Neural dynamics of event perception under reduced uncertainty

Karen Sasmita & Khena M. Swallow | Department of Psychology & Cognitive Science Program, Cornell University

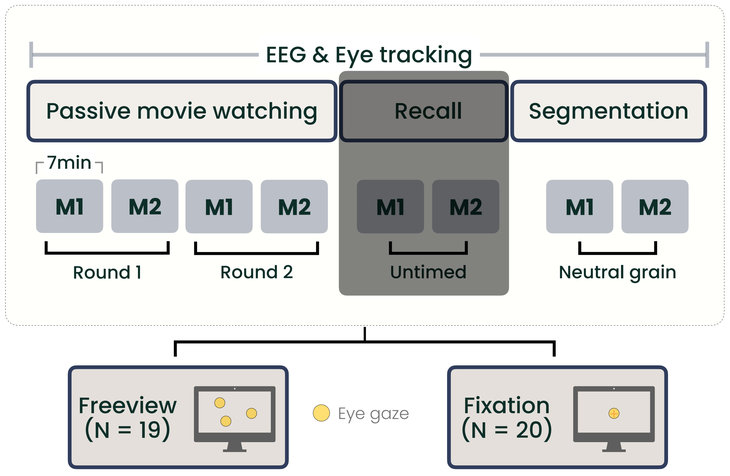
Introduction

- Event perception involves spontaneously dividing experience into discrete units (*event segmentation*) at points of uncertainty (*event boundaries*).[1]
- **How does event processing change when uncertainty around event boundaries are reduced?**

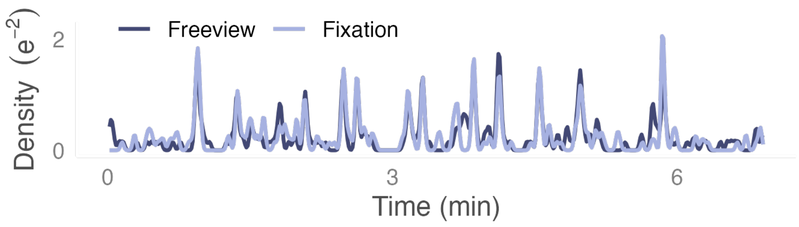
We examined whether EEG **delta (2-4 Hz)** and **alpha (8-12 Hz) power suppression** associated with external processing[2]:

- Are **more pronounced** at **event boundaries**
- Are **attenuated** with **reduced uncertainty**

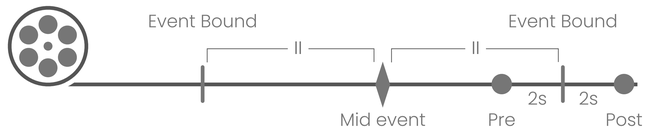
Experiment design

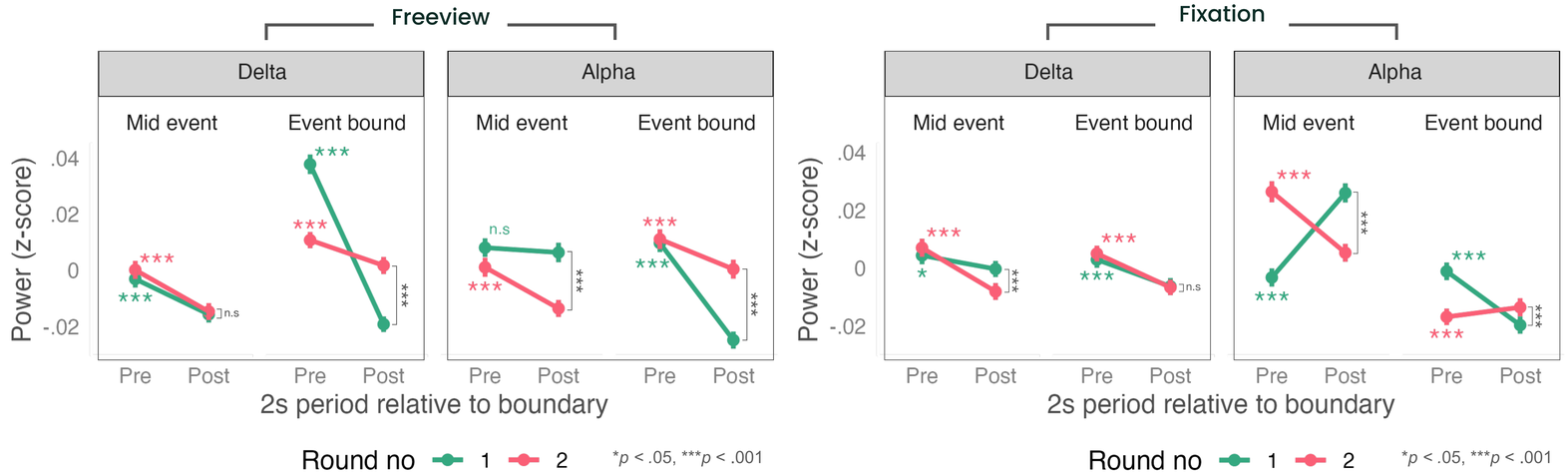


- Comparable segmentation in freeview and fixation.



Delta & Alpha power change across event boundaries and uncertainty level.

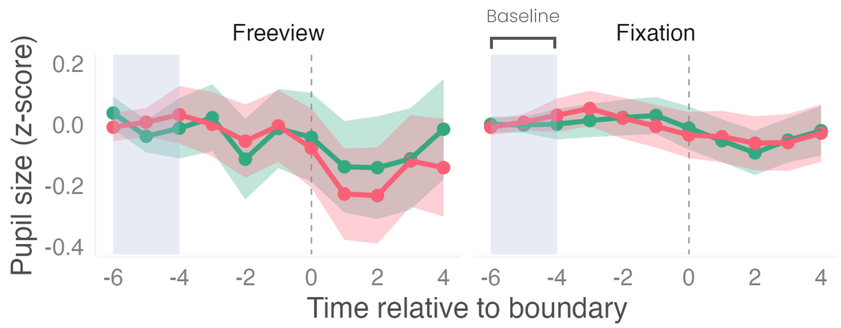




- Alpha suppression **at** & **across** event boundaries **attenuated** with ↓ uncertainty in freeview & fixation.
- Delta suppression **across** event boundaries **attenuated** with ↓ uncertainty in freeview.

Pupil size changes across event boundaries.

*Preliminary finding



- Pupil size **decreases** across event boundary.
- Decrease is **consistent** across degree of uncertainty.

Conclusion

- Neural markers of external processing are **amplified from pre to post** event boundaries.
- This effect was **attenuated** with reduction in uncertainty from:
  - Developing knowledge about **what happens when.**
  - Whether that knowledge was developed via **active visual sampling.**

References

1. Zacks, et al., (2007). *Psych Bull,* 133(2): 273-293.
2. Wamsley et al., (2023). *JoCN,* 35(10): 1617-1634

Download a copy

ss3837@cornell.edu