

# repetition positivity in an oddball paradigm

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SS 2021 course „methodological working in neuroscience“

## 1) Introduction

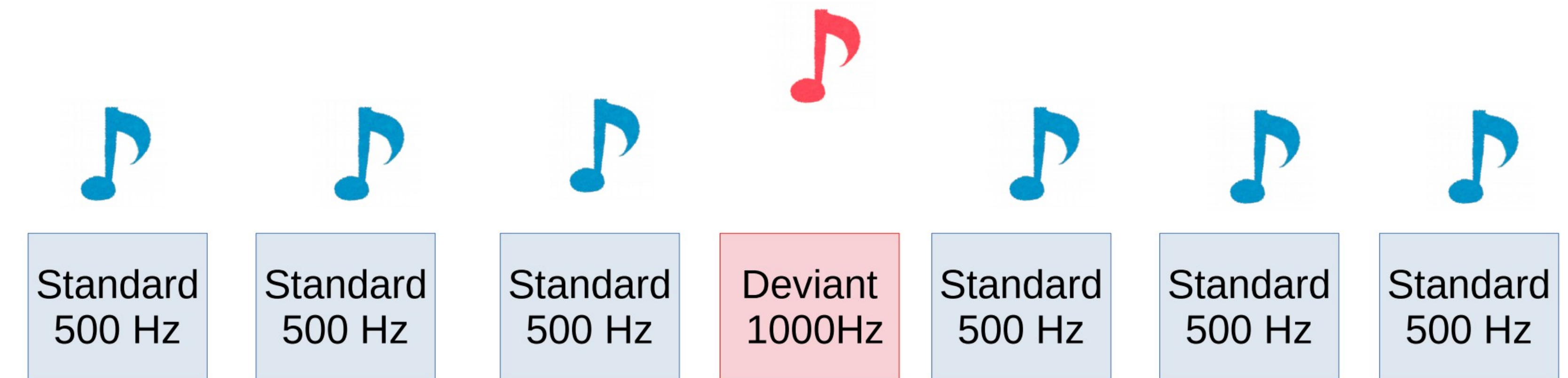
The repetition positivity (RP) is a slow fronto-central located positive wave occurring between 50 and 250 ms post-stimulus which is observable a repeated standard stimulus<sup>1</sup>. It is associated with memory trace and stimulus-specific adaption and increases with stimulus repetition<sup>2</sup>. I want to investigate the RP using the oddball paradigm, consisting of sequences of repetitive stimuli, that are infrequently interrupted by a deviant stimulus

## 2) hypothesis

- 1) Firstly, the typical P300 component should be observable
- 2) The increase of the RP with increasing number of repetition implies that the RP does not only depend on the last stimulus.  
Question: what happens to the RP after a deviant?  
a) the RP is reset completely  
b) the RP decreases but does not vanish

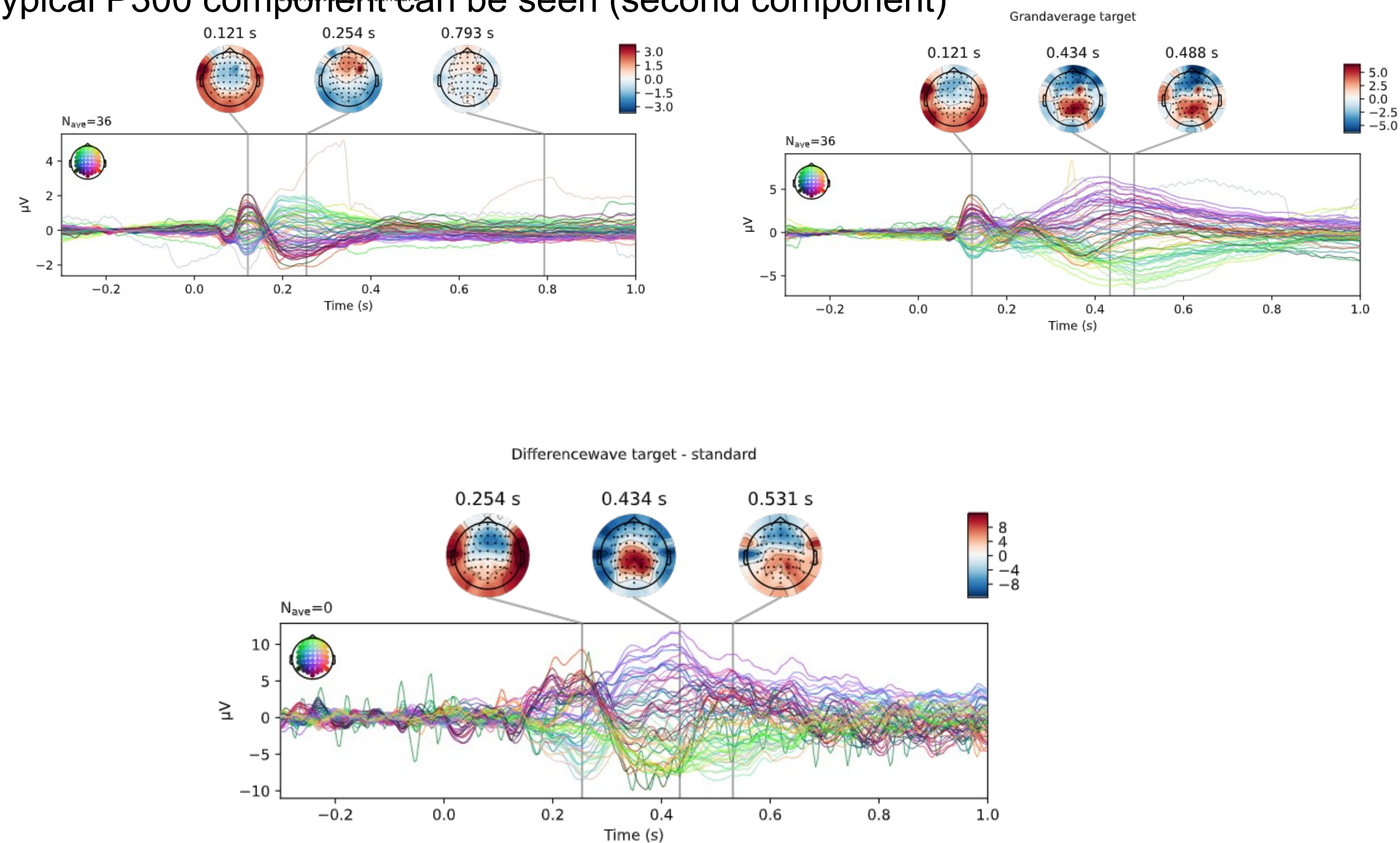
## 3) Methods

13 Participants performed three identical sessions of 13 minutes each. 750 stimuli were presented with 70% of them being standard (500 Hz pure tone lasting 60 milliseconds), 15% being oddball (1000 Hz pure tone lasting 60 ms) and 15% being distractors (1000 Hz white noise lasting 60 ms).<sup>3</sup>



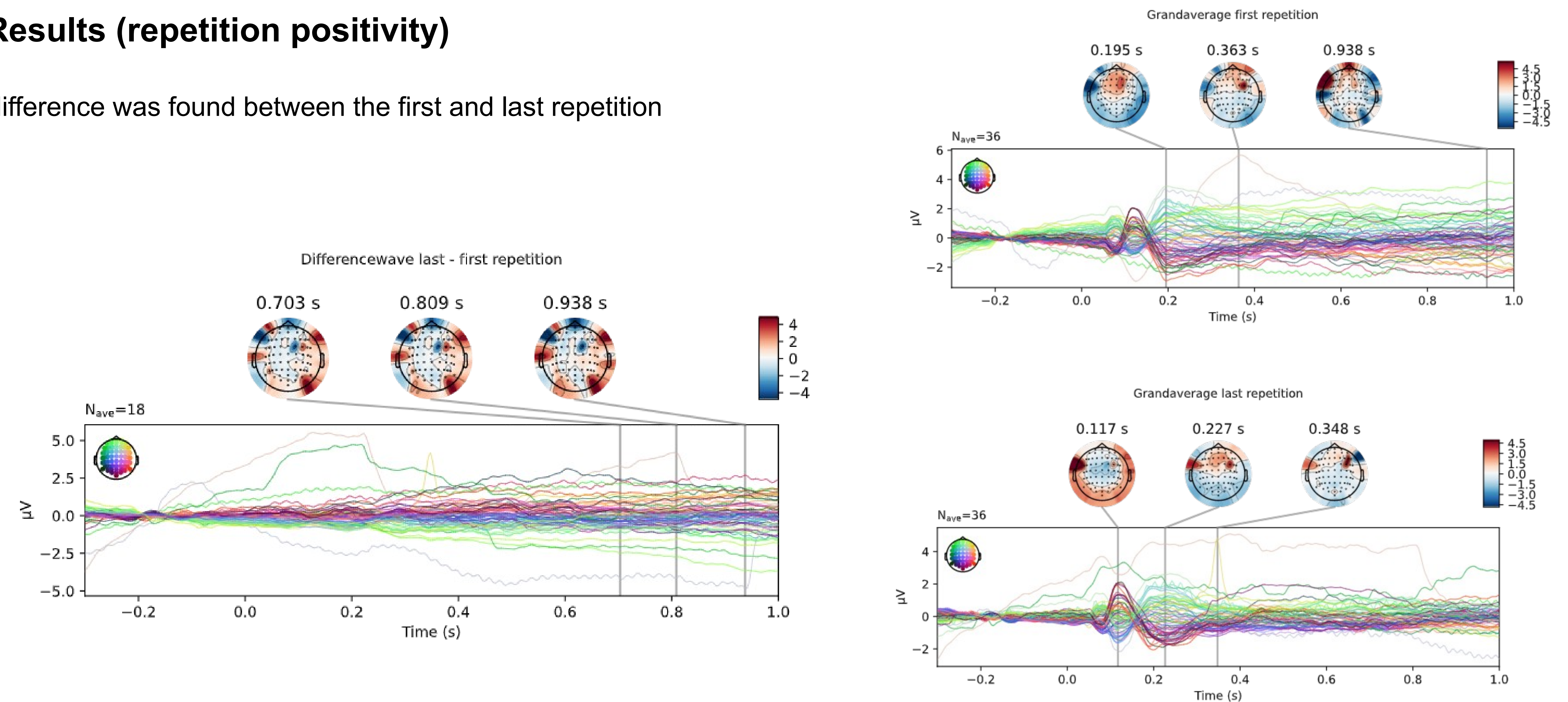
## 4) Results (oddball paradigm)

Typical P300 component can be seen (second component)



## 4) Results (repetition positivity)

No difference was found between the first and last repetition



## 5) Discussion

A typical P300 effect of the oddball paradigm could be observed for the target deviant items compared to the standard items. However the repetition positivity could not be observed. One reason could be that the RP did not exist in this design as it has a different design than other RP experiments, which had much more repetitions. Another reason could be that the RP does not decrease at all after the deviant so the amplitude of the first and last repetition are the same.

## 6) References

- 1) Haenschel, C., Vernon, D. J., Dwivedi, P., Gruzelier, J. H., & Baldeweg, T. (2005). Event-related brain potential correlates of human auditory sensory memory-trace formation. *Journal of Neuroscience*, 25(45), 10494-10501.
- 2) Baldeweg, T. (2007). ERP repetition effects and mismatch negativity generation: a predictive coding perspective. *Journal of Psychophysiology*, 21(3-4), 204-213.
- 3) Arnaud Delorme (2020). EEG data from an auditory oddball task. OpenNeuro. Dataset doi: 10.18112/openneuro.ds003061.v1.0.1