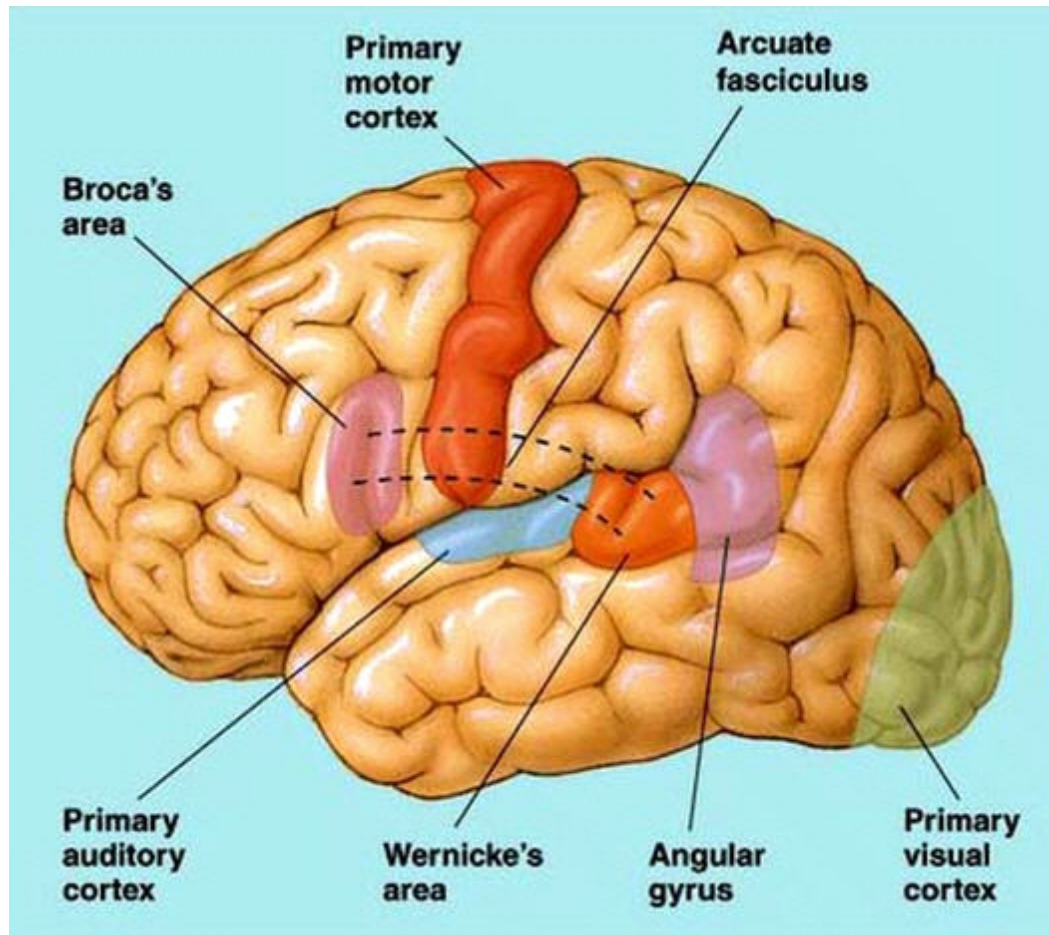


In how far are language regions  
affected?

# Language regions of the brain



# What is Language Lateralization?

- 2 brain hemispheres
- Early Research of Broca and Wernicke
- Studies on brain lesions

# Dependancy of Language Lateralization

- Handedness
  - Personal
  - Family History
- State of the art
  - Not fully understood
  - Need more investigation

# Looking for Participants

- Healthy right-handed children and adults
- $EHI \geq 50$
- Data of 170 participants (age 5 – 67) had an influence in the study's results

# Verb Generation Task

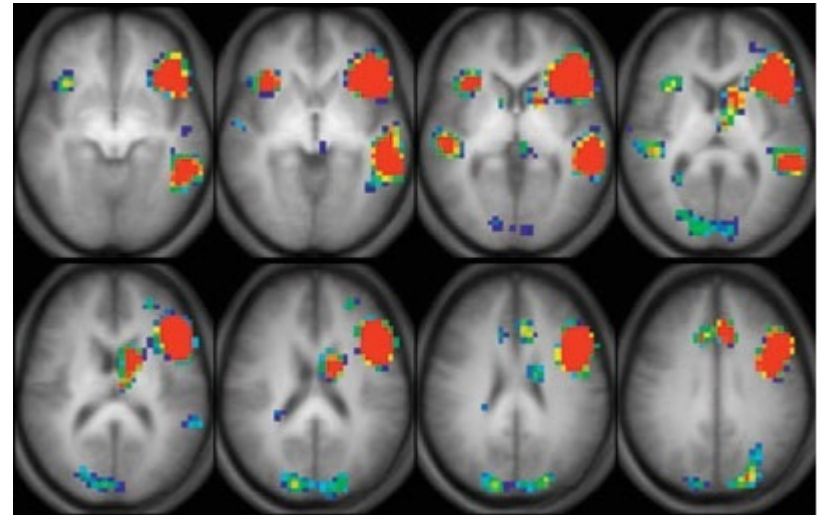
- One of a few cognitive tasks in neuroimaging studies
- Robust activation

# Verb Generation Task

- Block-design
  - Presenting a series of concrete nouns (One noun per 5s)
  - Five activation periods of 30s
  - Resting periods
  - Initial 30s rest period for allowing MRI to reach T1

# Estimating the Laterality Index

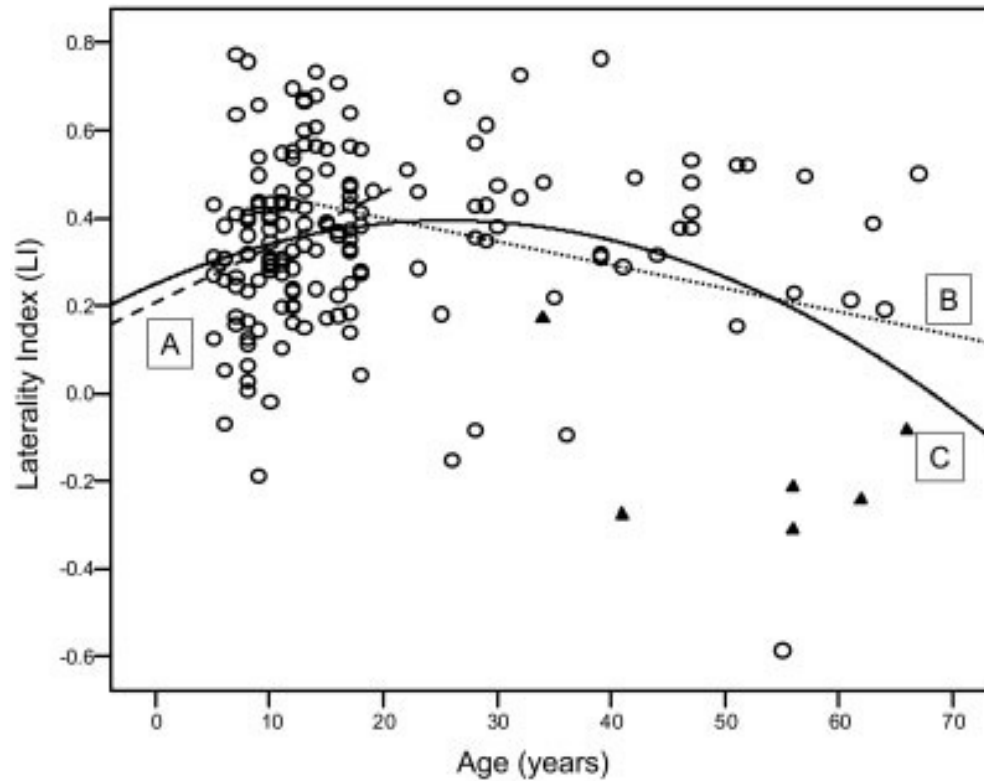
- Regions of Interest



- LI shows right-side ( $> 0.1$ ) or left-side ( $< -0.1$ ) domination



# Results



# Results

- Language becomes more lateralized to the left hemisphere by ageing
- Strongest left lateralization between 20 and 25
- Language lateralization decreased with age after 25

# Discussion

- Different results between studies on language lateralization in children
- Similar results on language lateralization in adults
- Language lateralization is predominantly driven by frontal brain regions

# Sources

1. Jerzy P. Szaflarski, Scott K. Holland, Vincent J. Schmithorst, and Anna W. Byars (2006) . fMRI Study of Language Lateralization in Children and Adults. *Human Brain Mapping*. 27, 202-212.
2. <http://www.acbrown.com/neuro/Lectures/Lang/NrLangSpch.htm>