

Chapter Ten: Language and Brain

1. NEUROLINGUISTICS AND PSYCHOLINGUISTICS

Neurolinguistics → the study of language processing and representation of language in the *brain*

Psycholinguistics → the study of the connections between language and *mind*

2. LOCALIZATION OF THE BRAIN

Different human cognitive abilities and behaviors are localized in specific parts of the brain

2.1. Aphasia

An impairment of language function due to localized cerebral damage

Broca's Aphasia

- **Agrammatic speech:** patients typically omit function words and inflections in their speech.
- Patients have word-finding pauses and disturbed word order.
- Patients have difficulty understanding complex sentences.

Wernicke's Aphasia

- **Anomia:** difficulty in finding the correct word and lexical morphemes.
- **Paragrammatism:** speech is fluent, with normal intonation, yet it is incomprehensible.
- **Paraphasia:** mispronunciation of words, or the production of inappropriate words.
 - **Phonemic jargon:** substituting phonemic segments, e.g. *table* → *sable*
 - **Neologistic jargon:** production of content words that have been fabricated, e.g. *splix*
 - **Semantic verbal paraphasia:** replacing the desired word with a related one, e.g. *paper* → *pencil*.
 - **Jargon aphasia:** substituting words unrelated semantically, e.g. *chair* → *engine*

Conduction Aphasia

- disrupted rhythm because of pauses and hesitations
- the task of repeating a word or phrase is difficult for them

2.2. Event-Related Potentials (ERPs)

2.3. Specific Language Impairment (SLI)

2.4. Language Savants

3. LATERALIZATION OF THE BRAIN

The development of control over different functions that are localized primarily on one side of the brain or the other:

Left hemisphere → **analytic** and **temporal activities**, e.g., mathematics, jigsaw-type puzzles, music in musicians, alphabet reading

Right hemisphere → **intuitive** and **holistic activities**, e.g., recognizing faces, guessing games, music in non-musicians, logographic reading

Lateralization coincides with **critical period**

Brain has **contralateral** function

3.1. Dichotic listening

Subjects more often correctly identified the linguistic stimulus that came via the right ear. This is known as the **right ear advantage** for *linguistic sounds*

- **Note:** From above discussion we can conclude that **contralateral** stimuli outweigh **ipsilateral** stimuli.

3.2. Childhood Brain Lesions

3.3. Split Brains

4. TONGUE TIPS AND SLIPS

Tip of the tongue → we feel that some word is just eluding us, that we know the word, but it just won't come to the surface

- **Note:** It suggests that our 'word-storage' system may be partially organized on the basis of some phonological information

Slip of the tongue:

- **Metathesis** → exchange in the normal sequence of elements in a sentence, e.g.
dear old queen → queer old dean
you have missed my history class → you have hissed my mystery class
- **Perseveration:** e.g., black box → black blox
- **Anticipation:** e.g., reading list → leading list
- **Shift** → one speech segment disappears from its appropriate location and appears somewhere else, e.g., she decides to hit it → she decide to hits it
- **Deletion:** e.g., his immortal soul → his immoral soul
- **Addition:** e.g., spic and span → spic and splan
- **Substitution:** e.g., Where is my tennis racquet? → Where is my tennis bat?

5. EXTRA POINTS TO REMEMBER

- **Agraphia** and **alexia**
- Right-hemisphere injury, are *intonation* and *non-literal language*.