

LANGUAGE AND THE BRAIN



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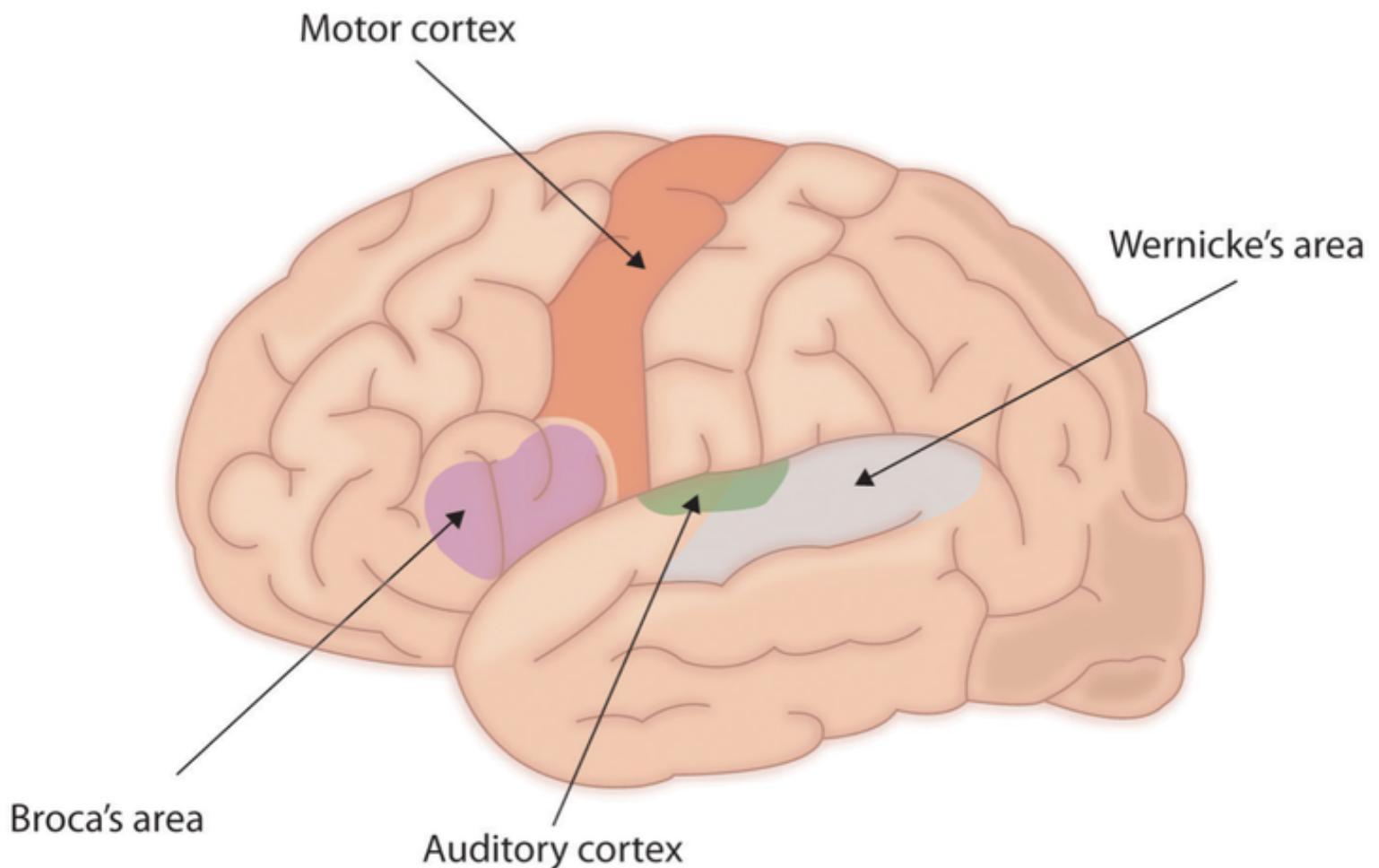
ORIGINS OF LANGUAGE



Language and sound are the basic components of human life and is essential to defining both cultures, customs, values, and traditions. It is a vital form of communication between humans as it allows us to share ideas, thoughts, and feelings. On a greater level, it has the ability to create societies and new communities!

Languages are said to have originated at once and in one place of southwestern Africa about 50,000–150,000 years ago, which is around the time when modern Homo sapiens evolved. Ever since, humans have over 7,000 different languages.

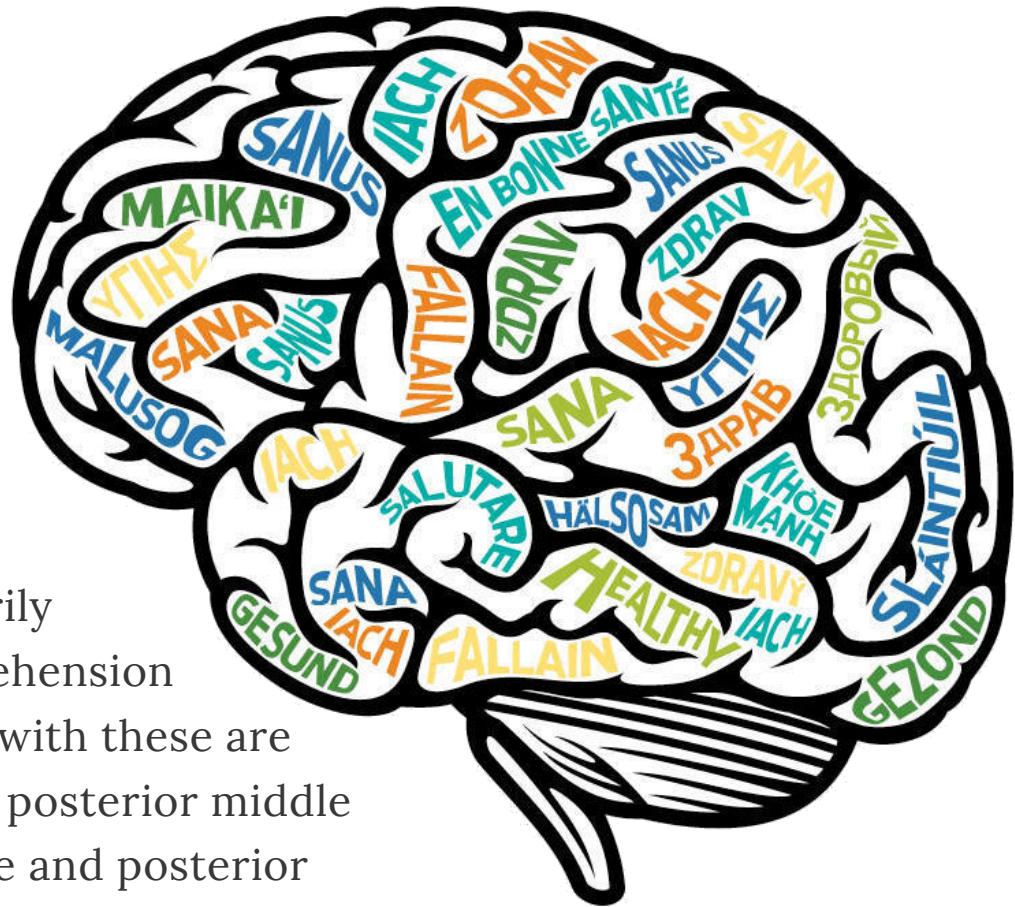
BRAIN FUNCTIONS



The most important parts of the brain that work to develop and produce language include the **motor cortex**, **Wernicke's area**, **Broca's area**, and the **auditory cortex**.

BRAIN FUNCTIONS (CONT'D)

Biologically, several parts of the brain are responsible for the creation, processing, and production of language. Specifically, in the frontal lobe, **Broca's area**, located on the left side, is vital in language production. In the temporal lobe, the area known as **Wernicke's area** is important for language development and is primarily responsible for the comprehension of speech. In combination with these are the primary **motor cortex**, posterior middle temporal gyrus, and middle and posterior superior temporal gyrus, and bilateral supramarginal gyri, which play a role in linking words and meanings and contribute to the physical production and reception of words and language with the help of the **auditory cortex**.



There are several language disorders that cause people to experience difficulty expressing themselves or understanding what others are saying. These disorders, also known as **receptive-expressive** language disorders, can cause troubles with communication as well as social interactions between people of all ages.



Stuttering

A speech disorder involving frequent problems with the normal fluency and flow of speech

Dysarthria

Weakness in the muscles used for speech, which often causes slowed or slurred speech.

Lisping

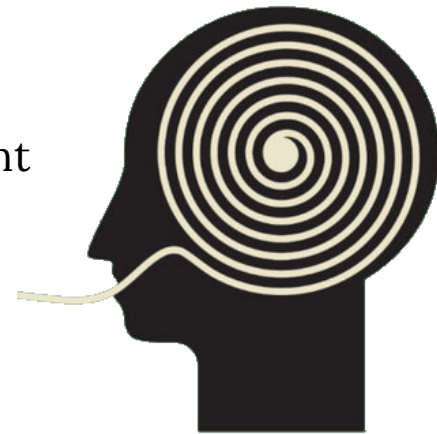
Lisps are caused by wrong tongue placements in the mouth, causing the distortion of words and syllables

Spasmodic Dysphonia

- A voice disorder that causes involuntary spasms in the muscles of larynx that causes a break and a tight strained or strangled sound

Apraxia of Speech (AOS)

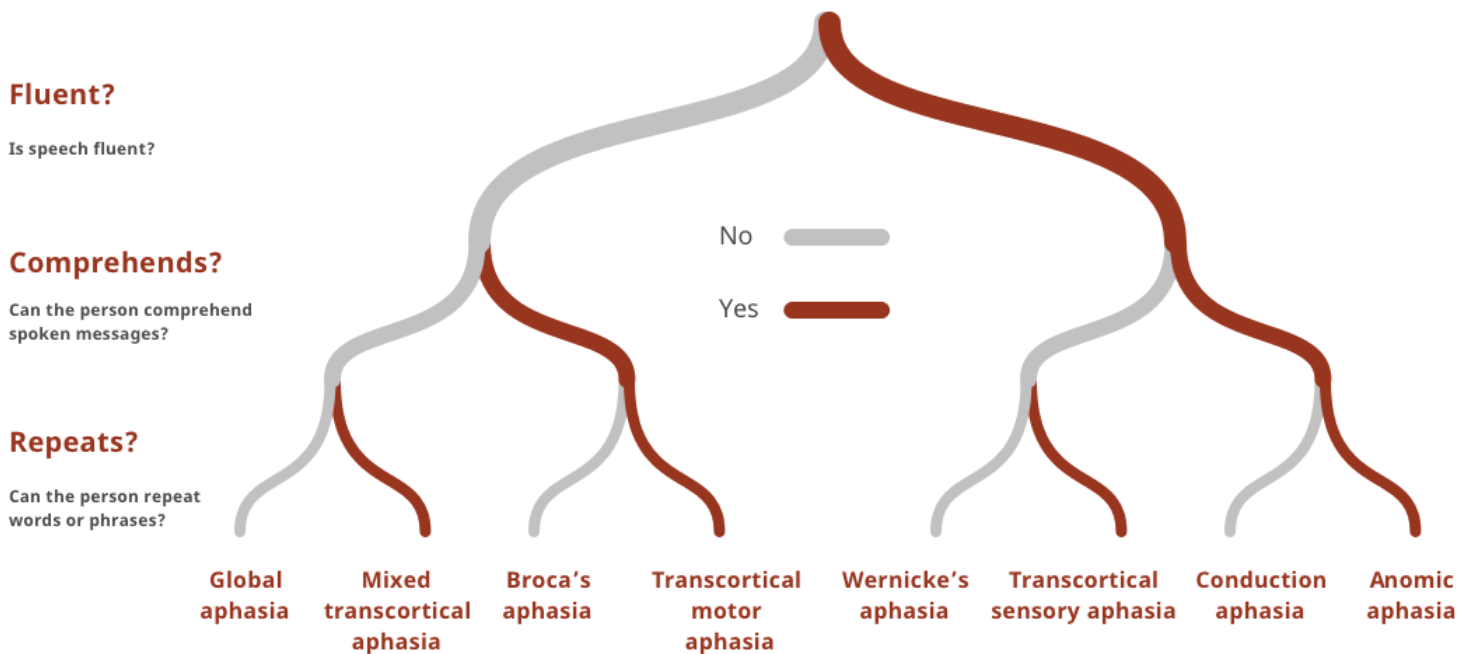
- A speech disorder in which a child has difficulty making accurate movements when speaking



LANGUAGE DISORDERS

Aphasia: Aphasia is one of the most common disorders resulting from a brain injury or other physical impairment.

Types of Aphasia



- **Global Aphasia:** Most severe type of aphasia characterized by the production of a few recognizable words with very little or no spoken language
- **Broca's Aphasia:** Known as non-fluent or expressive aphasia who have partial loss of their language ability.
- **Wernicke's Aphasia:** Known as fluent aphasia or receptive aphasia with and impaired ability to comprehend spoken words.
- **Mixed Non-Fluent Aphasia:** Characterized by limited and effortful speech.
- **Anomic Aphasia:** Characterized by the inability to come up with the right words of speech.
- **Primary Progressive Aphasia (PPA):** A neurological syndrome in which someone loses their ability to use language slowly and progressively.

LANGUAGE DISORDERS (CONT'D)

CURRENT RESEARCH

University of California San Francisco

Researchers have successfully developed a "speech neuroprosthesis" that aide a man who had paralysis to communicate in sentences by means of translating several signals from his brain to the vocal tract in words that change as text on the carried screen.



Cell Press

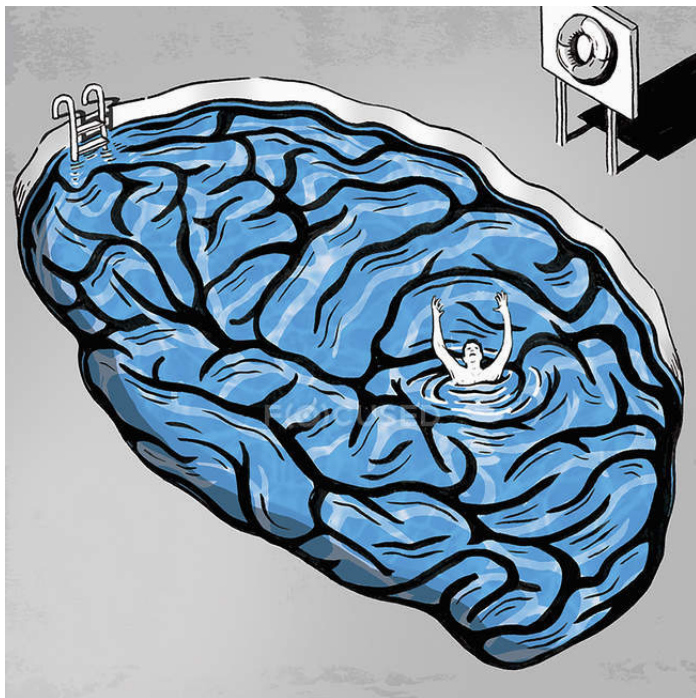
Neuroscientists have discovered a new pathway in the brain that processes the sounds of language. This suggests that auditory and speech processing occur in parallel, which contradicts the long-held theory that the brain processes acoustic information and then transform it into linguistic information in the form of communication.

CURRENT RESEARCH

(CONT'D)

University of Helsinki

Researchers noted that listening to vocal music is as simple as well as an economically efficient way of promoting recovery and flourishing brain health after a stroke.

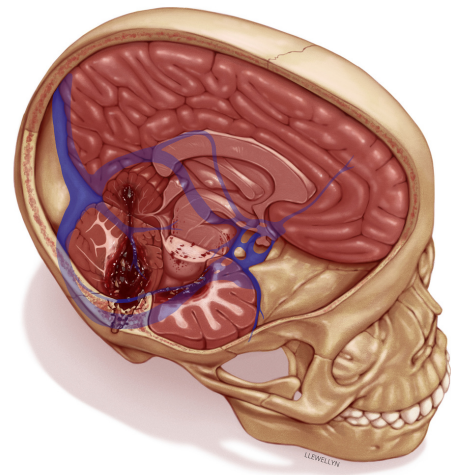


University of Delaware

Swimming a few laps will not allow a child to become an Olympic Swimming champion, but it just might help them become the next great writers and thinkers as noted by researchers. A recent study suggests that aerobic exercise, such as swimming and running, can boost young kids' vocabulary growth.



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RESOURCES



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