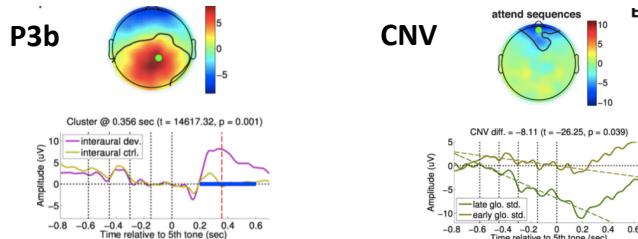


# What does consciousness add to expectations in EEG?

## Background

Hierarchical predictive coding (Friston 2008)

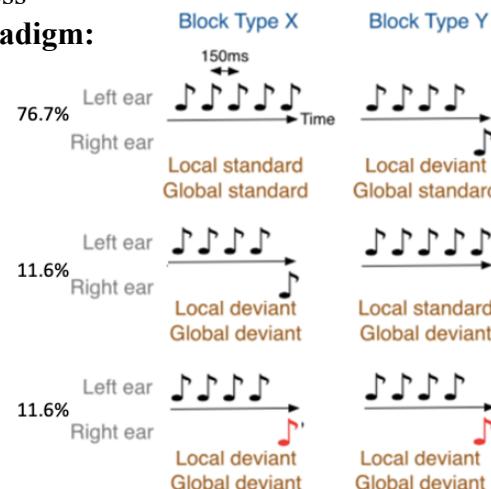
The hypothesis that cortical circuits use Bayesian inference to maintain a successive hierarchy of generative models of sensory causation – **P3b** (event related potential (ERP) for oddballs)



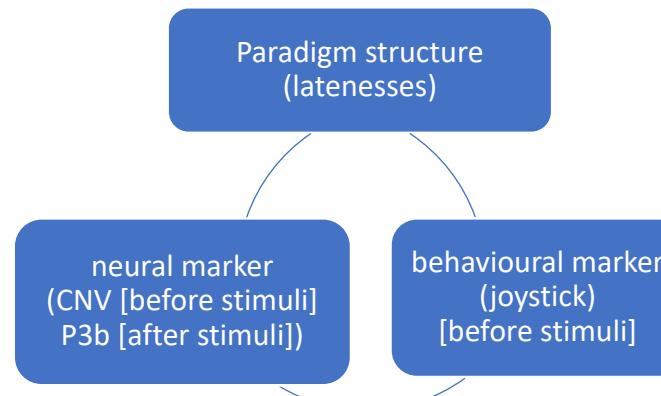
**Contingent negative variation (CNV)** (Walter et al. 1964; Chennu et al. 2013)

Event related potential during expectation, the slope of which varies with lateness

## Global-local paradigm:



## Hypotheses:



## Methods:

EEG!



### Within blocks:

Sequences:  
...001(1)/0001(1)/00001(1)... **[latenesses]**

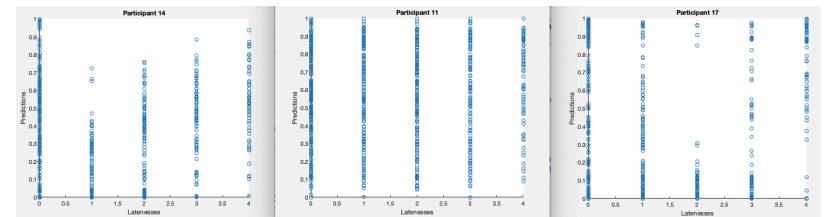
### Block structure:

- Classic global-local \*4  
– attention, no expectation
- Joystick prediction \*4  
– attention, expectation
- Motor control \*1 (no deviants)
- Classic global-local \*4  
– attention, expectation??

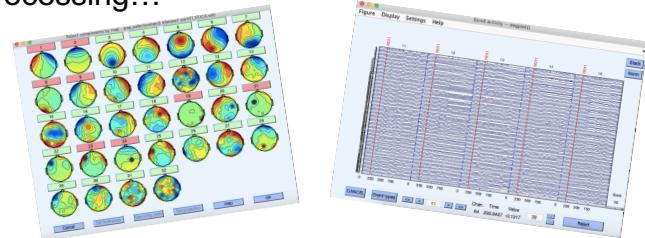


## Results so far:

### Behavioural:



### EEG: preprocessing...



## Plans

Finish data collection...

### Analyses:

- With latenesses:
  - Non-parametric: Kendal's tau
  - Parametric: linear contrast analyses
  - Trial-wise Polynomial regression?
- Without latenesses:
  - Correlation coefficient

... ...

Writing up!

## Discussion:

Did attention vary between blocks??

Chennu, Srivas, Valdas Noreika, David Gueorguiev, Alejandro Blenkmann, Silvia Kochen, Agustín Ibáñez, Adrian M. Owen, and Tristan A. Bekinschtein. 'Expectation and Attention in Hierarchical Auditory Prediction'. *Journal of Neuroscience* 33, no. 27 (3 July 2013): 11194–205. <https://doi.org/10.1523/JNEUROSCI.0114-13.2013>.

Friston, Karl. 'Hierarchical Models in the Brain'. *PLoS Computational Biology* 4, no. 11 (7 November 2008). <https://doi.org/10.1371/journal.pcbi.1000211>.

Walter, W. Grey, R. Cooper, V. J. Aldridge, W. C. McCALLUM, and A. L. Winter. 'Contingent Negative Variation : An Electric Sign of Sensori-Motor Association and Expectancy in the Human Brain'. *Nature* 203, no. 4943 (July 1964): 380. <https://doi.org/10.1038/203380a0>.