

Is pitch chroma discrimination automatic?

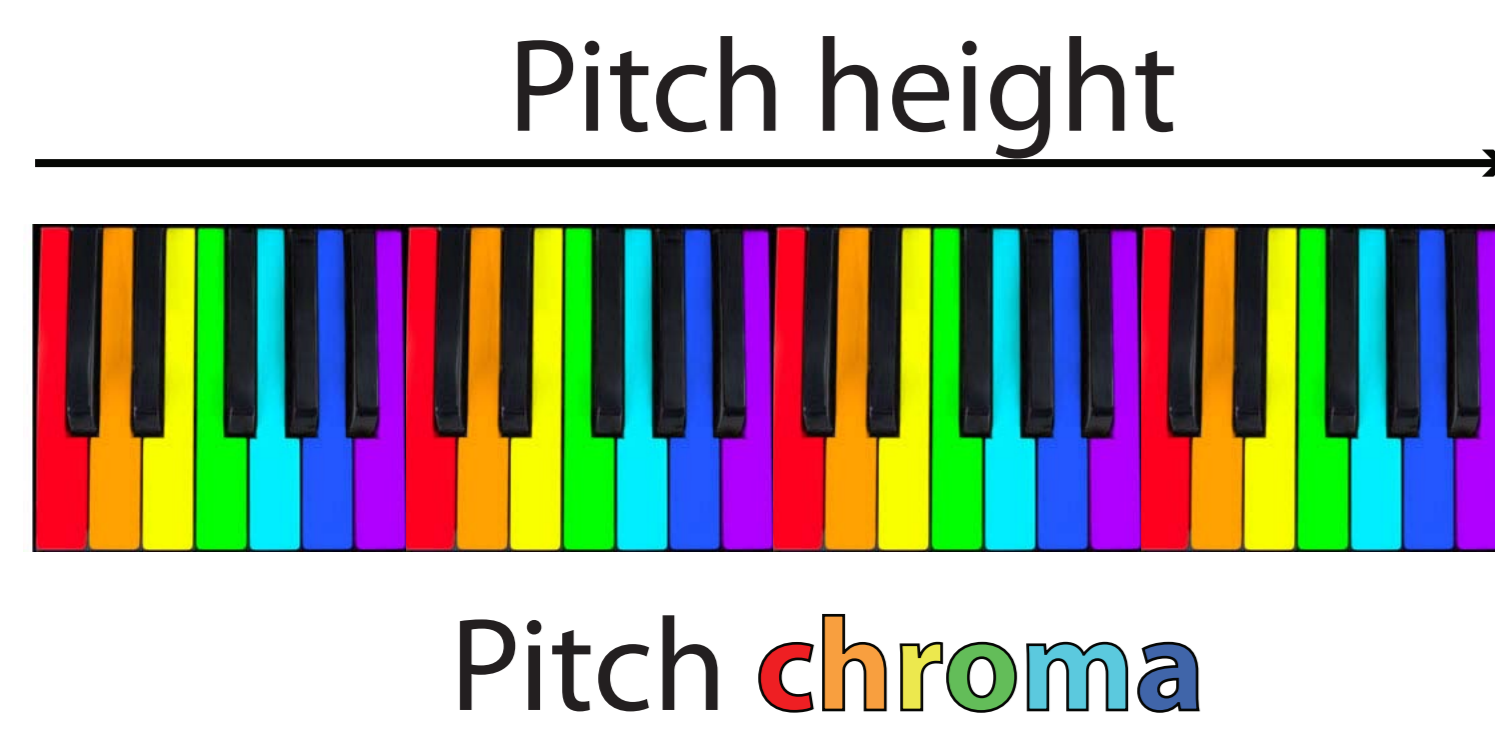
An EEG study

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Introduction

- Pitch is frequently described as bi-dimensional:

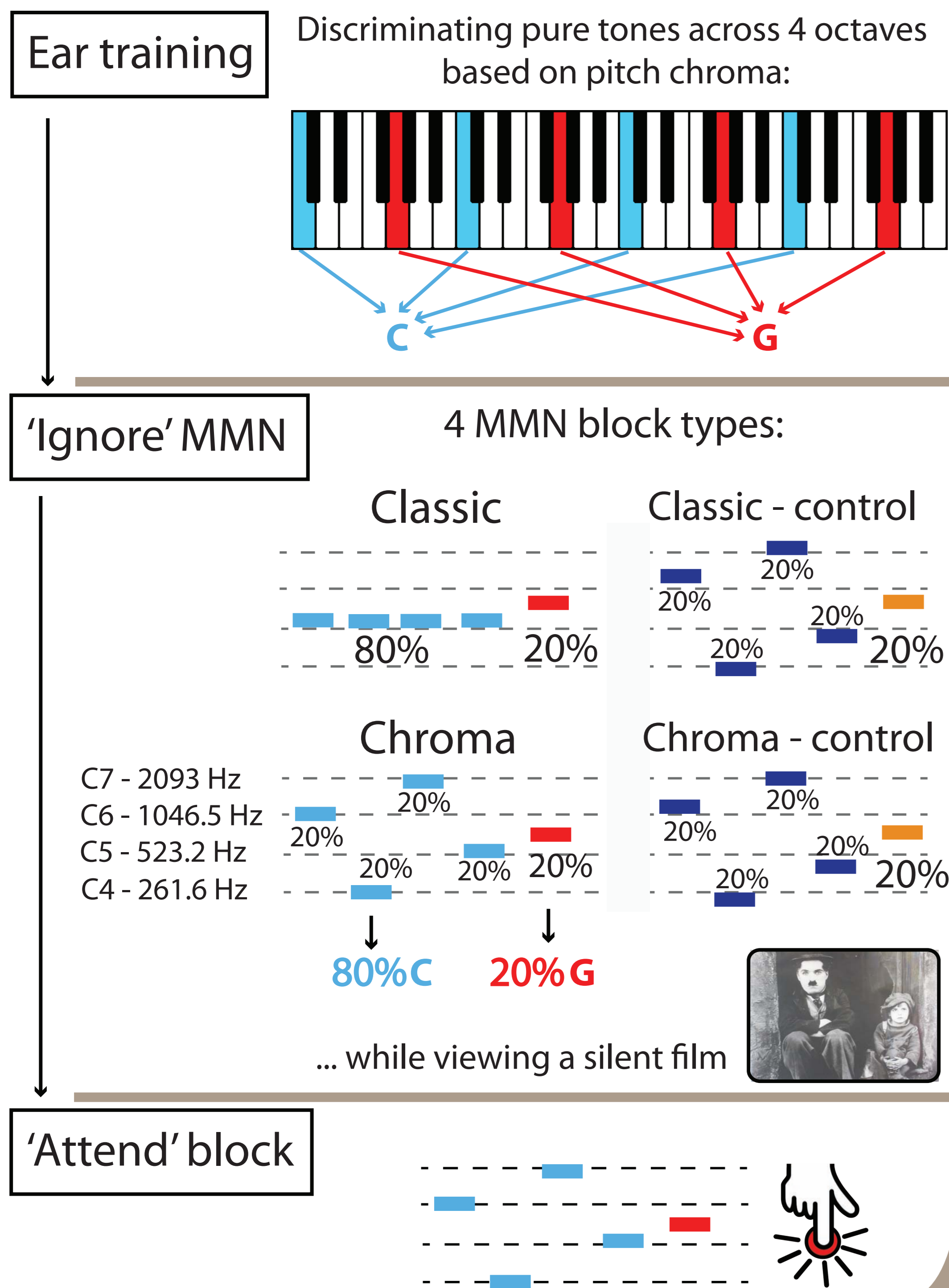


- Is pitch chroma processed automatically in the human brain?

- Mismatch Negativity (MMN) - an ERP (EEG) component indexing automatic detection of deviation from auditory regularity

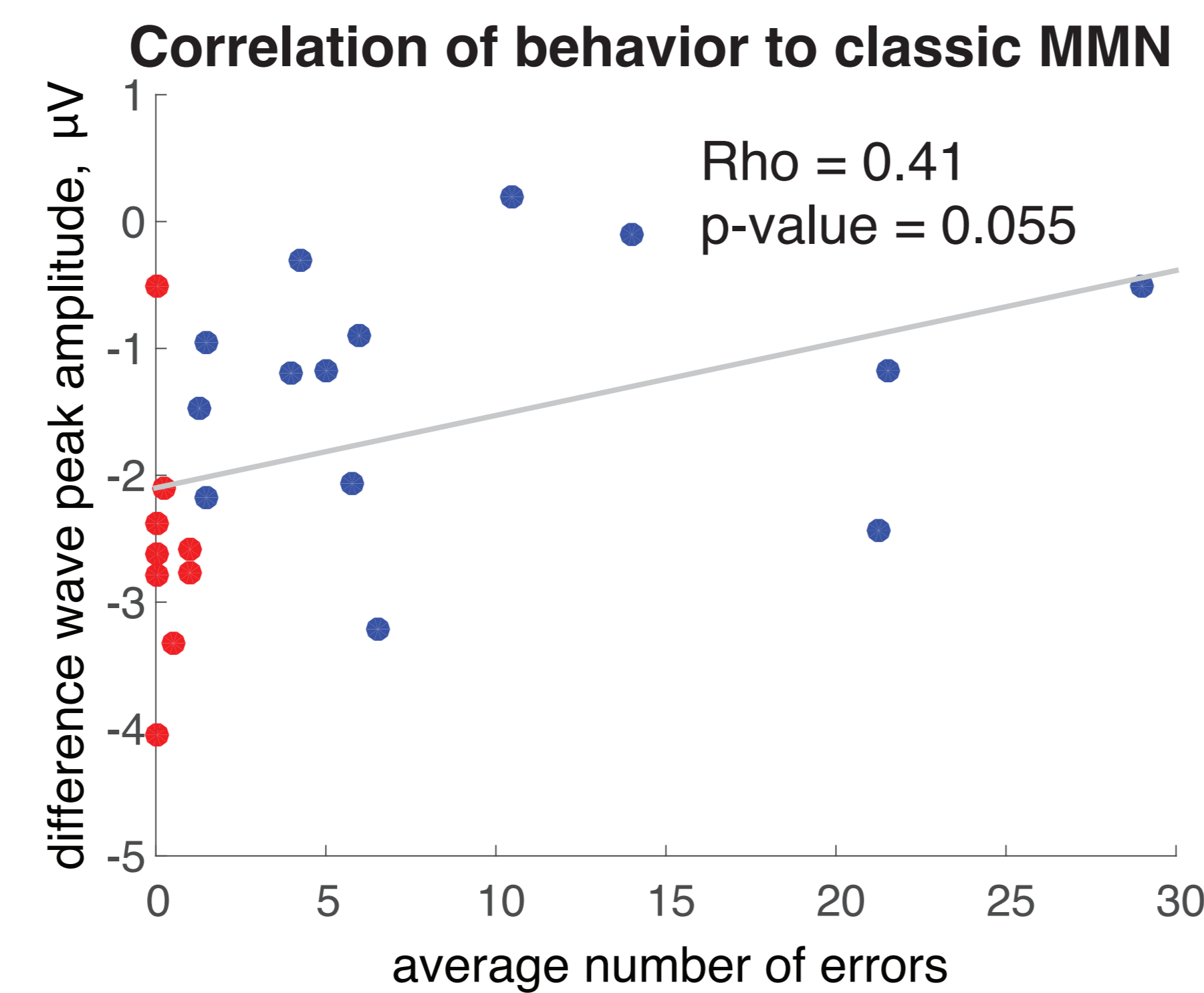
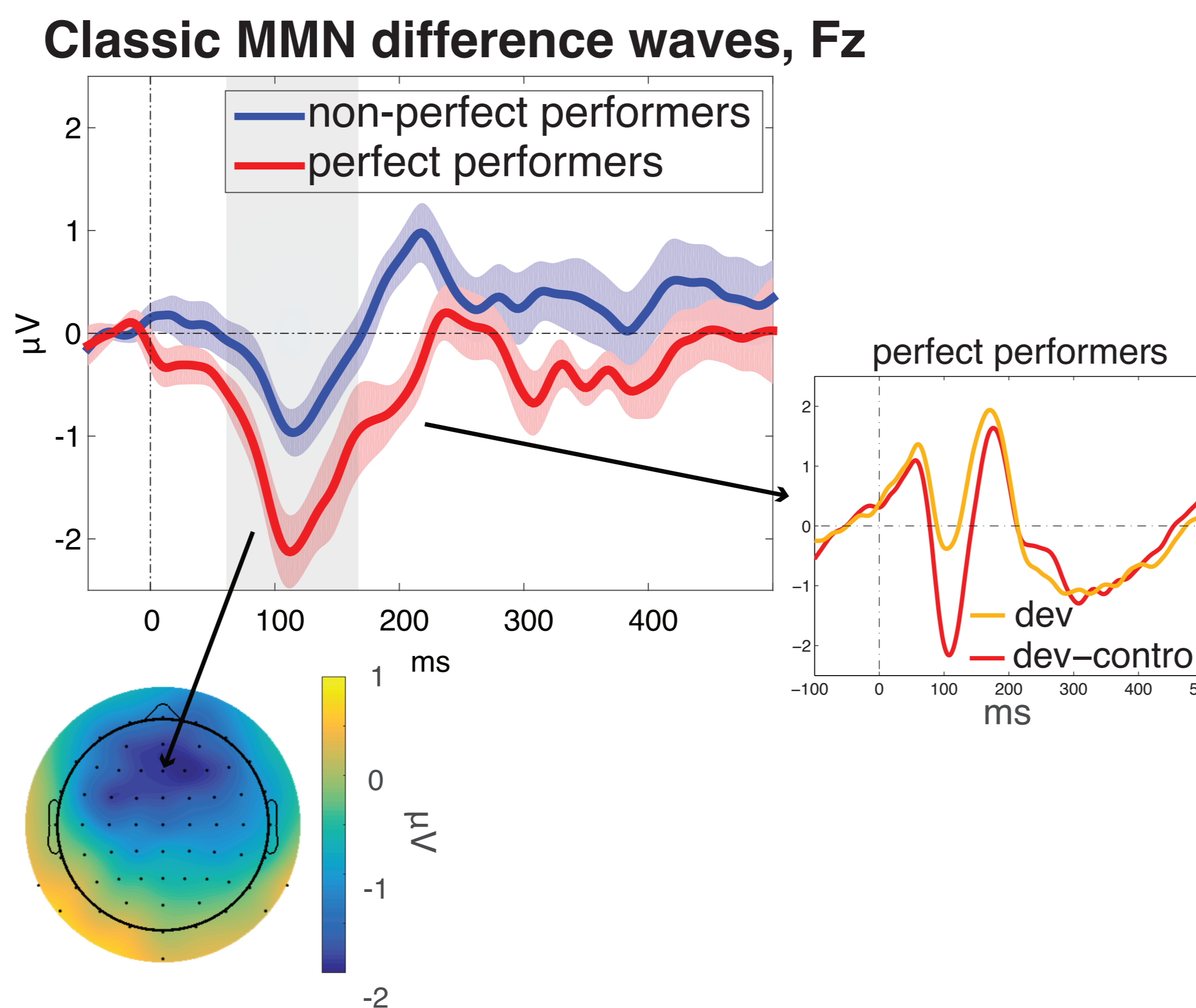
Methods

- 27 musicians, EEG experiment:



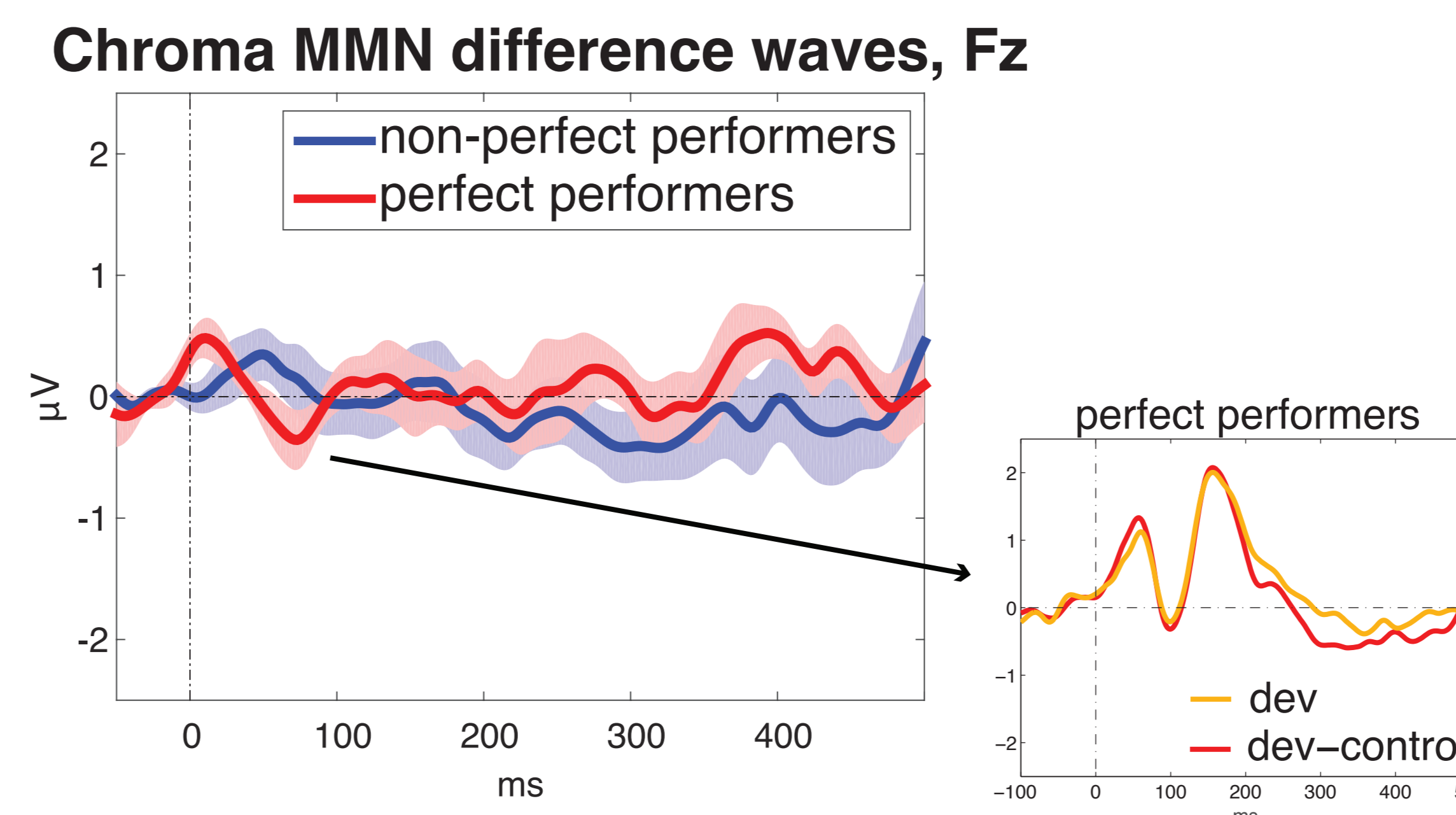
Results

- Classic MMN magnitude correlates to performance in the pitch chroma discrimination task.



Results

- No chroma-related MMN neither in good nor bad performers.

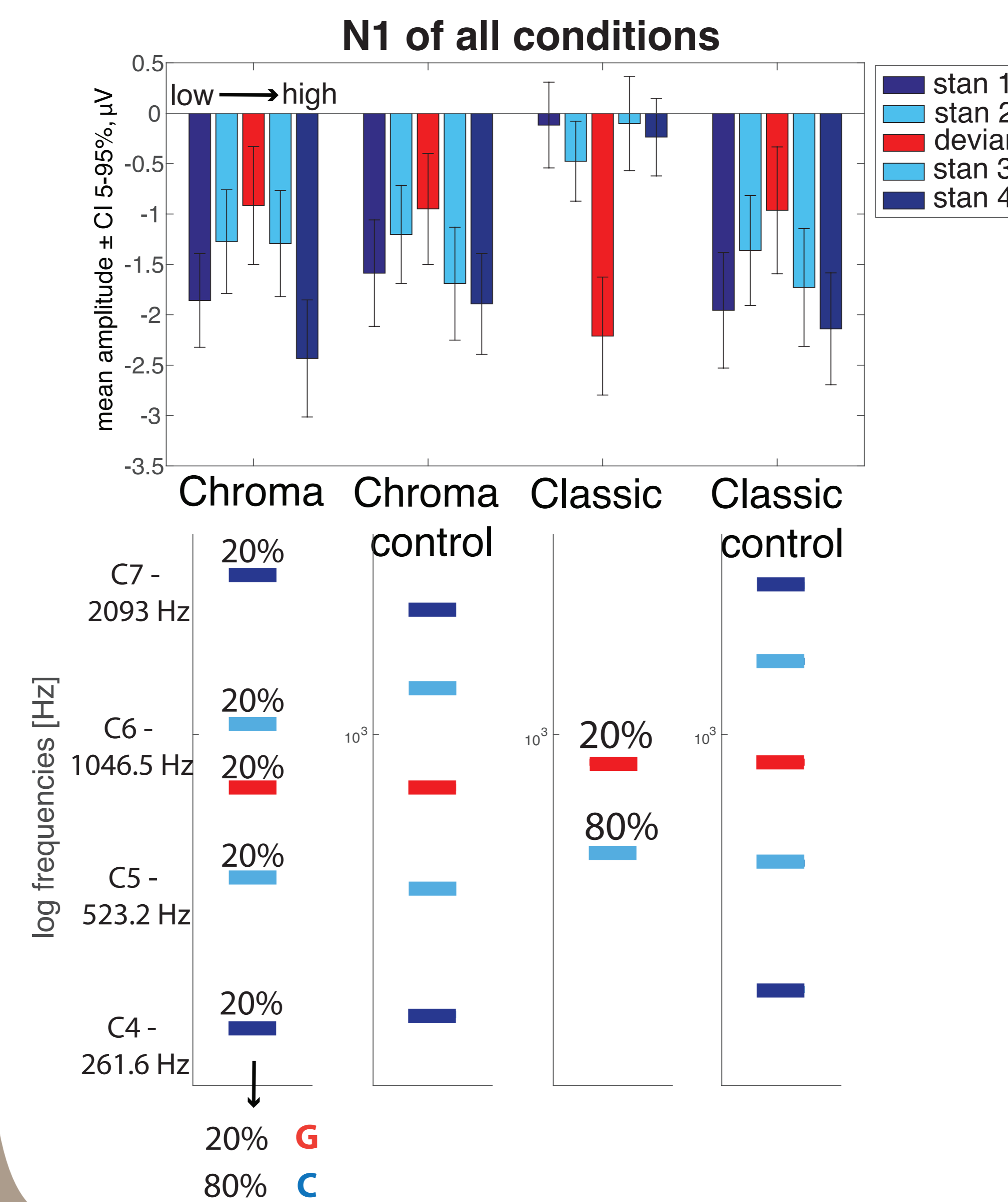


- N1 adaptation is based on distance from the mean

Repeated measures one-way ANOVA

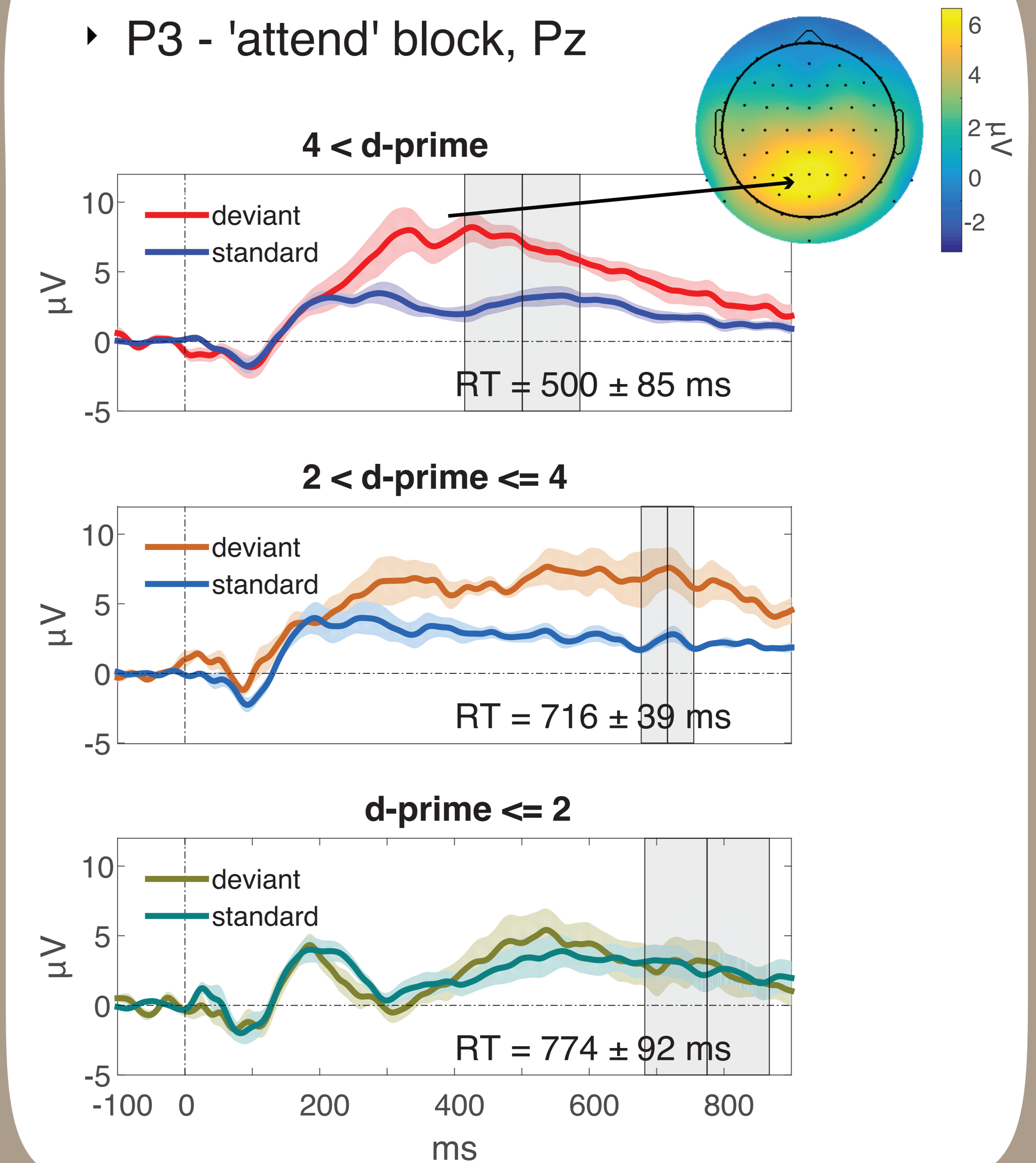
standard far from the mean
standard close to the mean
deviant

p <<< 0.01
highly significant in all block types



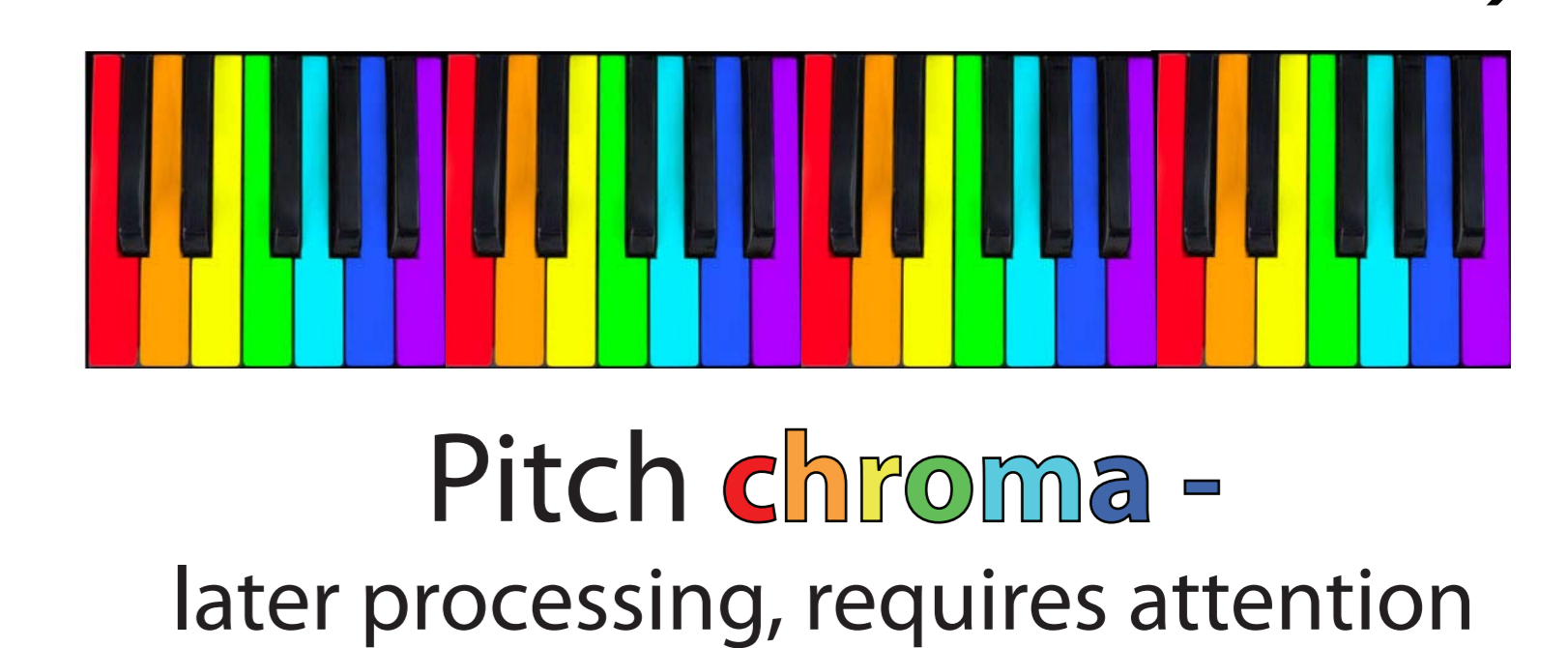
Results

- P3 - 'attend' block, Pz



Conclusion

Pitch height - processed automatically and pre-attentively



- Discriminating pitch chroma of pure tones is a task that can be learned and performed, but it is not implemented in the brain automatically and pre-attentively, and might require more elaborate cognitive processes.
- N1 modulated by temporal summary statistics?