TITLE

Analyzing the Effect of Timing on Spatiotemporal Sequence Learning in Mouse Primary Visual Cortex

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ABSTRACT

Recognizing and predicting spatiotemporal sequences is a fundamental component of neural function. We are studying this ability in the mouse primary visual cortex (V1), where studies have shown that visual experiences drive plasticity using the same mechanisms involved in learning. We are assaying plasticity using electrodes implanted in V1 to record visually evoked potentials (VEPs). Previous studies show that VEPs increase in magnitude following repeated exposure to a fixed 4 element long sequence of sinusoidal gradients with differing orientations, labeled ABCD. This increased response is not seen when the same visual elements are presented with an unexpected order, DCBA. In our experiment, we are testing how the timing of the visual presentation effects V1's ability to learn the sequence. Specifically, we use a training time of 300ms, which is twice the duration used in previous experiments. We hypothesize that the VEPs in response to familiar visual stimuli of 300ms will be greater in magnitude compared to that of the response to novel visual stimuli of different orders or different timings, implying that the mechanisms behind sequence learning for durations of 300ms are similar to those seen in past experiments.