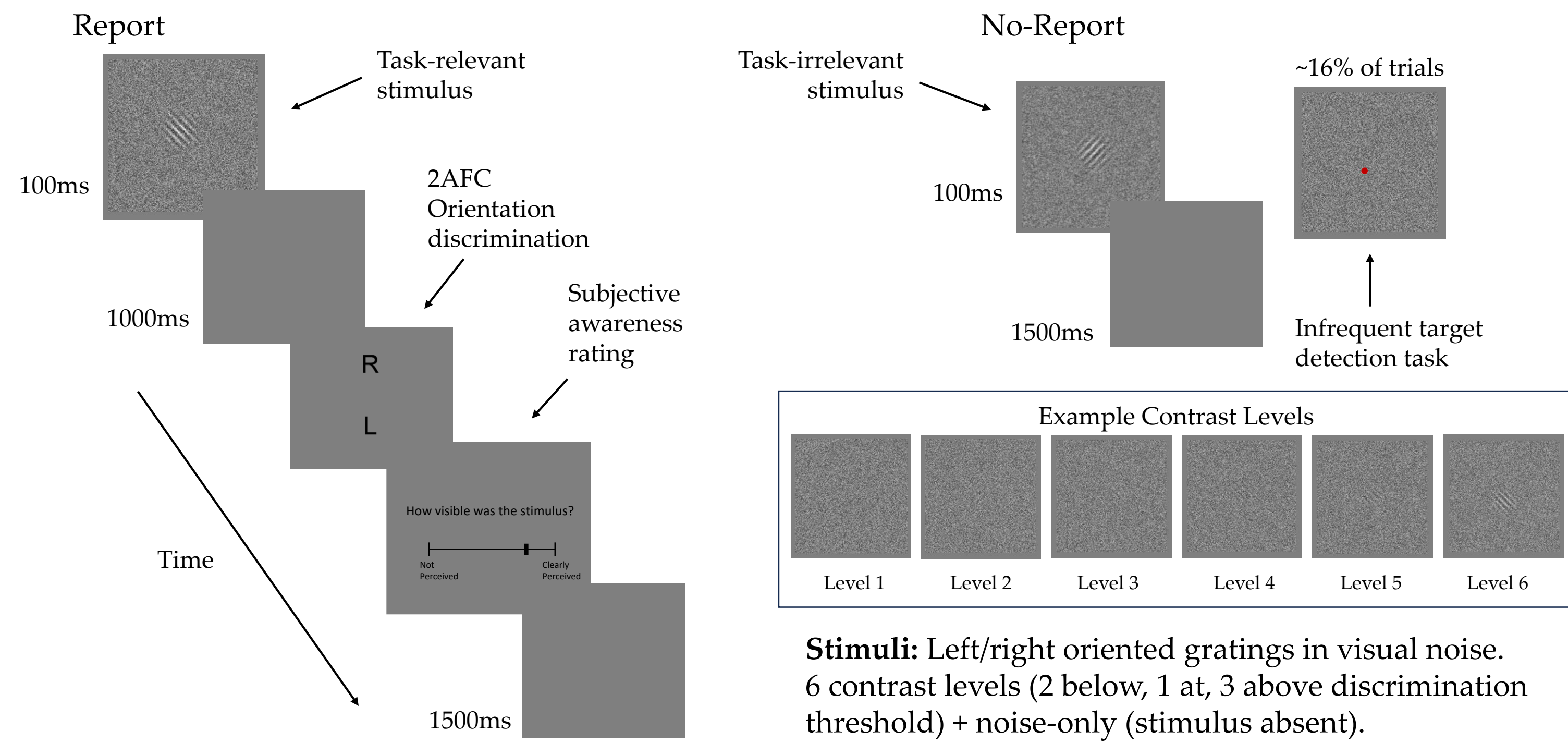


Introduction

- Bifurcation dynamics (see model below) from ~250-700 ms have been proposed as a potential signature of conscious processing in an auditory threshold paradigm [1], though the exact timing and topography of these signals, and their robustness to task manipulations remains controversial [2].
- 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 [3,4].
- To further explore the potential link between bifurcation dynamics and visual awareness, while avoiding complications caused by masking (i.e., overlapping brain responses to stimuli and masks), we used a simple stimulus degradation paradigm based on 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.

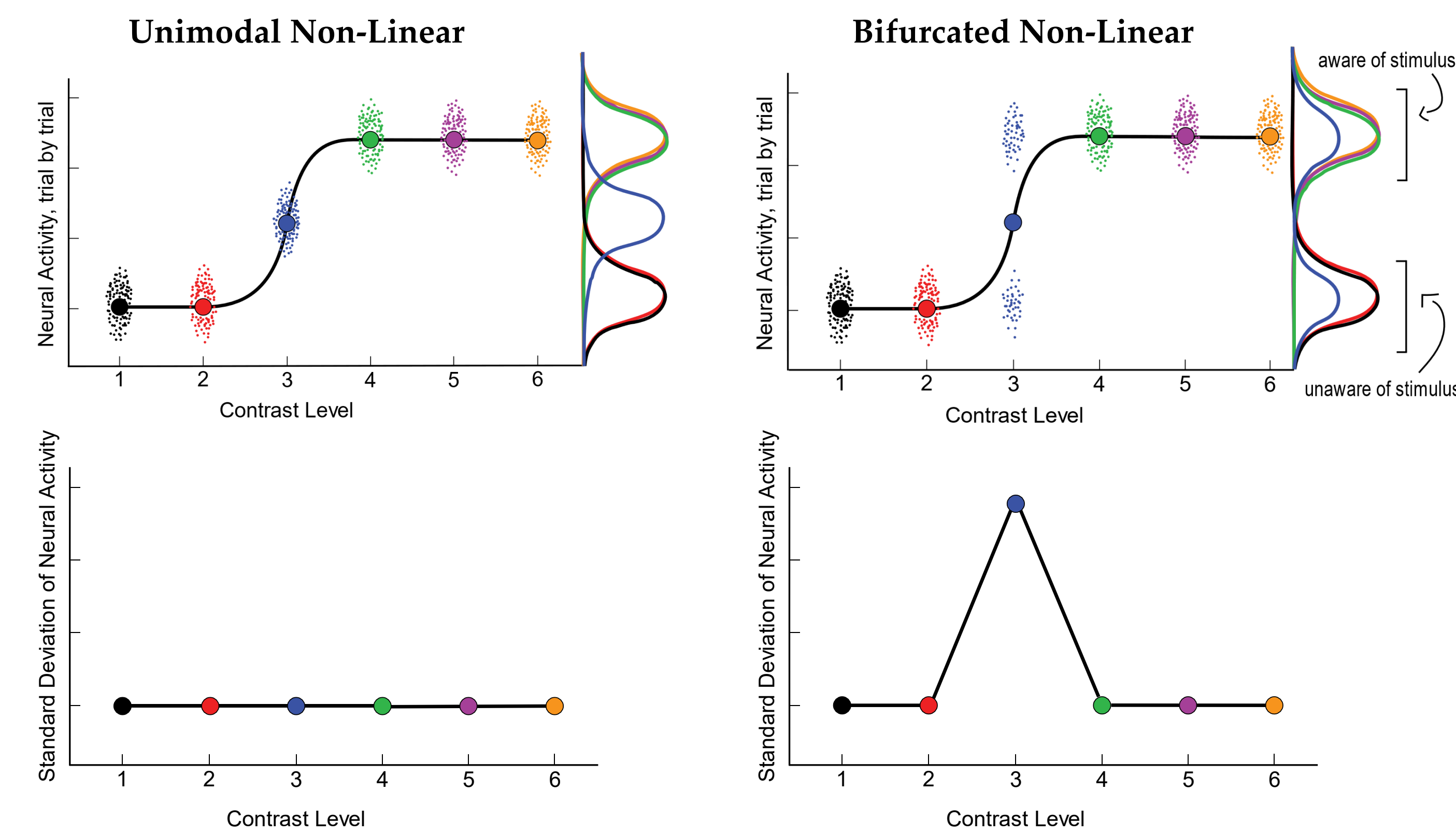
Methods

Staircase to calibrate individual discrimination thresholds (contrast level 3), then Report Task and No-Report Task (N=20, task-order counterbalanced)

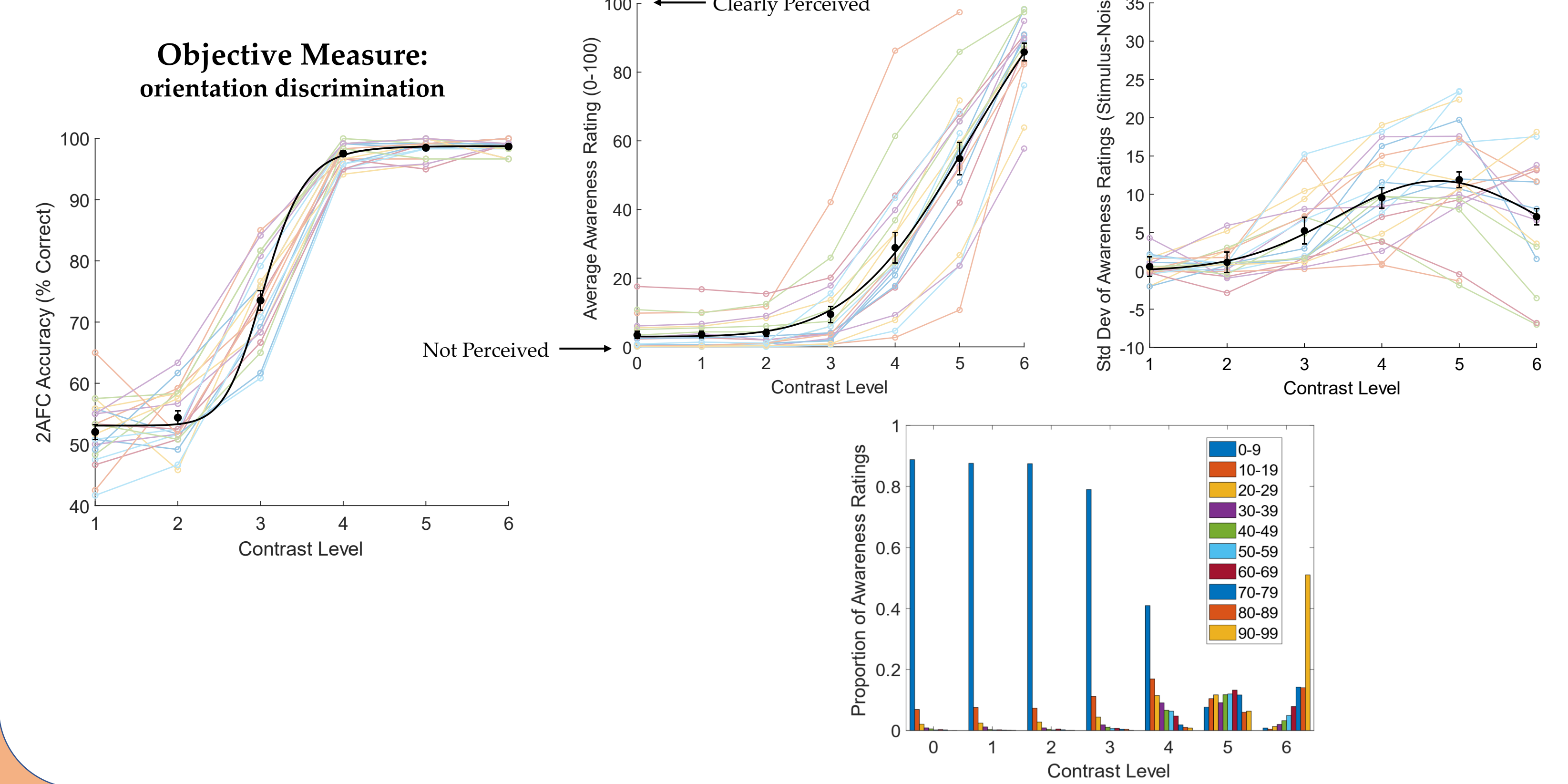


Bifurcation Model

inspired by Sergent et al. (2021)



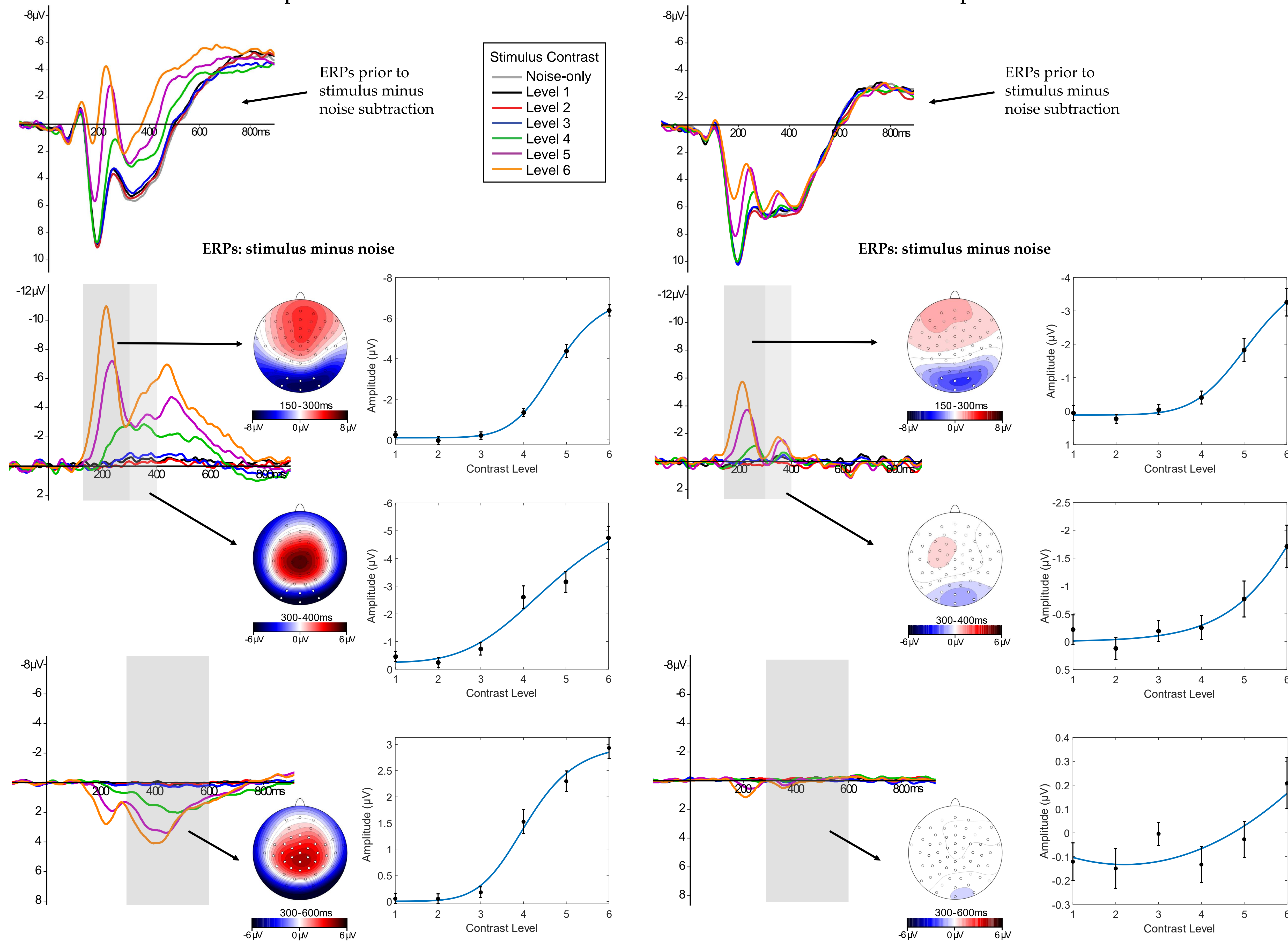
Behavioral Results



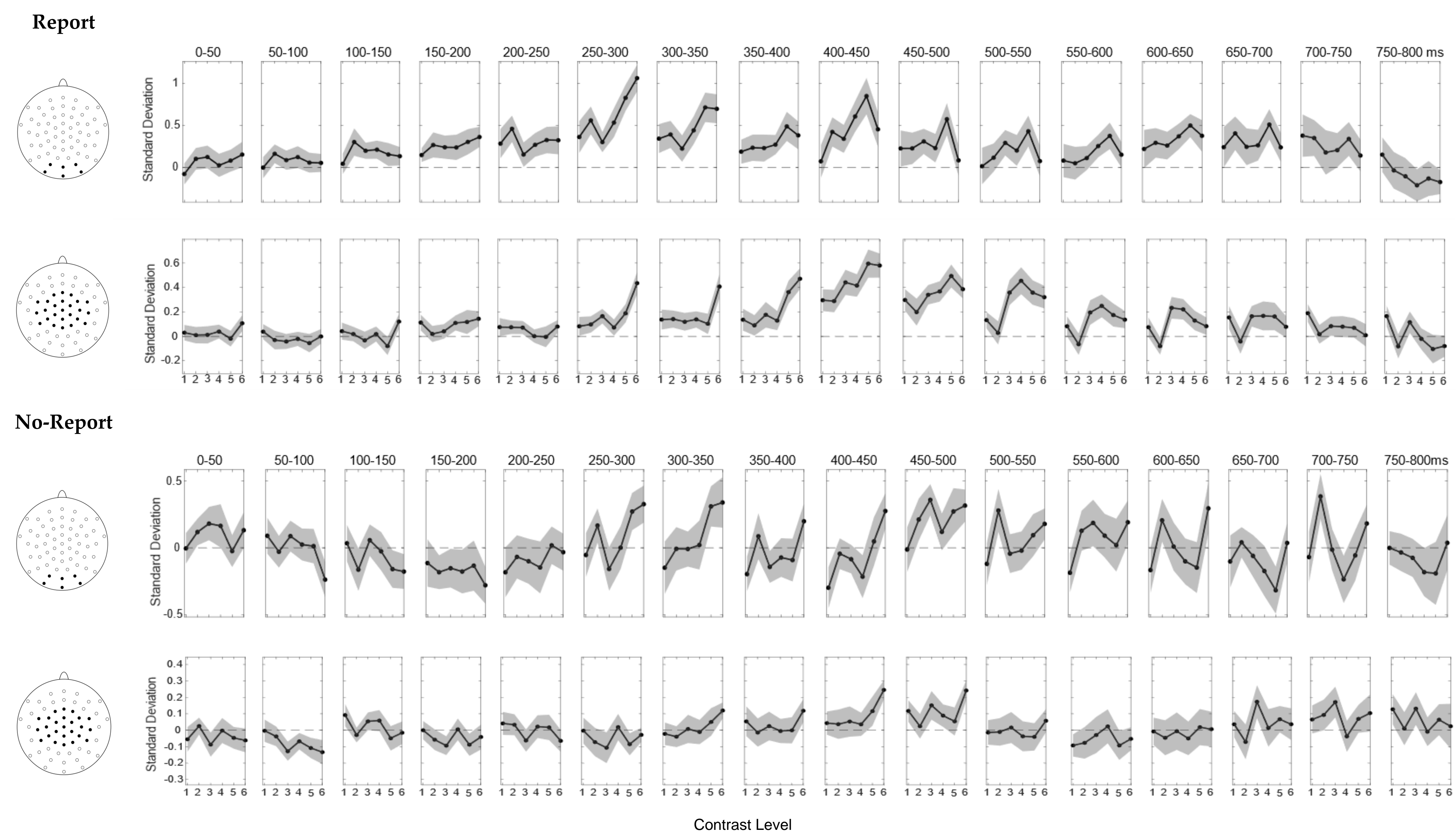
Report

Event-Related Potentials

No-Report



Inter-Trial EEG Variability



Discussion

- Non-linear patterns of EEG amplitudes across stimulus contrast were evident at both occipital (150-400ms) and fronto-central (300-600ms) electrode locations in the report task, but only at occipital ones in the no-report task.
- Inter-trial EEG variability analyses suggest brain signals correlated with awareness from ~300-450ms across tasks, at time windows later than the visual awareness negativity (VAN), but earlier than the P3b [2]. This signal manifested as a second posterior negativity that was clearest in the no-report condition due to the lack of spatio-temporal overlap from the P3b.
- Future analyses will use pattern classifiers to assess multivariate bifurcation dynamics.

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Acknowledgements

This study was supported in part by the Treiman Student Research Fund and the Templeton World Charity Foundation (TWCF-2022-30267 "Bifurcation Dynamics in a No-Report Paradigm").