

# Inside the Plastic Brain

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# PROPOSITIONS OF THE THESIS

## INSIDE THE PLASTIC BRAIN

Measuring and Modulating Cortical Excitability with Transcranial Brain  
Stimulation for the Study of Neuroplasticity

Lukas Schilberg

1. Corticospinal excitability measures of TMS are dependent on the phase of cortical neural oscillations at the time of stimulation
2. Time and site specific frequency and phase of neuronal rhythms influence the efficacy of TMS
3. Controlling the properties of individual neuronal rhythms allows for specified applications of TMS
4. Closed-loop TMS will improve TMS efficacy for applications on the individual level
5. For scientific progress it is crucial to thoroughly study and understand the most fundamental processes first, before jumping to premature conclusions based on faulty assumptions
6. The discovery of fundamental processes that are reliable on an individual level is preferable to findings that are merely generalizable to a certain population
7. Not only a significant result, but also the absence of a significant finding can provide meaningful information
8. The greatest excitement comes from the discovery of something unexpected
9. Individualizing the measurement and modulation of neuroplasticity mechanisms allows for more specified and more effective therapeutic application options, which will provide social and economic value
10. The valorization is in the pudding
11. Everyone benefits from science