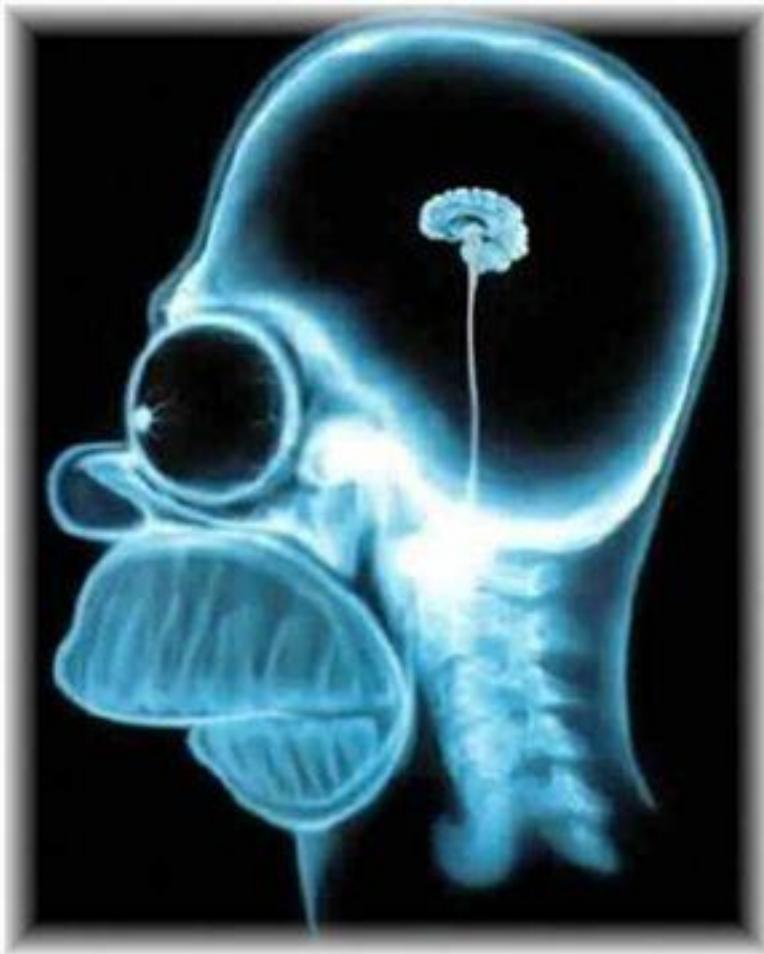


Do we really only use 10% of our brain?



NO!

That is a myth.

Where may that myth have come from???

Association Areas

- Any area not associated with receiving sensory information or coordinating muscle movements.
- Neurons in the association areas integrate information by associating various sensory inputs with stored memories.
- They interpret, integrate and act on information processed by the sensory areas.
- Found in all four lobes

■ Motor areas
■ Sensory areas
■ Association areas



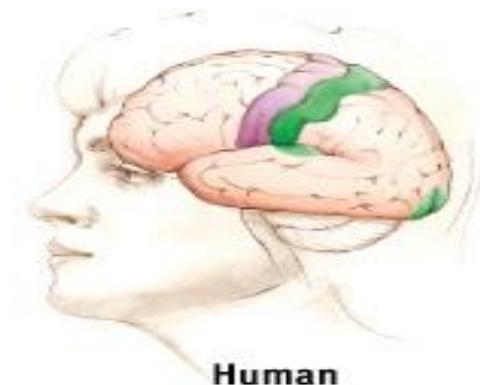
Rat



Cat

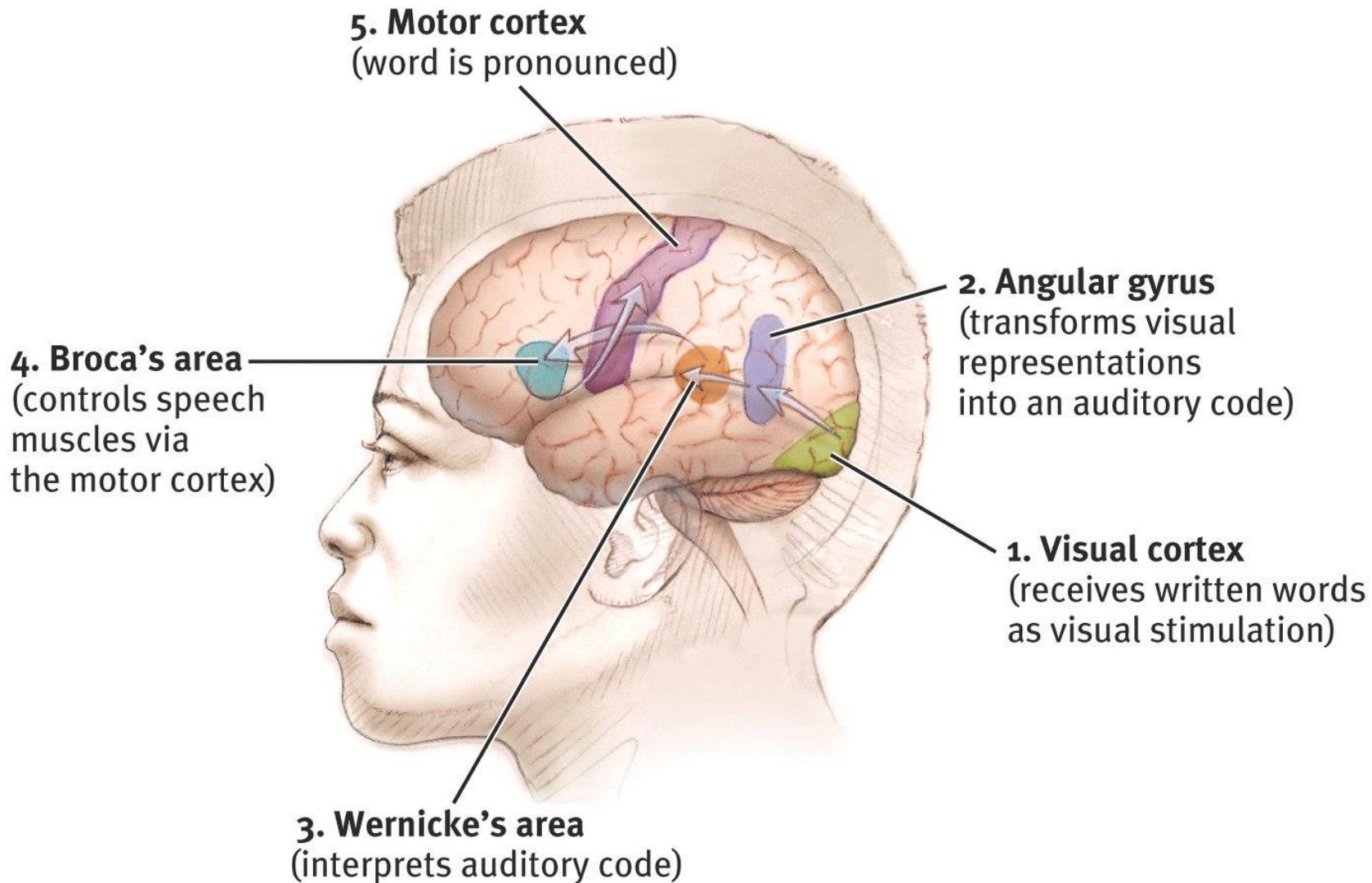


Chimpanzee



Human

Language



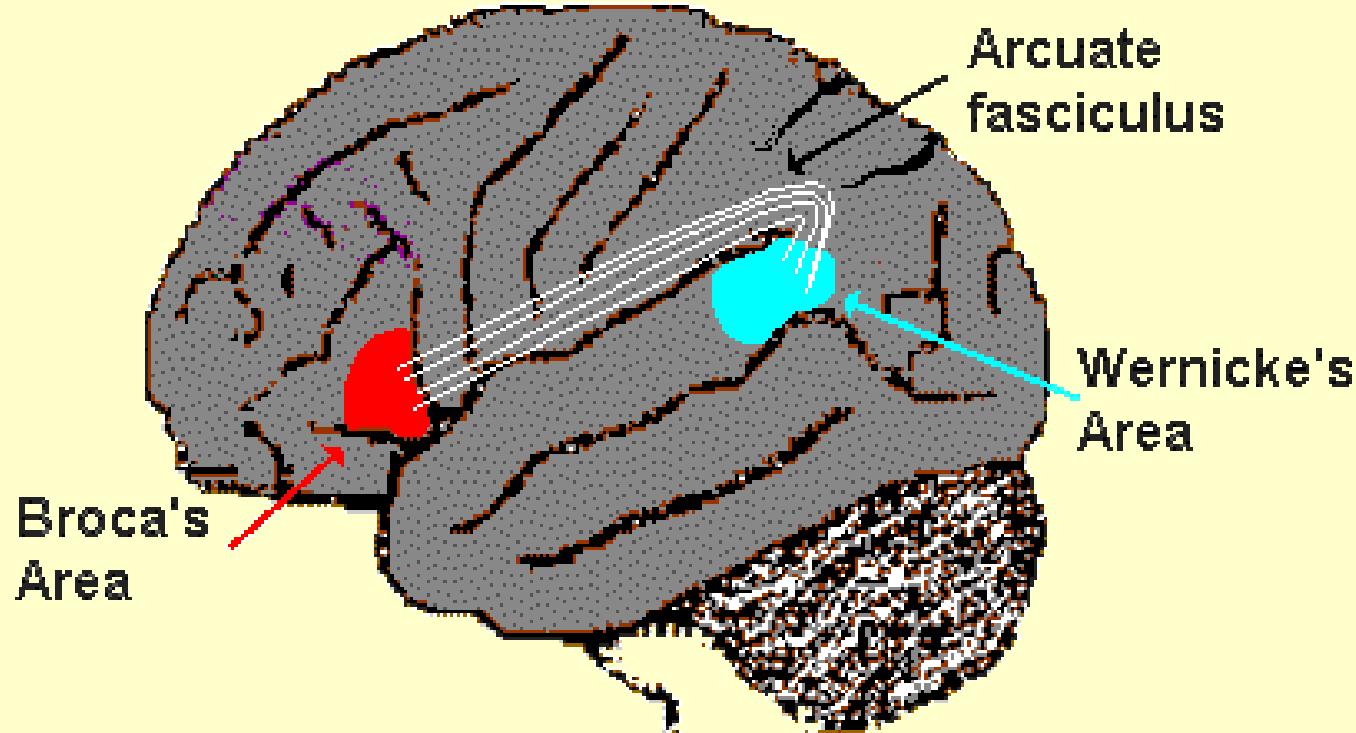
Speech In Humans - Left Hemisphere (98%)

- **Broca's area** - frontal lobe, secondary motor cortex area for muscles involved in speech. In the brain's left hemisphere which is responsible for speech production

Speech In Humans - Left Hemisphere (98%)

- **Wernicke's area** - temporo-parietal lobe, secondary auditory cortex. in the brain's left hemisphere which is reasoned to be responsible for processing of meaning, especially as it relates to verbal communication

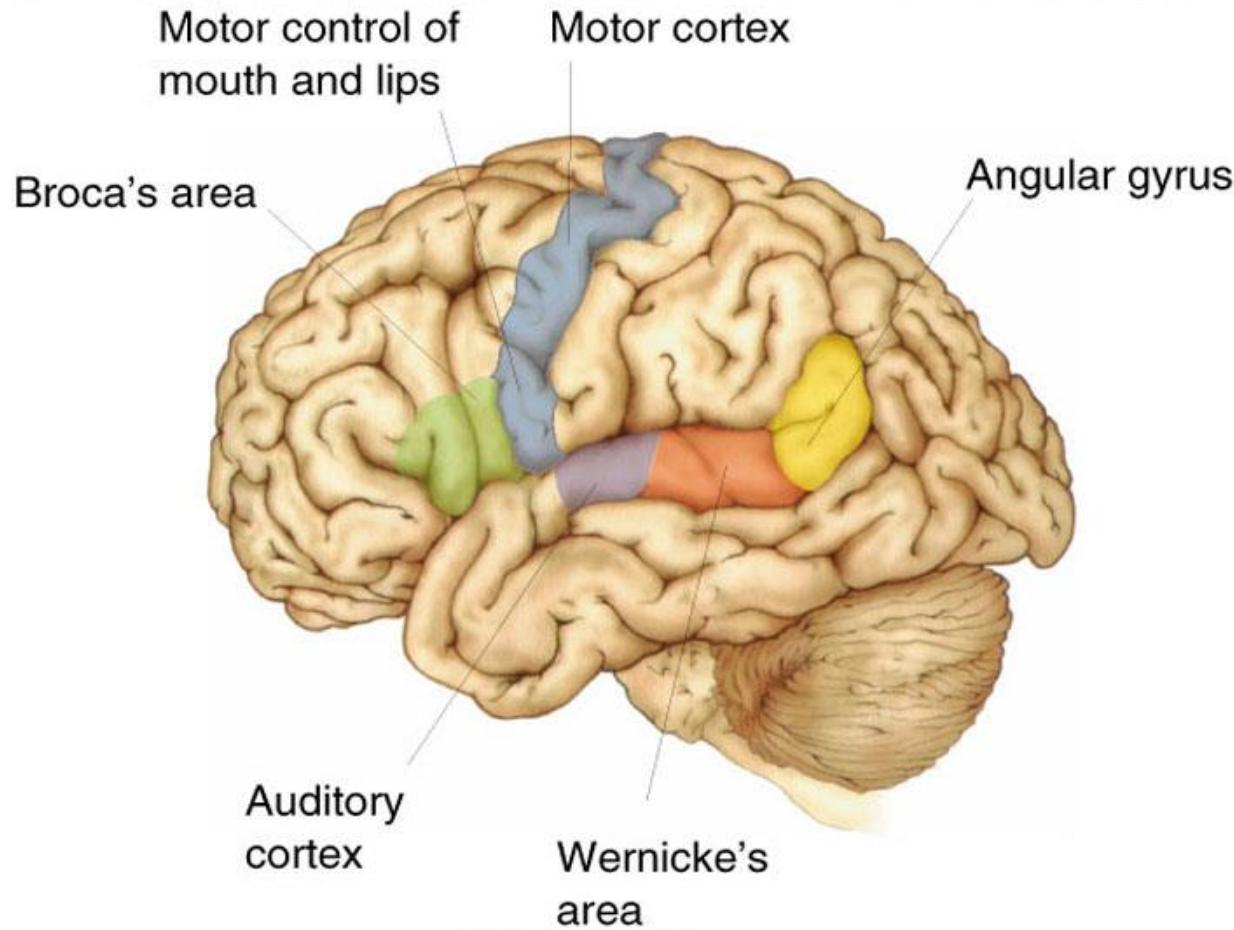
- **Arcuate fasciculus** - pathway from Wernicke's area to Broca's area



Language Areas of the Brain

Figure 20.1

Key components of the language system in the left hemisphere. In the frontal lobe, Broca's area lies next to the area that controls the mouth and lips in motor cortex. Wernicke's area, on the superior surface of the temporal lobe, lies between auditory cortex and the angular gyrus.

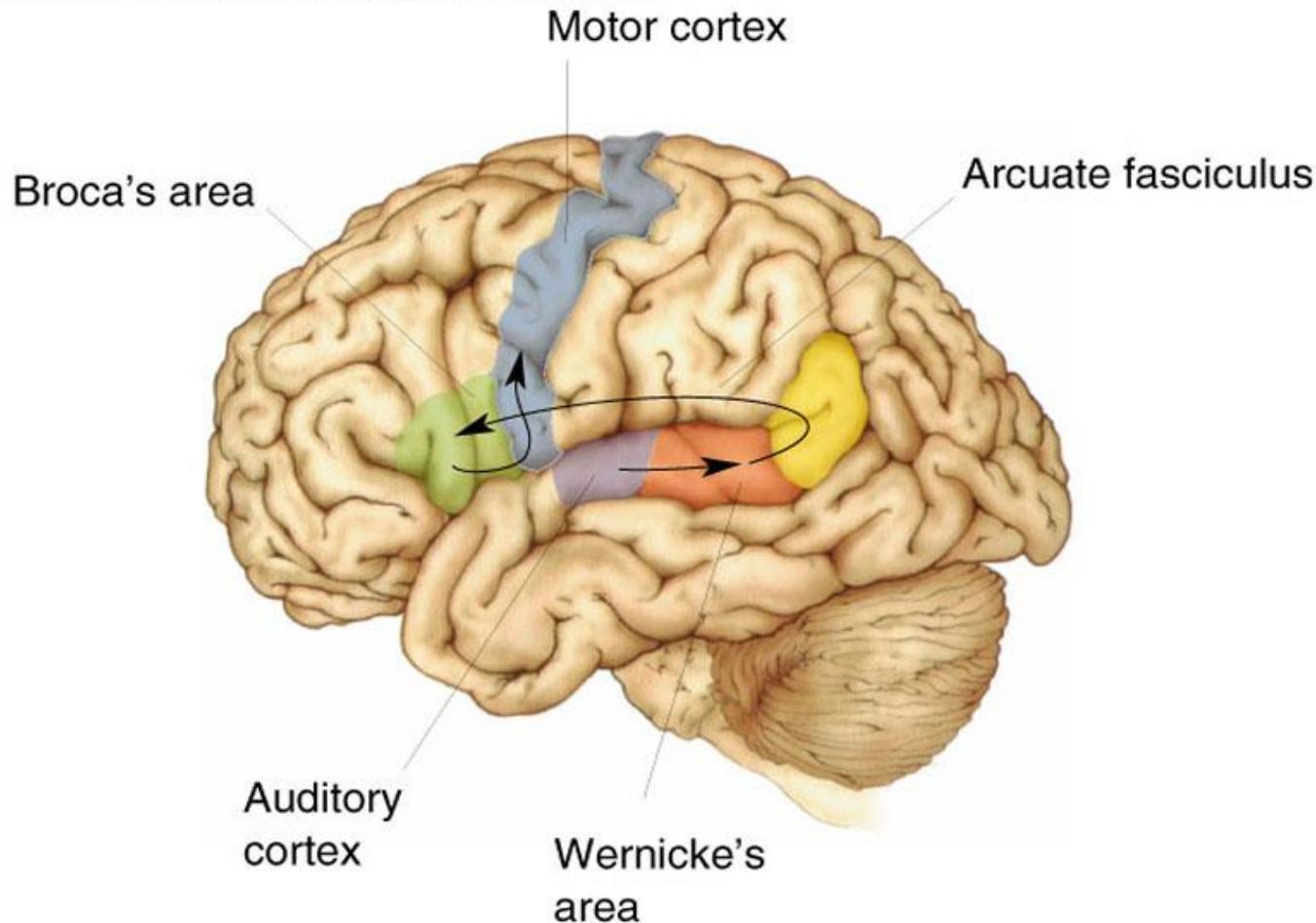


Speaking/Repeating a Heard Word

1. Primary auditory cortex
2. Wernicke's area
3. Arcuate fasciculus
4. Broca's area
5. Motor cortex

Speaking a Heard Word

Figure 20.2
Repeating a spoken word, according to the Wernicke-Geschwind model.



Speaking a Written Word

1. Visual cortex

2. Angular gyrus Where the written word is translated to internal monologue.

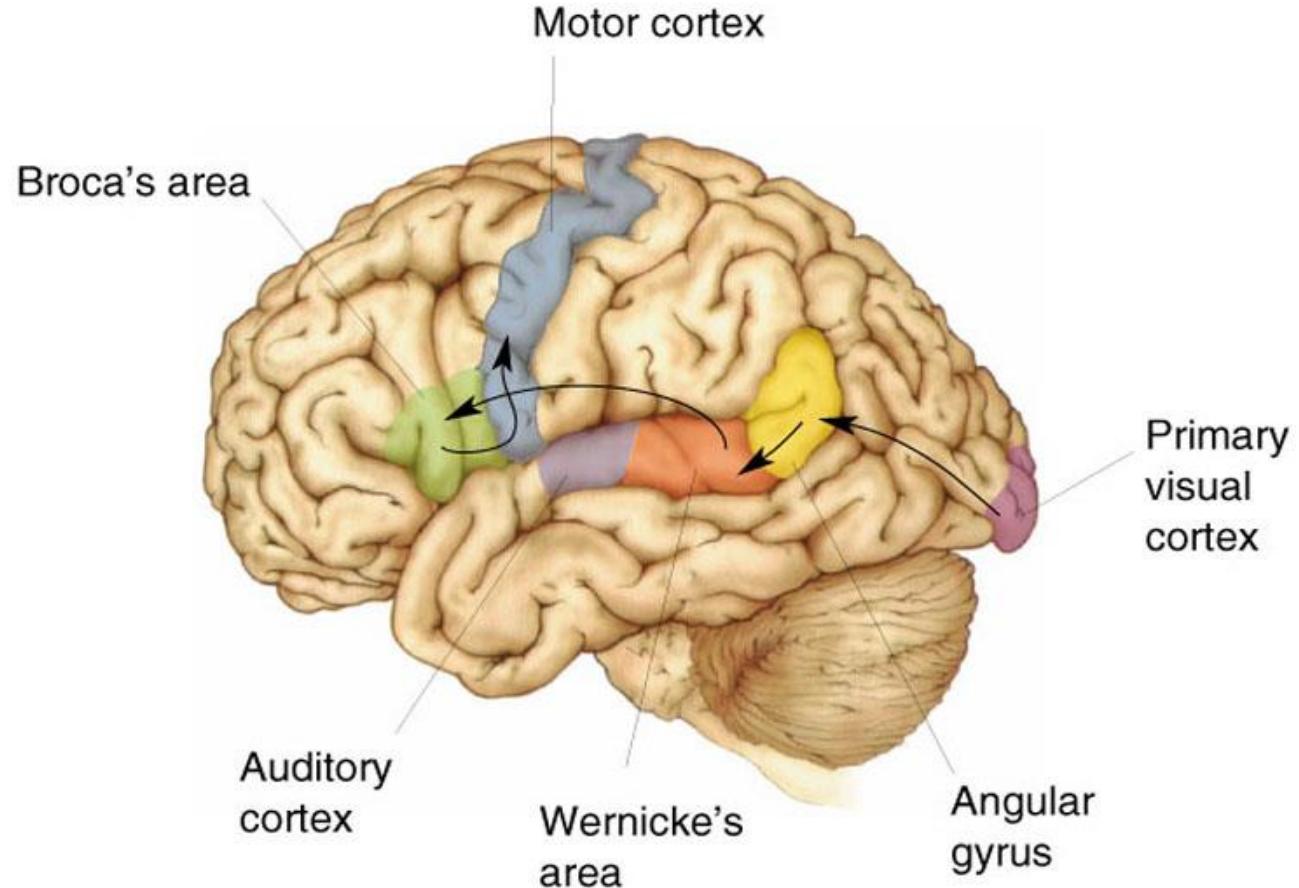
3. Wernicke's area

4. Arcuate fasciculus

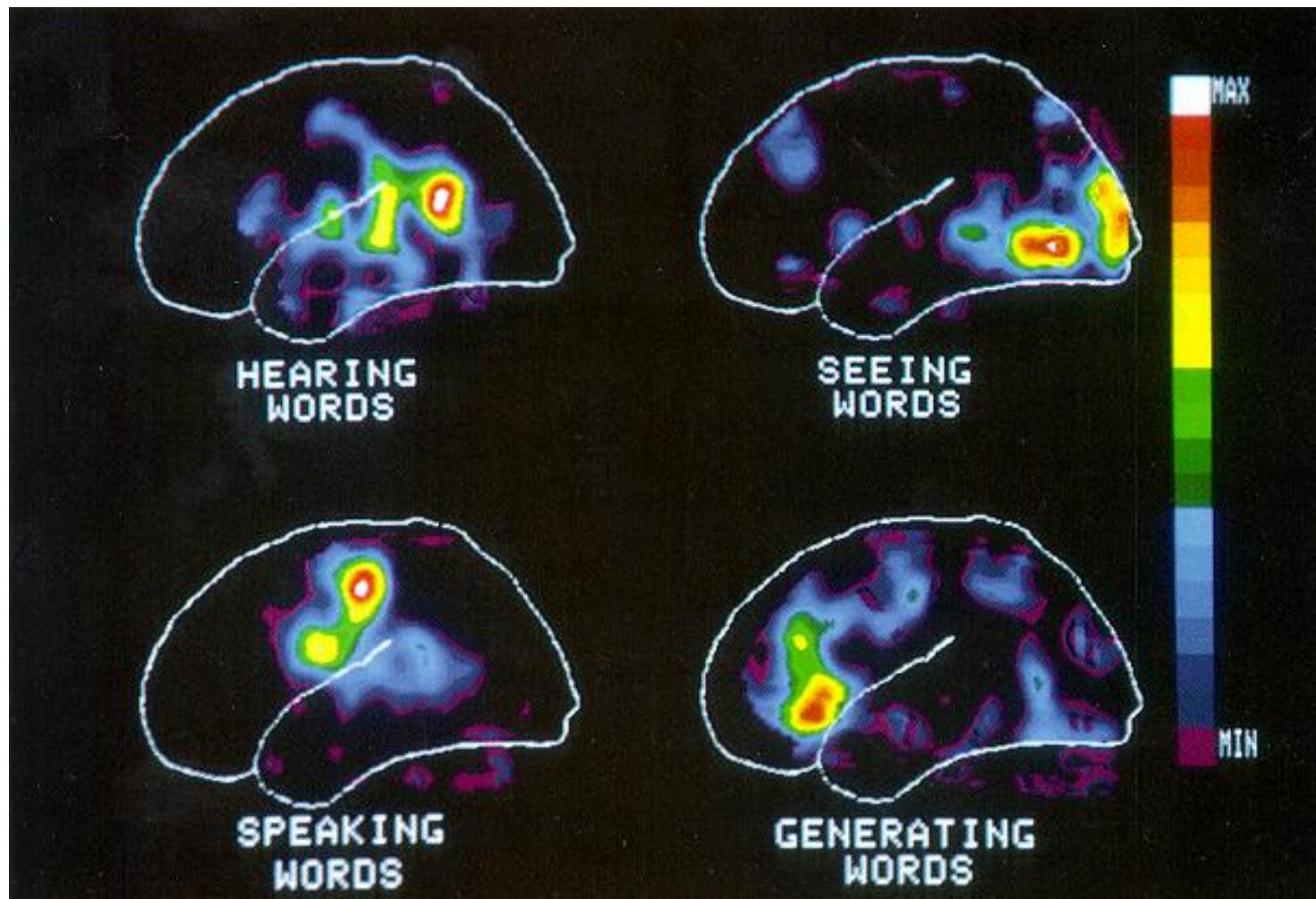
5. Broca's area

6. Motor cortex

Speaking a Written Word



Human PET Scans:



Speech Disorders

- Broca's (Expressive) aphasia - good comprehension but poor articulation (motor) of speech. (Can be caused by stroke.)
- Usually accompanies by *agraphia*, the inability to express thoughts in writing.
- Wernicke's aphasia - poor comprehension and fluent but meaningless speech. (Can be caused by a stroke.)
- Global aphasia (lesion of arcuate association area) - all aspects of language affected, poor comprehension and speech





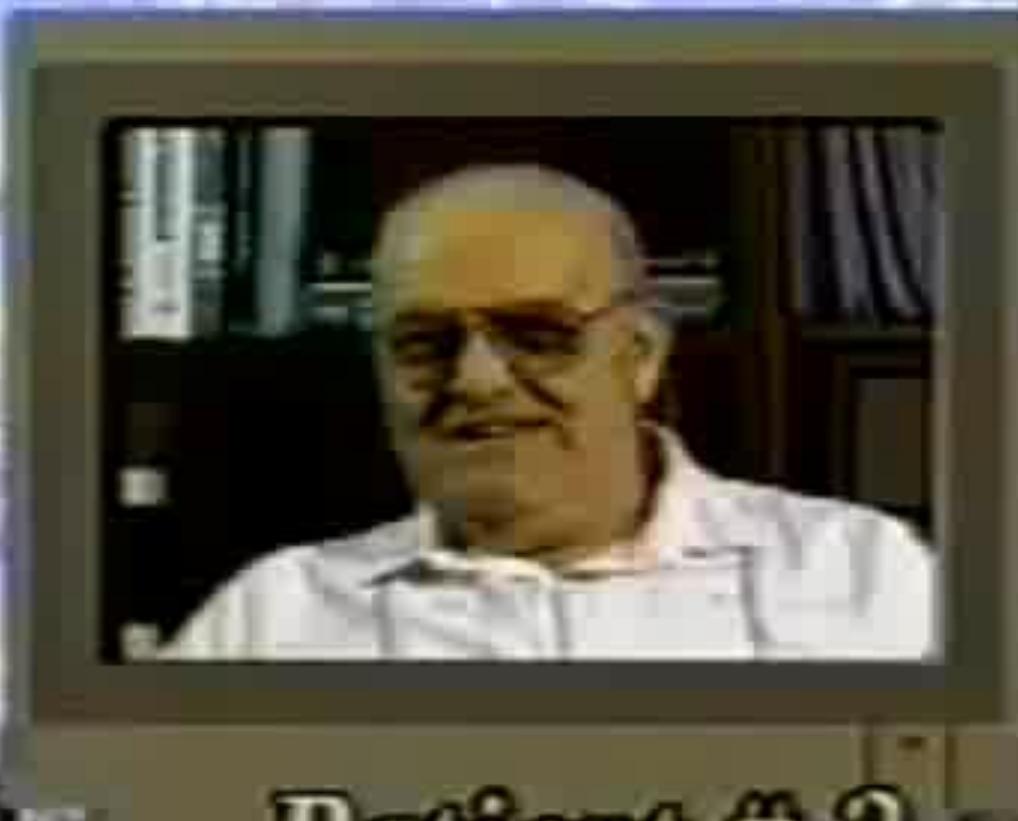
Broca's aphasia with
severe agrammatism



Wernicke's aphasia: Answering interview questions

Those suffering from Wernicke's Aphasia think that they are speaking correctly so if they could not sense that people were not understanding them, they would not know that they had a disorder.





Patient #2