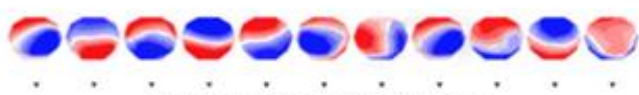
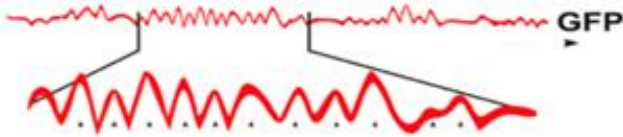
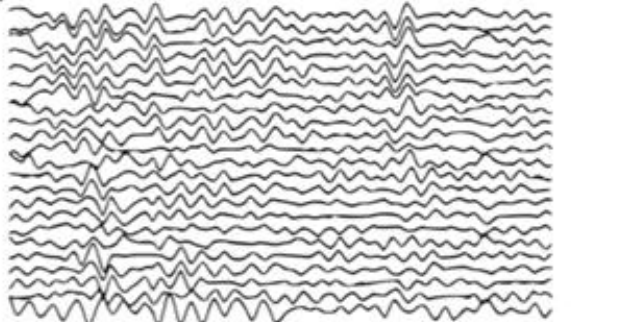


EEG microstates: Functional significance and short-term test-retest reliability

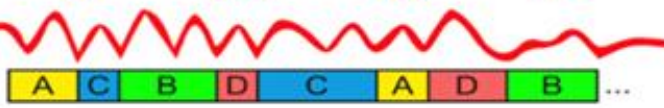
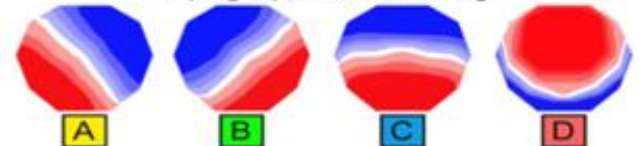
Elena Antonova, Martin Holding, Ho Chak Suen, Alex Sumich, Reinoud Maex, Chrystopher Nehaniv

4 canonical EEG microstates

Khanna et al (2015) *Neurosci Biobeh. Rev.*



Topographic Clustering



Duration (ms) Coverage (%) Occurrence (1 sec)

A → C – pair-wise transitional probabilities

Final sample

20 participants (16 males, mean age: 31.5, ± 12.5)

Paradigm design

2 Runs: mind-wandering → verbalization → visualization (x 2)

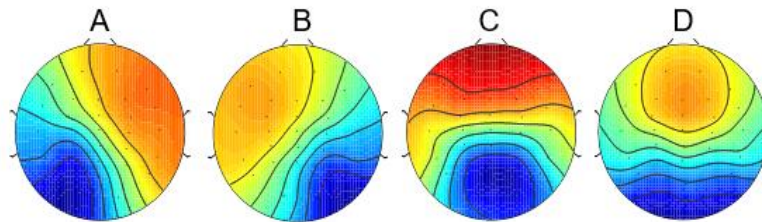
'square'



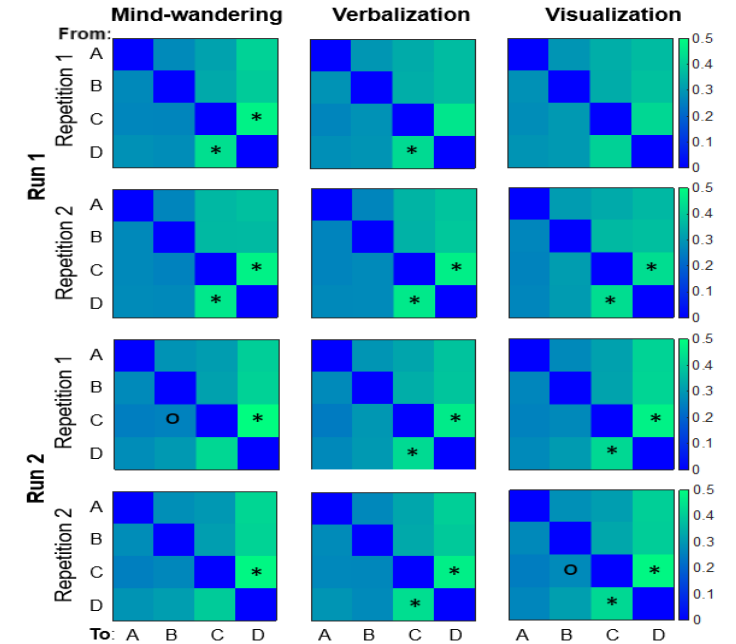
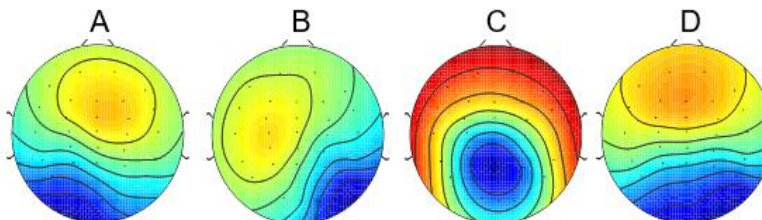
self-paced repetition every 2 sec

30-channel EEG cap

a) Maps of canonical EEG microstate classes from Milz et al. (2016) study



b) Maps of data-driven EEG microstate classes for the present study



Highlights

- EEG microstate class D appears to be associated with mind-wandering; the functional significance of A, B, and C is unclear.
- ICCs ranged between 0.3-0.9; *duration* and *occurrence* of class D had the highest; *duration* was most reliable parameter overall.
- Test-retest reliability of transition probabilities between EEG microstates is poor (due to poor reliability of *occurrence*).
- Alpha power driving EEG microstates was stronger at the start of each run (alpha poor test-retest reliability was good-to-excellent).
- Studies using EEG microstates as clinical biomarkers should use short experimental runs to avoid fatigue due to time-on-task.