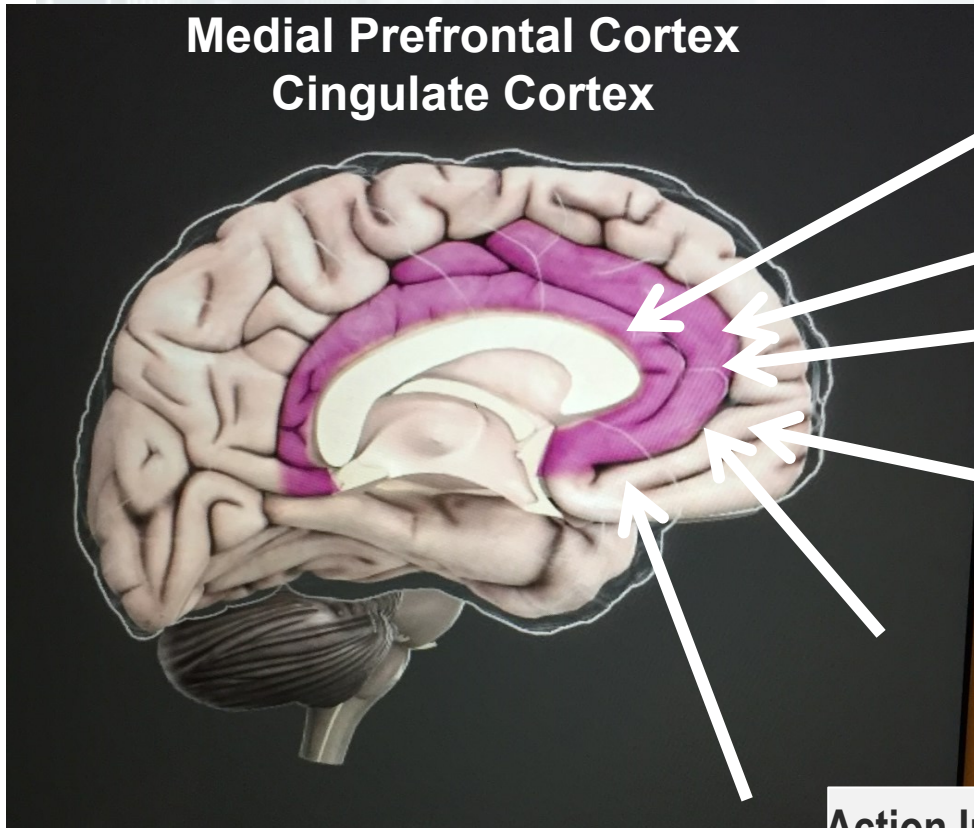


# NEURODRIVING

## "It takes brains to take risks"

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*Motor control and cognition*  
(Paus-2001)

Emotional conflict-amygdala  
(Etcin et al. 2006)

Effects of Alcohol Intoxication  
(Gundersen et al -2008)

Integrating negative affect, pain  
and cognitive control  
(Shackman et al-2011)

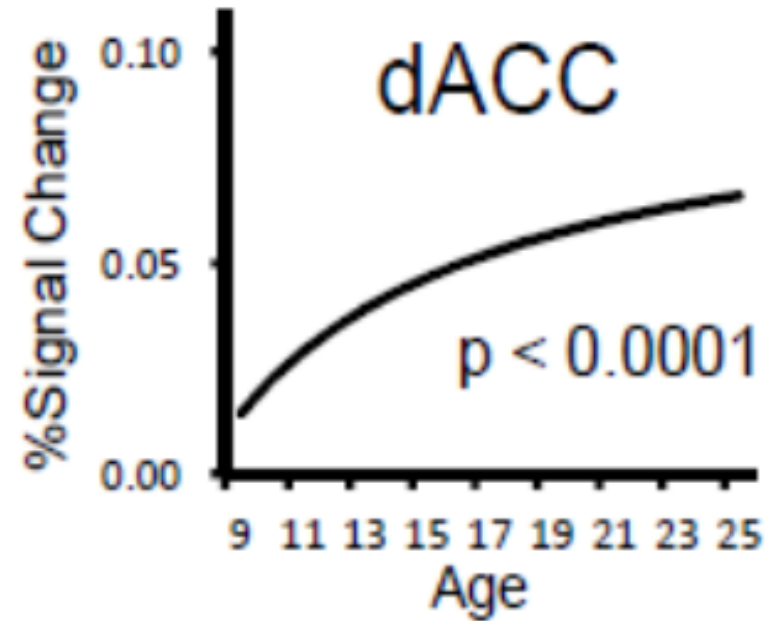
Error-related negativity - brain maturation  
(Tamnes et al.- 2013)

Action Initiation –temporal offset of actions  
(Lakshminarayan et al.-2013)

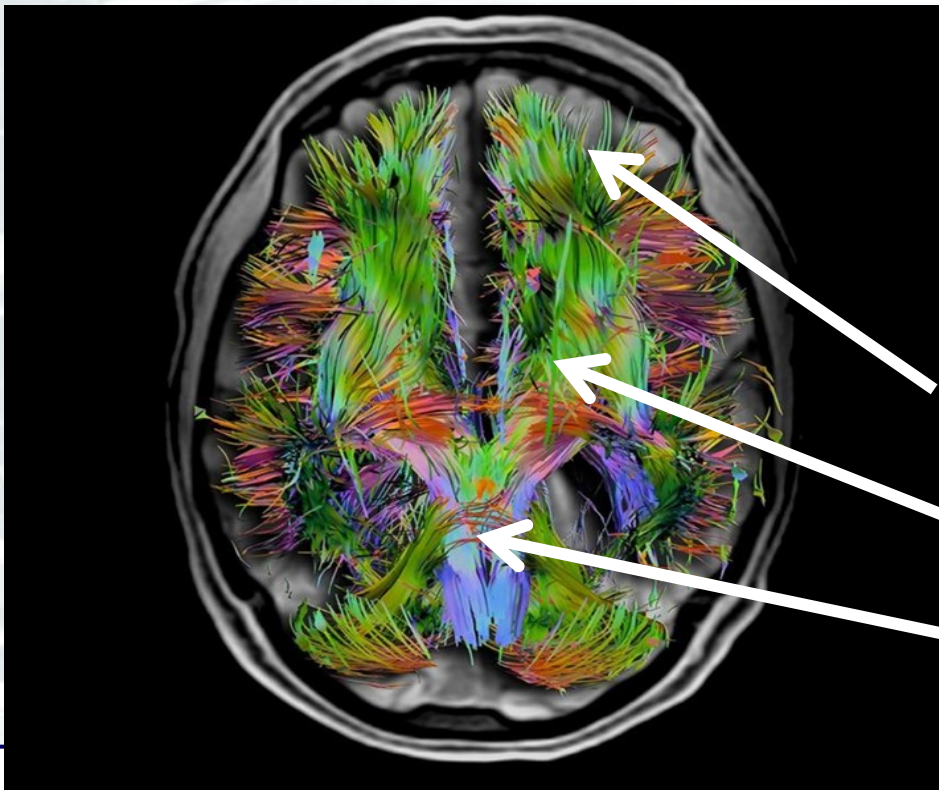
Medial Prefrontal Cortex  
Cingulate Cortex



Ordaz et al, 2010



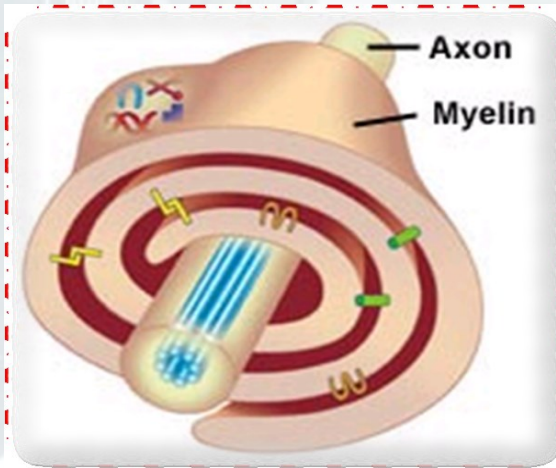
**White Matter (WM)**  
**The Transport System of the Brain:**  
**150-180 000km**



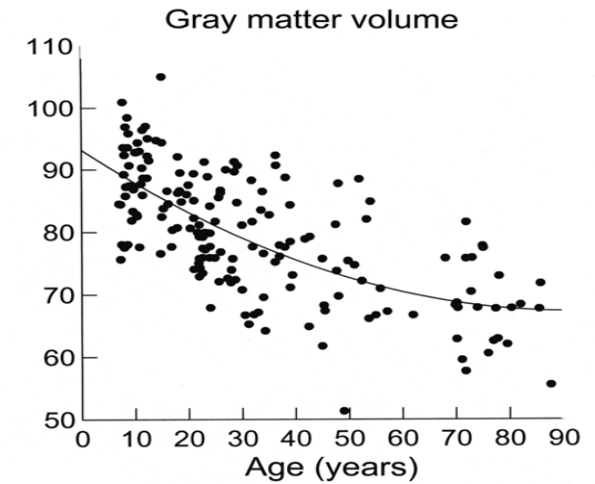
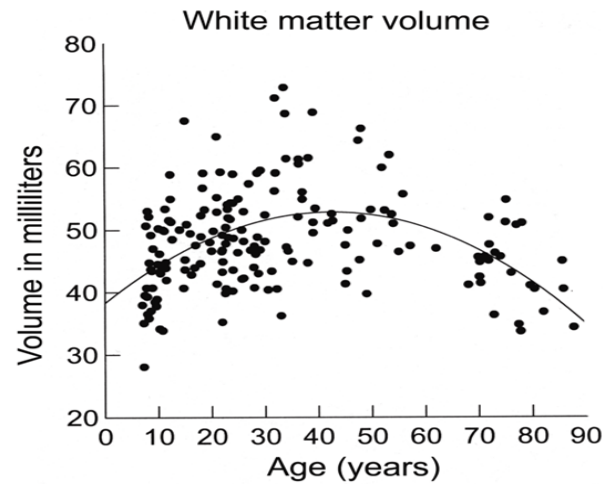
*WM as a Transport System*  
(Paus et al -2014)

*Genetics of WM development*  
(Chiang et al -2012)

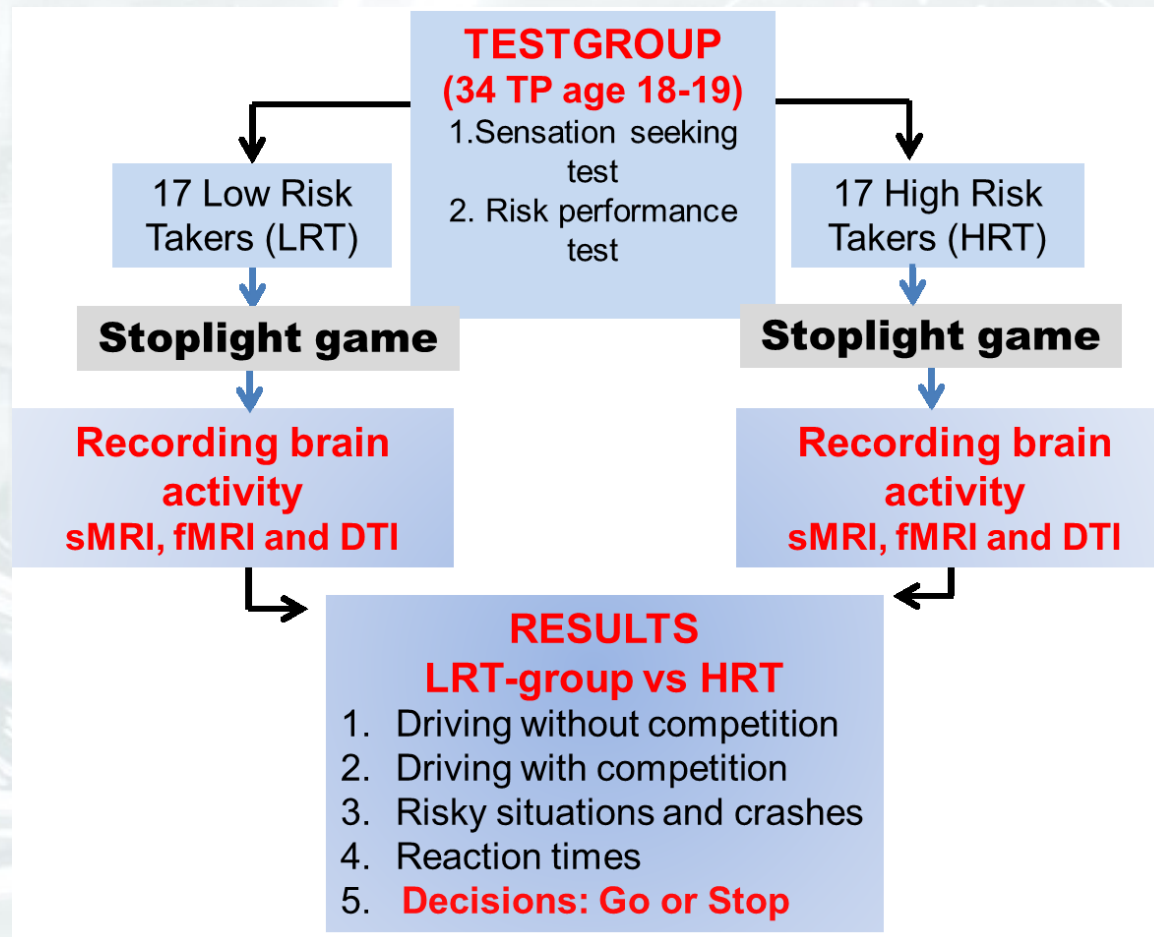
*Growth of WM in the Adolescent  
Brain* (Perrin et al -2008)



"Axons are not just wires for conducting electrical signals- they also serve as roads for carrying cargoes between the cell body and the synapse"  
(Paus et al-2014)

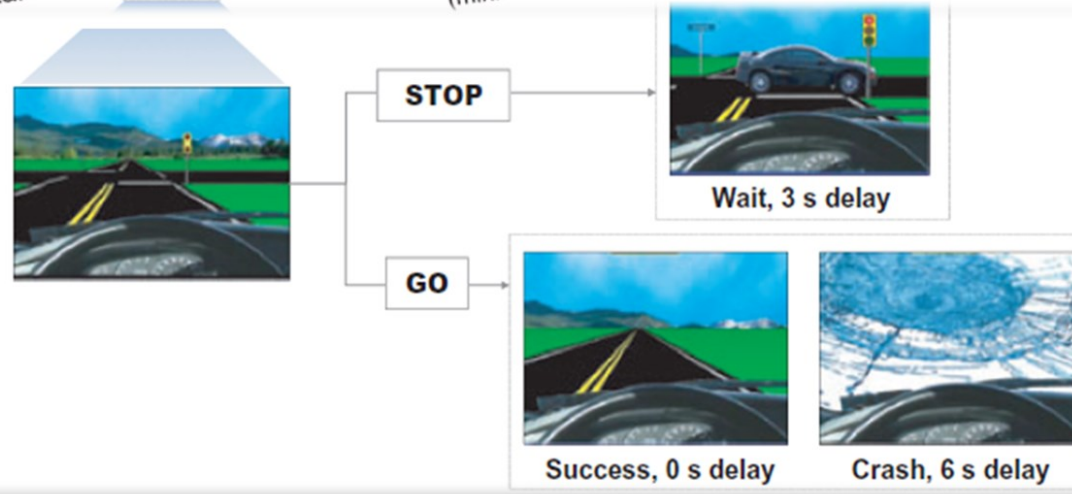
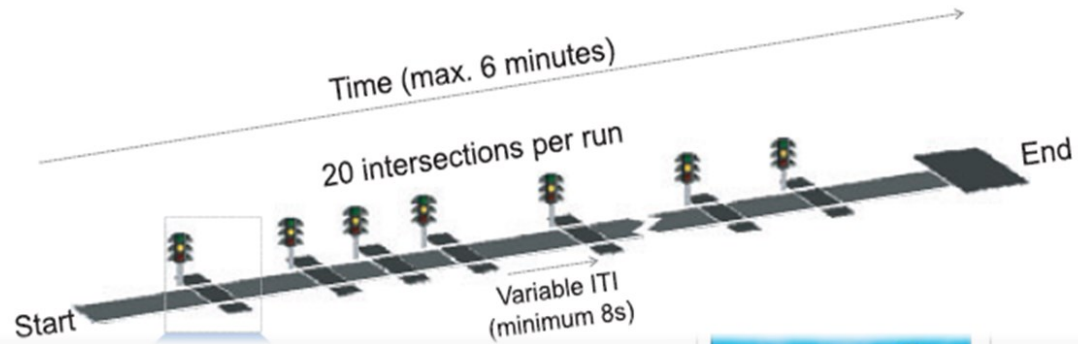


Sowell- 2007, UCLA Department of Neurology





Temple University, Philadelphia (Chein-2010)  
"Stoplight Driving Game"

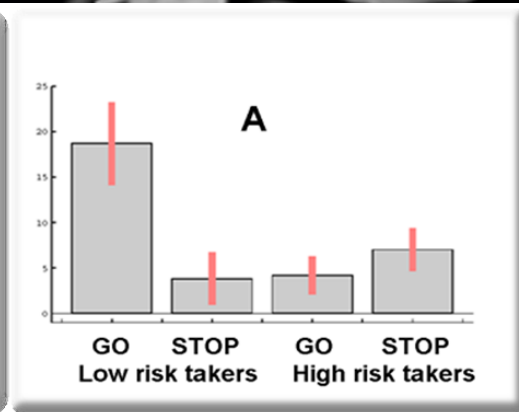
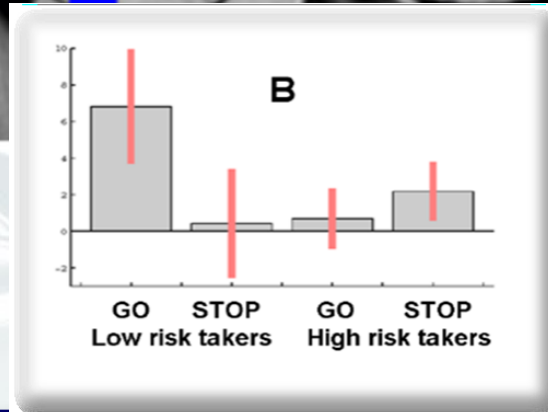
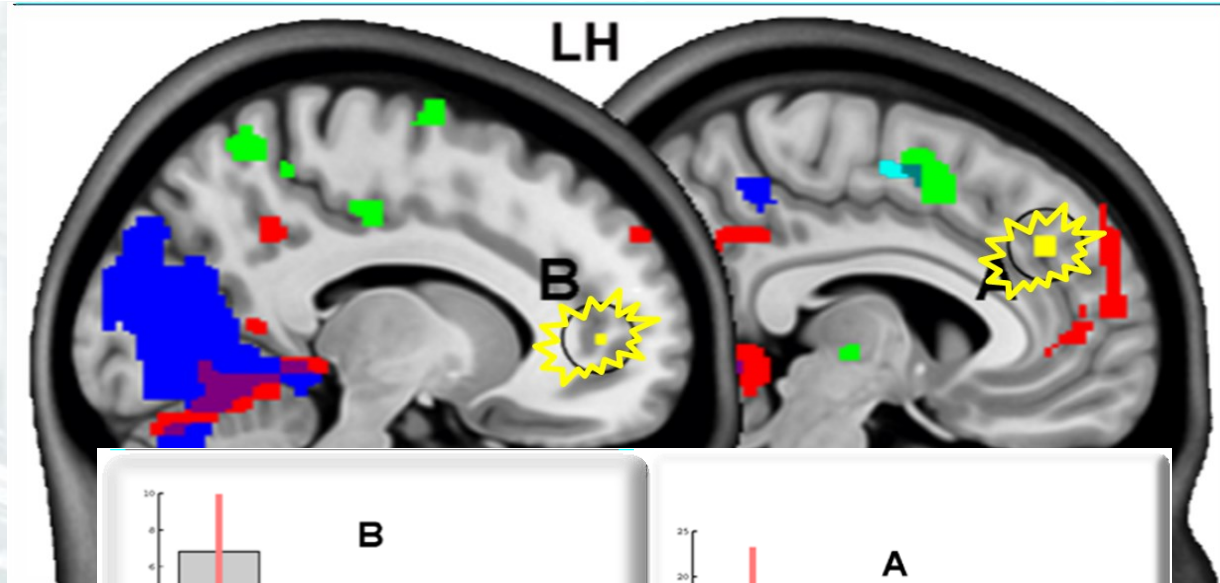








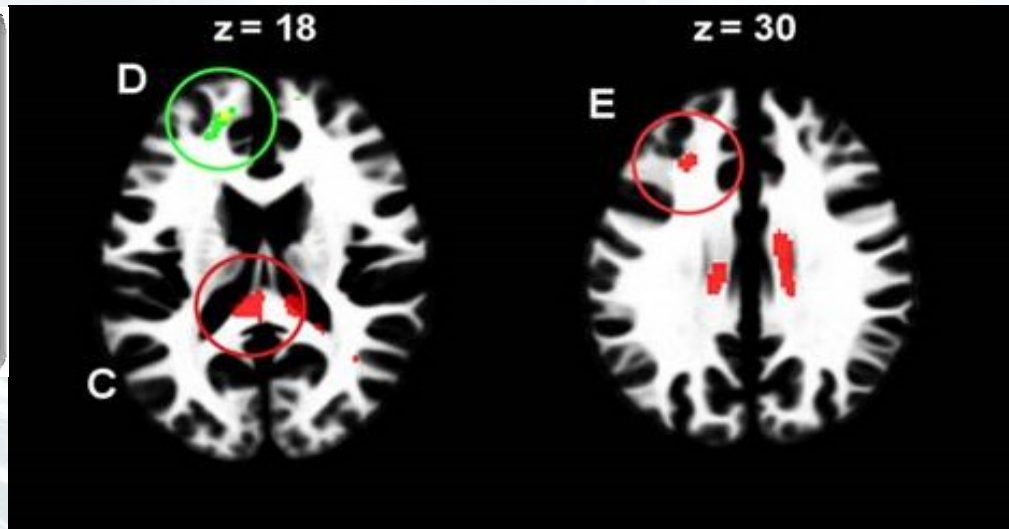
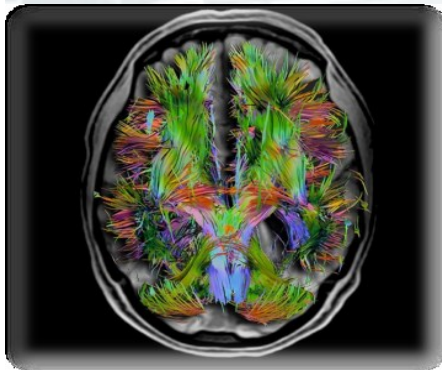
- LRT had higher activity in MPFC and dACC than HRT
  - **HRT has shorter reaction times**



Significant differences between HRT and LRT

C: - Splenium Corpus Callosum

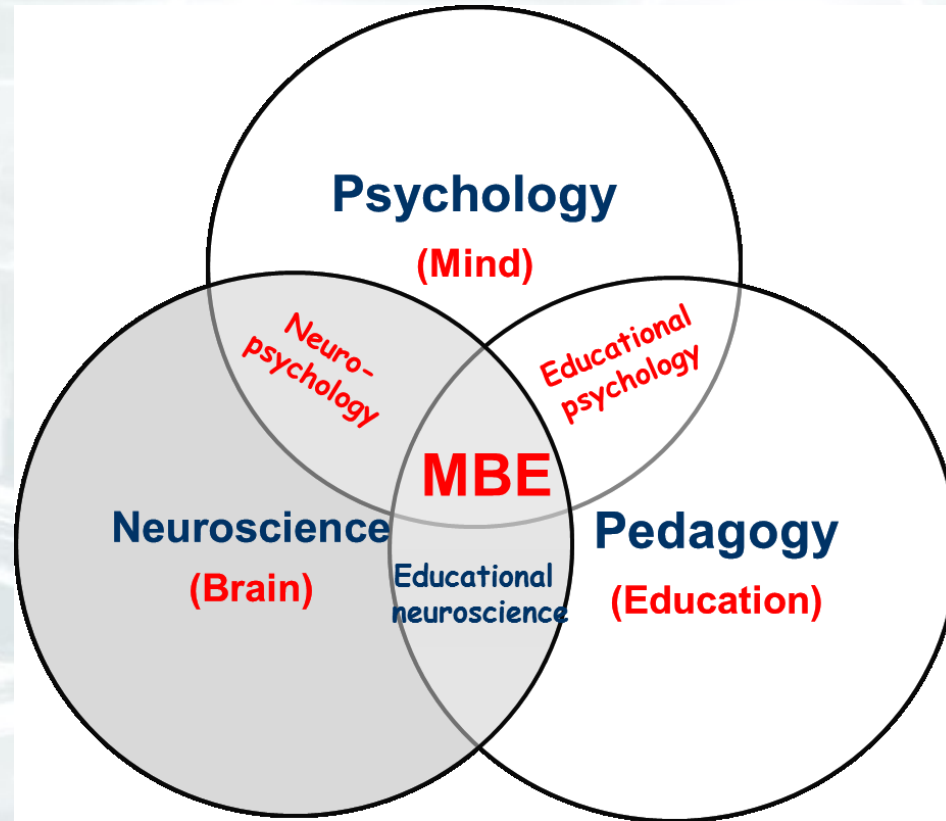
D and E: - Frontal Cortex (subgyral WM)



High risk-takers with more mature brain would calculate possible gains and risks of their (risky) behavior for the best, and show flexible behavior depending on the changing situation



# Mind, Brain and Education Science



**It`s all about the brain**  
**Thank you!**

