

ON THE NETWORK SPECIFICITY OF THE TMS-EVOKED POTENTIALS

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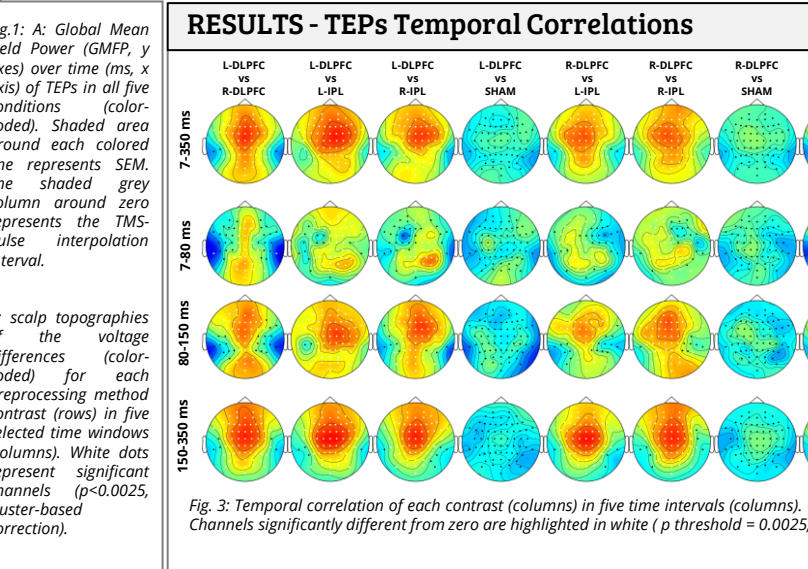
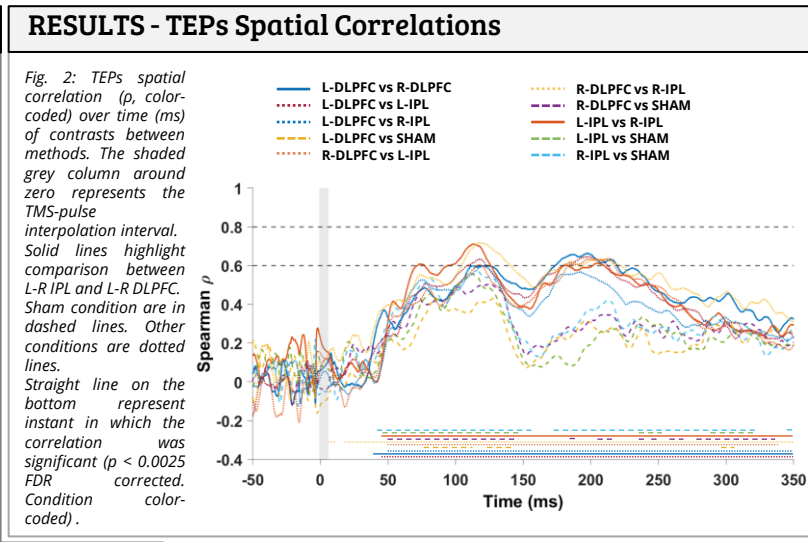
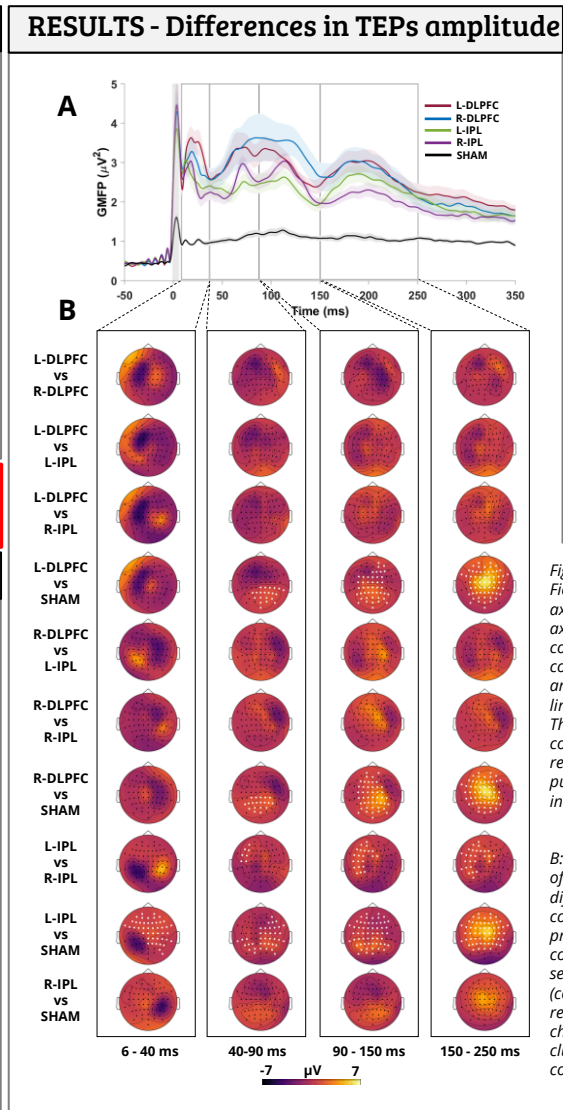
INTRODUCTION

- TMS-EEG can inform us about causal, effective connectivity [1].
- Targeting a network's node with TMS produces TMS-evoked potentials (TEPs) that represent the spread of the signal within the network [1] [2] [3].
- Here, we compared TEPs after the stimulation of different nodes of resting-state networks i.e., the default mode network (DMN) and the executive control network (ECN).

" Are TEPs specific for the stimulated network? "

METHODS

- 28 healthy elderly participants (65 – 80 y).
- 80 TMS single-pulses on nodes of the DMN i.e., L-R inferior parietal lobule (IPL) and on nodes of the ECN i.e., L-R dorsolateral prefrontal cortex (DLPFC).
- Cluster-based rm-ANOVA was performed to test differences between TEPs.
- Spearman correlation in temporal and spatial dimension was performed to find similarities between TEPs.
- H1: TEPs from the same network i.e., L- and R- DLPFC have no clusters of difference and are highly correlated in time and space. Comparisons between different network may have cluster of differences and may be less correlated.



RESULTS AND CONCLUSION

- Differences between conditions were significant mostly in real vs sham stimulations, except for L- vs R- IPL and R-IPL vs SHAM. The latter had a cluster of differences with a $p = 0.004$ that did not survive the Bonferroni correction (p threshold = 0.0025).
- Spatial correlation was low in the first 80 ms, with a steady increase that, according to the Shrout scale [2], reached moderate level at 100 ms for all conditions. After 100 ms, all the correlations with the sham dropped, while the other correlations reached again moderate level around 200 ms before slowly decreasing.
- Temporal correlations were moderate for most of real stimulation pairs. Sham condition was the least correlated.
- Low correlations in the first 80 ms suggest early area-specific responses.
- Moderate correlations with sham condition around 100 ms might represent non-specific sensory artifact that appears usually at those latencies.
- TEPs seem to show specificity to the target area and not to the target network. Further analyses are needed to clarify the specificity of the TEPs to the stimulated network i.e., component analysis.

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