Induction of self awareness in dreams through frontal low current stimulation of gamma activity

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Ursula Voss, Romain Holzmann, Allan Hobson,
Walter Paulus, Judith Koppehele-Gossel, Ansgar Klimke &
Michael A Nitsche

OR: How to lucid dream

A Tea Talk
by Kristin Völk, 30.05.2014

Lucid Dreaming

Figure 1 Brain stimulation in the gamma frequency range during REM sleep enhances lucid dreaming. Voss *et al.*[3] report that gamma stimulation during REM sleep enhances the ability to gain conscious awareness in dreams. Through achieving such lucidity, the sleeper in this image gains control over her dream and is able to fly.

Why of scientific interest

1. Brain activity changes between primary and secondary conscious state

2. Elevated activity in lower gamma band (25-100Hz)

- ➜ Does lucid dreaming trigger gamma-band activity?
- ➜ Or the other way around?
- ➜ Lucid dreams dependent on gamma activity?

Experimental Setup

Figure 1 Brain stimulation in the gamma frequency range during REM sleep enhances lucid dreaming. Voss *et al.*[3] report that gamma stimulation during REM sleep enhances the ability to gain conscious awareness in dreams. Through achieving such lucidity, the sleeper in this image gains control over her dream and is able to fly.
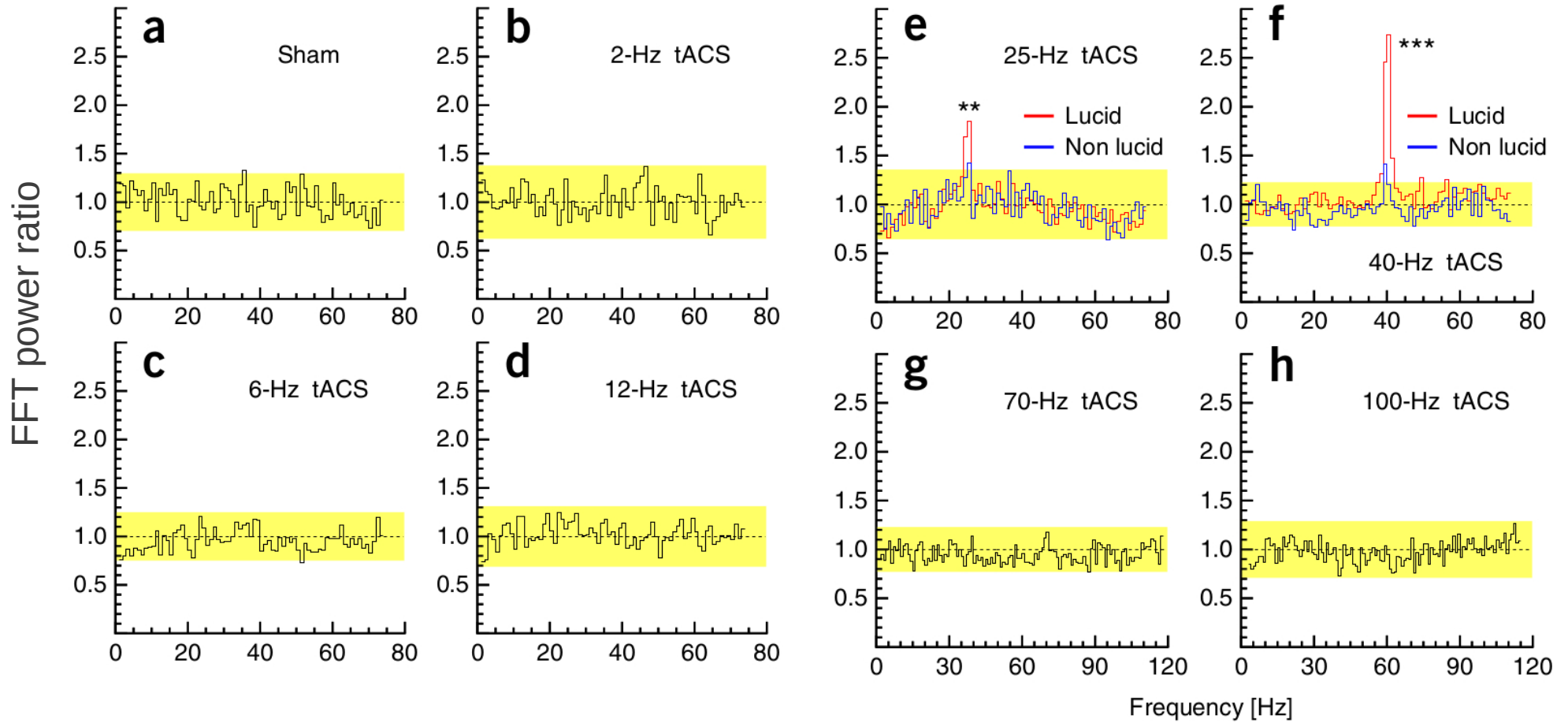
- fronto-temporal transcranial alternating current stimulation (tACS) @ 2, 6, 12, 25, 40, 70 & 100Hz and sham

- Recording of brain activity with EEG, EOG & EMG

- tACS after 2min of REM sleep → wake subjects, report dream (LuCiD scale)
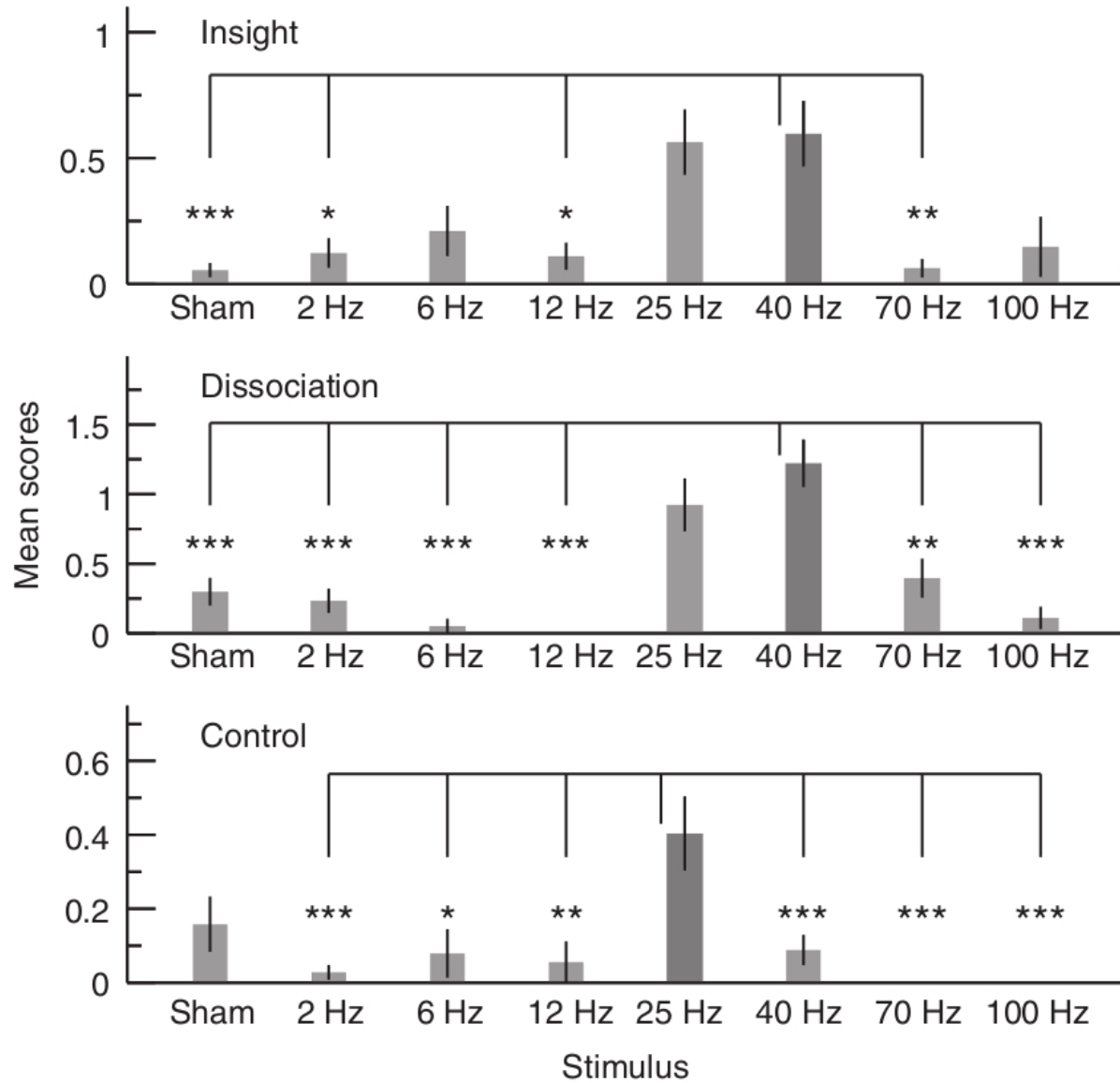
Consequences of tACS
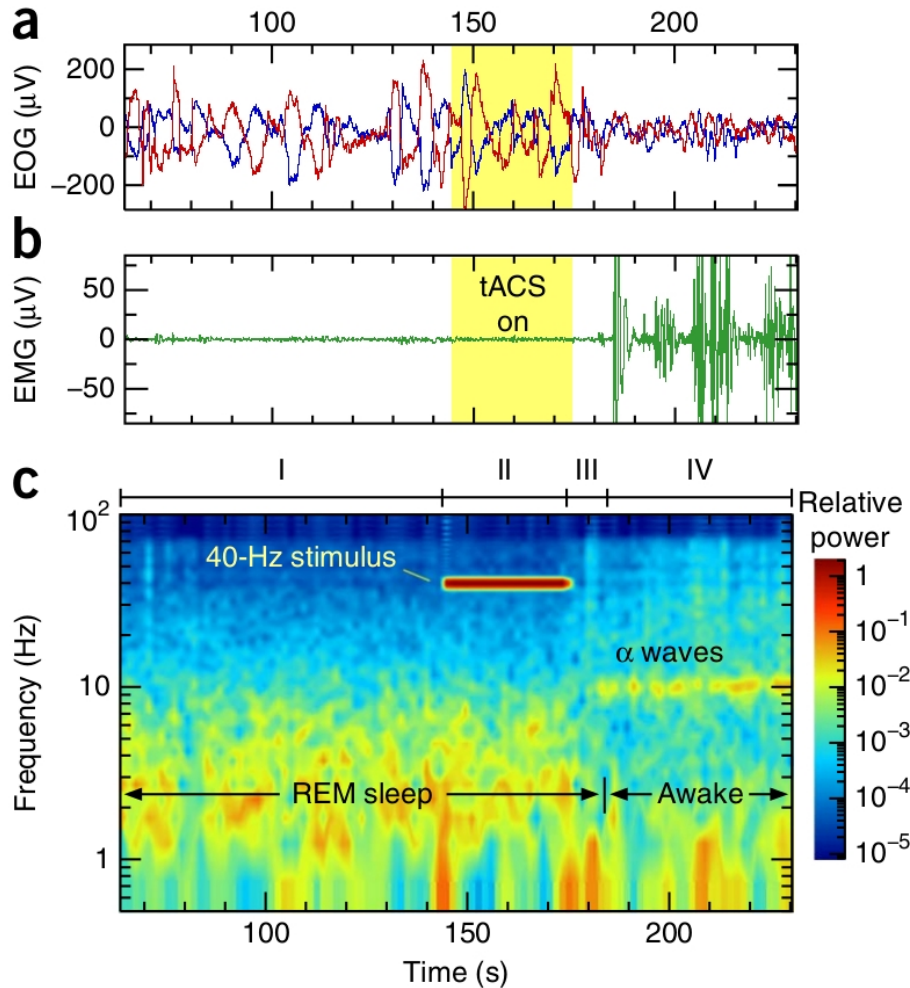
- REM sleep continuous through tACS

- Only change after awakening → alpha waves

Results of tACS

Results II of tACS

Conclusion

- tACS induced gamma oscillations alter conciuous awareness in REM sleep

- Effects only observer for 25Hz & 40Hz

  → oscillations relevant for higher brain functions

  → mediated by fast spiking interneurons involved gating sensory processing

- Medical applications:

  – restore/reset dysfunctional networks

  – PTSD: take control of nightmares