

## NEUROPSYCHOLINGUISTICS AS A SCIENTIFIC FIELD

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**Abstract.** *Neuropsycholinguistics is an interdisciplinary field that explores the relationship between language and the brain, examining how linguistic processes are represented and function within the neural architecture. This field integrates insights from psychology, linguistics, cognitive science, and neuroscience to understand how language is acquired, produced, and comprehended, as well as how brain injuries or neurological disorders affect linguistic abilities.*

**Keywords:** *neurolinguistics, aphasia, neurobiology, neurophysiology, neuropsychology, neorhetoric, nerve cell, neuron, somatic and autonomic parts.*

Neuropsycholinguistics originated both in our country and abroad in the late 1950s to early 1960s. It emerged in an interdisciplinary space, at the intersection of at least three sciences: neurology, psychology, and linguistics. The emergence of this field of knowledge was facilitated by the practical needs of aphasiology—an area of medicine that deals with the treatment of individuals suffering from speech disorders due to localized brain damage—aphasias. The "father" of Russian neuropsycholinguistics, Alexander Romanovich Luria, defined it as a field of science that "studies the brain mechanisms of speech activity and the changes in speech processes that occur due to localized brain damage."

The first achievements of neurolinguistics were related to solving practical tasks in the diagnosis and correction of speech disorders. However, the connection with psychology and linguistics significantly influenced its aspiration to establish itself as an independent theoretical field of knowledge, with its own unique subject matter and methods. A powerful impetus for the theoretical self-definition of neurolinguistics was the emergence and rapid development in our country of another young science—psycholinguistics.

The process of developing local psycholinguistics can be compared in intensity to an explosion. The self-definition of this field of knowledge occurred and continues to occur through an intrusion into neighboring scientific areas. It was psycholinguistics that initially provided a home for neurolinguistics within its scientific territory, rather unabashedly pulling it out of the realm of practical pedagogy and medicine.

As of now, neurolinguistics has not yet attained the status of an independent science. Partly, this is due to the lack of unity among leading specialists in this field regarding the fundamental parameters of the science: different researchers define the place of neurolinguistics among other sciences, its subject matter, tasks, and so on, in varying ways.

By the way, the lack of dedicated educational literature should also be considered an indicator of the scientific immaturity of the field of knowledge we are examining. Local psycholinguistics increasingly recognizes itself as an independent science, a science with its own unique subject of study, methods, and a range of problems and research tasks that delineate its

boundaries from adjacent fields. Within the context of university education, it appears as a coherent and internally structured educational and scientific discipline.

Having emerged in a major direction of global humanitarian thought and stimulated by the practical needs of psychology, pedagogy (including the methodology of teaching both native and foreign languages), neorhetoric, medicine, etc., psycholinguistics has not only managed to carve out its own sovereign scientific space over its fifty-year history but also continues to expand the boundaries of its domain year after year with increasing determination. The object of psycholinguistics should be considered the linguistic personality (i.e., a person in their ability to produce and understand speech), while the subject is communicative competence viewed from an individual-psychological perspective.

However, it would be irresponsible to assert that at this point our science has clearly defined contours of external and internal delineation, that its categorical and terminological apparatus has been fully developed and organized, and so on. Indeed, much within our scientific field appears vaguely defined and insufficiently differentiated. Despite recognizing its scientific completeness, high level of influence, and practical demand, psycholinguistics demonstrates a low level of self-reflection. This situation leads to the current stage of its development being characterized as a sort of invariant of different psycholinguistics. It would be more accurate to say that most psycholinguists are convinced that psycholinguistics is a science, but each of them has their own vision of what that science entails.

View of psycholinguistics, seeing it as something holistic and unified, reveals a multitude of contradictions regarding almost all key issues.

It is important to understand that the human brain reflects not so much the structure of language as the individual's capacity for communication and interaction. Within this capacity, communicative competence encompasses the coexistence and interflow of language and consciousness, speech and thought, word and image, as well as verbal and non-verbal sign components. Communicative competence, as a function of the brain, serves complex mechanisms and processes involved in the generation and understanding of speech in a variety of socially significant situations of human interaction. It is precisely these processes and mechanisms that psycholinguistics studies. Therefore, psycholinguistics organically includes the problems of neurolinguistics (the psycholinguistics of the brain) as one aspect of the individual-psychological investigation of one of the most important human aspects: the ability to speak and think.

The first component of the complex term "neuropsycholinguistics," namely "neuro-," firmly connects the scientific field we are discussing with a powerful branch of the tree of human sciences known as neuroscience. Its components include neurobiology, neurophysiology, neuropsychology, and so on. The connection between neurolinguistics and neuroscience compels us to examine the physiological mechanisms that facilitate speech activity.

As is well known, the physiological basis for all psychological processes is the nervous system. It is structured to provide direct access to and interaction with internal organs and the external environment, managing various motor (movement) and sensory processes. The nervous information system of our body is a highly complex structure that, however, consists of blocks.

The structural and functional unit of the brain is the nerve cell—neuron. The bodies of nerve cells form the gray matter of the brain, while their extensions, which create conduction pathways and nerves, constitute the white matter. The impact of stimuli on nerve endings (receptors) is transformed by neurons into electrochemical processes. This is a general rule for any of the sensory organs and for any signals entering the nervous system of a living being: all influences from the external and internal world are "written" in the language of electrochemical processes. These processes can reflect events at different levels: for example, the electrical activity of individual nerve cells, specific brain structures, the entire brain, or even individual ion channels.

The central nervous system is connected to the body through nerve fibers (nerves) that transmit impulses both to and from the brain and spinal cord. The cranial nerves and the nerves that emerge from the spinal cord, meaning all the nerves located outside the CNS, are referred to as the peripheral nervous system. This, in turn, consists of the somatic and autonomic parts.

The anatomical differences between these two parts of the peripheral nervous system are determined by their functional differences. The somatic part controls skeletal musculature and information from the sensory organs, while the autonomic (visceral, involuntary) part transmits information about internal organs and regulates their activity (including the heart, lungs, blood vessels, digestive system, reproductive organs, etc.).

The nervous system aligns the activity of the organism with the demands of the internal environment and external living conditions. Human psyche is a product of the activity of the brain. The brain and the collaborative activity of its cells become the physiological basis for higher mental functions, including consciousness. The speech function is exclusively and solely a prerogative of human brain activity. The tasks of studying its neurophysiological nature are far from being resolved. To uncover the mysteries of the brain's structure related to communicative competence, scientists have developed a special set of tools.

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