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NEUROCOGNITIVE MECHANISMS OF ARTISTIC IMAGERY PERCEPTION

The presented work examines the emerging field of neurolinguistics – neuropoetics, the subject of which is the study of the mechanisms of perception, interpretation and generation of poetic text involving various parts of the brain. Special attention is paid to the functional specialization of the hemisphere: the right hemisphere is associated with creative thinking, understanding metaphors, emotional expressions and holistic perception, while the left hemisphere is associated with logical thinking and processing verbal information. Experimental data are presented that prove the activation of emotional and sensory areas of the brain when perceiving poetry, in particular, the medial prefrontal cortex, amygdala, insula, as well as Broca's and Wernicke's zones. The features of oculomotor activity when reading a poetic text are considered: fixations, saccades, the influence of inversions and enjambments. The importance of intonation as a means of conveying poetic information is emphasized. Special attention is paid to artistic perception as an active spiritual process, including the choice of motive, stylization and realization of the author's idea through the word. The neural mechanisms of speech sound recognition, the organization of neural modules, and the role of intention neurons in the formation of expressive speech are also described. It is pointed out that the poetic text activates not only cognitive, but also aesthetic, sensory aspects of perception. Thus, neuropoetics is an interdisciplinary field that combines data from neurophysiology, psycholinguistics, and literary studies, and reveals a complex multilevel process of poetic creativity and perception.

Keywords: neuropoetics, artistic perception, imaginative thinking, emotional expression, neural mechanisms, neurolinguistics.

Introduction

The modern field of language and neuroscience is undergoing a period of intense interdisciplinary convergence, during which new research directions emerging at the intersection of neuroscience, cognitive linguistics, psycholinguistics, and literary studies. One such area is neuropoetics, a relatively new but rapidly growing field of study that examines the neurophysiological and cognitive processes underlying the perception, creation, and interpretation of poetic and literary texts.

Oneuropoetics aims to identify patterns of interaction between linguistic, figurative, emotional, and neurophysiological components in the process of artistic creation. It focuses on phenomena such as associative thinking, metaphorical thinking, imaginative representation, emotional expression, improvisation, and features of intonational and semantic perception in poetic speech. To study these processes, oneuropoetics draws on data from neuroimaging, neuropsychology, experimental psycholinguistics, and cognitive poetics.

The relevance of neuropoetic analysis lies in several aspects. Firstly, poetic texts as a specific form of speech combine both verbal and non-verbal elements, activating complex sensory-neural systems. This allows for a deeper understanding of the mechanisms behind poetic perception, not only clarifying ideas about the cognitive nature of language but also shedding light on processes of creativity, imagination, and artistic expression.

Secondly, neuropoetics demonstrates high heuristic potential in explaining complex phenomena such as ambiguity, metaphorical expression, emotional coloring, artistic intonation, and aesthetic perception in literary texts. By examining the neural basis of these processes, we can gain a deeper insight into the workings of the human mind and its capacity for creativity.

Thirdly, neuroscience-based approaches to poetry analysis offer a unique perspective on the intersection of language, emotion, and cognition, providing a more comprehensive understanding of the complexities of literary works. This approach allows us to appreciate the intricate interplay between the mind and the written word, leading to a richer and more nuanced appreciation of poetry.

An important stage in the evolution of the relationship between language and thought was the emergence of psycholinguistics as a distinct field. This field attempts to explain the fundamental differences between learning a language, which is a systematic set of signs, and the formation, perception, and translation of spoken language. It also explores the relationship between language as a system and the principles that govern its functioning [1, p. 139].

Materials and methods

This research is interdisciplinary in nature and draws on a variety of methods from different scientific disciplines, including cognitive linguistics, neuropsychology, neurolinguistics, literary criticism, and psycholinguistics.

The theoretical and analytical approach was used to analyze and interpret scientific literature on the functioning of cerebral hemispheres, the characteristics of artistic perception, speech activity, and poetic creation. In this framework, the works of V. S. Rotenberg, S. M. Bondarenko, M. V. Falikman, T. V. Skulachev, T. V. Chernigova, G. N. Sokolova, as well as contemporary neuroscientific research by A. Zeman and S. Liu were examined.

The comparative method was used to analyze differences in the perception of prose and poetry from the point of view of neurocognitive processes. We compared data on cognitive and emotional activation while reading texts of different genres.

The cognitive modeling method allowed us to present the cognitive structure of the perception and production of poetry in terms of neuropsychological and linguistic components. We paid special attention to building models of the interaction between the right and left hemispheres of the brain when dealing with metaphors, images, and ambiguous expressions.

The method of psycholinguistic analysis was employed in the interpretation of experiments designed to identify the intonational, rhythmic, and semantic features of poetic speech. Specifically, data from eye-tracking studies examining saccades and gaze fixation while reading poetic texts was analyzed.

The research material includes excerpts from poetic texts written by Russian and Kazakh authors, such as A.S. Pushkin and M. Zhumabayev, as well as results from neuroscience experiments that used functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) to study brain activity. Additionally, data on speech perception was collected through audiovisual analysis. The study also took into account information about brain activity during the process of poetic improvisation and recitation.

Thus, an integrated approach that combines theoretical analysis, modeling, and the interpretation of empirical data has made it possible to identify the key mechanisms behind neuropoietic activity and the artistic perception of text.

Results and discussion

In this study, we attempted to identify the cognitive and neurophysiological mechanisms that underlie the perception and production of poetic text. We also aimed to determine the role of different brain structures and hemispheres in the artistic creation process. Through the analysis of literature and neuroscience sources, we were able to formulate the following findings: 1. Specialization of the brain hemispheres in poetry perception and creativity: Research results suggest that the right hemisphere plays a crucial role in processing metaphors, figurative

language, and emotional components of a poem. Specifically, MRI data show activation of the prefrontal cortex, amygdala, and insula during the perception of poetic lines with ambiguity and allusion. The left hemisphere, on the other hand, is primarily activated when processing grammatical structures and logical-semantic linearity, reflecting its specialisation in speech and analytical thinking. 2. Mechanisms of Poetic Perception: Thanks to the analysis of experiments using eye-tracking technology, we have found that the perception of poetry is accompanied by more frequent regressive saccades, especially in areas of inversion and enjambment. This suggests a need for additional cognitive processing and re-examination of poetic content. The average duration of fixation on poetic lines is longer than on prose lines, due to the multi-layered nature of their semantics. 3. Neurocognitive Correlates of Poetic Improvisation. Studies on spontaneous poetic improvisation by S. Liu and A. Zeman have shown that during the beginning stages of improvisation, left-hemispheric strategies related to selecting lexical units and constructing syntax are dominant. However, by the end of the process, right-hemispheric zones become active, responsible for intuitive, holistic representations of images, emotional expression, and the rhythmic and melodic organization of speech. 4. The role of neural networks in artistic perception: Based on the Gestalt pyramid model (G. N. Sokolov), we have revealed that during the process of perceiving a poetic text, neural ensembles become activated, providing the integration of sensory, linguistic, and affective information. This supports the theory of the gnostic nature of literary text perception, in which individual stimuli (words, rhymes, images) are incorporated into a more complex, multi-layered structure. 5. Artistic perception as a cognitive and aesthetic process. Based on an analysis of literary sources (B. Mailakh and V. Nepomnyashchy), we have confirmed that poetic perception differs from ordinary perception not only in its depth and imagery, but also in the activation of specific aesthetic mechanisms. Artistic perception involves a motivational and value component, as well as aesthetic assessment and interpretation through linguistic images.

In recent years, a new field of neurolinguistics has been formed – neuropoetics. Her interests are focused on studying how the hemispheres of the human brain, its departments and the neural network of the central nervous system participate in the perception of external information, the formation of images, metaphors, associations, and the activation of imagination. When studying creative abilities and emotional intelligence, they usually consider the work of the right hemisphere. E. V. Petrova argues that the right hemisphere plays an important role in the implementation of imaginative thinking and emotional expression. According to neuro-linguistic data, activation of the right hemisphere is accompanied by increased emotional expression [2, p. 896]. V. S. Rotenberg, S. M. Bondarenko, exploring the role of the right hemisphere in activating poetic creativity, noted

that poetic creativity, as an operation with words, suffers deeply from damage to the right hemisphere, the specifics of hemispheric thinking is the willingness to holistically ««grasp», that is, to simultaneous perception of many objects and phenomena of the world as a whole with all its constituent elements» [3, p. 121].

The right hemisphere also contributes to the birth of poetic texts. They are not built according to the laws of logical thinking. The magic of fear is based on the use of context, ambiguous words. Let's recall the poems of M. Zhumabaev: ***Өмір - теңіз,*** *жоқ оның түбі, шеті,* ***Сылқ - сылқ күлген сықырлы толқын беті*** [4, p. 307].

In A. S. Pushkin's poem *«Я вас любил. Любовь еще быть может…»,* there are no specific images, but rather a concentrated ambiguity. The literary critic V. Nepomnyashchy argues that this ambiguity is present in these lines by the poet, manifesting itself through a certain simplicity of expression. It is difficult to immediately determine what exactly is being expressed in these verses – whether it is unheard-of self-denial, the pain that is overcome yet does not give up, resentment, jealousy, grateful humility, gratitude for past experiences, or the bitterness of an unappreciated and fading feeling [5, p. 221].

E. Hemingway's writing style may seem telegraphic, but this is a misleading impression. The writer has said that one can omit anything they want, as long as they know exactly what they are omitting.

When considering the functions of the right hemisphere, it is important to remember that the left hemisphere also plays a significant role, as it is associated with language and speech. This allows for unambiguous communication between people. However, the organization of a complex and multi-layered context is essential for a more holistic understanding of the internal connections between objects and events, which is the basis for creativity. Poets, in their creative process, perceive reality in its full complexity and diversity, with all its internal relationships.

A study conducted by Marilyn Zdenek compared the functions of the two hemispheres and found that the left hemisphere is specialized in logical thinking and processing verbal information. It is responsible for logical analysis and understanding, but only of the literal meaning of words.. The right hemisphere of the brain activates the imagination and is responsible for the understanding of metaphors and human emotions [6, p. 219]. Thanks to the brain structures located on the right side of the skull, the right hemisphere develops imagination and activates creative thinking. It contributes to the comprehension of allegorical expressions and metaphors, as well as participating in the activation of neural correlates responsible for the perception of speech and poetry.

The articles by T. V. Skulacheva and M. V. Falikman present the results of a study on the patterns observed in verse structure and the peculiarities of perceiving

information presented in a poetic form. The researchers call this pattern ambiguity, when it is impossible to determine the single meaning of a polysemous word in a text:

В голубой далекой спаленке/Твой ребенок ***опочил***
Тихо вылез карлик маленький/И часы остановил.

The word «опочил» can have two meanings: it can mean «fell asleep» or «died». Which one will the reader choose to understand the text?

In the process of listening to a poem, it is important to pay attention to the special intonation that it has. To test this, an experiment was conducted. The participants were given 30-second segments of text to listen to and then asked to decide whether they were listening to poetry or prose based on the pitch frequency. The results showed that there is indeed a specific intonation associated with poetry that is noticed during the listening process.

M.V. Falikman's research focuses on how the right-hemisphere of the brain affects the perception of poetry. According to A. Zeman [7, p. 133], when we perceive poetry, brain areas that process emotionally colored information are involved. Some researchers have studied the problem of how the human brain generates poetry. In the work of S. Lew [8], the brain correlates of poetic improvisation were investigated. 12 participants took part in the study. To identify specific brain correlates of poetry generation, brain activity during improvisation was compared to brain activity during the recitation of poems that the participants memorized before the experiment. Both improvisation and memorized poems were performed to the same music track [9, p. 3360]. The following changes have occurred during the process of creating a poetic text through improvisation:

1) There was an increase in activity in the medial prefrontal cortex of the left hemisphere, which correlated with the activation of «emotional» brain areas (amygdala and insula) and the dorsal prefrontal cortex of the right hemisphere (decreased activity). This can be interpreted as a decrease in the ability to program and control actions, as well as to focus attention during improvisation.

2) At the start of improvisation, the left-hemisphere regions of the cerebral cortex contributed more. Towards the end, the right hemisphere regions became more involved, characterized by a more holistic information processing approach.

In poetry, unlike prose, every word is carefully chosen and each line is carefully constructed. This leads to repetitive patterns and inversions. M. V. Falikman has also studied eye movements while reading poetry. She found that, when reading, the eye does not move smoothly over the text, as it would when following a moving object. Instead, it makes small jumps or saccades forward, but occasionally returns to earlier parts of the text.

The research analyzes not only the number and duration of these stops or fixations, but also the direction and length of the saccades. The researcher has also

investigated eye movements in relation to poetic techniques such as anjambment. In an experiment, she studied how anjambments affect the reading experience. Eye movements were recorded during this process [10, p. 350].

T. N. Ushakova, in her writings, focused on the functional specialization of the cerebral hemispheres in speech activity. She found that the cortex of the left hemisphere contains three speech zones that act as a unified speech mechanism. Two of these zones coincide with Broca's area and Wernicke's area, while the third is located in the upper part of the premotor gyrus. Wernicke's and Broca's zones are considered the most important. Subcortical structures, primarily the posterior thalamic nuclei, play a significant role in the functioning of the speech mechanism. The cortical speech zones communicate through the thalamus, acting as an integrating center for speech production and comprehension [11, p. 171]. T. V. Chernigovskaya believes that the work of the verbal network is activated by a neural network distributed across different areas of the brain. The functioning of cognitive units, such as words and their combinations, as well as visual images, occurs through the formation of specific neuronal ensembles that link neurons in different regions of the cerebral cortex. The same object or concept can become part of several associative networks [12, p. 109]. G. N. Sokolov argues that the brain responds to complex stimuli through a neural structure organized in the shape of a pyramid. At the top of the pyramid, there are gnostic units or Gestalt detectors that form a holistic perception of the complex stimulus. These gnostic units are responsible for recognizing patterns and forming a unified perception of the stimulus.

Complex holistic acts, such as identifying a specific object or person, require the activation of higher-level neurons, including specialized «consciousness neurons». These neurons are located at the apex of the pyramid and are responsible for integrating information from different areas of the brain to create a unified perception [13, p. 250].

The so-called «intention neurons» are of interest, as they are associated with the performance of imitative movements. E. N. Sokolov also pays attention to the neural support for specific language elements, such as neuronal phoneme detectors. These neurons selectively respond to syllables, words, and combinations of words, according to Sokolov. If these units have a structure similar to that of intention neurons-including an association between a perceived element (phoneme, syllable, or word) and the elements of pronunciation or articulation of that perceived object -then this structure at the neural level can explain the expressive nature of speech.

In poetic and discursive activities, we have an artistic perception that differs from our usual perception. This is an aesthetic perception, which means the specific reflection of works of art, as well as natural, social, and cultural objects with aesthetic value, over time. The nature of this perception is determined by the

object being reflected, including its properties. However, the process of reflection is not a passive reproduction of an object. It is the result of the active spiritual activity of the individual [14]. Artistic poetic perception is realized through the process of selecting a specific motif from the diverse world that best expresses the author's intent. This is followed by the design process, which involves reworking the motif poetically and stylizing it. The author then embodies their idea in words through artistic perception. During this process, attention should be paid to the development of linguistic skills in mastering the surrounding world through words. Through the artist's search for the right words to convey ideas, thoughts, and feelings, verbal images are created.

B. Meilah argued that artistic perception is inextricably linked to the creative process. This process includes three stages: 1) the idea that the artist has in mind; 2) the steps the artist takes to bring their idea to life, culminating in the finished work; and 3) how the audience perceives the work [15, p. 39].

The motive is the reason behind a poet's perception of reality. According to A. N. Leontiev, a motive is an object that satisfies a specific need and is reflected in some way by the individual, leading them to act. Next, we will examine the stages of artistic perception. This includes visual, auditory, or taste perception of a real-life object. To do so, we need to understand the work of sensory areas in the brain. The sensory cortex of the brain covers the entire postcentral gyrus and includes the somatosensory cortex, parietal lobe, visual cortex (field 17), and auditory cortex. The visual cortex consists of the primary visual cortex and the associative visual cortex. The primary visual cortex is where the cranial spur tract ends. It transmits information from the corresponding halves of both retinas, which are located in the visual field of the other eye.

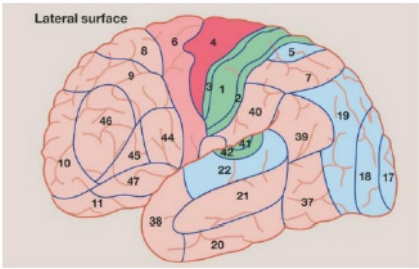

Figure 1 – Somatosensory cortex of the brain

This myelinated pathway forms pale visual stripes (Gennari lines) in the primary visual cortex before making contact with spiny granular cells in the high-

grained layer IV. The spiny granular cells are found in ocular dominant columns, which are so called because they are alternately matched by impulses from the left and right eyes. The cranked-spur tract is represented in the cortex in such a way that corresponding points from the two retinas are located in adjacent columns on the same line, making it suitable for binocular vision. A series of these columns form modules where information from both eyes is processed at the edges. Undifferentiated impulses from the cranked core are transformed into a number of properties in layer VI of the primary visual cortex due to the distribution of neurons in functional columns in this layer. The interconnections between neurons provide the basis for the definition of object contours, their size, direction of movement, and direction of visual stimuli. Further cortical interactions lead to complex processing [16].

They are located in the medial and lateral sections of field 19. The lateral group of models belongs to the dorsal visual pathway, which responds to the question «Where?». The medial group belongs to the ventral pathway, which answers the question «What?». Both pathways function simultaneously. The dorsal pathway is responsible for determining the location of objects in the visual field, while the ventral pathway processes information about the identity of objects. As a result of research, it was found that the lateral part of field 19 plays a crucial role in registering movements occurring in the opposite half of the visual field. This information is then transmitted to the posterior parietal cortex, which is responsible for spatial perception and allows us to determine the position and orientation of objects in space. The posterior parietal cortex also receives inputs from the thalamus and interacts with other brain regions involved in visual processing.. This ventral pathway connects to the anterior medial section of field 19, which is located in the fusiform gyrus, a part of the occipito-temporal gyrus. This area is involved in the recognition of three types of visual features. The shapes and modules of all types of objects are located in a relatively lateral section. In the middle section there are modules that recognize human faces. In the relatively medial department, there is a department that recognizes colors other than white and black. Recognition of individual objects and faces is a function of the anterior «what?» visual pathway in the inferior temporal gyrus (field 20) and the cortex of the right temporal lobe (field 38).

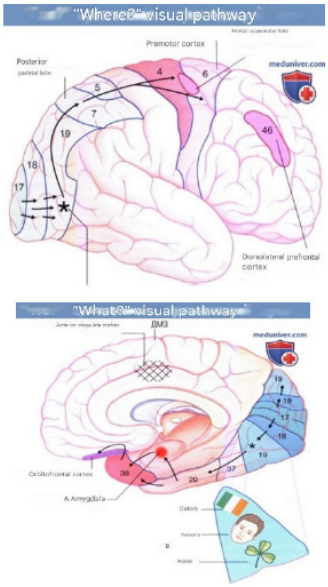

Figure 2 – is a model of the visual pathway.

The auditory cortex (fields 41, 42, and 22) is located in the anterior transverse temporal gyrus of Heschl, which corresponds to fields 41 and 42 on the upper surface of the superior temporal gyrus. Information from the medial cranial body is directed to field 41. The cortex has a columnar organization, with each column corresponding to a specific frequency. High-frequency tones activate the lateral columns in Heschl's gyrus, while low-frequency tones activate the medial columns [16].

The process of artistic perception, whether visual, auditory, or other, also includes the following components: the subject of perception, the object of perception, and their interaction. A.V. Bondarko believes that artistic perception involves, first and foremost, observing reality from the perspective of an «omniscient author». Figurative-poetic perception is characterized by elements that are observable and have figurative concreteness. It is associated with poetic time, space, and the image of the observer, as well as their perception of the world and expression of their feelings and thoughts.

In the process of artistic perception of the objective world, the poet experiences sensory tension, which can be understood as «a multitude of perceptual impressions per unit of text, aimed at creating perceptual images through language»

[17, p. 201]. The methods of creating sensory tension in a poetic text include the use of metaphors, comparisons, a flurry of enumeration, and simultaneous slices of perceptions. These techniques help to create a vivid and dynamic image in the reader's mind. Another technique used in poetry is the use of sensory imagery, which involves using other senses, such as touch and taste, to create images that are not directly perceived through sight or hearing. The creation of these non-sensory images is influenced by cultural and personal factors, as well as the author's worldview. When creating sensory images, the author takes into account the physical characteristics of objects, such as size, shape, color, texture, and sound, in order to create a more realistic and engaging experience for the reader. These perceptual features can vary depending on the object and the context in which it is being observed, *dark, red, sharp, loud, soft, etc.*

To describe the experience of each sense, there are specific words, for example in A. N. Maikov's poetry. *Стою я как влюбленный, Стою и слушаю, тобой обвороженный* [18, p. 780]. *Быть в темноте, выйти на свет* и др.

Artistic perception as a cognitive process has several essential characteristics, including: 1. Subjectivity: The reflection of objects and phenomena of the real world as individual experiences. 2. Integrity: The formation of an integrated image of an object by identifying its main features. 3. Structurality: The ability to organize stimuli into coherent structures. 4. Constancy: The perception of objects as constant in size, color, and shape. 5. Meaningfulness: Attributing meaning to perceived objects and expressing it through language. 6. Selectivity: Preference for certain objects or qualities over others. 7. Apperception: The influence of personal experiences, skills, knowledge, and interests on perception [19, p. 125].

Thus, as a result of studying the role of the left and right hemispheres in the artistic perception of poetry, it has been found that the right hemisphere plays a significant role in stimulating poetic creativity and the imagination of poets. While the left hemisphere also contributes to the process of artistic perception, it occurs in the sensory region of Wernicke's area. This process involves the participation of neurons in various brain regions, including the supramarginal, middle, and superior temporal gyri, as well as the sensory and motor cortices, premotor cortex, and inferior frontal gyrus. Different types of perception, such as visual, auditory, and others, are facilitated by the functioning of the sensory cortex, including the somatosensory cortex and the visual (fields 17, 18, and 19), auditory (fields 41 and 42), and other areas. The auditory cortex, located in the Heschl's gyrus, plays a crucial role in auditory perception.

Artistic perception encompasses perceptual, intellectual, and artistic-perceptual activities. During this process, perceptual and linguistic images are formed, which are connected to the poet's imagination and poetic consciousness. The author expresses their emotional attitude through these images.

Conclusion

The research conducted revealed the neurocognitive and psychophysiological bases of artistic perception and poetic creativity. Through the analysis of data from neuroscience, cognitive psychology, and literary studies, we were able to demonstrate that the processes of poetic perception and imagination are rooted in a complex interplay of sensory, motor, associative, and emotional components.

Neurophysiological studies have revealed that when reading a literary text, not only areas traditionally associated with language processing (such as the Wernicke area and inferior frontal gyrus) become active, but also sensory areas of the brain responsible for visual, auditory, and somatosensory perception. This finding supports the idea that a poetic text can evoke non-literal (or cross-modal) images, which are influenced by the author's and reader's cultural and personal experiences.

Imagination, as demonstrated by the works of L. S. Vygotsky and L. Yakovleva, is an essential component of artistic perception. It enables the individual to mentally interact with objects, creating stable images and representations of the world. Imagination utilizes sensory features, even in the absence of a corresponding external stimulus, confirming the activation of sensory regions of the brain during imaginative activity.

Therefore, artistic perception may be regarded as a unique form of cognitive activity that integrates perceptual, intellectual, and emotional-imaginative processes. Poetic consciousness arises at the intersection of neurophysiological mechanisms, individual experience, and cultural context. The result of this process is a distinctive perception of the world expressed through language and artistic imagery.

References

1 **Карабаева, Л. К., Ереханова, Ф. Т., Тасполатов, Б. Т.** Актуальные проблемы когнитивной лингвистики на современном этапе // Ясауи университетінің хабаршысы, 2024. – No 1(131). – Б. 135–148. – https://doi.org/10.47526/2024-1/2664-0686.121

2 **Фабри, М.** Функциональная топография мозолистого тела, исследованная с помощью ДТИ и фМРТ / М. Фабри, Гл. Пьерпаоли, П. Барбарези, Г. Полонара // World J. Radiol, 2014. – Вып. 6. – № 12. – С. 895–906.

3 **Ротенберг, В. С., Бондареко, С. М.** Функциональная асимметрия полушарий мозга, типы мышления и обучения // Педагогическая психология. – М., 2012. – с. 255.

4 **Жумабаев, М.** Исповедь. – Петропавловск, 2011. – 375с.

5 Непомнящий, В. С. Пушкин : Избранные работы. – 1060–1990. В 2-х тт. – М., 2011. – 492 с.

6 **Мерили Зденек.** Развитие правого полушария // [Электронный ресурс]. – https://svitk.ru/004_book/14b/3135_zdonek_razvitie_pravogo_poluhariya.php.

7 **Zeman, A., Milton F., Smith, A., Rulance, R.** By heart. An fmRI sudy of brain activation by poetry and pross // Journal of Consciousness Studies, 2013. Vol. 20. – № 9–10 / Pp. 132–158.

8 **Liu, S., Chow, H.M., Xu, Y., Erkkinnen, M. G., Swett, K. E., Eagle, M. W., Rizik-Baer, D. A., Braun, A. R.** Neutral Correlates of lyrical improvisation: An FMRI study of freestyle nap // Scientific Reports, 2012. Vol. 2. Art. 834. URL: http://www.nature.com/articles/srep00834 (дата доступа: 05.09.2016).

9 **Liu, S., Erkkinnen, M. G., Healey, M. D., Xu, Y., Sweet, K. E., Chow, H. M., Braun, A. R.** Brain activity and connectivity during poetry composition : Toward a multidimension model of the creative process // Human Brain Mapping, 2015. – Vol. 36. – № 9. – Pp. 3351–3372.

10 **Фаликман, М. В.** Нейропоэтика как область когнитивных исследований: методы регистрации активности мозга и движений глаз в исследованиях восприятия и порождения поэтического тексте // Труды Института русского языка им. В. В. Виноградова, 2017, Вып. 14. – С. 349–368.

11 **Ушакова, Т. Н.** Язык и мозг // Психолингвистика. – М., 2006. – С. 164–179.

12 **Черниговская, Т. В.** Нейро- и психолингвистика. – М., 2003. – 109 с.

13 **Соколов, Е. Н., Шмелев, Л. А.** Нейробионика : организация нейроподобных элементов и систем. – М., 1983. – 279 с.

14 [Электронный ресурс]. – https://esthetiks.ru/vospriyatie_estetic_cheskol.html (дата обращения 8.3.23).

15 **Мейлах, Б.** Художественное восприятие (Аспекты и методы изучения) / Б. Мейлах // Вопросы литературы, 1970 – № 10. – С. 38–55

16 [Электронный ресурс]. – https://meduniver.com/Medical/Neurology/sensornie_zoni_mozga.html

17 **Харченко, В. К.** Лингвосенсорика. Фундаментальные и прикладные аспекты. – М. : Книжный дом «Либроком», 2012. – 216 с.

18 **Майков, А. Н.** Избранные произведения. – М., 1977. – 909 с.

19 **Лаврова, С. Ю.** Говорящий как наблюдатель: лингвоаксиологический аспект. – Череповец : ЧГУ, 2017. – 240 с.

References

1 **Karabaeva, L. K., Erekhanova, F. T., Taspolatov, B. T.** Aktual'nye problemy kognitivnoy lingvistiki na sovremennom etape

[Topical Issues of Cognitive Linguistics at the Present Stage] // [Electronic resource]. – https://Iasaui universitetinin khabarchy, 2024. – No. 1(131). – P. 135–148. – https://doi.org/10.47526/2024-1/2664-0686.121

2 **Fabri, M., Pierpaoli, G., Barbarezi, P., Polonara, G.** Funktsional'naya topografiya mozolistogo tela, issledovannaya s pomoshch'yu DTI i fMRT [Functional Topography of the Corpus Callosum Investigated Using DTI and fMRI] // World J. Radiol, 2014. – Vol. 6. – No. 12. – P. 895–906.

3 **Rotenberg, V. S., Bondareko, S. M.** Funktsional'naya asimmetriya polushariy mozga, tipy myshleniya i obucheniya [Functional Asymmetry of Brain Hemispheres, Thinking and Learning Types] // Pedagogicheskaia psikhologiia. – Moscow, 2012. – P. 255.

4 **Zhumabaev, M.** Ispoved' [Confession]. – Petropavlovsk, 2011. – 375 p.

5 **Nepomniachshiy, V. S.** Pushkin: Izbrannye raboty [Pushkin: Selected Works]. – 1060–1990. In 2 vols. – Moscow, 2011. – 492 p.

6 **Zdenek, Merili.** Razvitie pravogo polushariya [Development of the Right Hemisphere] // [Electronic resource]. – https://svitk.ru/004_book/14b/3135_zdonek_razvitie_pravogo_poluhariya.php

7 **Zeman, A., Milton, F., Smith, A., Rulance, R.** By heart. An fMRI study of brain activation by poetry and prose // Journal of Consciousness Studies, 2013. – Vol. 20. – No. 9–10. – Pp. 132–158.

8 **Liu, S., Chow, H. M., Xu, Y., Erkkinnen, M. G., Swett, K. E., Eagle, M. W., Rizik-Baer, D. A., Braun, A. R.** Neural Correlates of Lyrical Improvisation: An fMRI Study of Freestyle Rap // Scientific Reports, 2012. – Vol. 2. – Art. 834. [Electronic resource]. – URL: http://www.nature.com/articles/srep00834 (accessed: 05.09.2016).

9 **Liu, S., Erkkinnen, M. G., Healey, M. D., Xu, Y., Sweet, K. E., Chow, H. M., Braun, A.R.** Brain Activity and Connectivity During Poetry Composition: Toward a Multidimensional Model of the Creative Process // Human Brain Mapping, 2015. – Vol. 36. – No. 9. – Pp. 3351–3372.

10 **Falikman, M. V.** Neiropoetika kak oblast' kognitivnykh issledovaniy: metody registratsii aktivnosti mozga i dvizheniy glaz v issledovaniyakh vospriyatiia i porozhdeniia poeticheskogo teksta [Neuro-Poetics as a Field of Cognitive Studies: Brain and Eye Movement Registration Methods in Poetry Perception and Production] // Trudy Instituta russkogo yazyka im. V.V. Vinogradova, 2017. – Issue 14. – Pp. 349–368.

11 **Ushakova, T. N.** Yazyk i mozg [Language and Brain] // Psikholingvistika. – M., 2006. – Pp. 164–179.

12 **Chernigovskaya, T. V.** Neiro- i psikholingvistika [Neuro- and Psycholinguistics]. – M., 2003. – 109 p.

13 **Sokolov, E. N., Shmelev, L. A.** Neirobionika: organizatsiia neiro-podobnykh elementov i sistem [Neurobionics : The Organization of Neural-Like Elements and Systems]. – Moscow, 1983. – 279 p.

14 Vospriyatie estheticheskikh ob'ektov [Perception of Aesthetic Objects] // http://esthetiks.ru/vospriyatie_estetic_cheskol.html (accessed: 08.03.2023).

15 **Meilakh, B.** Khudozhestvennoe vospriyatie (Aspekty i metody izucheniya) [Artistic Perception (Aspects and Methods of Study)] // Voprosy literatury, 1970. – No. 10. – Pp. 38–55.

16 Sensornye zony mozga [Sensory Zones of the Brain] // https://meduniver.com/Medical/Neurology/sensornie_zoni_mozga.html

17 **Kharchenko, V. K.** Lingvosensorika. Fundamental'nye i prikladnye aspekty [Linguosensorics: Fundamental and Applied Aspects]. – Moscow : Knizhnyy dom «Librokom», 2012. – 216 p.

18 **Maikov, A. N.** Izbrannye proizvedeniya [Selected Works]. – Moscow, 1977. – 909 p.

19 **Lavrova, S. Yu.** Govoryashchiy kak nablyudatel' : lingvoaksiologicheskiy aspekt [The Speaker as an Observer : A Linguo-Axiological Aspect]. – Cherepovets : ChGU, 2017. – 240 p.

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КӨРКЕМ БЕЙНЕНІ ҚАБЫЛДАУДАҒЫ НЕЙРОКОГНИТИВТІК МЕХАНИЗМДЕР

Ұсынылған жұмыста нейролингвистиканың дамып келе жатқан бағыты – нейропоэтика қарастырылады, оның тақырыбы мидың әртүрлі бөлімдерінің қатысуымен поэтикалық мәтінді қабылдау, түсіндіру және құру механизмдерін зерттеу болып табылады. Жарты шарлардың функционалды мамандануына ерекше назар аударылады: оң жарты шар бейнелі ойлаумен, метафораларды түсінумен, эмоционалды экспрессиямен және тұтас қабылдаумен,

ал сол жақ логикалық ойлаумен және ауызша ақпаратты өңдеумен байланысты. Поэзияны қабылдау кезінде мидың эмоционалды және сенсорлық аймақтарының, атап айтқанда медиальды префронтальды қыртыстың, амигдаланың, Аралдың, сондай-ақ Брок пен Вернике аймақтарының белсендірілуін дәлелдейтін эксперимент деректері келтірілген. Поэтикалық мәтінді оқу кезінде окуломоторлық белсенділіктің ерекшеліктері қарастырылады: фиксациялар, саккадтар, инверсиялар мен анжамбмандардың әсері. Интонацияның поэтикалық ақпаратты беру құралы ретіндегі маңыздылығы атап өтіледі. Көркемдік қабылдауға мотивті таңдауды, стильдеуді және сөз арқылы авторлық ниетті жүзеге асыруды қамтитын белсенді рухани процесс ретінде ерекше назар аударылады. Сөйлеу дыбыстарын танудың нейрондық механизмдері, нейрондық модульдердің ұйымдастырылуы және экспрессивті сөйлеуді қалыптастырудағы ниет нейрондарының рөлі де сипатталған. Поэтикалық мәтін қабылдаудың когнитивті ғана емес, эстетикалық, сенсорлық аспектілерін де белсендіретіні көрсетілген. Осылайша, нейропоэтика нейрофизиология, психолингвистика және әдебиеттану деректерін біріктіретін және поэтикалық шығармашылық пен қабылдаудың күрделі көп деңгейлі процесін ашатын пәнаралық сала болып табылады.

Кілтті сөздер: нейропоэтика, көркемдік қабылдау, бейнелі ойлау, эмоционалды экспрессия, нейрондық механизмдер, нейролингвистика.

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НЕЙРОКОГНИТИВНЫЕ МЕХАНИЗМЫ ВОСПРИЯТИЯ ХУДОЖЕСТВЕННОГО ОБРАЗА

В представленной работе рассматривается формирующееся направление нейролингвистики — нейропоэтика, предметом которого является исследование механизмов восприятия, интерпретации и порождения поэтического текста с участием различных отделов головного мозга. Особое внимание уделяется функциональной специализации полушарий: правое полушарие связано с образным

мышлением, пониманием метафор, эмоциональной экспрессией и целостным восприятием, а левое — с логическим мышлением и обработкой вербальной информации. Приводятся данные экспериментов, доказывающие активацию эмоциональных и сенсорных зон мозга при восприятии стихов, в частности медиальной префронтальной коры, миндалины, островка, а также зон Брока и Вернике. Рассматриваются особенности глазодвигательной активности при чтении стихотворного текста: фиксации, саккады, влияние инверсий и анжамбманов. Подчеркивается важность интонации как средства передачи поэтической информации. Отдельное внимание уделяется художественному восприятию как активному духовному процессу, включающему выбор мотива, стилизацию и реализацию авторского замысла через слово. Описываются также нейронные механизмы распознавания звуков речи, организация нейронных модулей и роль нейронов интенций в формировании экспрессивной речи. Указывается, что поэтический текст активизирует не только когнитивные, но и эстетические, чувственные аспекты восприятия. Таким образом, нейропоэтика представляет собой междисциплинарную область, объединяющую данные нейрофизиологии, психолингвистики и литературоведения, и раскрывающую сложный многоуровневый процесс поэтического творчества и восприятия.

Ключевые слова: нейропоэтика, художественное восприятие, образное мышление, эмоциональная экспрессия, нейронные механизмы, нейролингвистика.

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