the two key words in the utterance. It should also be considered, semantically close words are more often put in relation to one another, establishing familiarity over a course of time. This becomes clear by the comparison of the examples “Babies are angles” and “Dictionaries are microscopes of words”. The former exemplifies a conventional metaphor, in which the key concepts have overlapping semantics and are easily associated with each other, whereas the latter exemplifies a novel metaphor, with key concepts remote from one another and (therefore) containing not as much overlapping semantic relationships.

This assumption about the role of metaphor familiarity stands perfectly in line with most studies, which reflect the tendency for greater brain activity in the left cerebral hemisphere for processing conventional metaphors, whereas the right cerebral hemisphere is more involved

in processing novel metaphors. The distinct brain regions responsible are presumably the following: the bilateral inferior frontal and middle frontal gyri and various temporal regions. Researchers M. Faust and Y. N. Kenett claim **the Network Theory** provides an explanation for this notion the following way. The left cerebral hemisphere is said to express “semantic rigidity”, denoting networks of nodes in which every single node connects to another small group of nodes. Conversely, the right cerebral hemisphere is said to express “semantic chaos”, characterized by tightly interrelated networks facilitating quick links between semantically distant concepts to be made. Ultimately, the rigid networks of the left hemisphere enable the meaning of conventional metaphor to be retrieved quickly, and contrarily, the fast networks of the right hemisphere allow for the understanding of novel metaphors. Alternatively, the **Graded Salience Hypothesis** would also account for this particular hemispheric specialization, claiming the right cerebral hemisphere engages in non-salient, i.e., novel metaphor, figurative language processing, whereas the left cerebral hemisphere engages in salient, i.e., conventional metaphor, figurative language processing [Kenett, Faust, 2014; Giora, 1997].

When turning to metaphor production, the difference between conventional metaphors and novel metaphors is also observed. Much like metaphor comprehension, the production of conventional and novel metaphors calls for similar cognitive processes. This way, conventional metaphors require lexical proficiency. At the same time, the making of novel metaphors entails executive functions, such as verbal fluency and fluid intelligence. One of the processes associated with verbal fluency, namely that of semantic cue, is very similar to the attributive category required for metaphor comprehension.

Unfortunately, up to this point, metaphor production, or creative cognition, has not been investigated much and neurological research is therefore still relatively scarce. Nevertheless, several tendencies have been identified. So far, it has been established metaphor production entails multiple brain systems responsible for executive control, semantic integration, and self-generated thought. The brain systems involved in cognitive control and self-generated thought have been named the executive control network and the default network, respectively. Together the networks are thought to give rise to creative idea generation and assessment. The exact interplay between these networks, however, has not been determined yet and is still under research [Beaty, Silvia, Benedek, 2017]. An fMRI experiment on novel metaphor production carried out by M. Benedek, R. Beaty et al, has shown activation of multiple brain regions, most noteworthy of which is the left angular gyrus. The left angular gyrus has been proven to be involved in a number of semantic processes, metaphor processing among others, and is therefore considered a “supramodal association area”, which “... may extract and relate shared semantic information between remotely associated concepts during metaphor processing” [Beaty, Silvia, Benedek, 2017: 164].

Conclusion. Metaphor theories overviewed above each focus upon a particular aspect of metaphor production and/ or perception, offering an insight into linguistic, philosophical,

pragmatic, conceptual nature of this multifaceted phenomenon. Metaphor research, having started with Aristotle's definition of it as a condensed simile, has proceeded uninterrupted for more than two millennia. Metaphor gained particular attention in XX century when the research focus shifted from linguistic "surface" to its deeper, cognitive, foundations. I.A. Richards was the first to lay the groundworks of modern metaphor analysis with his Interaction Theory of Metaphor, later to be elaborated by M. Black in his Substitution View. Conceptual Metaphor Theory introduced by G. Lakoff and M. Johnson's 1980 pioneering book "Metaphors We Live By" has so far been the most influential metaphor research framework. It was soon followed by numerous revised and modified versions, all dealing with conceptual system rather than language: the Conceptual Integration Theory (the Blending Theory) by G. Fauconnier and M. Turner, the Primary Metaphor Hypothesis by J. Grady, the Categorization View of the Metaphor presented by S. Glucksberg and B. Keysar, the Career of Metaphor Hypothesis by B.F. Bowdle and D. Gentner, the Deliberate Metaphor Theory Metaphor by G. Steen. Among the latest findings are the Network Theory and its alternative, the Graded Salience Hypothesis, both dealing with neurolinguistic aspects of metaphor. All of the above mentioned theories, while shedding light on metaphor itself, also provide valuable details about changing philosophical, scientific and technological tendencies in the study of language as a means of communication and a mirror of culture.

References

- Aristotle (2007) On rhetoric: a theory of civic discourse. Oxford: Oxford University Press.
- Ashworth, E. (2007) Metaphor and the Logicians from Aristotle to Cajetan. *The Many Roots of Medieval Logic: The Aristotelian and the Non-Aristotelian Traditions*. The Netherlands: Brill, 2007: 181–197.
- Beaty, R. E., Silvia, P. J., Benedek, M. (2017). Brain networks underlying novel metaphor production. *Brain and Cognition*, 111: 163–170.
- Beeman, M. (1998) Coarse semantic coding and discourse comprehension. *Right hemisphere language comprehension: Perspectives from cognitive neuroscience*. New York, Psychology Press: 255–284.
- Benedek, M. (2014). Creating metaphors: The neural basis of figurative language production. *NeuroImage*, 90: 99–106.
- Black, M. (1962) Models and Metaphors: Studies in Language and Philosophy. Ithaca: Cornell University Press.
- Black, M. (1977) More about Metaphor. *Dialectica*, 31 (3/4): 431–57.
- Black, M. (1979) How Metaphors Work: A Reply to Donald Davidson. *Critical Inquiry*, 6 (1): 131–143.
- Bowdle, B. F., Gentner, D. (2005). The Career of Metaphor. *Psychological Review*, 112 (1): 193–216.
- Boyd, R. (1998) Metaphor and theory change: What is "metaphor" a metaphor for. *Metaphor and Thought*. Ortony A. (Ed.): 481–532.
- Cornelissen, J. P., Kafouros, M. (2008). The Emergent Organization: Primary and Complex Metaphors in Theorizing about Organizations. *Organization Studies*, 29 (7): 957–978.
- Cornell, W.E. (1991). Knowledge, Representation and Metaphor. Dordrecht: Kluwer Academic Publishers.
- Costa Lima, P. L. (2006). About Primary Metaphors. *D.E.L.T.A.*, 22: 109–122.
- Coulson, S., Lai, V. T. (2016). Editorial: The Metaphorical Brain. *Frontiers in Human Neuroscience*, 9: 1–3.
- Dong, Y. R. (2004). Don't Keep Them in the Dark! Teaching Metaphors to English Language Learners. *The English Journal*, 93 (4): 29–35.
- Evans, V. (2005) The Meaning of Time: Polysemy, the Lexicon and Conceptual Structure. *Journal of Linguistics*, 41, 1: 33–75.
- Fauconnier, G., Turner, M. (1998). Conceptual Integration Networks. *Cognitive Science*, 22 (2): 133–187.
- Fauconnier, G., Turner, M. (2003). Conceptual Blending, Form and Meaning. *Recherches en Communication, Sémiotique cognitive – Cognitive Semiotics*, 19: 57–86.
- Fogelin, R. J. (2011) Figuratively Speaking. New York: Oxford University Press.
- Gibbs, R. (2006) Metaphor Interpretation as Embodied Simulation. *Mind & Language*, 21: 434–458.
- Gibbs, R. (2011) Advancing the debate on deliberate metaphor. *Metaphor and the Social World*, 1: 67–69.
- Gibbs, R. (2019) Metaphor as Dynamical–Ecological Performance. *Metaphor and Symbol*, 34 (1): 33–44.
- Giora, R. (1997) Understanding figurative and literal language: The graded salience hypothesis. *Cognitive Linguistics*, 8–3: 183–206.

- Glucksberg, S., Keysar, B. (1990). Understanding metaphorical comparisons: Beyond similarity. *Psychological Review*, 97 (1): 3–18.
- Gokcesu, B. S. (2009). Comparison, Categorization, and Metaphor Comprehension. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 31: 567–572.
- Grady, J. (1997). Foundations of meaning: primary metaphors and primary scenes. Berkeley, California: University of California at Berkeley.
- Grady, J. (2005). Primary metaphors as inputs to conceptual integration. *Journal of Pragmatics*, 37: 1595–1614.
- Kenett, Y.N., Faust M. (2014) Rigidity, chaos and integration: hemispheric interaction and individual differences in metaphor comprehension. *Frontiers in Human Neuroscience*, 8. Available at: <https://doi.org/10.3389/fnhum.2014.00511> (date of access: 1.02.2023).
- Kennedy G.A. (2007) Aristotle. On rhetoric: a theory of civic discourse. Translated with introduction, notes, and appendices by George A. Kennedy. New York; Oxford: Oxford University Press, 2007.
- Keyesers, C., Gazzola, V. (2014). Hebbian learning and predictive mirror neurons for actions, sensations and emotions. *Philosophical Transactions of the Royal Society*, 369: 1–11.
- Kimmel, M. (2010) Why we mix metaphors (and mix them well): Discourse coherence, conceptual metaphor, and beyond. *Journal of Pragmatics*, 42: 97–115.
- Kirby, J. (1997) Aristotle on Metaphor. *American Journal of Philology*, 4 (118): 517–554.
- Kounios, J., Beeman, M. (2014) The Cognitive Neuroscience of Insight. *Annual Review of Psychology*, 65: 71–93.
- Kövecses, Z. (2008) Conceptual metaphor theory. Some criticisms and alternative proposals. *Annual Review of Cognitive Linguistics*, 6: 168–184.
- Kövecses, Z. (2018). Ten Lectures on Figurative Meaning–Making: The Role of Body and Context. Leiden: Brill.
- Lakoff, G. (1998) The contemporary theory of metaphor. *Metaphor and Thought*. Cambridge University Press: 202–251.
- Lakoff, G. (2008). The neural theory of metaphor. *The Cambridge Handbook of Metaphor and Thought*. R. Gibbs, Jr. (Ed.). Cambridge, Cambridge University Press: 17–38.
- Lakoff, G., Johnson, M. (2010). *Metaphors We Live By*. Chicago, University of Chicago Press.
- Levin, S. R. (1982) Aristotle's Theory of Metaphor. *Philosophy & Rhetoric*, 15, 1: 24–46.
- Marcos, A. (1997) The tension between Aristotle's theories and uses of metaphor. *Studies in History and Philosophy of Science*, 28, 1: PP. 123–139.
- McGlone, M. (2007). What is the explanatory value of a conceptual metaphor? *Language & Communication*, 27 (2): 109–126.
- Müller, N., Nagels, A., Kauschke, C. (2021). Metaphorical expressions originating from human senses: Psycholinguistic and affective norms for German metaphors for internal state terms (MIST database). *Behavior Research Methods*, 54 (3): 365–377.
- Ortiz, M. J. (2011). Primary metaphors and monomodal visual metaphors. *Journal of Pragmatics*, 43: 1568–1580.
- Richards, I. A. (1936) The Philosophy of Rhetoric. London, Oxford University Press.
- Ritchie, L. D. (2004). Lost in “Conceptual Space”: Metaphors of Conceptual Integration. *Metaphor and Symbol*, 19 (1): 31–50.
- Schmidt, G. L., Seger, C. A. (2009). Neural correlates of metaphor processing: The role of figurativeness, familiarity and difficulty. *Brain and Cognition*, 71 (3): 375–386.
- Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A. A., Krennmayr, T. (2010). Metaphor in usage. *Cognitive Linguistics*, 21(4): 765–796.
- Steen, G. (2008). The Paradox of Metaphor: Why We Need a Three-Dimensional Model of Metaphor. *Metaphor and Symbol*, 23 (4): 213–241.
- Steen, G. (2011). The contemporary theory of metaphor – now new and improved! *Review of Cognitive Linguistics*, 9 (1): 26–64.
- Steen, G. (2017) Deliberate Metaphor Theory: Basic assumptions, main tenets, urgent issues. *Intercultural Pragmatics*, 14 (1): 1–24.
- Surovtsev, V. A., Syrov, V. N. (2015). The Cognitive Role of Metaphors in Processes of Cultural Production. *Procedia – Social and Behavioral Sciences*, 200: 130–134.
- Trčková, D. (2014) Representation of Natural Catastrophes in Newspaper Discourse. Brno, Masarykova univerzita.
- Turner, M., Fauconnier G. (1995). Conceptual Integration and Formal Expression. *Journal of Metaphor and Symbolic Activity*, 10 (3): 183–203.
- Waggoner, J. E. (1990). Interaction Theories of Metaphor: Psychological Perspectives. *Metaphor and Symbolic Activity*, 5 (2): 91–108.
- West, D. A. (2007) Richards' Theory of Metaphor: Between Protocognitivism and Poststructuralism. *Stylistics and Social Cognition*. Leiden, The Netherlands: Brill: 1–18.
- Youguo, D. (2013). Study on The Essence of Metaphor. *International Academic Workshop on Social Science*: 560–562.

© Коннова М.Н., Вестербейк А.М.Г., 2023

Коннова Мария Николаевна – доктор филологических наук, профессор Высшей школы филологии и кросс-культурной коммуникации Балтийского федерального университета им. И. Канта. Контактные данные: 236041, Россия, Калининград, ул. А. Невского 14 (Russia, Kaliningrad, Alexandra Nevskogo str. 14). E-mail: mkonnova@kantiana.ru.

Вестербейк Аника Грете Мария – магистрант Балтийского федерального университета им. И. Канта. Контактные данные: 236041, Россия, Калининград, ул. А. Невского 14 (Russia, Kaliningrad, Alexandra Nevskogo str. 14). E-mail: anikawesterbeek@gmail.com.

Статья поступила в редакцию: 14.06.2023.