

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2023-11-1-58-66
UDC 159.9:808.2:338.2(045)
JEL C45, Z13

Linguoculturology and the Linguistic Picture of the World through the Neuropsychological Prism

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ABSTRACT

The authors consider linguoculturology through the science of neuropsychology. They define and clarify the concepts necessary for the review of linguoculturology and the linguistic picture of the world through neuroscience, which can reveal the impact of culture and language on human consciousness. The **problem** is that the research on unconscious processes is not sufficiently widely disclosed and remains little studied. The **goal** is to identify the relationship between language and cultural concepts that most effectively affect the human subconscious. The **tasks** are to determine the relationship between culture and language through the neuropsychological prism of response triggers; to consider the manifestation of culture, which is reflected in the language, in unconscious – psychic suggestion; to establish the interdependence of national-specific features of the genesis of the linguistic worldview through ambivalent concepts. The relevance lies in the growing attention of the international community on the correlation of truth and “fake”, acceptance and rejection, as well as a broad interest in the field of neuropsychology. The **methodology** of this work is a descriptive review of EEG (electroencephalogram), MRI (magnetic resonance imaging), and sound recording devices. **The main conclusions.** Human triggers (triggers) are inseparable from culture, language, and communication methods that lead to a narrowed perception of one’s own response. The manifestation of culture is reflected in the language, influences the people’s perceptions and their beliefs, where suggestion affects human consciousness.

Keywords: neural networks; brain; linguoculturology; neuropsychology; consciousness

For citation: Sharafieva L.M., Tretyakova G.V. Linguoculturology and the linguistic picture of the world through the neuropsychological prism. *Review of Business and Economics Studies*. 2023;11(1):58-66. DOI: 10.26794/2308-944X-2023-11-1-58-66

ОРИГИНАЛЬНАЯ СТАТЬЯ

Лингвокультурология и языковая картина мира сквозь призму нейрпсихологии

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АННОТАЦИЯ

Авторы рассматривают лингвокультурологию в качестве неотъемлемой компоненты языка и культуры в формировании картины мира. Определяют и уточняют понятия, которые необходимы для обзора лингвокультурологии и языковой картины мира через нейрпсихологию, нейронауку, способную раскрыть воздействие культуры и языка на сознание человека. **Проблематика** состоит в том, что исследования неосознанных процессов недостаточно широко раскрыты и мало изучены. **Цель** – выявить отношение

между языком и культурными концептами, наиболее результативно влияющими на подсознание человека. **Задачи** – определить взаимосвязь культуры и языка через нейропсихологическую призму триггеров реагирования; рассмотреть проявление культуры, которая отразилась в языке, в бессознательно-психической суггестии; установить взаимозависимости национально-специфических особенностей генезиса языковой картины мира через амбивалентные понятия. **Актуальность** заключается в растущем внимании международного сообщества к соотношению правды и «фейка», принятия-отторжения, а также широкий интерес к области науки нейропсихология. **Методология** работы включает описательный обзор ЭЭГ (электроэнцефалограмм), МРТ (магнитно-резонансной томографии), звукозаписывающих устройств. **Основные выводы:** человеческие триггеры (спусковые крючки) неразрывно связаны с культурой, языком, способами коммуникации, которые приводят к суженному восприятию собственного реагирования. Проявление культуры отражается в языке, оказывает влияние на восприятие людей и их убеждения, где суггестия воздействует на сознание человека.

Ключевые слова: нейронные сети; головной мозг; лингвокультурология; нейропсихология; сознание

Для цитирования: Шарафиева Л.М., Третьякова Г.В. Лингвокультурология и языковая картина мира сквозь призму нейропсихологии. *Review of Business and Economics Studies*. 2023;11(1):58-66. DOI: 10.26794/2308-944X-2023-11-1-58-66

Introduction and literature review

Society today has turned out to be on the eve of a new era, where it is necessary to critically evaluate not only the consciously perceived space but also semantic (semantic meaning of language units), exegetic (to understand the quoted text, speech), unconscious (in the absence of consciousness control), linguoculturological (hidden subtext of culture), and neuropsychological (connection of structure and functioning) direction of deductive axiomatics of the elements' properties. Thinking and language are coherent (interconnected) with each other. The language is influenced by society, and its lexical and semantic structure reflects the specifics of the national worldview [1]. Language is a structured system of signs, free components of vocabulary, which allows the mental process of thinking to model, logically build patterns of the surrounding world, through the subjectively experienced abilities of consciousness. The choice of a person and a society to use the language apparatus depends on the inner potential of the individual. Potential should be considered in close interaction of a set of psychological properties and features, structural relations of unconscious choice to achieve a certain level of success. By developing each person individually, society as a whole develops [2], therefore, the potential of the individual should appear as acceptable economically stable concepts of creative meaning.

Linguoculturology studies the problem of the interaction of language and culture [3]. The language is expressed through the culture of the peo-

ple, through the vision of the picture of the world, the available reserves of concepts and ideas [4]. Cultural heritage, transmitted to the next generation in a behavioral and imitative form, is inextricably linked with the internal psychophysiological characteristics of generations. Neuropsychology allows a person to look into the areas of the subconscious (unconscious). Neuropsychology is a field of psychological science that studies the brain organization of mental processes. Neuropsychology is related to psychology and neuroscience (the connection of the structure and functioning of the brain with mental processes and behavior). Neuropsychology studies the structure and functional organization of higher mental functions, psychological processes and emotional regulation from the standpoint of a systematic approach [5]. The work aims to identify the relationship between language and cultural concepts that most effectively affect the subconscious of a person. The following tasks are outlined: to determine the relationship between culture and language through the neuropsychological prism of response triggers; to consider the manifestation of culture, which is reflected in the language, in unconscious – psychic suggestion; to establish the interdependence of the genesis national-specific features in the linguistic worldview through ambivalent concepts.

A person perceives the communicative and informational space through semantic connections. Linguoculturology serves as a guideline for recognizing the methods of influencing society on each other. Linguoculturology is a complex inter-level and basic unit of linguoculturological research, which

includes not only the linguistic meaning, but also the extra-linguistic content of the sign itself. The dialectical unity of linguistic and extralinguistic parameters, studying the totality of ethnic, social, historical, geographical factors inextricably linked with the development of language allows humanity to find common ground. Thus, the picture of the world in linguoculturological, semantic, exegetical, linguocultural and even in conscious illumination [6] does not provide actual characteristics of the image and ideas about the surrounding world.

However, the preference (warning, prevention) consists in the fact that the integrity of consciousness, which gives an account of its internal mental experience, does not have the properties of an adequately true perception of reality, since the protective mechanisms of the psyche limit, sequester (reduce the boundaries of perception, mindfulness) the surrounding world. Thus, the conceptual system of a person inevitably correlates with their belonging to a particular cultural community [7]. Providentially (predetermined) the question arises: “How to evaluate the objective world if a person’s cognitive abilities (consciousness, thinking, speech, language) do not have the necessary tools.” The science of neuropsychology makes it possible to authenticate the linguistic and cultural aspects of the linguistic picture of the world. The problem is that the existing tools and methods do not allow us to assess the objectivity of the subjective perception of the world. The boundary between the understanding of different cultures flows from the picture of the world, which is reproduced, realized and, therefore, interpreted based on the culture of the people. The basis of modern neuropsychology is the theory of the systemic organization of higher mental functions, the concept of which is that any mental function is carried out due to the functional interaction of different areas of the brain, each of which makes its own “specific contribution” [8].

Methodology

Different issues of linguoculturology have been touched upon by different scholars recently. Among them we distinguish: Zh. Konyratbayeva [9], N. Saibekova [10], T. Tagirova [11], Z. Abidin [12], F. Bustan, A. Semiun, J. Bire [13]. But they have come to the conclusion that the semantic concept of language is not so much thought of by a native speaker as experienced by them. The amplitude of the experiences can be determined by

correlating the recordings of the electrical activity of the parameters of the unconscious response to speech patterns (program patterns) of the reflective macroscopic activity of the surface layer of the brain below it. Modern laboratory devices and methods such as EEG (electroencephalogram), MRI (magnetic resonance imaging), sound recording devices are the optimal tools for obtaining unconscious linguistic and cultural subtexts, as well as systems of information delivery. The same information is a language construct, it can be reproduced by sensory analyzers (olfaction, touch, hearing), and then transformed into electromagnetic signals, then transmitted through neuronal circuits to the brain, recoded into an electrical signal, which is subsequently processed (reflexive patterns are activated, and the rest of the information enters the unconscious — it is not realized), the necessary frequency of activated signals is recoded into the mode of the language code of the sign system, then retransmitted by the cognitive system of thinking of the logical connection “if A, then B”, is detected by consciousness in the form of images, then reproduced using speech or actions. Thus, the brain is the main organ of the nervous system, which serves as a tool for transcoding electromagnetic waves of different frequencies into electrical impulses, for decoding and displaying recoded information inside and outside the body. Neural networks of the brain recognize patterns and programs of a linguistic and cultural concept based on the cultural heritage of humankind, thereby initiating only those patterns whose impulse activates the total signal level.

Laboratory devices can record electrical impulses in the brain before they are transcoded into codes of language, thinking and consciousness, that is, information about his subsequent thoughts will arrive before the recipient realizes.

The principle of operation of MRI is based on measuring the electromagnetic response of atomic nuclei in a strong permanent magnetic field in response to their excitation by a certain combination of electromagnetic waves [14].

The principle of EEG operation is that electrical impulses arising in the brain transmit them to a computer for decoding and displaying in the form of waves of various frequencies.

The principle of operation of sound recording devices: A linguistic message of a cultural nature is

transcoded into acoustic vibrations of a sound wave into an electrical signal, then read and recorded in the form of oscillatory movements, converted depending on the magnitude of frequencies, for example, from 50 to 16,000 Hz, with a sensitivity of 1.8 mV/Pa.

Coding levels

1. The transformation of sound acoustic vibrations of the air into an electrical signal occurs with the help of the ear organ. The process of mutual transformation of an electric magnetic field into an electromagnetic field occurs in the inner ear — the cochlea (filled with liquid) vibrations enter the liquid where the cortical organ is located, consisting of 30,000 hair cells that pickup sound vibrations and transmit a signal to the auditory zone of the cerebral cortex. Each of the hair cells reacts to a certain sound frequency. The transfer rate is 10 milliseconds. The human ear is able to perceive sounds of a wide range — from 16–20 to 16,000–20,000 Hz (according to various authors) [10] (unconscious level).

2. Through synaptic connections, brain neurons form complex electrical impulses, the constant flow of afferentations of which depends on the pattern (template) and trigger (trigger) activation. The brain of each individual person is tuned to an individual experience (unconsciously).

3. Activation of reproduction patterns occurs due to a neural connection that was formed earlier by inherited and social linguistic, cultural concepts (unconsciously).

4. Recoding into a language code consisting of a system of conventional, socially accepted designations (unconsciously).

5. An electrical signal is recoded into a logical chain using cognitive thinking ability, building a logical chain, if A, then B (unconsciously).

6. Zone of consciousness (0.013 seconds — 13 milliseconds).

7. The formation of images occurs consciously, but the necessary time for reformulation into a language construct depends on the volume of the system of signs, thanks to which a person will be able to formulate words.

8. The formation of clear concepts, recoding the single images into sensory experience (consciously).

9. Transcoding into a speech construct, in healthy people, directly depends on two components. First, the formation of the volume of speech

in early infancy is measured in the spectrum of duration without deliberation in the ratio of pauses necessary to reproduce the next sentence. Second, a constantly replenishing stock of words and constructions that need to be continuously applied in practice, talking and reading aloud. Reading to oneself activates other areas of the brain (consciously).

10. Acceptance for the truth. The ready-made response pattern is transmitted to the recognition system, characterized by solipsism — the recognition of one's individual consciousness, the belief that the decision was independent and deliberate (unconsciously).

11. The design of the speech unit in compliance with the norms of the language [15]. Speech markers are scattered, they depend on the direction of professional activity (consciously).

Thus, the linguocultural linguistic picture of the world does not depend on the words themselves, coming in the form of sound waves of various amplitudes of vibrations to the brain, but on the form of template activation that was instilled by a particular culture. Therefore, neuropsychology allows researchers to study not the meaning of words, but a pattern — an unconscious message that a person also unknowingly takes for truth or falsehood. In other words, it does not matter what they say, it is important how the brain reacts to the template patterns of perception.

For a more visual perception of the brain with the help of the science of neuropsychology, we use the direction of connectionism to display the author's model of brain activity (*Fig. 1*).

Any scientific discipline has arisen from theory because the human body is a complex apparatus for transcoding information; in order for concepts to arise, images are needed that form a hypothesis through representations and a linguistic construct, which is subsequently proved through the construction of models or concepts.

Results

The linguistic and cultural linguistic message depends on: the culture of human upbringing, which in turn activates a chain of restrictions, strict enforcement of linguistic and behavioral prohibitions; social norms that define the limits of the boundaries of awareness.

By means of language, a person's worldview is formed. Sound vibrations of waves of different frequencies, due to the electromagnetic response,

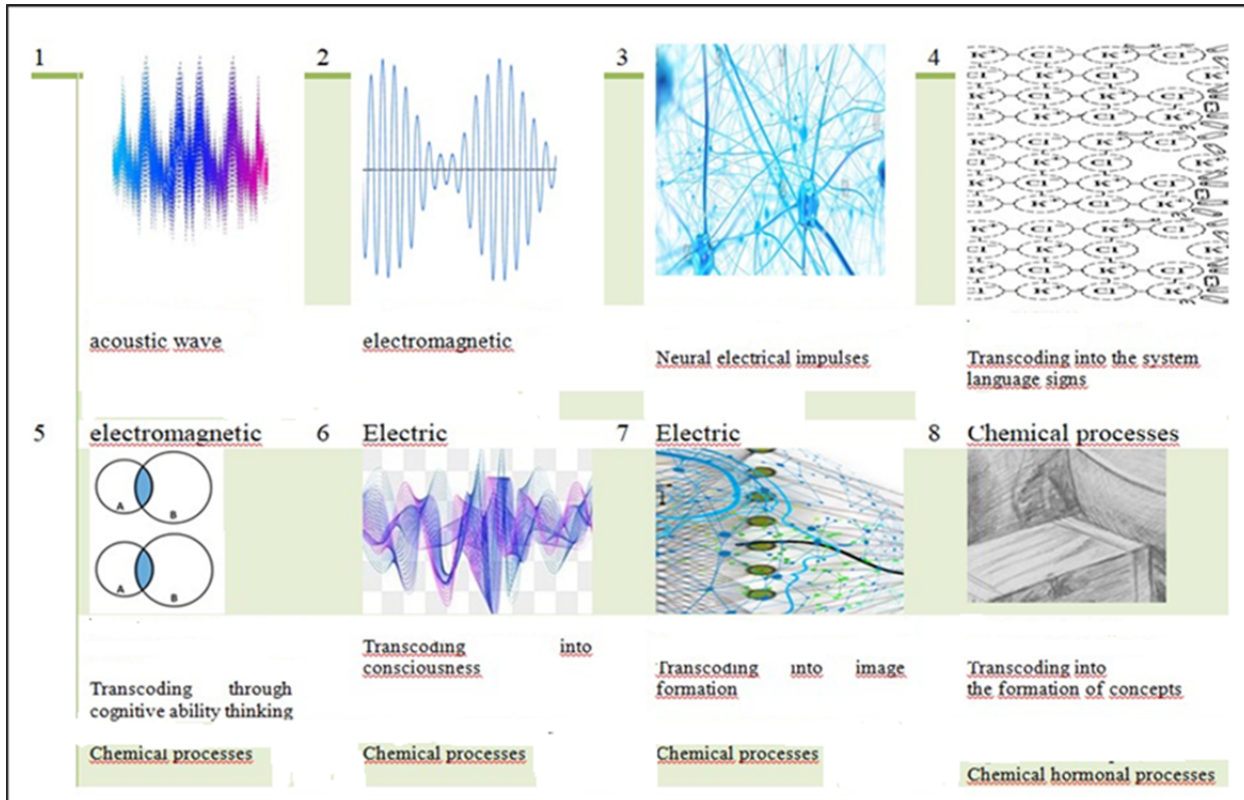


Fig. 1. Diagram of an artificial neural network simulating the work of the brain

Source: Produced by the authors in the experiments.

transmit signals that are activated in the neural connections of the brain. If the neuron did not catch the frequency of vibrations, it means that this signal was not reflected in the template neural connections, without recognizing the premise of the message, the recipient does not respond to the message. Linguistic and cultural aspect of the utterance in a certain message is transmitted to sound recording devices via fMRI before the process of transformation of transcoding into a sign language system. The invariant part of the worldview is determined by the type of relationship between the cultural and linguistic community, but in neuropsychological processes, the trigger determines the nature of the direction, the unconscious re-experience of the established relationships pattern. The interdependence of culture and language through the neuropsychological prism of reaction triggers, statements in the form of a narrative, an urge, an order, a request, or a question can be recorded on laboratory devices. The process of comprehension and reflection in the national language through the obscene vocabulary of one's appeals on recipients has a greater influence in the form of obedience than statements in the polite form of a request (Fig. 2).

The integrative area of macro and micro culture is imposed on the processes of awareness, where a person unconsciously chooses a familiar pattern that he believes. Non-linguistic cultural content is a continuous, transmitted from generation to generation installation, through the defense and justification of beliefs that seem to be one's own. Thus, protecting national forms of being [16], a system of neural networks is formed in neural connections, spreading out the entire brain, which in psychology is commonly called the Self-concept. The systematic representation of the culture of a people in its language [9] is reflected not only in the speech form but also in the neural connections of the brain. A person understands their native language because neural connections are established, which are activated, receive and transmit electrical impulses to the system of neural networks. The form of presentation of the statement is significant. The linguistic and cultural field as a certain picture of the world, the semantic perception of concepts determines the conscious choice of people listening, believing, accepting, obeying. The unity of the linguistic and mental content of functioning and reflectivity in the neurons of the brain is recorded in the form of familiar patterns, which does not

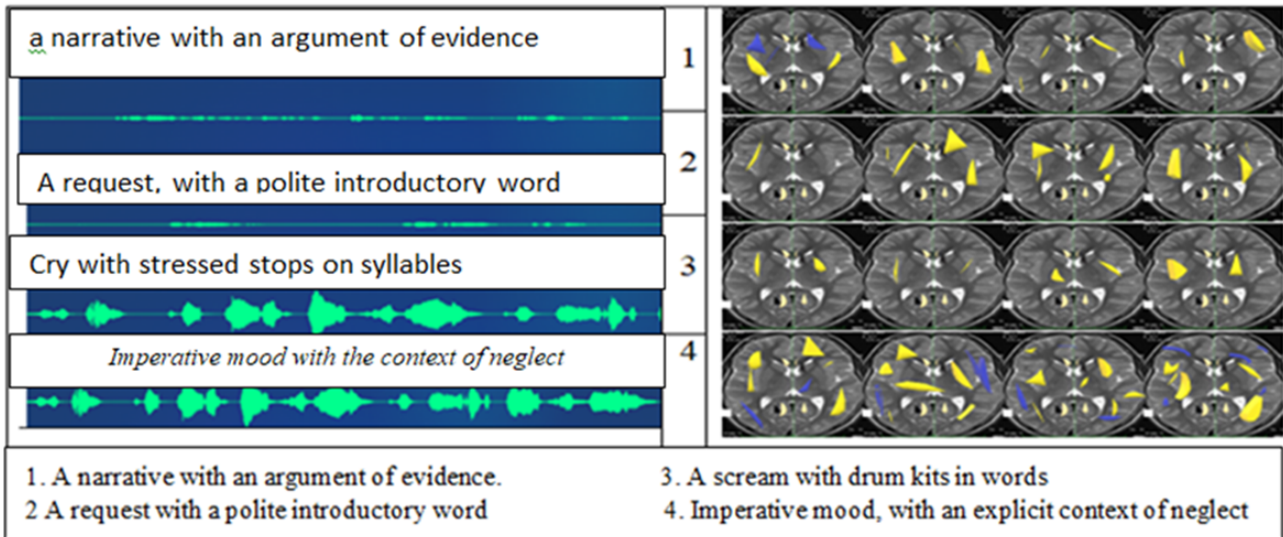


Fig. 2. The effect of carrier patterns on the activation of brain areas using fMRI and sound recording devices

Source: Produced by the authors in the experiments.

allow to go beyond the framework of knowledge, unconsciously accepted as the truth. Shouting is not a trigger of obedience and belief (Fig. 2, No. 3). If the cultural heritage inculcates communication with a hidden or explicit subtext of neglect to its people, then such a people will hear, obey and believe through the appeal of the language message in a dismissive form (Fig. 2, No. 4), when the polite utterance occurs (Fig. 2, No. 2) the neural connection will not be detected as a template and will not perceive the information, leaving it neutral. Linguoculturalism of the linguistic picture of the world is really considered to be a powerful tool. Having heard a foreign speech for the first time, a person hears only paired sound combinations. The Chinese language is read by the morphemes “chan-nan-tan”, the French “poon-sva-kel plu-zve”, the Tatar language “tygysh-mygysch-chire”. The brain perceives language through a set of familiar letter combinations, does not recognize the meaning, does not react emotionally, does not listen because it does not understand. Linguoculturology, one of the main blocks of language culture, is dual in nature. The keeper of cultural value is simultaneously a template for the activation of neural structures occurring in the brain with the help of electronic impulses. The manifestation of culture, which is reflected in the language, in the unconscious — psychic suggestion is the source of uncritical attitudes of the psyche. It is impossible to critically evaluate and compare since the electrical impulses of brain neurons catch signals only of familiar patterns. The linguoculturological

concept of another culture will make it possible to understand not knowledge of the language and its iconic constructs, but repeated triggers (an external constant stimulus), and coming from different sources. For example, “hi” is the most common English word that is perceived and understood in many countries [16]. A kind of trigger “hi-hi” is familiar to a person, even if he is not a native speaker. An external constant stimulus allowed the formation of a neural connection, thereby opening the possibility for electronic impulses to send a signal to the addressee, provided a means to re-code into a figurative concept, in some exceptional cases, without knowing either the meaning or the translation of the word.

The interdependence of the national-specific features of the genesis of the linguistic picture of the world through ambivalent concepts in relation to something affected not only the form of perception and acceptance, but also the neuropsychology of brain structures. Implementation (application in practice) through the language is pronounced literally. For example, Chinese representatives, having learned Russian, say: “I’m looking at a book”, then, as the Russians: “I’m reading a book.” The generic concepts of “looking” and “reading” are identical for the Chinese, distinctive for the Russians. The linguoculturology of national traditions has firmly entered the consciousness of mankind not only as a carrier of traditions and culture, but also in the system through the prism of perception. The culture of the Chinese people is based on a clear image, copying and reproduction. Hieroglyphs

are exact copies of the drawings showing words. The Chinese are really watching, not reading. For example, the word “A” field actually represents a square of a field section. Neuropsychology looks deeper, allowing us to explain the trajectory of the Chinese worldview. In the brain of representatives of China, neurons do not read the meaning, but a ready-made whole picture. The Chinese people perceive the world through pictures. That is why the Chinese copy drawings, reproducing exact copies of any original. This linguoculturological ability has been acquired and accumulated over the centuries, being replaced by civilizations, but without losing the linguoculturological construct, which is read by neural connections literally from birth. The Chinese economy is based on the exact copying and reproduction of drawings only because during centuries-old culture their brains have learned to work in the offline mode. Americans say: “This is a city”, “What is it?” and other sentences where the main factor is the construction: subject, verb, complement. Neural connections thanks to the linguistic culture of generations, where a linguistic sign has a certain meaning, an extralinguistic one — a concept, an object, transforming into correctly constructed sentences, allowed representatives of Western culture to acquire transformation skills in an unconscious mode of neural network formation [17]. The American economy is created on the services sector and the transformation of knowledge, creating a new product in the form of microchips, artificial neurons, etc. The culture and language of the Russian people is concise, filled with deep meaning, in the language of culture there is a diverse number of introductory words, personifications, participial constructions. The Russian language is rich in additional, embellishing sonorous, melodic, multiple concepts. The Russian language is emotional, that is why it is possible to describe in all colors the beauty that furiously surrounds the unrestrained human culture of being. A great heritage of culture and traditions is reflected in certain combinations of the brain neural networks and expressed in the ability to reflect oneself, to inform the brain neural networks in the language of bright flashes of emotions (*Fig. 2, No. 4*). Neural connections are activated only with such an impact [18]. Thanks to emotionality, rich Russian language, the economy of the Russian kingdom was previously built on extraordinary creative abilities: Khokhloma, Gzhel, fine art, oral

creativity, writing was expressed through the inner world of the people.

Conclusions

Scientific novelty of this study:

1. By defining the brain as an information transcoding organ, people learn to understand the processes of its work.
2. Linguoculturology can be considered through the deductive axiomatics of the properties of its elements.
3. The interdependencies of the national-specific features of the genesis of the linguistic worldview through ambivalent concepts of dual experiences can be detected up to the moment of awareness thanks to laboratory devices capable of catching the slightest impulses of the brain.

Linguoculturology can be considered through the deductive axiomatics of its elements’ properties. Axiomatics consists in ways of building neural connections of the brain, which can be studied thanks to the science of neuropsychology and laboratory research methods. The deduction of the linguistic picture of the world through the culture of the people consists in the fact that the reasoning in which new horizons of knowledge are derived from general defining provisions to particular conclusions, consisting in the fact that the patterns (templates) of acceptance should be critically grounded not only on the cultural aspect, but also on the specifics of the brain.

Language is a system of signs that allows a person to name the surrounding space; however, language proficiency is not enough to understand and accept information. The relationship between language and cultural concepts that unconsciously affect a person’s subconscious is necessary. Linguoculturology should influence the stable concept of creative meaning, which must be taken into account while educating the next generations.

The semantic structure of language directs the semantic meaning of language units only to those triggers (trigger) that activate certain areas in the brain through electrical signals sent by neurons. The same concept is interpreted through the subjective vision of a person, identifying with his picture of the world, based on the culture and traditions of the people.

The coherence of thinking and language consists in the fact that without the logical construction of the chain “if A, then B” by thinking, it is not possible to

trace the connection of its individual elements, just as the opposite is impossible without naming the cognitive ability of thinking to build logical chains.

Triggers (trigger hooks) are inseparable from culture, language, and communication methods that lead to a narrowed perception of one's own response.

The manifestation of culture reflected in language leaves an imprint of people's perceptions and their beliefs, in which suggestion affects a person's consciousness.

The interdependence of the national-specific features of the world linguistic picture genesis through ambivalent concepts of dual experiences can be detected up to the moment of awareness thanks to laboratory devices capable of catching the slightest impulses of the brain.

In the science of neuropsychology, the main organ of the nervous system, the brain, should be considered in a multifaceted interpretation in order to understand the outlines of the boundaries of possibilities. By defining the brain as an information transcoding organ, people learn to understand the processes of its work. Laboratory EEG devices (electroencephalogram), MRI (Magnetic resonance imaging), sound recording devices, tools that allow detecting activated zones, open up new possibilities for understanding ourselves. The devices themselves are recorders, the received information penetrates into the graphic translation; meters of the electromagnetic response of atomic nuclei by recoding into MR images (Megapixel); sound pulses meet the surface reflected from them, and measure the time of the signal,

which allows detecting objects without external interference.

Thus, each person understands the same statement in his own way, partly due to the linguistic and cultural aspects of seeing the picture of the world. Therefore, the system of judgments that is used to analyze things from a critical point of view and events will lead to the same conclusions every time, since the electromagnetic pulse that comes from the external environment, thanks to neurons (axons and dendrites) is recoded into an electric one, but is not activated by brain areas, since different cultures have different patterns. It is possible to activate triggers through multiple repetitions, then the neurons form a neural connection that recognizes the electrical signals of a new pattern. Language and the concept in neuroscience are of secondary importance, since sound in the human hearing apparatus — the ear is recoded into a sound wave of various frequencies, with the help of brain neurons it is recoded into an electrical pulse, decoding will occur only due to the activation of familiar patterns.

The essential sustainable recurring relationships peculiar for all phenomena would be an evidence base for the recognition of this phenomenon.

The science of neuropsychology, a relatively new direction in which the functional organization of higher mental processes is studied. A systematic approach is aimed at studying norms and pathologies, a new round of research can include studies of a singular nature (beyond consciousness), thanks to which humanity will open the curtain of the effects, connected with culture, traditions and language on the personality.

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Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 19.02.2023; revised on 09.03.2023 and accepted for publication on 12.03.2023.

The authors read and approved the final version of the manuscript.