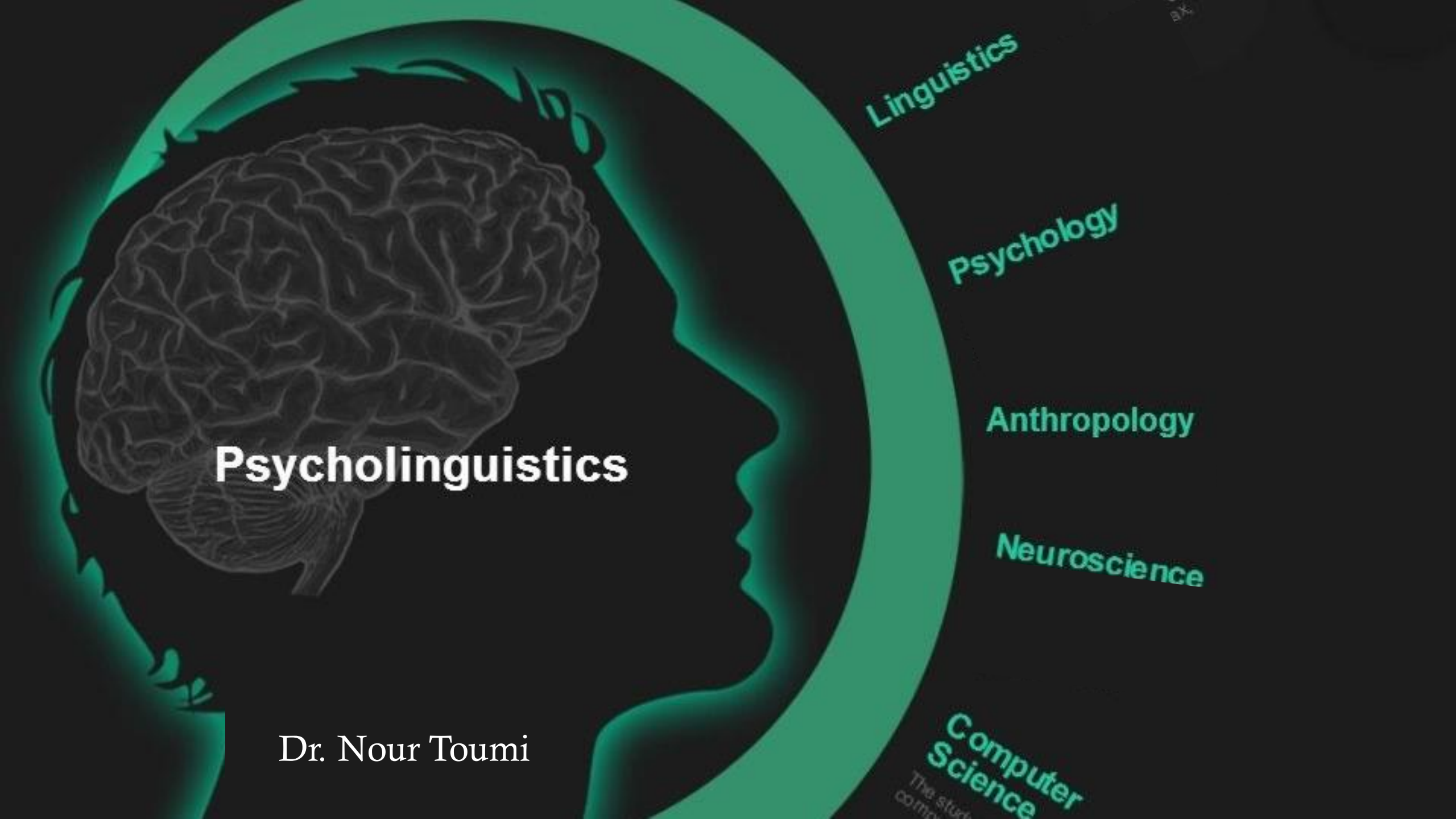
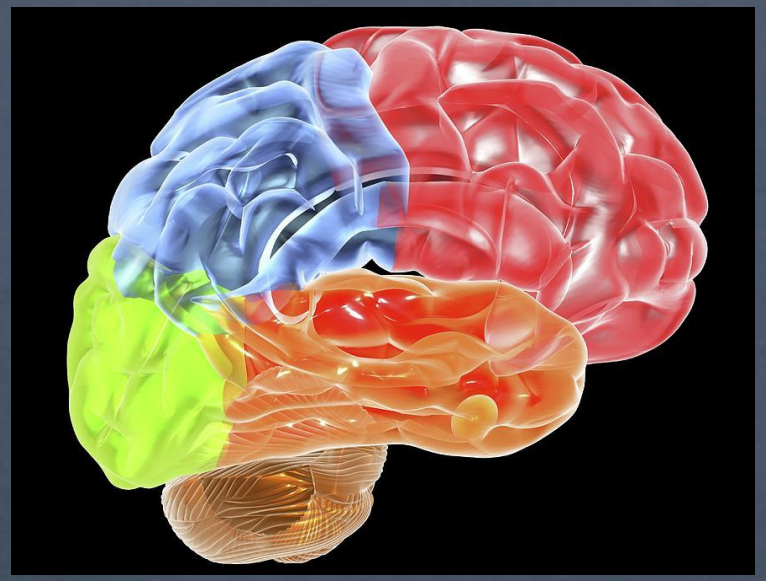


Dr. Nour Toumi

Lecture outline

- Origin and definition
- Branches of Psycholinguistics
- Speech production
- Sub-levels of speech production
- Language and the brain
- Neurolinguistics
- Broca's Area: Speech Production
- Wernicke's Area: Speech Interpretation
- Localisation



Origin and definition

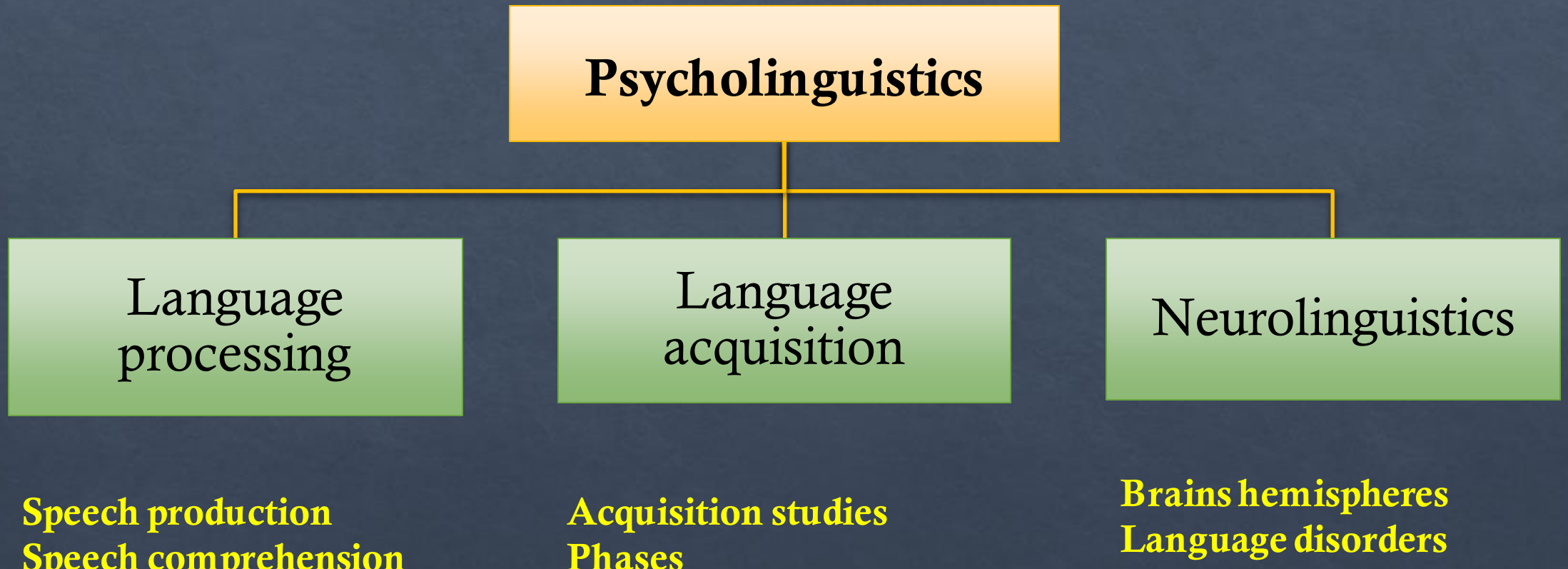
Psycholinguistics is the branch of study which combines the disciplines of Psychology and Linguistics. It is concerned with the relationship between human mind and language as it examines the process that occur in the brain while producing and receiving both spoken and written discourse.

The term “Psycholinguistic” was coined in 1936 by Jacob Robert Kantor in his book “An Objective Psychology of Grammar” and started being used among his team at Indiana University.

However, the term came into widespread usage only in 1946 after the publication of an Article entitled “Psycholinguistics: A review” by Nicholas Pronko when it was used for the first time to talk about an interdisciplinary science “that could be coherent”.

- Psycholinguistics deals with language and mind.
- Psycholinguistics is directly related to the process of encoding and decoding of the code (language)
- Psycholinguistics discusses processes which are going on in the speaker and hearers minds.

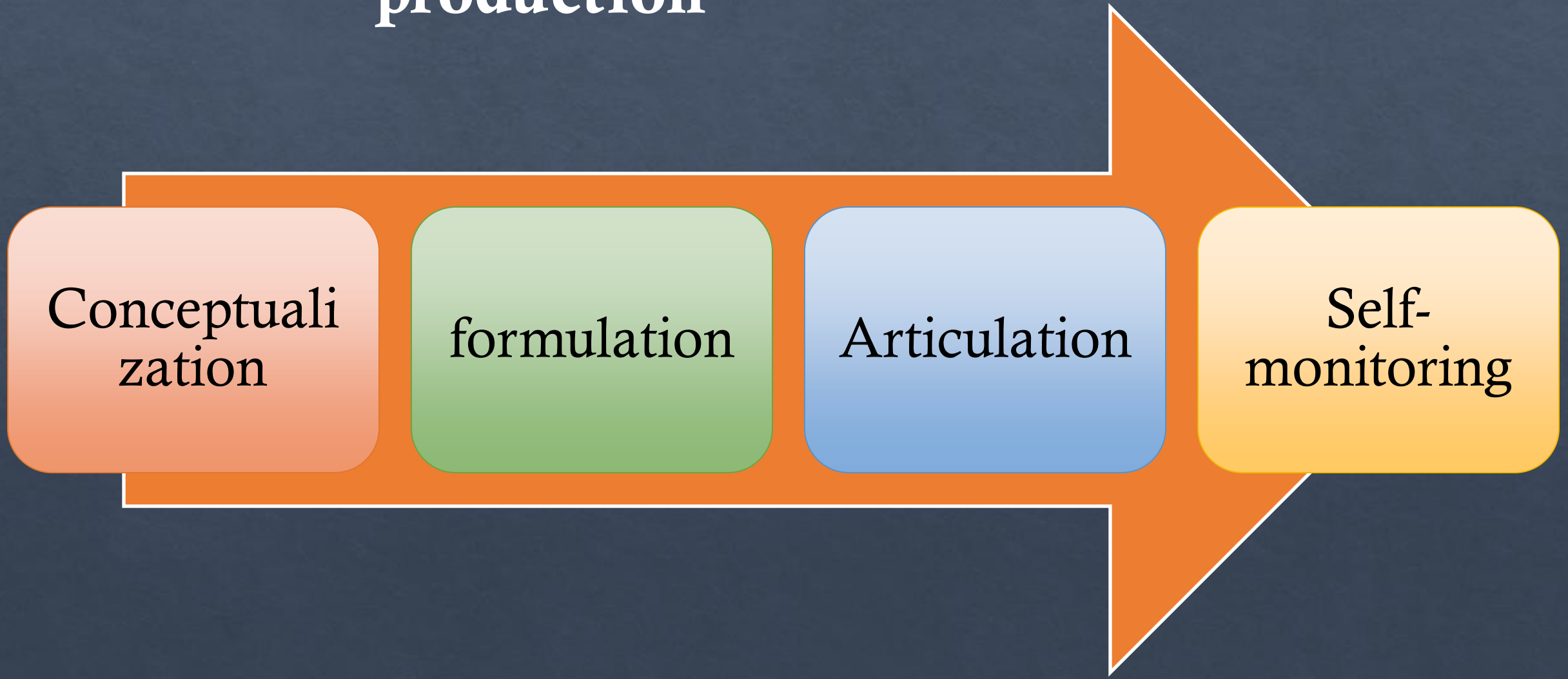
Branches of Psycholinguistics



Speech production

- Language production is the production of spoken and written language. It describes all stages from having a concept into linguistic form (how the brain creates and understands language).

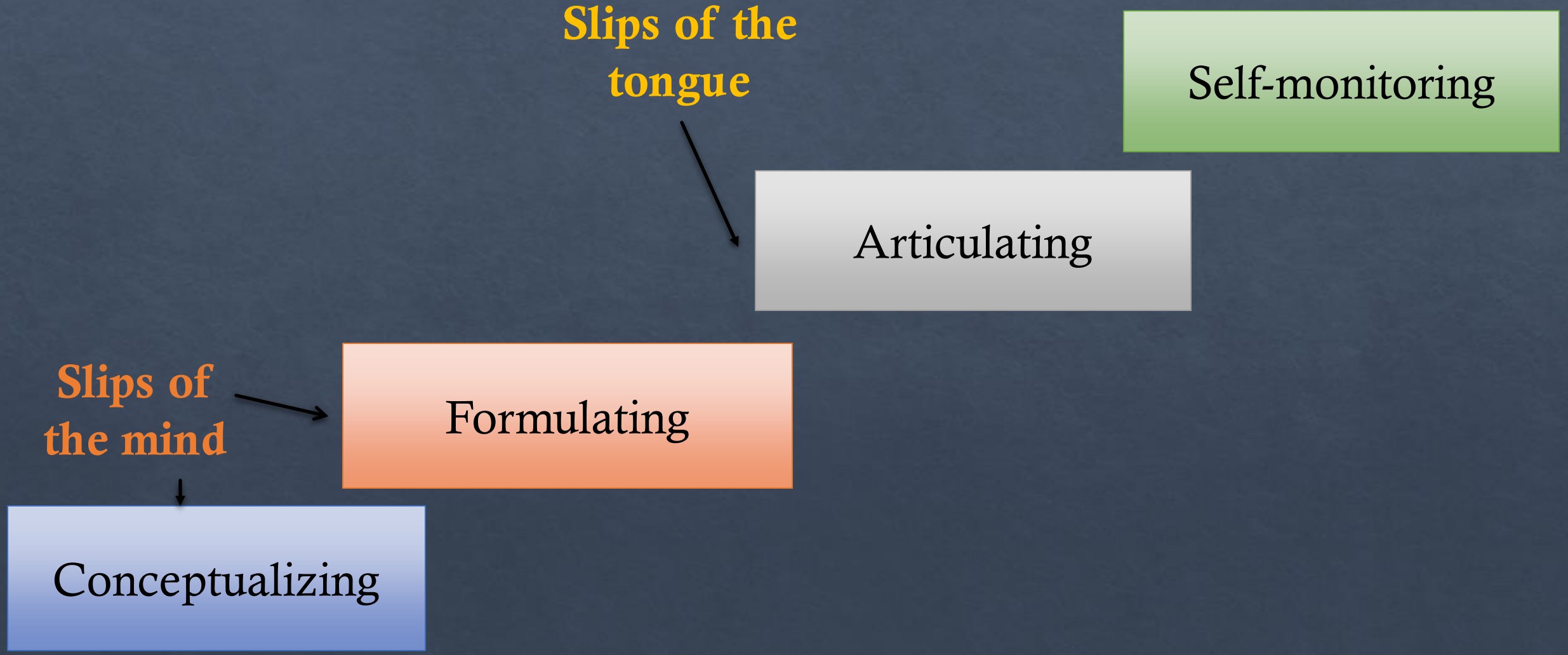
Sub-levels of speech production



- There are three insights of production process:

1. It demonstrates that speakers are constantly self-editing.
2. It suggests that speakers are intuitively sensitive to what stage of production process went wrong, if indeed a mistake was made.
3. There is a distinction between performance and competence.

From thought to speech or written texts



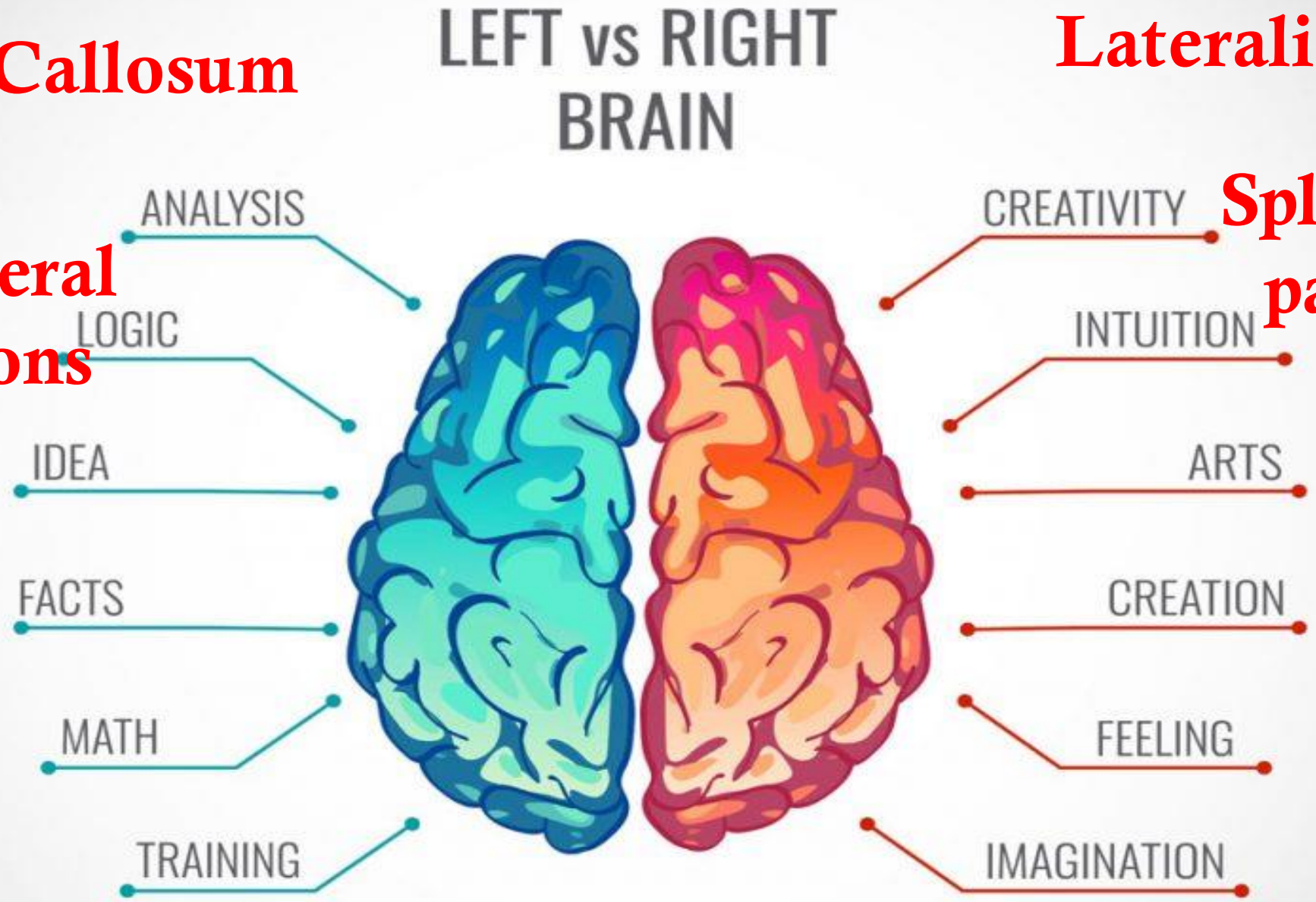
Language and the brain

Corpus Callosum

Lateralization

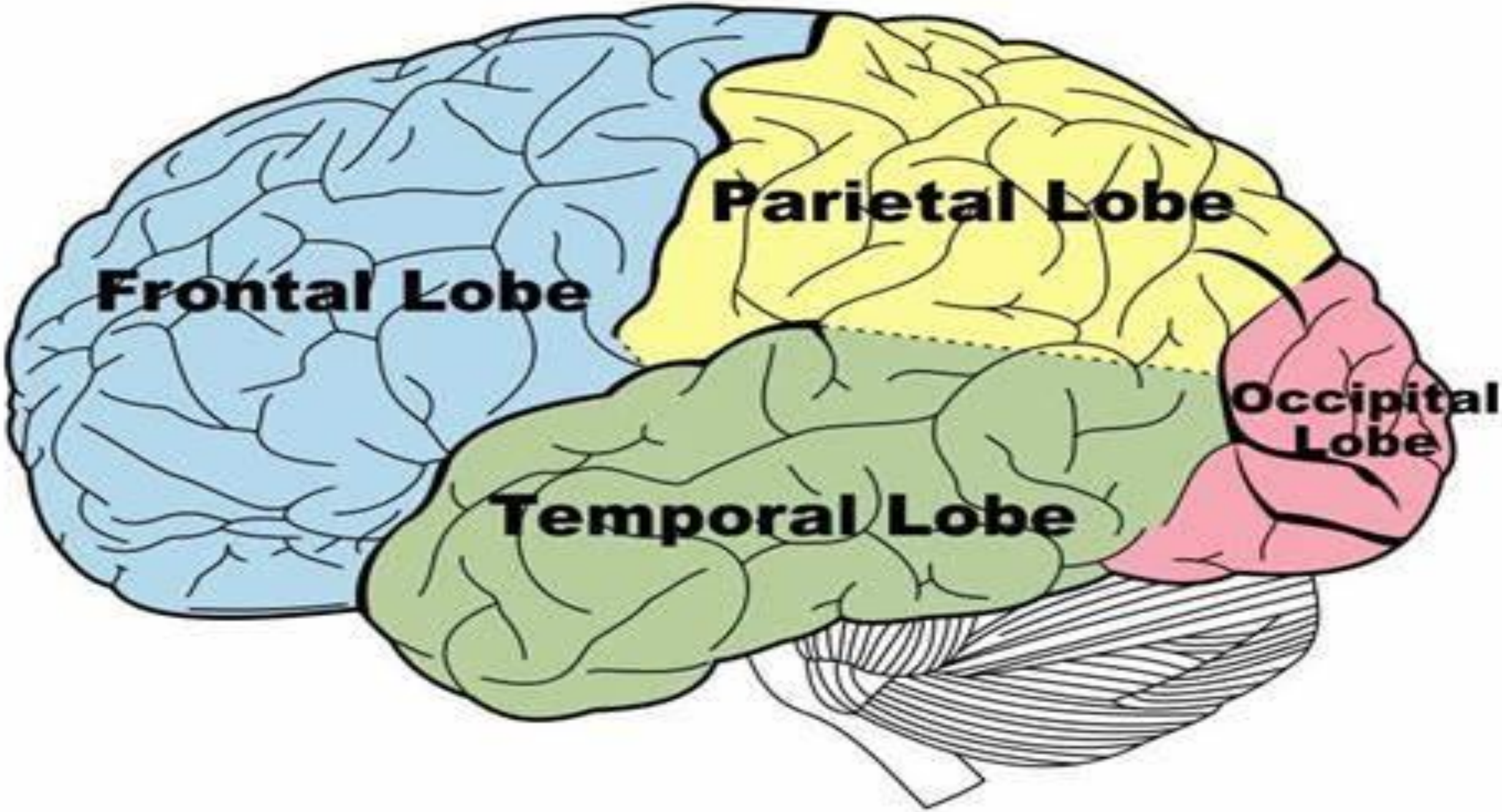
Split-brain patients

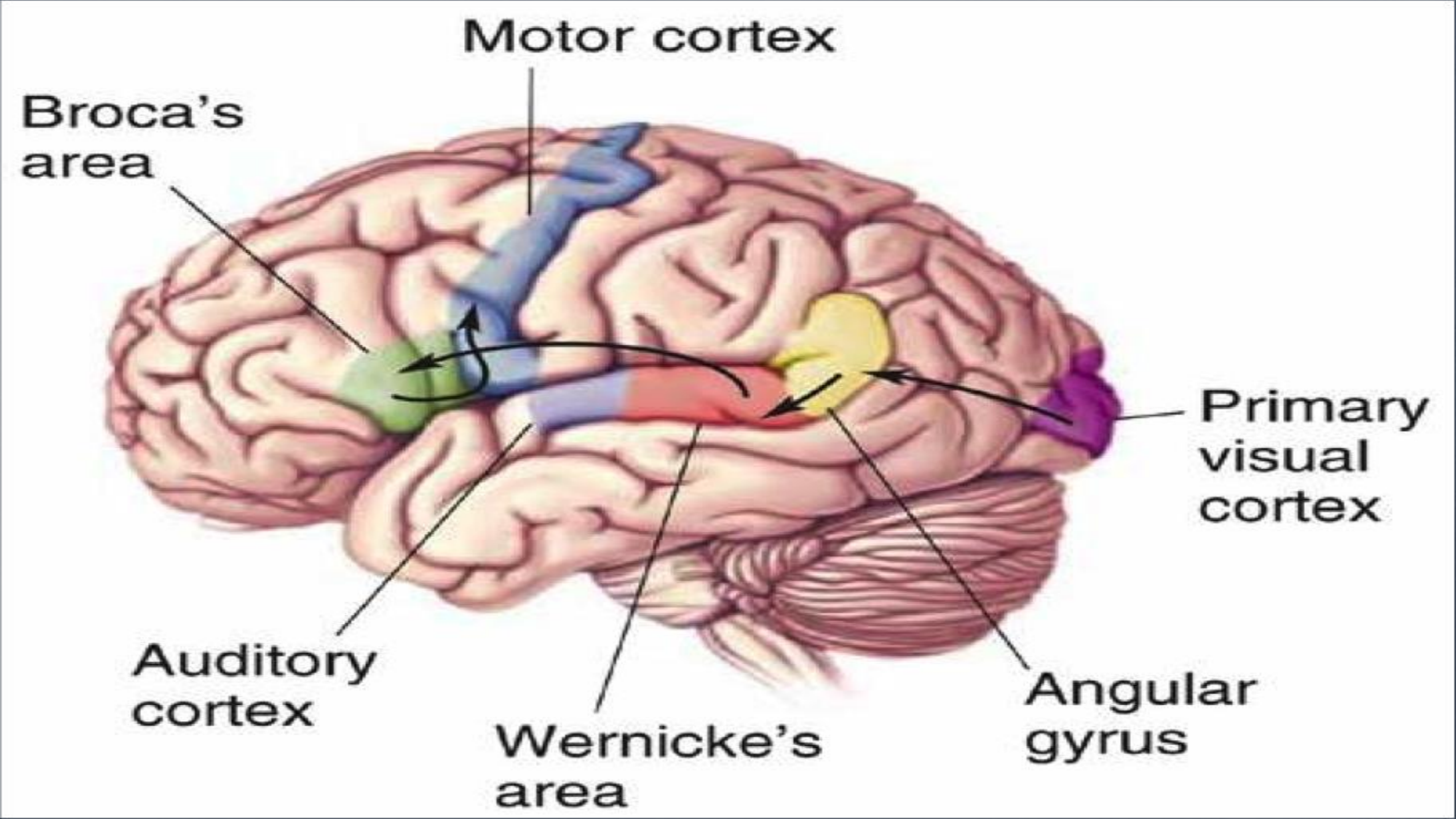
Contralateral connections



Neurolinguistics

- Neurolinguistics is an old term for psycholinguistics. In the 18th century the relationship between language and the human brain was called neurolinguistics.
- Neurolinguistics is the study of neural mechanisms or the neurobiological features of the brain that control language acquisition, production and comprehension.


Frontal Lobe
Parietal Lobe
Occipital Lobe
Temporal Lobe


Motor cortex
Broca's area
Primary visual cortex
Auditory cortex
Wernicke's area
Angular gyrus

Broca's Area: Speech Production

- **Location:** Frontal lobe. Interestingly, Broca's area is located just on a single brain hemisphere (left hemisphere).
- **Main Function:** Language production.
- **Result of Damage:** People who suffer damage to Broca's area have difficult time producing language in a clear syntax.
- If you damage some area in the right hemisphere there will be no difficulty in producing speech (this is why we say language is located in the left hemisphere).

Wernicke's Area: Speech Interpretation

- **Location:** Temporal lobe, at the end of the Lateral fissure, where the temporal lobe meets the parietal lobe.
- **Main Function:** Speech comprehension.
- **Result of Damage:** People who suffer damage to Wernicke's area are not able to understand speech. They can often produce speech fluently, but their words may not make sense.

- In order to have successful processing of language **Broca's (where one stores language)** and **Wernicke's (system of analysis of language, understand language)** these two areas need to be linked. In other words, you need to have a link between language production and language comprehension.
- **Arcuate fasciculus**: fasciculus combines Broca's and Wernicke's areas to achieve the comprehension and production of language.

Localisation

Localisation means that language ability can be given some **specific locations** in the brain and the process of hearing a word, understanding it then saying it, is done through a specific pattern or steps. The word is heard and understood thanks to **Wernicke's area** then the **arcuate fasciculus** transfers that understanding to **Broca's area**, then **Broca's area** sends a signal to the motor cortex to move the necessary muscles to articulate the word.

Language Loss (Aphasia)

- Language loss is the degradation of language in the brain (the **left hemisphere**). It leads to the inability to **understand** or **produce language** (reading and writing included). This may be due to an accident which affected the left hemisphere or a result of a **Trauma.** Language loss is also given the name of **Aphasia.**

Signs and symptoms of Aphasia

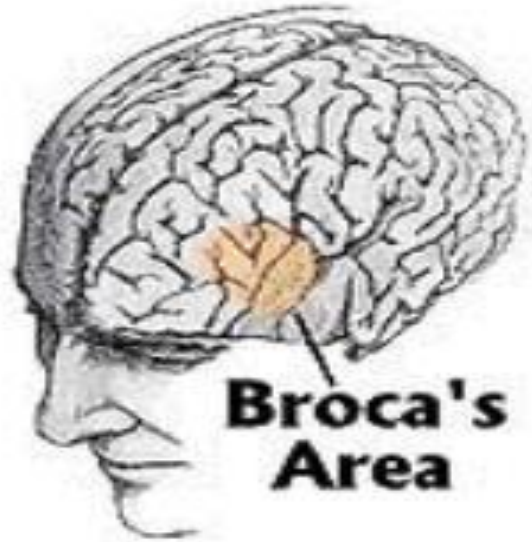
- Inability to understand language.
- Inability to pronouns.
- Inability to speak spontaneously.
- Inability to form words.
- Anomia inability to name objects.
- Excessive use of personal neologisms.
- Inability to repeat clear phrases results in the stammering of patients.
- Paraphasia.
- Agrammatism
- Incomplete sentences.

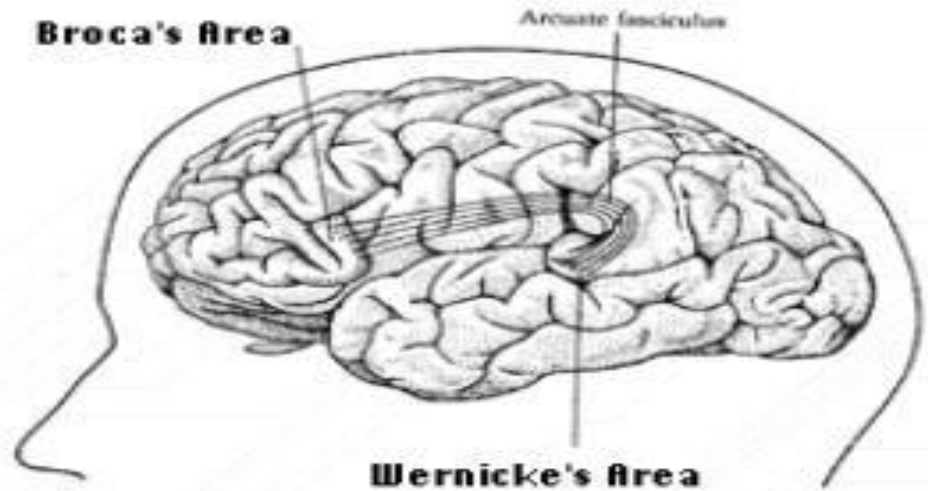
- Inability to read and write.
- Inability to follow simple requests.
- Dysprosody.

Broca's aphasia

Damage to Broca's area results in:

- **slow labored speech**
- **little grammatical fluency**
  - **omission of function words**
  - **omission of inflections**
- **word finding difficulty**
- **comprehension may be impaired**

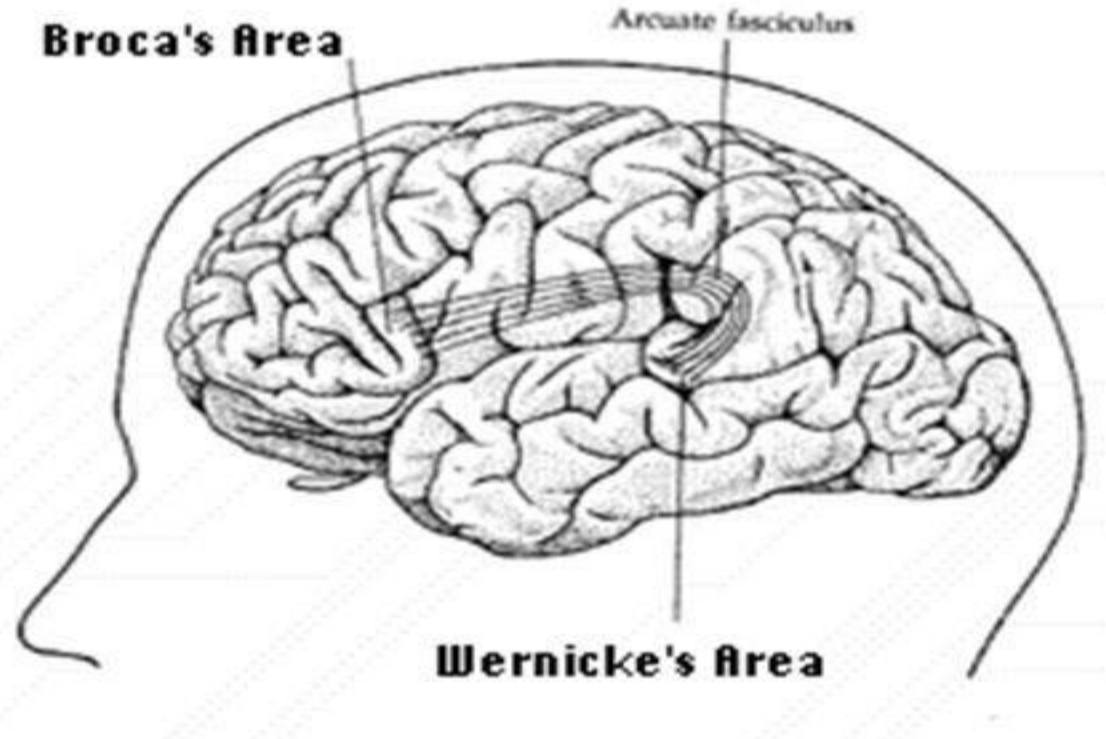




Wernicke's aphasia

Damage to Wernicke's area results in:

- **Loss of meaningful messages**
  - **But fluent and grammatical**
  - **paraphasias or inappropriate words**
  - **neologisms - invented words**
- **language comprehension difficulty, especially with complex sentences**



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