Transcranial random noise stimulation enhances retention performance after training of a complex cognitive task.

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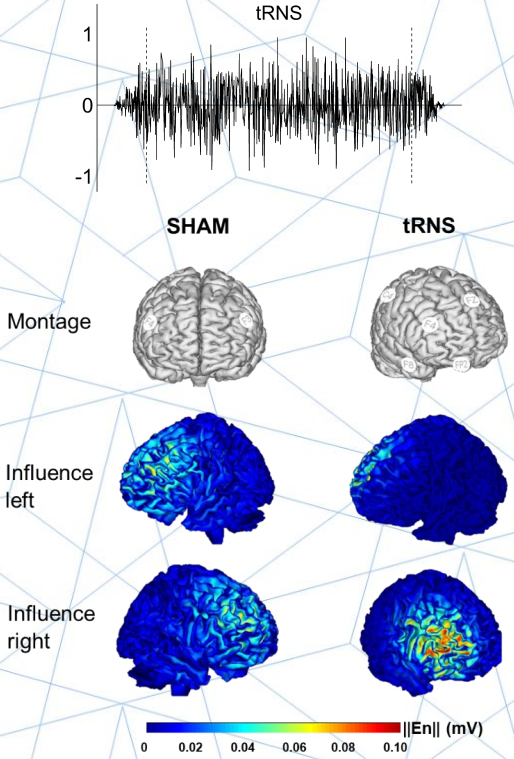
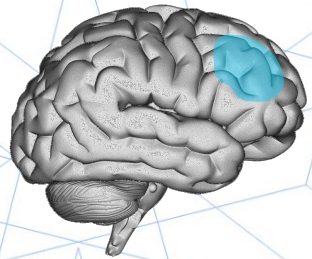
Introduction & Objectives





rDLPFC

rDLPFC
right Dorsolateral Prefrontal Cortex

IMPLICATED IN

complex task management [1]

OBJECTIVES

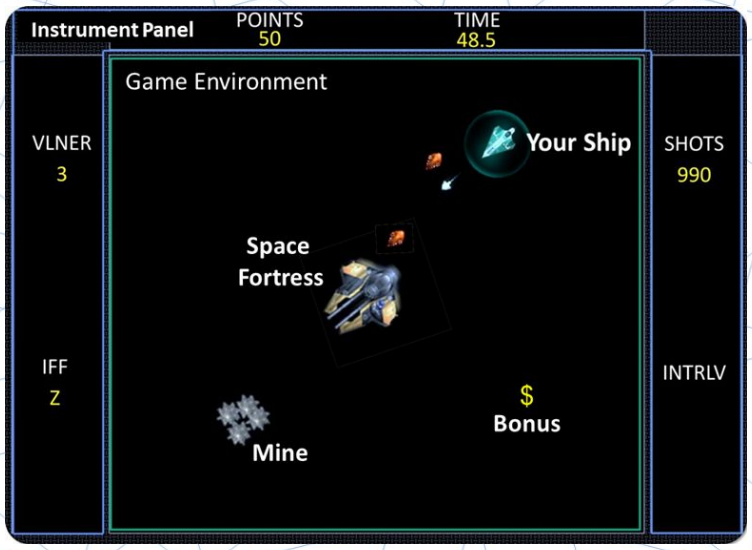
- ➔ To assess effect of tRNS over behavioral performance in complex task training
- ➔ Based on Snowball et al. (2013)[2]

HYPOTHESIS

Better long-term and retention performances for the stimulated group compared to sham.

Methods

The Space Fortress Game[3]



Total Score
Sum of 4 Sub-Scores

- Fortress
- Flight
- Bonus
- Mine

40 Healthy Participants

randomly assigned

STIM | **SHAM**

Each participant performed 11 game sessions (GS) over 7 consecutive days and 2 GS 10 days later.

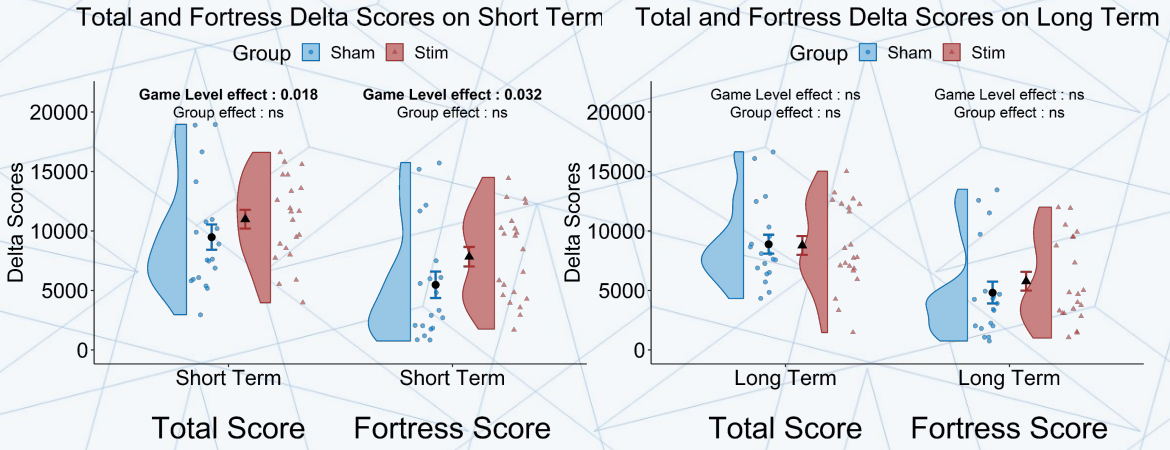
1 Game Session :

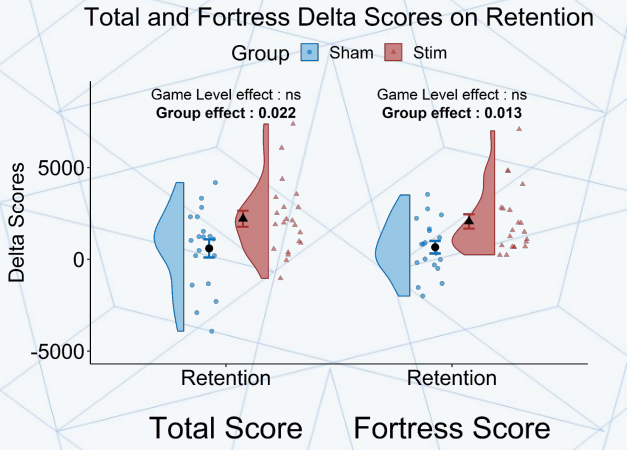
- 2 * 10” Space Fortress
- 20” Stimulation (STIM or SHAM)

Baseline	Training 1	Training 2	Training 3	Short-Term	Long-Term
Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 15**
GS1	GS2 GS3	GS4 GS5	GS6 GS7	GS8 GS9	GS10 GS11

Retention

Results





No Group effect on Short Term nor on Long Term Δ Scores

Group effect on Retention Δ Score

STIM > SHAM

Take home message

CONCLUSION

Stimulation of the rDLPFC

MAY NOT INDUCE

Faster Learning
Global progress of performance

MAY LEAD TO

Better consolidation effects of what has been learned

Stimulation of a specific target may not have a macroscopic effect[4]

PERSPECTIVES

- ➔ Further study on light aircraft pilots
- ➔ tRNS during ecological behavioral task : flight and multitasking
- ➔ Further evidence of a possible consolidation effect of focal tRNS over complex task management

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