

# Effect of aging on the brain

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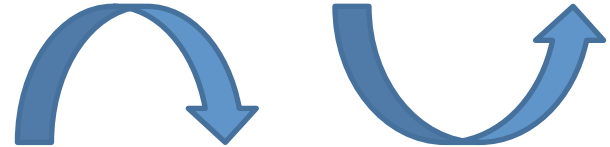
Universität des Saarlandes, 04-12-2014

# Overview

- Which general skills and regions of the brain are affected?
- In how far are language regions affected?
- How can good performance levels in language comprehension be maintained?

Which general skills and regions of the brain are affected?

- the structure of the brain

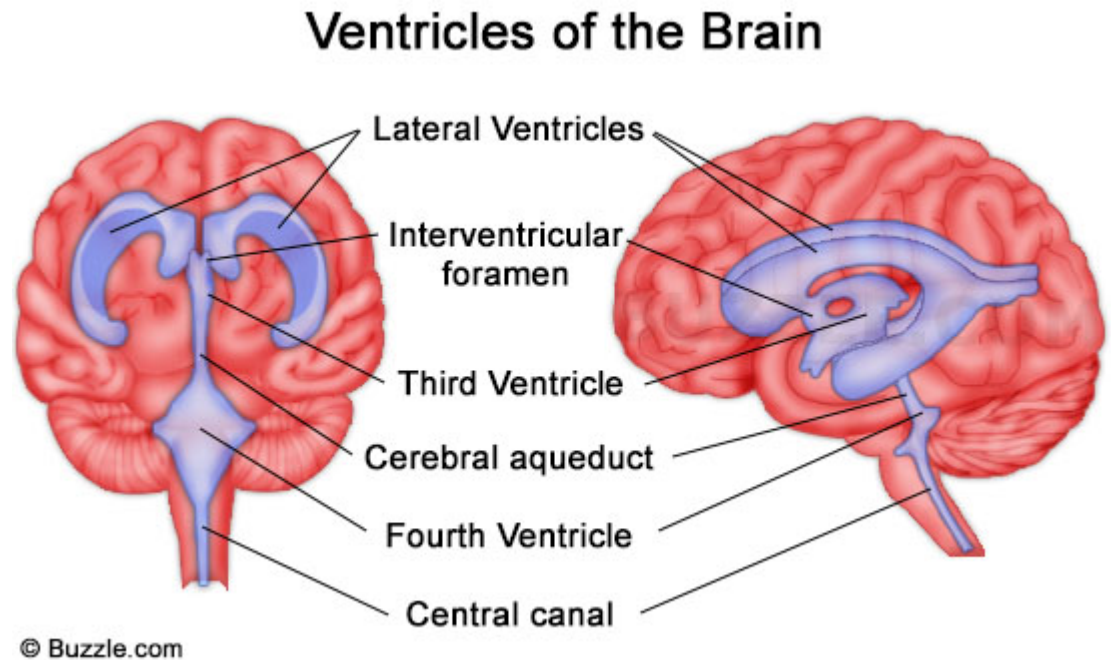


- aging + structural brain changes

- magnetic resonance imaging (MRI) studies

# brain changes

- Brain: shrinks in volume
- ventricular system expands

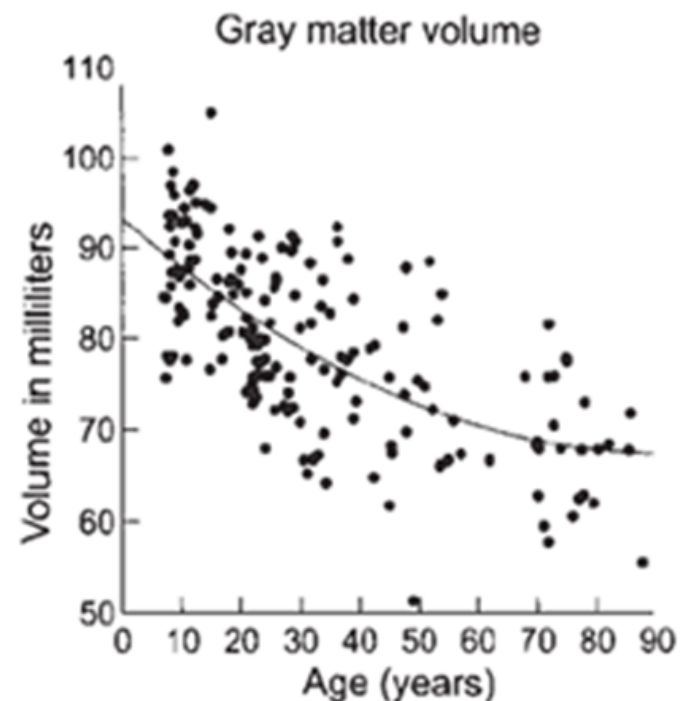




# volumetric brain reductions

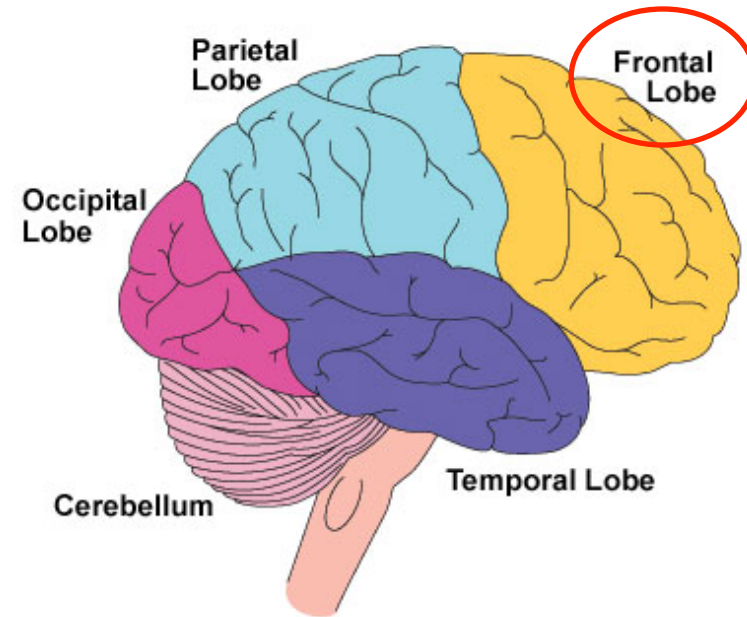
- shrinkage of neurons
- reductions of synaptic spines
- lower numbers of synapses

→ reductions in  
grey matter



# reductions in grey matter

- Loss in
  - **prefrontal cortex**
  - executive functions  
(e.g. controlling the attention)



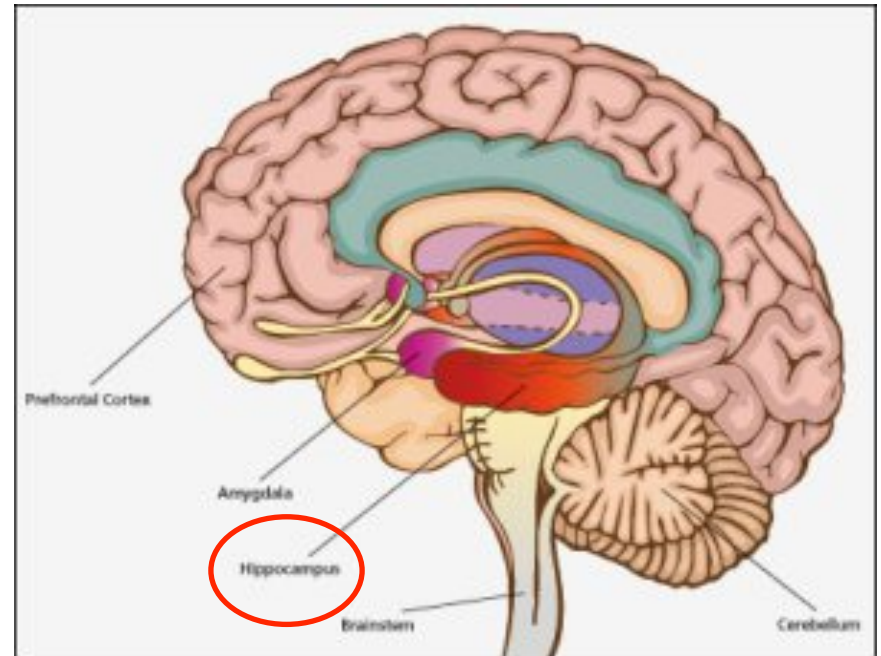
Picture source: <https://www.withfriendship.com/user/mithunss/temporal-lobe.php> (24-11-14)

- **hippocampus**
- long term memory (episodic memory)



# reductions in grey matter

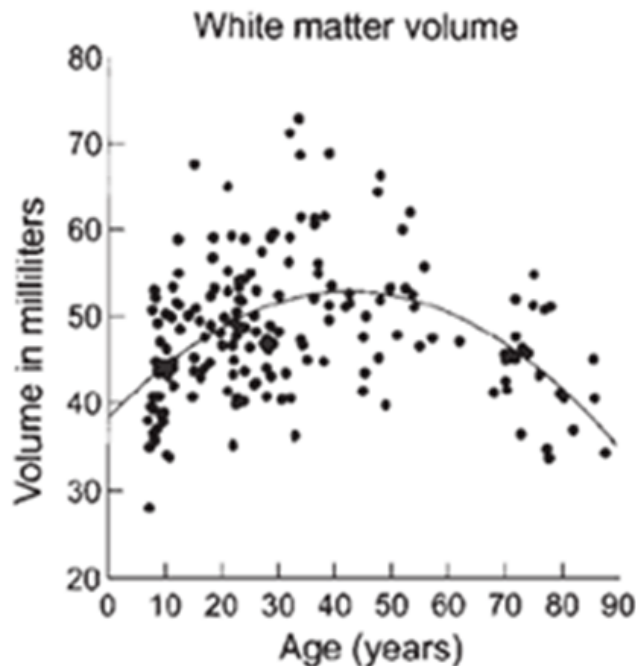
- Loss in
  - **prefrontal cortex**
    - executive functions  
(e.g. controlling the attention)



- **hippocampus**
  - long term memory (episodic memory)
  - Alzheimer

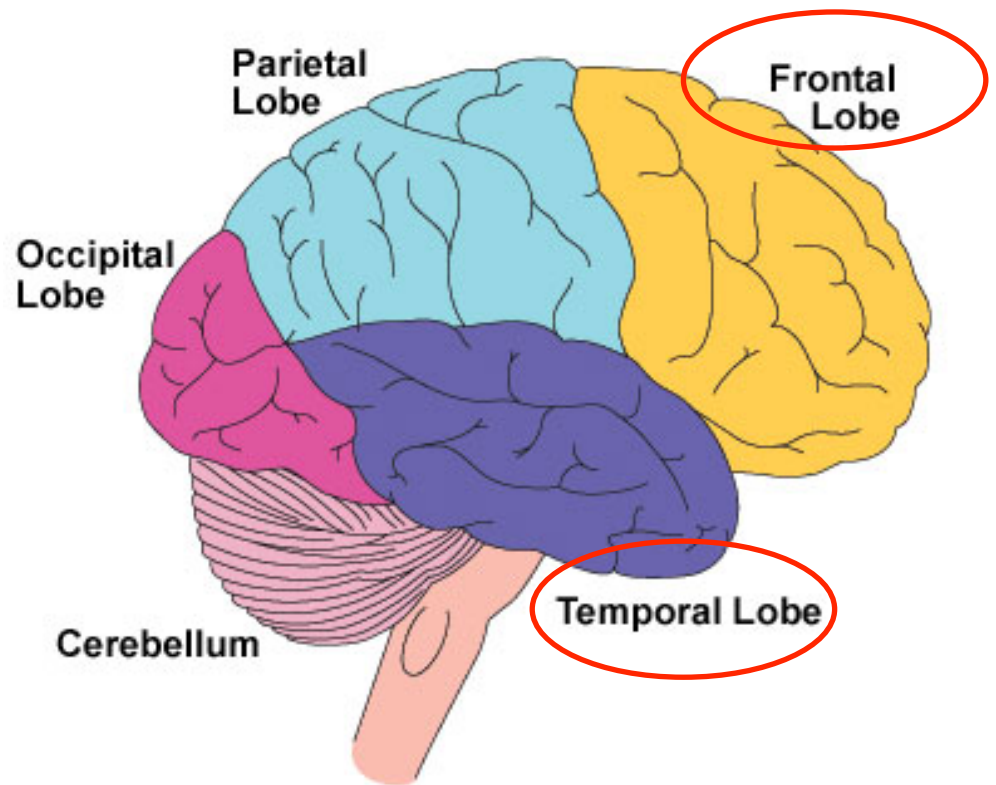
# reductions in white matter

- the length of myelinated axons
  - Loss of mental processing speech
  - reduce communication between the brain areas



# the pattern of changes

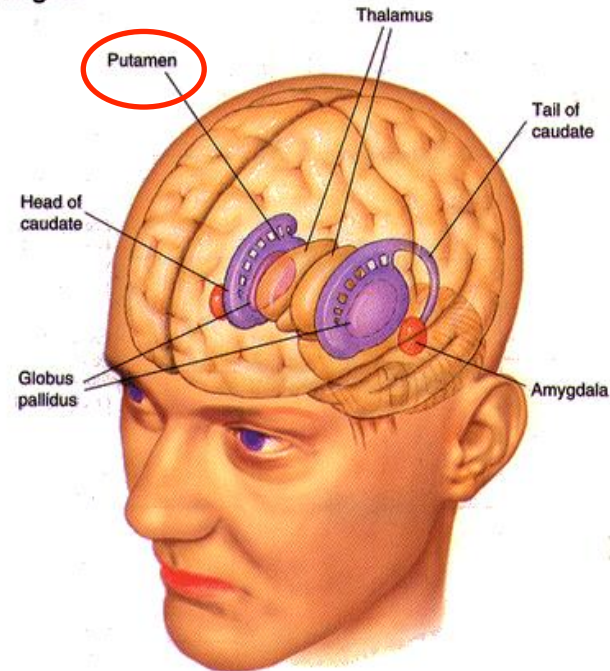
- highly heterogeneous
- the changes:
  - frontal cortex
  - temporal cortex
  - putamen
  - thalamus
  - n. accumbens



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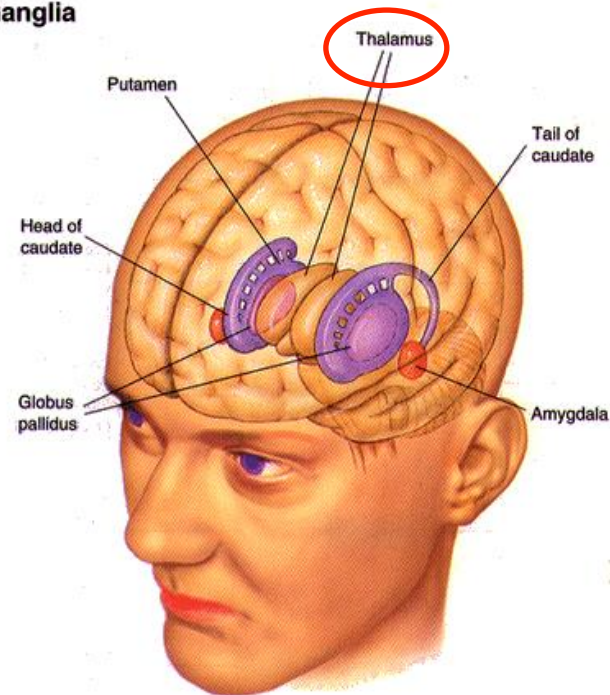
► The Basal Ganglia



# the pattern of changes

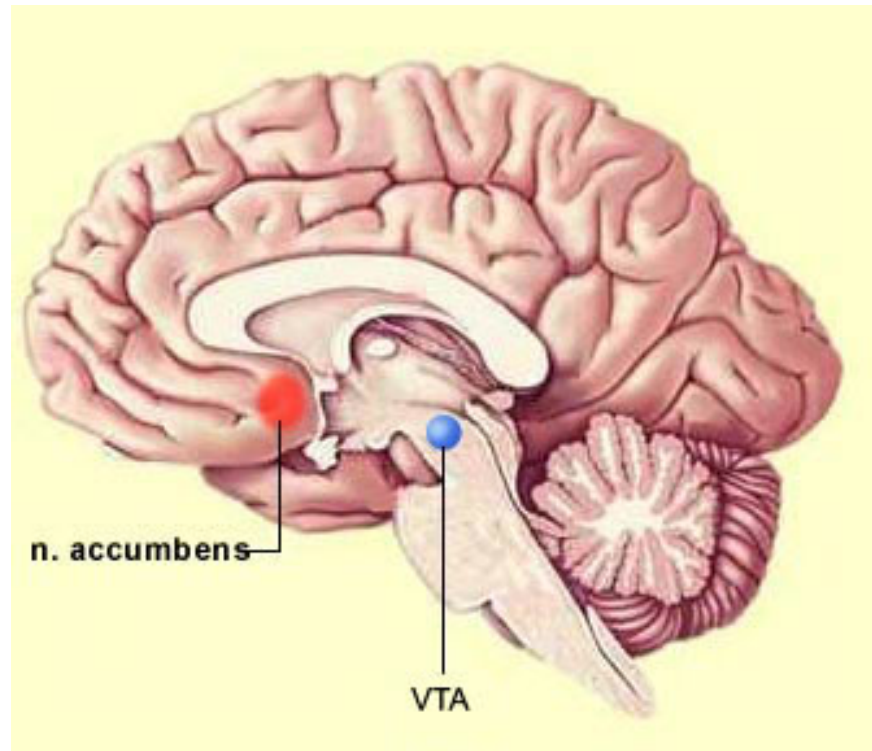
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# Literatur

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