

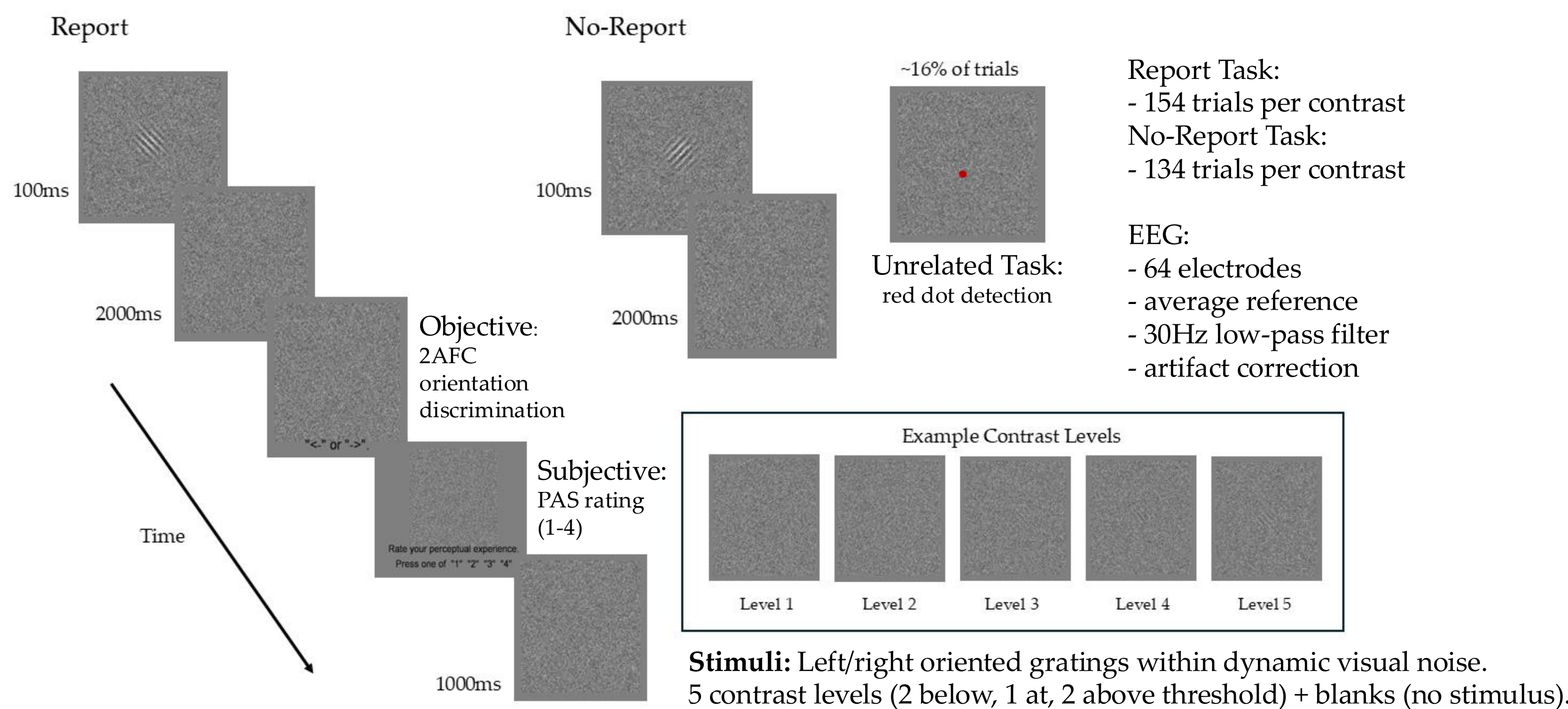
## Introduction

- Bifurcation dynamics from ~250-700 ms have been proposed as a potential signature of conscious processing in an auditory threshold paradigm [1].
- Similar results have been reported in visual masking paradigms, with signs of bifurcation dynamics found at ~250-300 ms or ~300-500 ms, depending on the reporting task [2,3].

- To further explore bifurcation dynamics supporting visual awareness, while avoiding complications caused by stimulus-mask overlap, here, we used a stimulus degradation paradigm more closely matched with the auditory paradigm of Sergent et al. (2021) [1].
- Stimulus contrast was manipulated around perceptual threshold in both report and no-report conditions, while analyses focused on (1) identifying EEG signals with non-linear amplitude profiles, and (2) testing for bifurcation dynamics via inter-trial EEG variability.

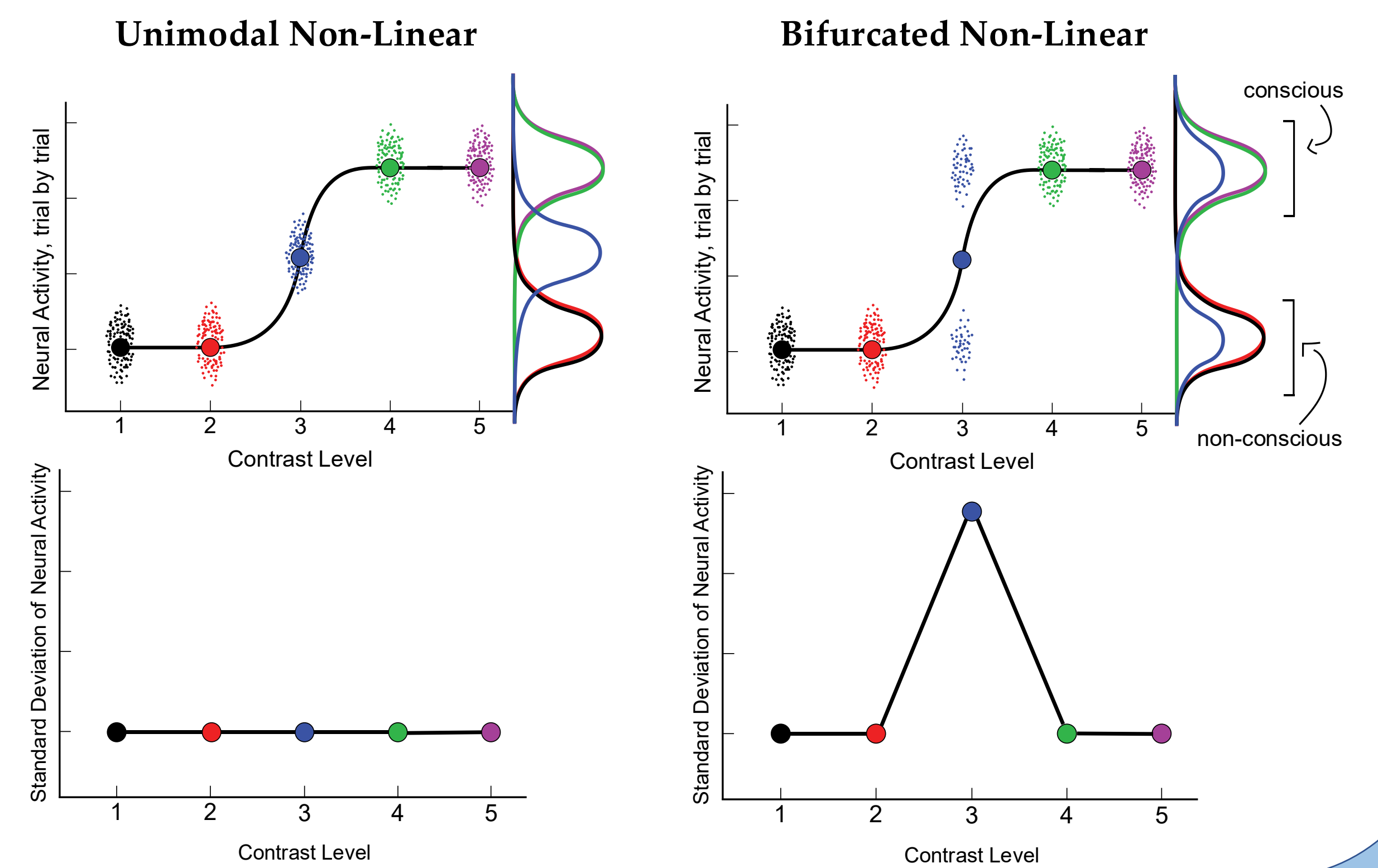
## Methods

Staircase to calibrate individual detection thresholds (contrast level 3), then Report Task (N=18) or No-Report Task (N=15)



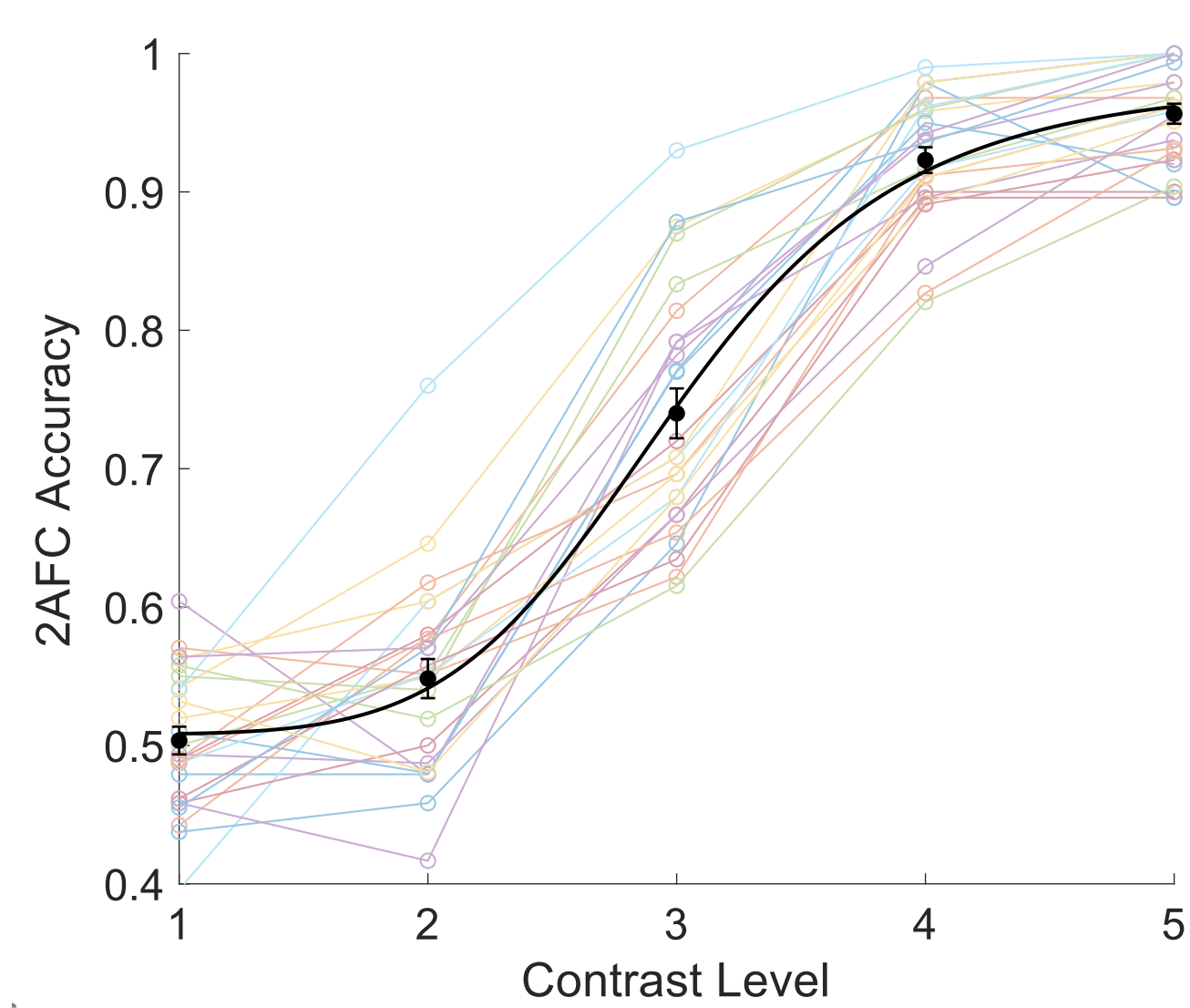
## Bifurcation Model

inspired by Sergent et al. (2021)

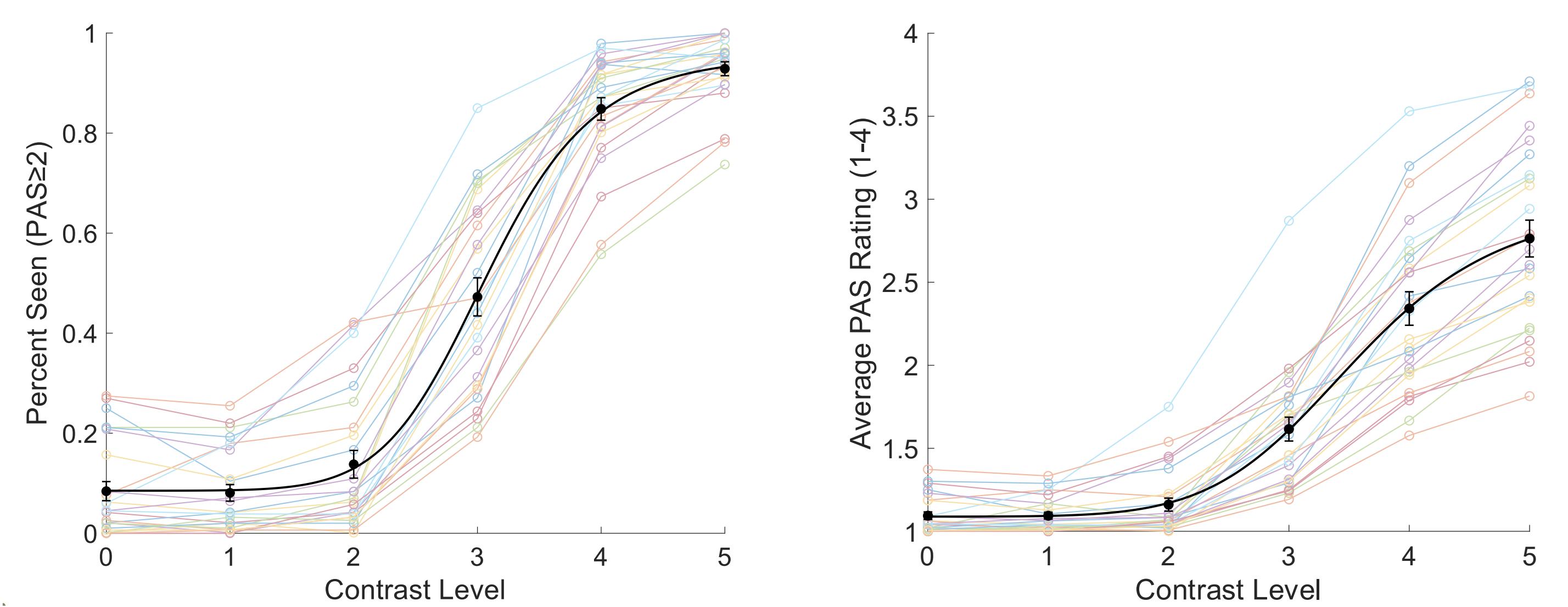


## Behavioral Results (N = 25)

### Objective Task (orientation discrimination)



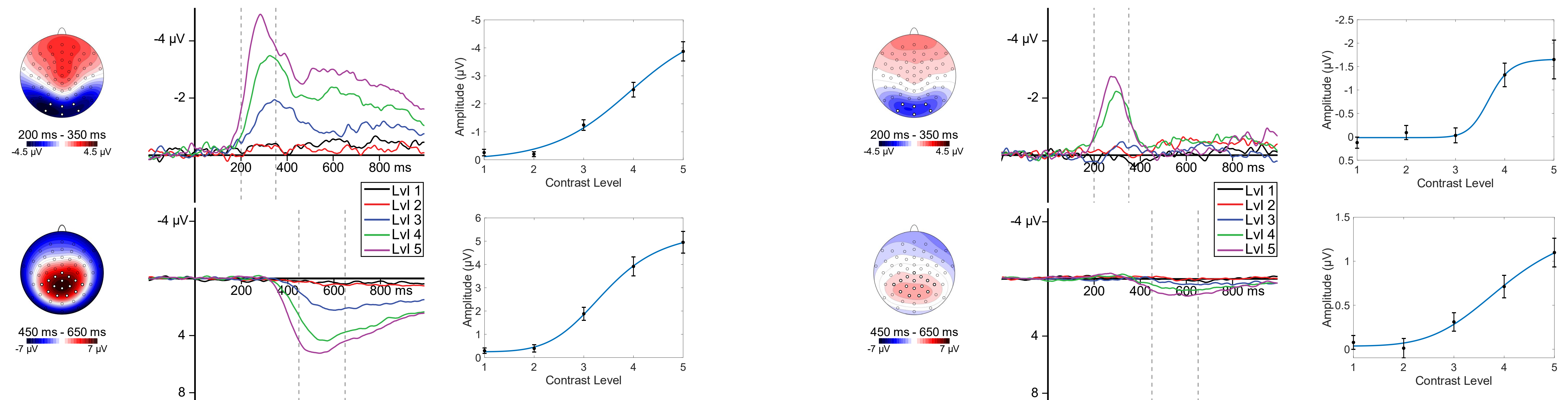
### Subjective Task (PAS scale)



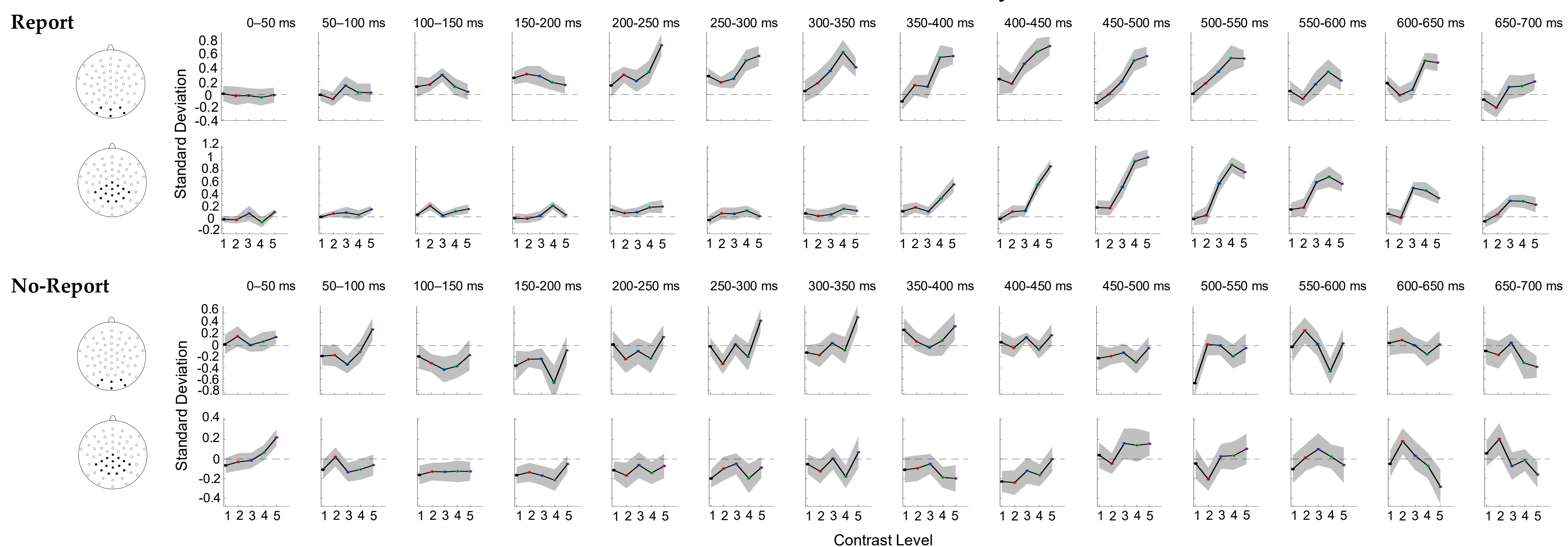
## Report

## Event-Related Potentials

## No-Report



## Inter-Trial EEG Variability



## Discussion

- Non-linear patterns of EEG amplitudes across stimulus contrast were evident at both early (250-350ms) and late (450-650ms) time windows, matching some of the patterns in the behavioral data.
- Inter-trial EEG variability analyses, however, failed to show clear signs of bifurcation dynamics, which were expected to manifest as peaks in variability at perceptual threshold (inverted "V" pattern across the 5 contrasts).
- Future analyses will assess multivariate bifurcation dynamics by using pattern classifiers to determine the inter-trial variability of the distance of neural responses at each contrast level from a decision hyperplane.

## References

- Sergent, C., Corazzol, M., Labouret, G., Stockart, F., Wexler, M., King, J.-R., Meyniel, F., & Pressnitzer, D. (2021). Bifurcation in brain dynamics reveals a signature of conscious processing independent of report. *Nature Communications*, 12(1), 1149.
- Cohen, M. A., Dembski, C., Ortego, K., Steinhilber, C., & Pitts, M. (2024). Neural signatures of visual awareness independent of postperceptual processing. *Cerebral Cortex*, 34(11), bhac415.
- Del Cul, A., Baillet, S., & Dehaene, S. (2007). Brain dynamics underlying the nonlinear threshold for access to consciousness. *PLoS Biology*, 5(10), e260.

## Acknowledgements

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