tDCS fails to affect criterion shifting during recognition memory

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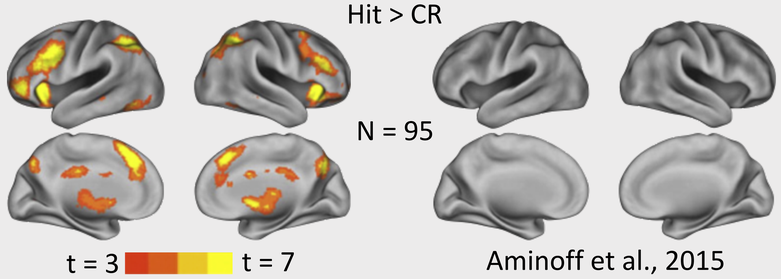
Abstract: 1060
P2.151

Fronto-Parietal Network

When people are conservative with their memory judgments there is increased fronto-parietal fMRI activity in the hit > correct rejection (CR) contrast[1].

Conservative **Liberal**



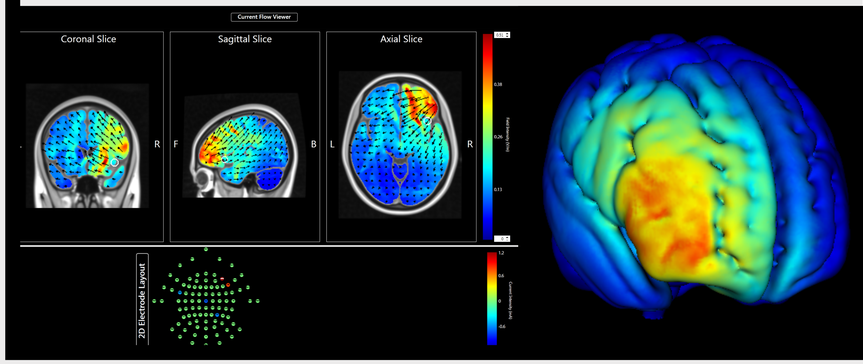
Can neurostimulation manipulate decision criteria?

Attempt 1: rTMS (continuous theta burst) over frontal regions failed to affect decision criteria[2].

Attempt 2: Diffuse tDCS over right prefrontal cortex in an attempt to affect larger brain area

Hypothesis

Anodal stimulation over right PFC should cause participants to establish more conservative decision criteria whereas cathodal stimulation should cause participants to establish more liberal criteria relative to sham. There are no expected differences in discriminability performance.



Recognition Memory Task

Study: 100 face images shown for 0.3 s
Test 1: Conservative bias condition: 30% of images are old
Test 2: Liberal bias condition: 70% of images are old

Within subject design

3 sessions (anodal, cathodal, sham): 2 tasks/session
Conduct task without tDCS and again with tDCS

Conclusion

Diffuse tDCS over right PFC failed to affect decision criteria or discriminability

What is ineffective? Neurostimulation methods, study design, and/or theory?

References

[1] Aminoff, E., Freeman, S., Clewett, D., Tipper, C., Frithsen, A., Johnson, A., Grafton, S.G., & Miller, M. (2015). Maintaining a cautious state of mind during a recognition test: A large-scale fMRI study. *Neuropsychologia, 67*, 132-147. https://doi.org/10.1016/j.neuropsychologia.2014.12.011

[2] Layher, E., Santander, T., Volz, L. J., & Miller, M. B. (2018). Failure to Affect Decision Criteria During Recognition Memory With Continuous Theta Burst Stimulation. *Frontiers in Neuroscience, 12*(705). https://doi.org/10.3389/fnins.2018.00705

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Brain Stimulation: 02/26/2019

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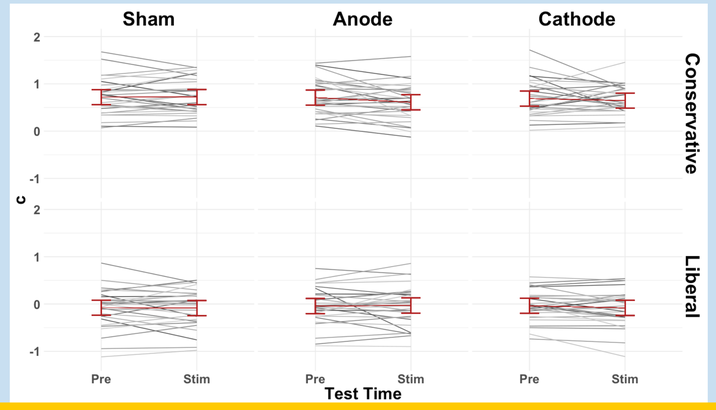
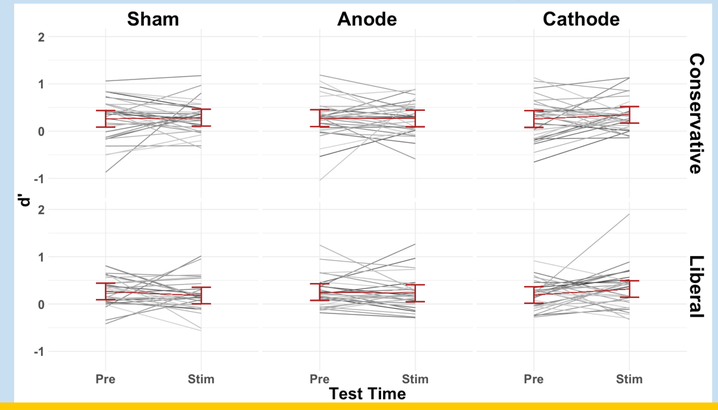
Results N = 30

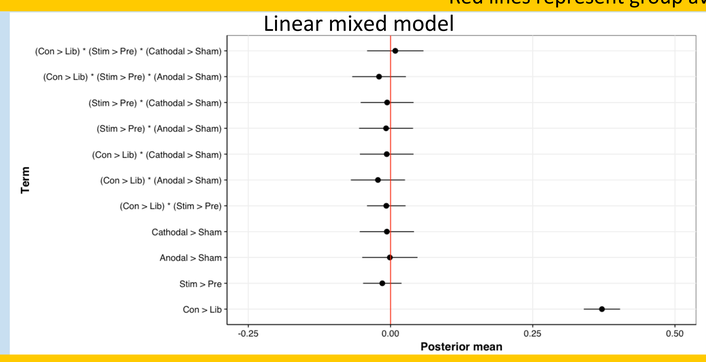
Decision Criteria

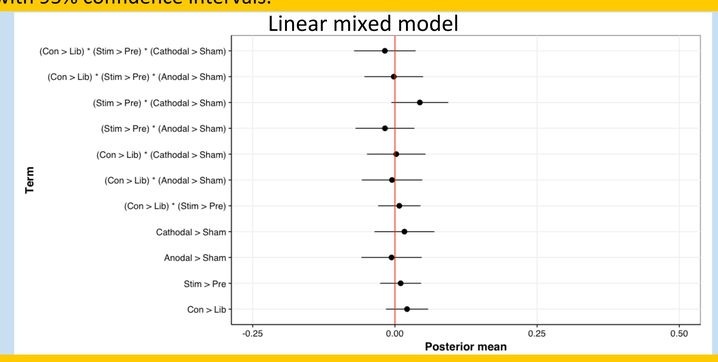


Discriminability



Gray lines indicate individual subject performance before (Pre) and during (Stim) tDCS during the conservative and liberal recognition memory test blocks.
Red lines represent group averages fitted with 95% confidence intervals.





Posterior mean of parameter estimates across fixed effects for c (left) and d' (right) models, fitted with 95% confidence intervals. Estimates NOT spanning zero are significant