**INTRODUCTION TO NEUROLINGUITICS AND LINGUISTIC APHASIOLOGY**

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**Introduction**

**What is neuroscience and neurolinguistics?**

Neurolinguistic is a smaller branch of a larger domain termed as neuroscience. Neuroscience is the scientific study of the nervous system (central nervous system including the brain, spinal cord, and peripheral nervous system), its functions and disorders.

It is considered as a multidisciplinary science which prioritise on understanding the fundamental and emergent properties of neurons, glia and neural circuits inside the brain by combining cellular, functional, evolutionary, computational, molecular and medical aspects of the nervous system.

Neuroscientists have broadly categorized neuroscience into various disciplines based on the research areas and subjects of their studies, amongst which cognitive neuroscience is well versed with neurolinguistic and psycholinguistic.

Neurolinguistics is a branch of cognitive neuroscience, along with different fields such as systemic, movement, sensory, cellular and others, representing the branches of neuroscience in figure 1.1.

Language Acquisition; Understanding and Processing

Language Impairment

**Other explanations of Neurolinguistic includes:**

Neurolinguistics is concerned with how the brain represents and utilizes language, how the brain acquires and how this process of language develops throughout human life, how the brain is affected by disease impacting language disorders, and whether and how it can be compared to analogous processes in non-human species.

Neurolinguistics is the study of how language is represented in the brain: that is, how and where our brains store our knowledge of the language (or languages) that we speak, understand, read, and write, what happens in our brains as we acquire that knowledge, and what happens as we use it in our everyday lives.

Neurolinguistics studies the relation of language and communication with respect to different aspects of brain function, in other words it tries to analyse and review that how the brain comprehends and produces language and communication. Hence, it is also a combination of neuroscience theory (how the brain is structured and how it functions) and linguistic theory (how language is structured and how it functions).

Other than neuroscience and language, psychology is one of the central disciplinary sources for neurolinguistics. Psycholinguistic is the study of the steps in language processing that are required for speaking and understanding words and sentences as well as in disorders of speech, language, and reading. It prioritises more learning followed by languages. Both neurolinguistics and psycholinguistics are deeply entwined, however neurolinguistics more emphasises on studies of the brain structure and functions. [6] [8][9]

**What are acknowledged by Neurolinguists?**

The main questions of interest for neurolinguistics were first addressed very far back in history. In 1960s, Chomsky’s influence boosted the linguistics and the development of psycholinguistics as a defined field helped to establish “Neurolinguistics” in the field.

A neurolinguist can acknowledge various important questions related to language and human brain by various neurolinguistic studies. The list can grow out of answers to questions such as the following:

1. How language form in human brains?
2. Why is human communication system so elaborative and unique from that of other animals?
3. Does human brain use the same kind of neural computation and processing for language as for other cognitive systems, such as music, painting or mathematical problem solving?
4. Where does the words or lexicons stored in the human brain that one has learned or acquired? Which brain areas are responsible for understanding and expressing the language?
5. In case of bilinguals/ multilingual, how one switches between two languages and keep them from interfering with each other?
6. In case of bilingualism, how a human brain is different from the brain of someone who speaks only one language, and why?
7. Is the left hemisphere always dominant and considered as the language side?
8. How does a word ‘come to mind’ when someone need it (and why sometimes it does not appear at all?).
9. How can we make artificial intelligence or computer simulations of language processing, language development, and language loss?
10. How can we design experiments that will allow us to test our models and hypotheses about language processing?

**Relationship of neurolinguistic with brain, language, and neurological language disorder:**

Neurolinguistics deals with relationship between brain and language holding several different views and theories from different researchers.

The most common type of theory of neurolinguistic, studies the impact of brain damage on language and communication. For instance, after stroke or other brain injury, if one loses the ability to talk or to read, how well can one learn to talk again and what will be the duration for achieving such?

Linguistic aphasiology is the subject matter of neurological language disorder.The study of acquired language disorders considered to be the answer of final set of questions that are central to neurolinguistics. Aphasias- are neurological language disorders caused by brain disorders or damage often defined as a focal lesion (i.e., a lesion of one or more specific areas) has been scientifically investigated by various neurologist and neurolinguistics. Aphasiology or linguistic aphasiology is one of the dominant branches of neurolinguistics which has been investigated before 19th century and came into picture by two eminent neurologists, Paul Broca and Carl Wernicke via theories and models.

**Linguists and the linguistic influence on aphasiology**:

Traditionally Aphasia research was an area for neurologists, but philosophers and psychologists have also had considerable influence on the area. The term neurolinguistics was eventually adopted for these studies aimed to gain better understanding of the role of the brain in normal speech.

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