

Language

Group of articulate sounds that human beings use for expressing thoughts or feelings

Verbal language / Written language / Sign (gestual) language

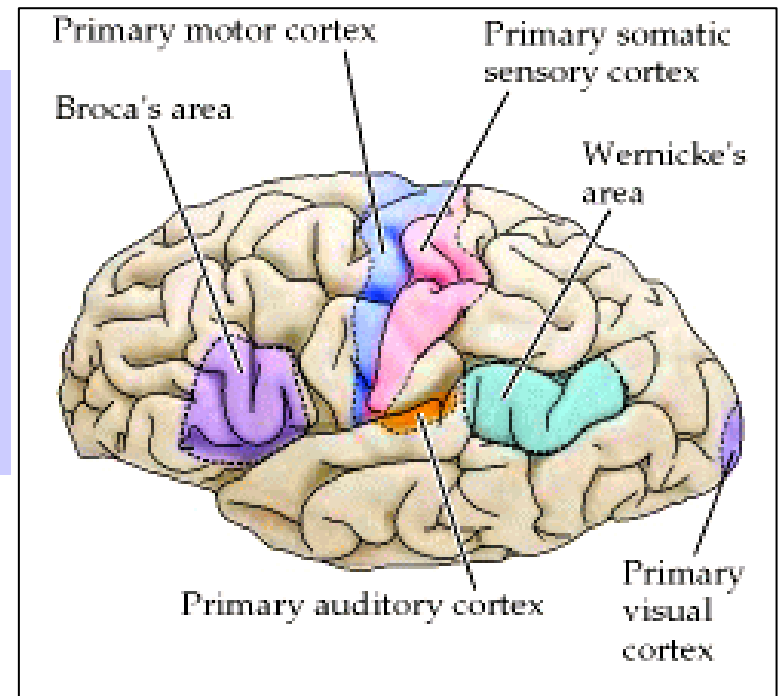
Language uses a system of symbols → Symbolic representation

Functional systems involved in language:

1. Motor systems
2. Sensory auditory systems
Touch and vision for written language
3. Other cortical regions

Importance of context and intonation in verbal language

Neural structures involved in language

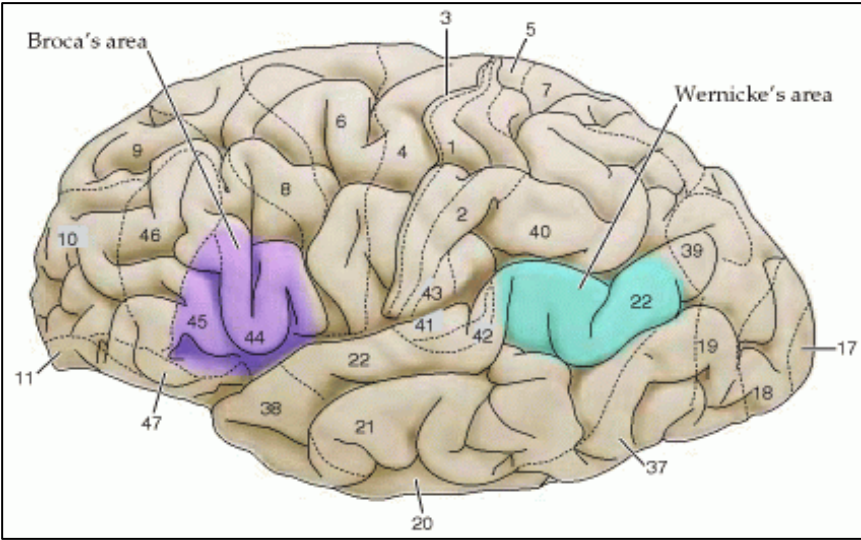


Cortical areas involved in language

Study of brain of aphasic patients

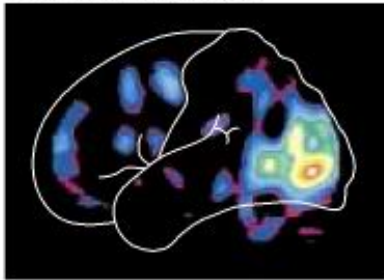
Broca's aphasia

Wernicke's aphasia

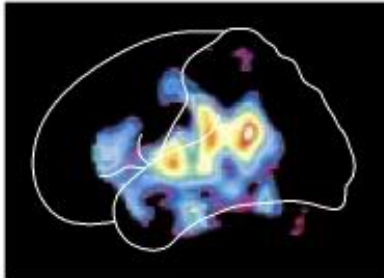


Neuroimaging techniques on normal subjects (PET, NMR)

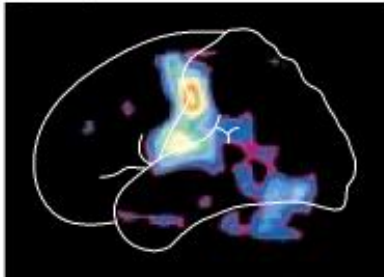
Passively viewing words



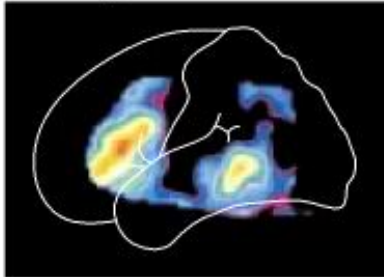
Listening to words



Speaking words



Generating words

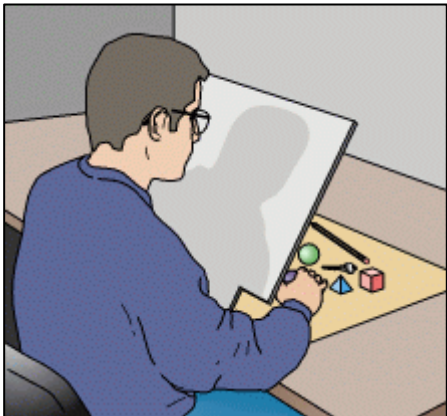
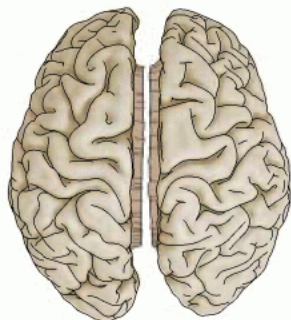


Characteristics of Broca's and Wernicke's aphasia

<i>Broca's aphasia</i>	<i>Wernicke's aphasia</i>
Halting speech	Fluent speech
Repetitive	Little repetition
Disordered syntax	Syntax adequate
Disordered structure of individual words	Inappropriate words
Cannot reproduce sentences	Can reproduce sentences

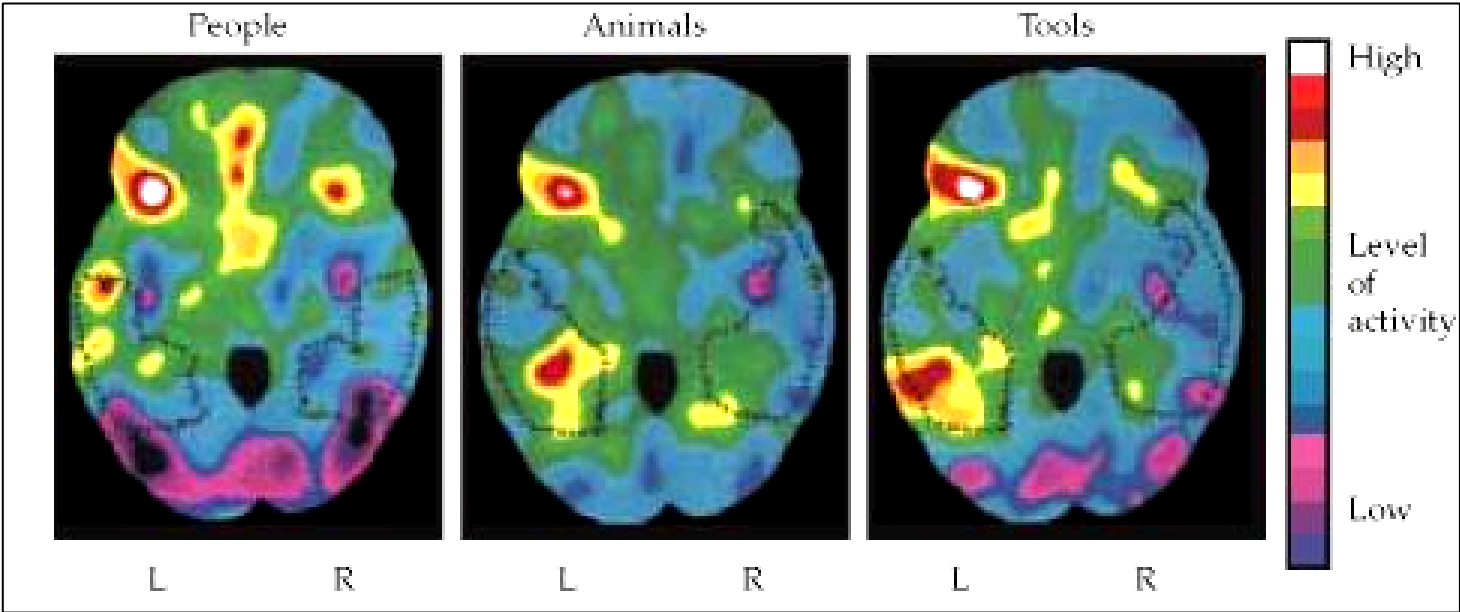
Language and lateralization in the nervous system

Split-brain patients



Some left hemisphere functions	Some right hemisphere functions
Analysis of right visual field	Analysis of left visual field
Stereognosis (right hand)	Stereognosis (left hand)
Lexical and syntactic language	Emotional coloring of language
Writing	Spatial abilities
Speech	Rudimentary speech

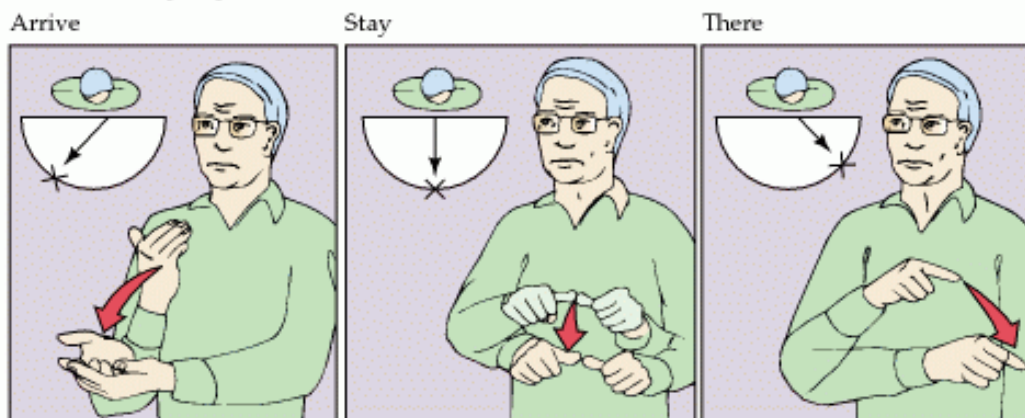
PET studies in normal subjects listening and talking about particular topics



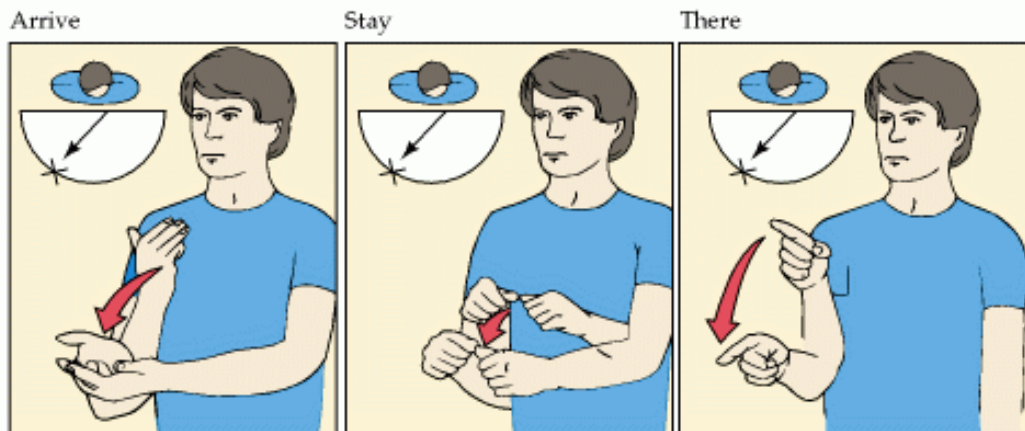
Structures and lateralization in sign language

Signing deficits in deaf people with language area lesions in left hemisphere

Patient with signing deficit:



Correct form:



Language development

Critical period of learning language

