



No5(5)
2026

- 13.00.00 Pedagogika fanlari
- 13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
- 13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
- 13.00.03 Maxsus pedagogika
- 13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
- 13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
- 13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohaları va bosqichlari bo'yicha)
- 13.00.07 Ta'limda menejment
- 13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
- 13.00.09 Ijtimoiy pedagogika
- 07.00.00 Tarix fanlari
- 19.00.00 Psixologiya fanlari
- 01.00.00 Fizika-matematika fanlari
- 02.00.00 Kimyo fanlari
- 03.00.00 Biologiya fanlari
- 09.00.00 Falsafa fanlari
- 10.00.00 Filologiya fanlari
- 11.00.00 Geografiya fanlari

M AKTABGACHA VA AKTAB TA'LIMI

Pedagogika, psixologiya fanlariga ixtisoslashgan ilmiy jurnal

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PRAGMATIC FUNCTIONS IN NEUROLINGUISTIC COMMUNICATION

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Abstract: This article discusses the role of neurolinguistics in understanding language processing in the human brain. It analyzes the relationship between language and brain activity, the functions of different brain regions in speech production and comprehension, and the importance of neurolinguistic research in modern science. The article also examines how memory, cognition, and neural systems contribute to language acquisition and communication. In addition, modern technologies used in neurolinguistic studies and their practical significance in education and medicine are highlighted.

Key words: neurolinguistics, language processing, human brain, cognition, speech production, language comprehension, neural systems, psycholinguistics, brain hemispheres, communication.

Annotatsiya: Ushbu maqolada neyrolingvistikaning inson miyasida tilni qayta ishlash jarayonini tushunishdagi o'rni yoritilgan. Unda til va miya faoliyati o'rtasidagi bog'liqlik, nutqni hosil qilish va tushunishda miyaning turli qismlari funksiyalari hamda neyrolingvistik tadqiqotlarning zamonaviy ilm-fandagi ahamiyati tahlil qilingan. Maqolada, shuningdek, xotira, kognitiv jarayonlar va neyron tizimlarning tilni o'zlashtirish hamda muloqotdagi o'rni ko'rib chiqilgan. Bundan tashqari, neyrolingvistik tadqiqotlarda qo'llanilayotgan zamonaviy texnologiyalar va ularning ta'lim hamda tibbiyotdagi amaliy ahamiyati yoritilgan.

Kalit so'zlar: neyrolingvistika, tilni qayta ishlash, inson miyasi, kognitsiya, nutq hosil qilish, tilni tushunish, neyron tizimlar, psixolingvistika, miya yarimsharlari, muloqot.

Аннотация: В данной статье рассматривается роль нейролингвистики в понимании процессов обработки языка в человеческом мозге. Анализируются взаимосвязь между языком и деятельностью мозга, функции различных областей мозга в формировании и понимании речи, а также значение нейролингвистических исследований в современной науке. В статье также рассматривается вклад памяти, когнитивных процессов и нейронных систем в усвоение языка и коммуникацию. Кроме того, освещаются современные технологии, используемые в нейролингвистических исследованиях, и их практическое значение в образовании и медицине.

Ключевые слова: нейролингвистика, обработка языка, человеческий мозг, когнития, формирование речи, понимание языка, нейронные системы, психоллингвистика, полушария мозга, коммуникация.

INTRODUCTION

Language is one of the most important abilities of human beings, allowing people to communicate, share ideas, and express emotions. The study of how language is processed in the brain has become a major field of scientific research known as neurolinguistics. Neurolinguistics combines linguistics, psychology, neuroscience, and cognitive science to understand the relationship between language and the human brain. In recent decades, technological developments such as brain imaging and artificial intelligence have provided new opportunities to study language functions in the brain. Scientists have discovered that different parts of the brain are responsible for various aspects of language, including speaking, listening, reading, and writing. Understanding these processes is essential not only for linguistic studies but also for medical treatment, language education, and cognitive development.

LITERATURE REVIEW

Neurolinguistics focuses on how the brain produces, understands, and stores language. The human brain consists of two hemispheres, and language functions are mainly controlled by the left hemisphere. Two important regions associated with language are Broca's area and Wernicke's area. Broca's area is respon-



sible for speech production and grammatical organization, while Wernicke's area is associated with language comprehension and meaning interpretation. Damage to these areas can cause language disorders known as aphasia.

Language processing in the brain involves several complex cognitive activities. When a person hears or reads words, the brain identifies sounds, recognizes meanings, and connects information with memory. This process occurs within milliseconds through neural networks. Cognitive functions such as attention, memory, and perception play an important role in understanding and producing language effectively. Neurolinguistic studies have shown that language acquisition begins at an early stage of life. Children learn language naturally through interaction with their environment. The brain's flexibility, known as neuroplasticity, helps children acquire multiple languages more easily than adults. Researchers believe that early language exposure strengthens neural connections related to communication and cognitive skills.

Modern technologies have significantly contributed to neurolinguistic research. Functional Magnetic Resonance Imaging (fMRI) and Electroencephalography (EEG) allow scientists to observe brain activity during language tasks. These technologies help researchers understand how the brain reacts to words, sentences, and sounds. They are also useful in diagnosing speech disorders and developing rehabilitation methods for patients with brain injuries. Neurolinguistics also has practical applications in education. Teachers and language instructors use neurolinguistic principles to improve language learning methods. Interactive learning, audiovisual materials, repetition techniques, and communicative activities stimulate brain activity and help students learn languages more effectively. Furthermore, neurolinguistics supports the development of modern language-teaching technologies and digital learning platforms. Another important area of neurolinguistics is the study of bilingualism and multilingualism. Research indicates that speaking more than one language can improve cognitive flexibility, memory, and problem-solving abilities. Multilingual individuals often demonstrate stronger executive brain functions and better mental adaptability.

ANALYSIS AND RESULTS

In medicine, neurolinguistics plays a significant role in the treatment of speech and communication disorders. Specialists use neurolinguistic methods to help patients recover language abilities after strokes, brain injuries, or neurological diseases. Speech therapy and cognitive rehabilitation programs are based on a scientific understanding of brain-language relationships. Neurolinguistics investigates the biological and neurological foundations of language. It examines how the human brain organizes linguistic information and how neural systems control speech, comprehension, reading, and writing. Scientists believe that language is one of the most complex cognitive functions of the brain because it simultaneously involves memory, perception, attention, reasoning, and motor coordination. The study of language processing helps researchers understand not only communication but also the structure and functioning of the human mind.

One of the central topics in neurolinguistics is the localization of language functions in the brain. Research has shown that the left hemisphere of the brain is dominant for language in most individuals. Broca's area, located in the frontal lobe, is mainly responsible for speech production, sentence formation, and grammatical structure. Damage to this area often causes Broca's aphasia, a condition in which a person understands language but has difficulty producing fluent speech. Wernicke's area, located in the temporal lobe, controls language comprehension and the interpretation of meaning. Patients with Wernicke's aphasia can speak fluently, but their speech may lack meaning or logical structure. In addition to these two areas, other regions of the brain also participate in language processing. The angular gyrus contributes to reading and writing abilities, while the auditory cortex processes speech sounds. The motor cortex controls the physical movement of speech organs such as the tongue, lips, and vocal cords. These different regions work together through neural connections to ensure effective communication. This demonstrates that language processing is not limited to one part of the brain but involves a complex neural network.

Neurolinguists also study how the brain processes sounds and words during communication. When a person hears speech, the auditory system first identifies sound signals and transfers them to the brain. The brain then recognizes phonemes, combines them into words, and interprets grammatical structures and meanings. This process occurs extremely quickly and automatically. Researchers explain that the brain uses stored linguistic patterns and previous experiences to understand spoken or written language efficiently. Memory plays a crucial role in language processing. Short-term memory helps individuals temporarily store words and sentence structures during conversation, while long-term memory stores vocabulary, grammar rules, and language experiences. Semantic memory is responsible for understanding meanings and concepts, whereas procedural memory supports automatic language use, such as pronunciation and grammatical application. Without memory systems, effective communication would not be possible.



Another important aspect of neurolinguistics is language acquisition. Children acquire language naturally through exposure to and interaction with parents and society. During early childhood, the brain demonstrates high neuroplasticity, meaning that it can adapt and form new neural connections rapidly. This explains why children can learn multiple languages more easily than adults. Researchers suggest that there is a “critical period” for language acquisition during which the brain is especially responsive to linguistic input. Bilingualism and multilingualism are also significant research areas in neurolinguistics. Studies indicate that bilingual individuals often possess greater cognitive flexibility, stronger memory skills, and improved problem-solving abilities. Switching between languages activates executive functions in the brain and strengthens mental control systems. Neurolinguists have found that multilingualism may even delay cognitive decline and neurological diseases such as Alzheimer’s disease.

Modern brain-imaging technologies have revolutionized neurolinguistic studies. Functional Magnetic Resonance Imaging (fMRI), Positron Emission Tomography (PET), and Electroencephalography (EEG) allow scientists to observe brain activity during language tasks. These technologies provide detailed information about which brain regions become active during speaking, reading, or listening. They also help researchers analyze how neural pathways function in healthy individuals and in patients with language disorders. Neurolinguistics has practical applications in medicine and rehabilitation. People who suffer from strokes, traumatic brain injuries, or neurological diseases often experience speech and language impairments. Speech therapists use neurolinguistic methods to help patients recover communication abilities through exercises, repetition, and cognitive training. Advances in neuroscience have improved rehabilitation programs and increased recovery opportunities for patients with aphasia and other speech disorders. In education, neurolinguistic principles are widely used to improve language-teaching methods. Educators apply interactive activities, visual materials, storytelling, and repetition strategies to stimulate brain activity and improve language retention. Digital technologies such as language-learning applications, virtual classrooms, and artificial intelligence systems are also based on neurolinguistic understandings of how the brain learns and processes language.

Furthermore, neurolinguistics contributes to the development of artificial intelligence and natural language-processing systems. Scientists and computer engineers study human language mechanisms to create intelligent systems capable of understanding and generating human speech. Voice assistants, machine-translation tools, and speech-recognition programs are examples of technologies influenced by neurolinguistic research. This demonstrates the growing importance of neurolinguistics in modern technological development. Overall, the study of language processing in the human brain continues to expand scientific knowledge about communication, cognition, and neural activity. Neurolinguistics not only explains how people use language but also provides practical solutions in education, healthcare, and technology.

CONCLUSION

In conclusion, neurolinguistics is an important scientific field that studies the relationship between language and the human brain. It helps researchers understand how people produce, comprehend, and acquire language through neural processes. Modern technologies and scientific methods have significantly expanded knowledge about language processing and brain activity. Neurolinguistic research contributes not only to linguistics but also to education, psychology, artificial intelligence, and medicine. Therefore, the study of language processing in the human brain remains one of the most significant directions in contemporary science.

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- 13.00.00 Pedagogika fanlari
 - 13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
 - 13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
 - 13.00.03 Maxsus pedagogika
 - 13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
 - 13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
 - 13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohaları va bosqichlari bo'yicha)
 - 13.00.07 Ta'limda menejment
 - 13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
 - 13.00.09 Ijtimoiy pedagogika
 - 07.00.00 Tarix fanlari
 - 19.00.00 Psixologiya fanlari
 - 01.00.00 Fizika-matematika fanlari
 - 02.00.00 Kimyo fanlari
 - 03.00.00 Biologiya fanlari
 - 09.00.00 Falsafa fanlari
 - 10.00.00 Filologiya fanlari
 - 11.00.00 Geografiya fanlari



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