

## NEUROLINGUISTICS AS AN INTERDISCIPLINARY SCIENCE

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### Abstract

The article makes a certain contribution to Methodology, Neuro-linguistics, Classroom Management, Cognitive Linguistics, and Text Interpretation. For further investigation we can suggest the followings: cross-level competence on language learning in different types standards and distinguishing skills of language. According to this helpful investigation the state of congruence in neuro-linguistic programming is believed to help with language fluency, as it suggests that teaching non-verbal communication in conjunction with phonology and functional language produces better language learning results.

### Keywords:

neural mechanisms, cognitive psychology, aphasiological era, neuro-imaging, cerebral hemispheres, comprehension of language, speech processing.

### INTRODUCTION

Neurolinguistics is an irrelevant and up to dated scientific sphere of linguistics which researches and works on the relationship between language, cognition and the brain. Neurolinguistics is the study of the neural mechanisms in the human brain that curb the rendition, generation and acquisition of language. That is how and where our brains store our knowledge of the language (or languages) that we speak, comprehend, analyze, read and write, what occurs in our brains when we obtain that competence, and what happens when we implement it in our life spam.

Neurolinguistics is by its peculiarity an interdisciplinary enterprise, and integrates the limits between linguistics and other scientific s that are connected to the study of the brain (mainly cognitive psychology, neuropsychology and cognitive neuroscience). When acquired from the point of view of the neurosciences, neurolinguistics indicates how the brain interacts in language processes, both in healthy and pathological conditions; conversely, from a linguistics standpoint, neurolinguistics tends to ensure how language systems can be instantiated in the brain, i.e. how patterns and rules exhibited in human languages are performed and grounded in the brain. Moreover, neurolinguistics has a basic medical influence for reflection and cure of patients suffering from aphasia and other language disorders. (Doemland. 2001)

### THEORETICAL BACKGROUND

The field was officially opened up by the nineteenth-century neurologist Paul Broca with his observations of the correlation between language disturbance and brain damage. Since then, over 100 years of investigation into the organization of

language in the brain were based on a lesion-deficit approach, in a localizationist perspective. The significance of a brain area was deduced through observation of deficits following a lesion to that brain region, and the exact localization of the lesion was verified through post-mortem examination (Tosey, P, & Mathison, J. 2010). The aphasiological era developed a functional model of language production and comprehension that highlighted the role of frontal and temporal regions (and connections between them) in the left hemisphere, a model that has informed diagnosis and research up to date. The state of knowledge began to change in the 1990s, with the advent of new methodologies for the functional exploration of the living brain (Bandler. 2012).

Today it is possible to identify the cerebral regions involved in the on-going performance of a specific linguistic task, and to relate brain activity to specific processing stages unfolding over time. With the contribution of functional neuro-imaging and neurophysiology techniques, along with significant advances in clinical investigations, the field of neurolinguistics has substantially broadened. On the one hand, the original model of language organization in the brain is currently undergoing a process of revision, which emphasizes the role of distributed cerebral networks, rather than specific isolated areas, with differences in regional involvement and relative order of recruitment related to specific language sub-functions. On the other hand, scholars have started to investigate subtler questions than the production and comprehension dichotomy, approaching the representation of components such as phonology, syntax, semantics, and more recently pragmatics.

### **METHODOLOGY**

While the field is relatively old and can be traced back to the nineteenth century, the term 'neurolinguistics' is quite recent. During the aphasiological era, what we now call neurolinguistics was entrenched in the province of neurology, thus lacking a specific characterization. Only after the study of language-brain relations attracted the linguists' interest, promoting the circulation of the term. Roman Jackson was probably the first linguist to realize the potential relevance of neurolinguistic research for linguistic theories. Jackson pointed out the importance of aphasia for understanding how language is instantiated in the healthy brain, and for confirming or disconfirming grammatical models stemming from theoretical linguistics (Jackson 2014). The year 1985 witnessed the birth of the Journal of Neurolinguistics, presented as "the first and only journal that bears the name of this relatively new but fast developing field called Neurolinguistics and "the only journal concerned with the interface of neurology and linguistics, an interdisciplinary realm of specialization that takes upon itself the exploration of brain function in language behavior and experience" (Tosey. 2003).

"The primary goal of the field of neurolinguistics is to understand and explicate the neurological bases of language and speech, and to characterize the mechanisms and processes involve in language use. The study of neurolinguistics is broad-based; it includes language and speech impairments in the adult aphasias and in children, as well as reading disabilities and the lateralization of function as it relates to language and speech processing." (Robert, B. and Santa, C. 2016)

Nowadays the term neuro-linguistics has become popular and stands aside other labels, among which "neuroscience of language" and "neurobiology of

language”, depending on the emphasis placed either on the linguistic or on the neuro- scientific perspective.

So, Neurolinguistics is the study of the neural and electrochemical bases of language development and use. How is language actually stored in and process by the brain?

Regarding the physical features of the brain, it is divided into two nearly symmetrical halves, the left and right cerebral hemispheres. Each part of the brain is responsible for processing certain kind of information. They are connected by a bundle of nerves and they communicate with each other.

Right hemisphere processes creativity, patterns, spatial and context; awareness of second language learning; dominance for procession of intonation (Sheila Humstein. 2010). Functions:

- Connected to left side of the body
- Processes information more diffusely and simultaneously
- Responsible for relational and mathematical operations
- Specializes in recognizing places, faces, objects, and nonverbal skills – music, visual, functions, artistic ability
- Responsible for emotional and social needs; the seat of passion and dreams
- Responsible for gestures, facial movements, and body language
- Understanding and remembering things we do and see
- Putting bits of information together to make an entire picture

Left hemisphere processes speech, analysis, time, sequence. Production and comprehension of language mainly happens in the left hemisphere. Function:

- Responsible for language acquisition and ability to speak languages;
- Processes information in a linear and sequential manner;
- Responsible for verbal expression, language functions and capacity to use language meaningfully;
- Responsible for invariable and arithmetic operation;
- Specializes in recognizing words and numbers;
- Does logical and analytical thinking;
- Memory for spoken and written messages;
- Detailed analysis of information.

Neurolinguistics, the relation between language and the structure and function of the nervous system, is a relatively new field in psychology, which may give the interviewer two additional advantages. Neurolinguistic factors explain the probable link between eye movement and the brain's language processing mechanisms (Turan, B., &Stemberger, R. M. 2000). This explanation distinguishes among the idea and information processing modes through which we function and suggests that each of us has preferences in the way in which we process information. The three primary modes of processing information are:

- Visual
- Auditory
- Kinesthetic

For example, when a person attempts to discern a faint sound, he generally looks toward the ear closest to the sound. After engaging in this movement a few hundred thousand times, over many years of development, the individual's brain

becomes “hard-wired,” or programmed, to reflexively look toward his ear when trying to hear or remember a sound. The same thing occurs with vision and kinesics. A person will survey a picture by moving his eyes up and across the picture to register its composition, colors, and size. Again, once the individual does this a few hundred thousand times, it too becomes programmed into the individual's psychomotor pathways. Kinesis thinkers are programmed by looking down to their abdomens when the butterflies of nervousness and fear are present.

### **CONCLUSION**

Neurolinguistics is the study of how language is represented in the brain. Although this is a relatively recent term, the field of the study back to the nineteenth century. Establishing the location of language in the brain was an early challenge, but one event incidentally provided a clue.

As an interdisciplinary field, neuro-linguistics draws methodology and theory from the fields such as neuroscience, linguistics, cognitive science, neurobiology, communication disorders, neuro-psychology and computer science.

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