

# Striving for cognitive enhancement with RT-FMRI neurofeedback

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## Propositions of the thesis

### STRIVING FOR COGNITIVE ENHANCEMENT WITH RT-FMRI NEUROFEEDBACK

Tabea Kamp

1. Humans have the inherent strong capability to self-regulate their own cognition, emotions and behaviour, even their own brain activation. Neurofeedback might help to further refine this capability.
2. The state of the default mode network can predict subsequent cognitive performance levels and might therefore constitute an interposing gate for cognitive processing.
3. Whether rt-fMRI neurofeedback could be a method to enhance cognition still remains to be proven, including understanding neurofeedback mechanisms, elucidating brain states to be enhanced and assessing behavioural effects of brain state modulation.
4. Cognitive enhancement, independent of the method used to achieve it, should be investigated under special ethical considerations and researchers should prevent any abuse of potential scientific outcomes.
5. Interdisciplinary exchange between neuroscientific researchers and psychotherapeutic practitioners in neurofeedback research will increase the applicability and success of neurofeedback applications in the clinical field.
6. Descriptive results are important for getting a gist of the data. Within neurofeedback studies, single runs might contain more information and explanations of information processing than originally thought.
7. Making pre-registration of scientific studies more accessible would benefit the scientific community and work against the replication crisis.
8. Rt-fMRI neurofeedback might (if proven successfully) constitute an alternative, non-pharmacological add-on tool and learning mechanism to train cognitive functions in the future.
9. *"We cannot expect in the immediate future that all women who seek it will achieve full equality of opportunity. But if women are to start moving towards that goal, we must believe in ourselves or no one else will believe in us; we must match our aspirations with the competence, courage and determination to succeed."* (Rosalyn Yalow, medical physicist & 1977 Nobel Prize winner)