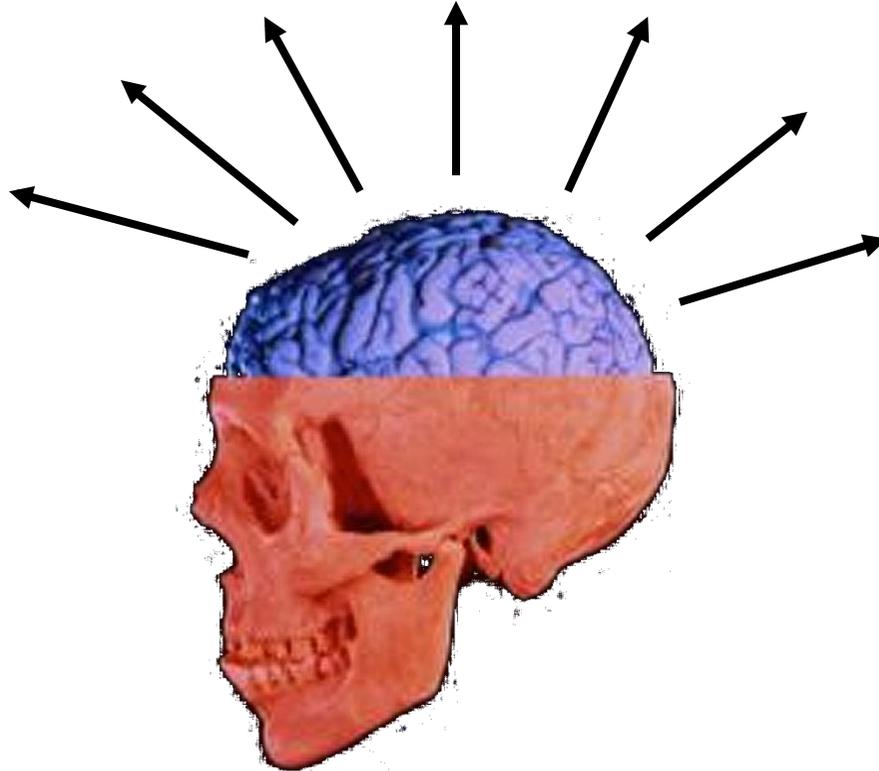
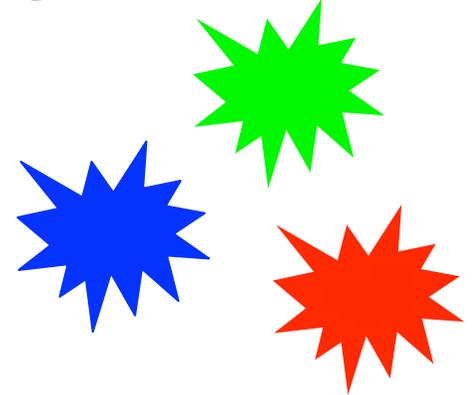
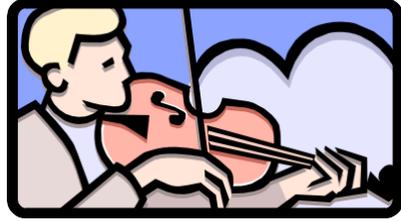
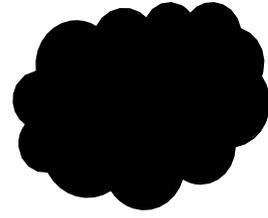
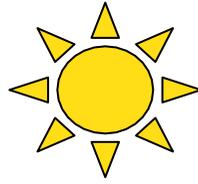


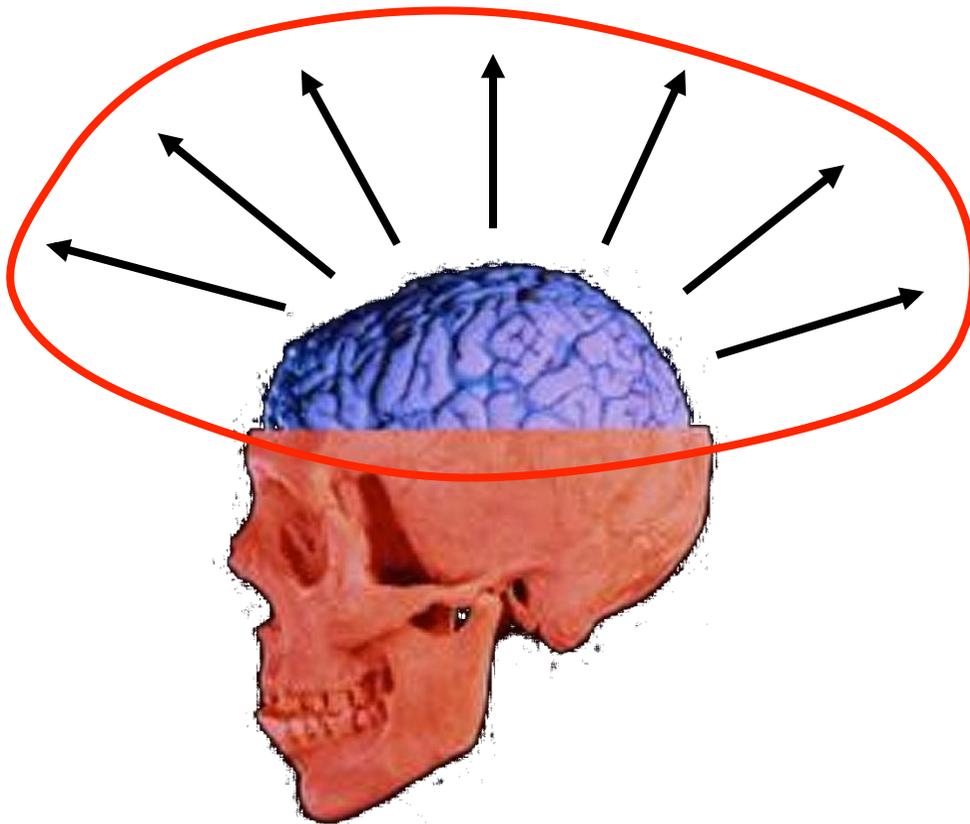
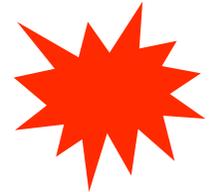
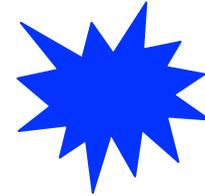
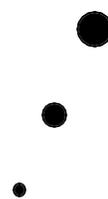
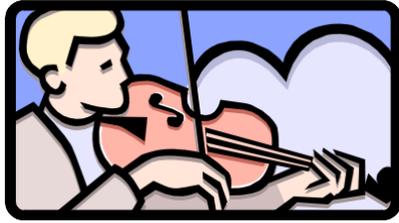
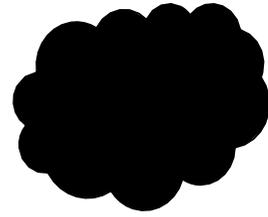
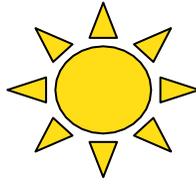
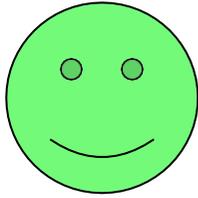
The „hard problem“ of consciousness

# The „hard problem“ of consciousness

The hard problem of consciousness is to explain how qualia arise from physical processes in the brain.

(→David Chalmers)





# Hard problem

- It is widely accepted that consciousness depends on the processes in the brain: Whenever there is a change in one's consciousness, there must be a underlying change in one's brain states/processes
- Thus, **brain** processes are the likely **causes** for consciousness
- **Hard problem**: In spite of all this, it is **in no way evident how** consciousness (qualia) could arise from brain processes involving the interaction of carbon-, hydrogen- and oxygen atoms, brain cells, neurotransmitters etc.

Getting a feel for the hard problem of  
consciousness

# Flohr on consciousness

«The relationship between brain processes and states of consciousness is unexplained. Even more: it appears **inconceivable** how it could be explained. It appears - in principle - impossible to conceive how physical-chemical processes could become conscious states like perceptions, sensations, memories, thoughts, pains, hunger, thirst, disgust etc.»

# Flohr and Du-Bois Reymond

## Summary of arguments

- consciousness: qualia, Erlebnisqualitäten
- mystery: to explain how qualia can arise from a material brain
- it's **inconceivable**! how can the movement of matter in my brain ever amount to something like conscious experience?
- **no sufficient cause** for consciousness in the brain is evident or even **imaginable**

Some thought experiments  
underscoring the hard problem of  
consciousness

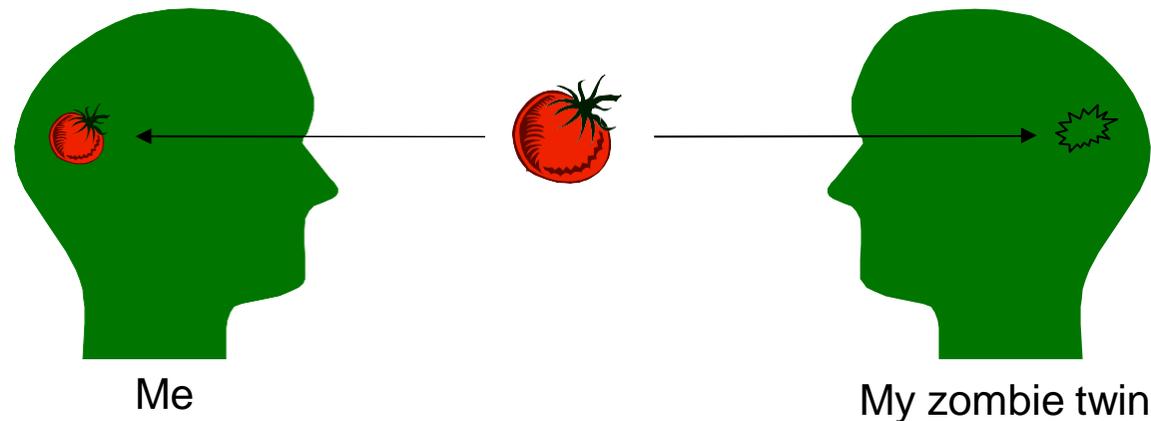
## II. NCCs

**NCC** = Neural correlate of consciousness

= the brain state or process that occurs  
whenever a given conscious experience  
occurs

# III. Zombies

# Absent Qualia: My zombie twin



- Imagine that you have a special kind of twin. Your twin is special in that his brain is a **physical copy** of yours, that is, its physical (and functional) organization is identical to yours in every respect
- However, your twin completely lacks all conscious experience of the world. He **has no qualia** at all. His inner life takes place in complete „darkness“
- Is such as scenario **conceivable**?

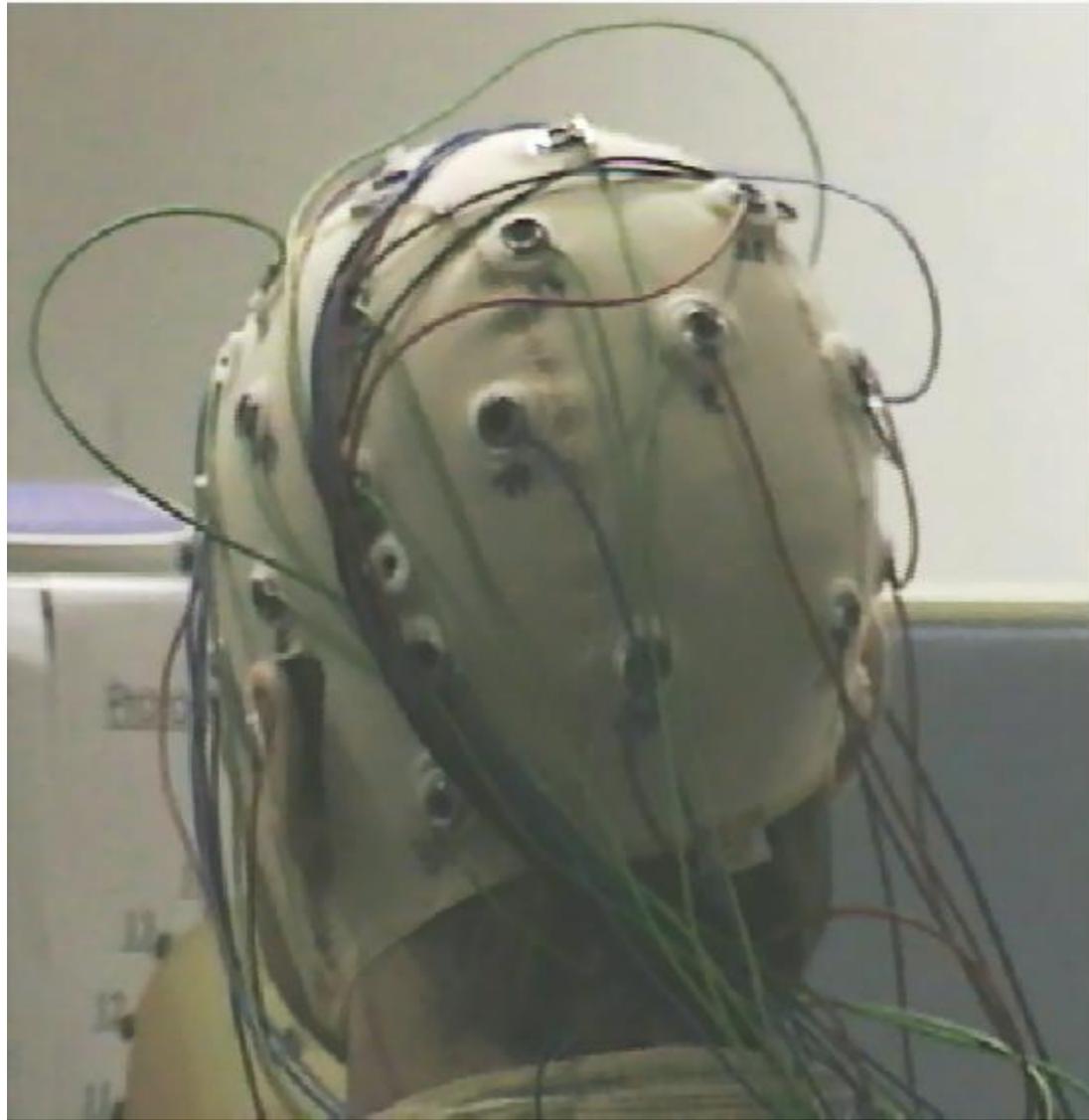
# Mary and the „Knowledge Argument“ (F. Jackson)

- ▶ Mary: Brilliant Neuroscientist, who **has never experienced color (has never had color qualia)** in her life. But she has all the physical knowledge about how color experience is generated in the brain.
- ▶ Question: When Mary experiences **color for the first time** (e.g. the blue of the sky), will she **learn a new fact** about the world?  
Something like a „subjective fact“?
- ▶ If so, then physicalism is false, because the set of facts about the world is larger than the set of physical facts about the world.
- ▶ Epistemological or ontological consequences?

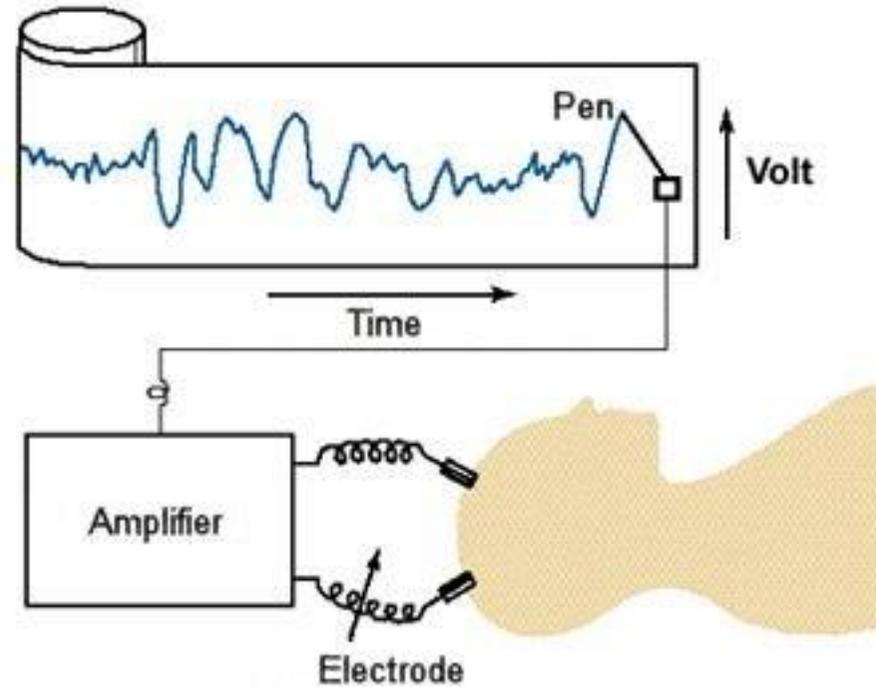
# What, if accepted, do the absent/inverted qualia arguments prove?

- **Explanatory** gap:
- Although consciousness may be grounded in physics (i.e. no *ontological* gap), at present we cannot understand or explain *how* it is grounded in physics- not even in principle. In other words, there is an explanatory gap between physical (or neurobiological) facts and facts about consciousness / qualia. This is a gap in our knowledge.
- The particular importance of the conceivability of zombies w. absent qualia for the explanatory gap is this:
  - The **conceivability** of absent qualia indicates...
  - ...the logical **possibility** of a situation which is...
  - ...**incompatible** with a **physical explanation** of qualia/consciousness
  - → Explanatory gap

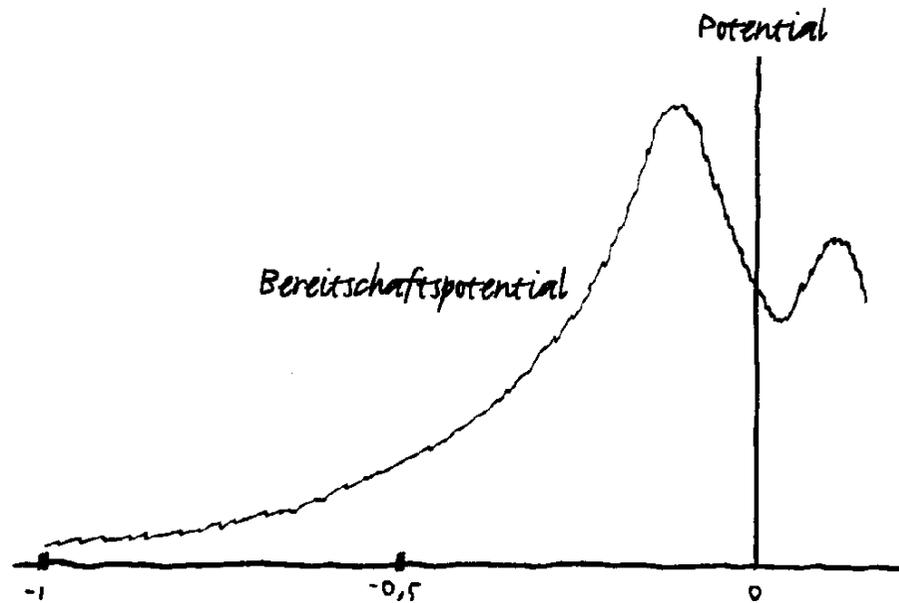
# The question of free will: Libet's and Co experiments

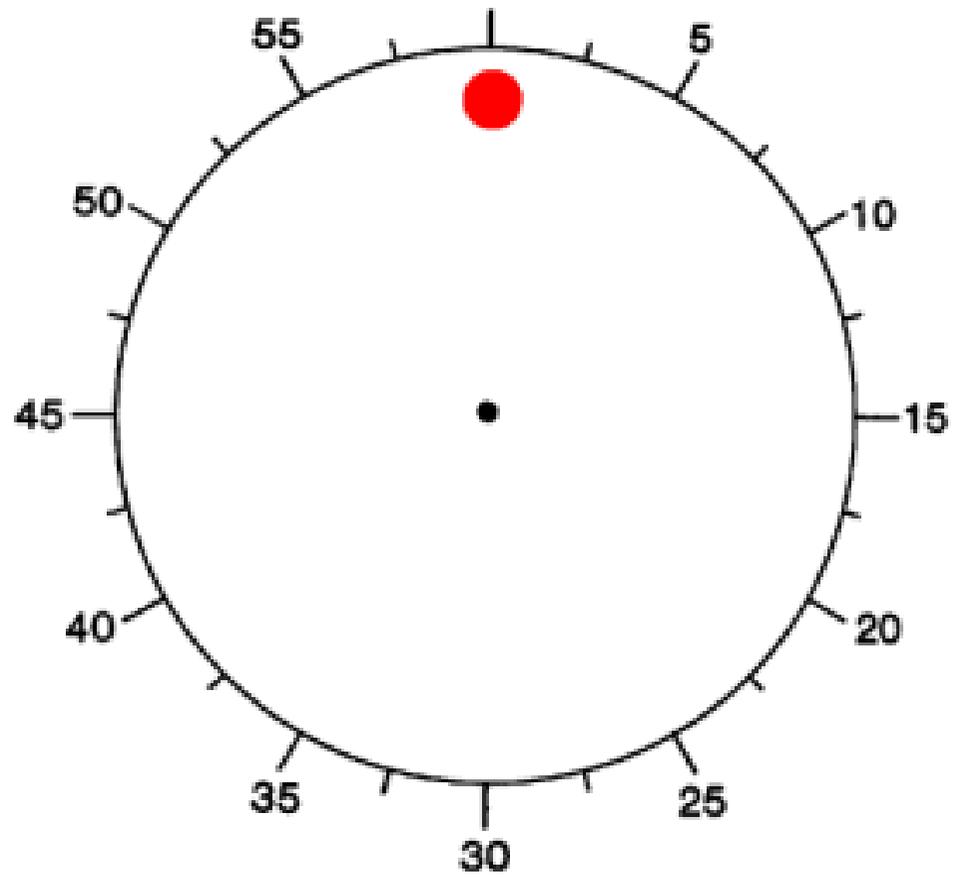


# The EEG: a quick reminder

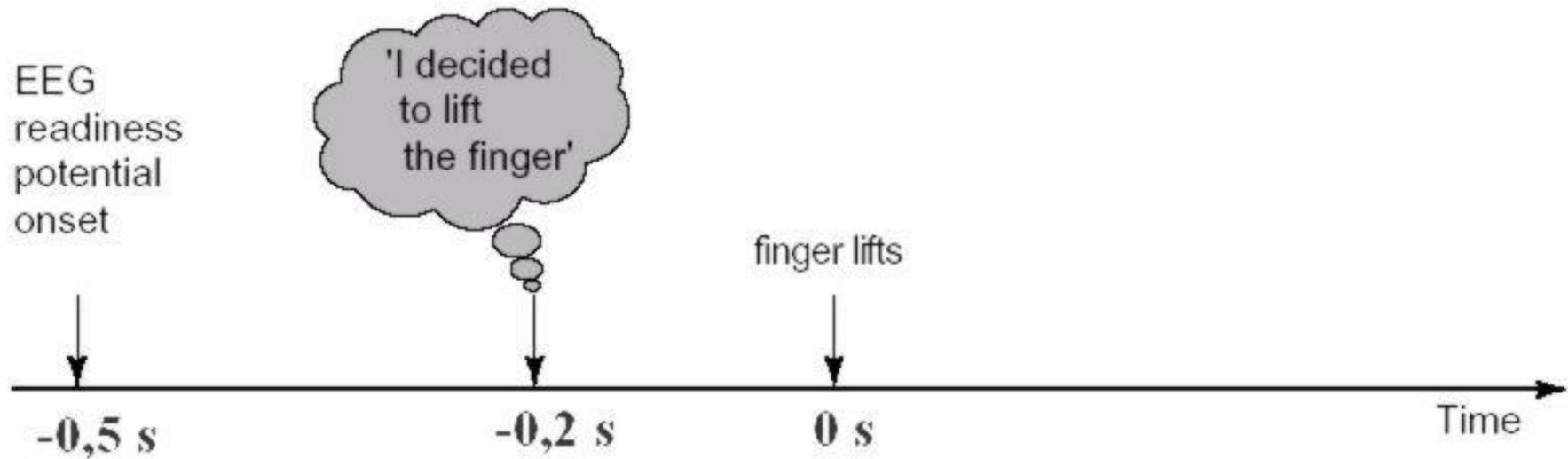


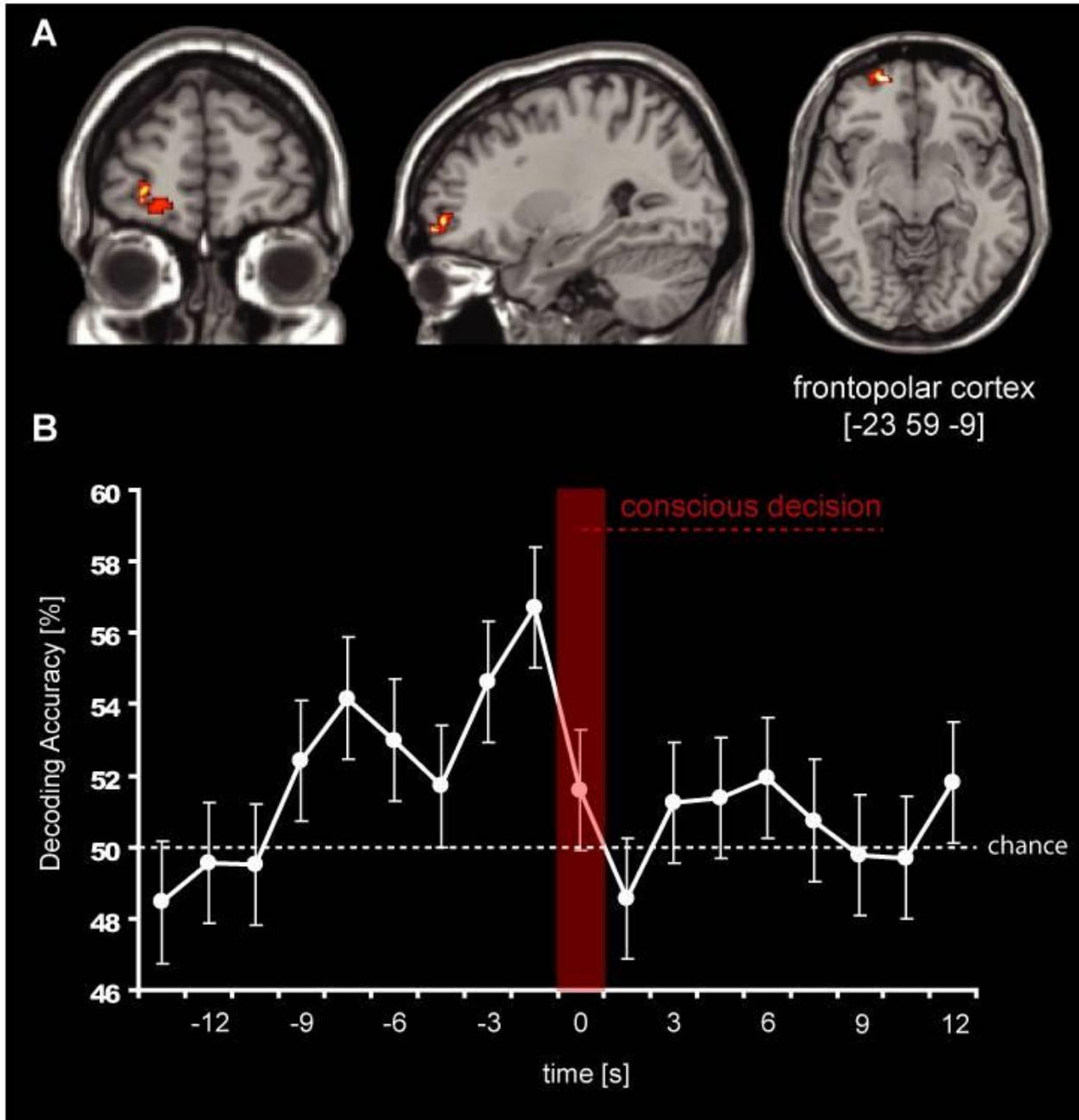
# The readiness potential „Bereitschaftspotential“ H. Kornhuber and L. Deecke (1965)





# Libet's experiment: summary





Bode et al. 2011