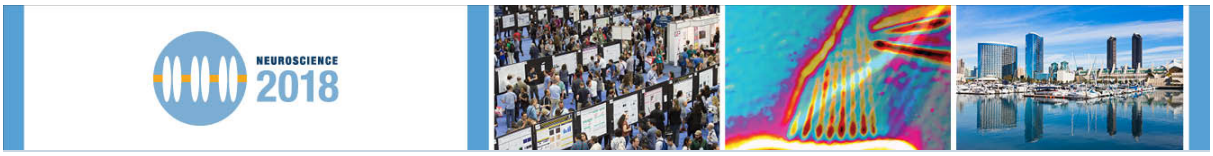

(https://www.abstractsonline.com/pp8/#!/4649)

Session 789 - Human Cognition and Behavior: Perception and Imagery II

Add to Itinerary

789.12 / JJJ22 - Pupil dynamics as a covert measure of conscious perception in a visual no report paradigm

November 7, 2018, 1:00 PM - 5:00 PM | SDCC Halls B-H

Presenter at Poster
Wed, Nov. 7, 2018, 4:00 PM - 5:00 PM

Authors

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Abstract

Despite competing models for the neural mechanisms of conscious perception, neuroimaging and electrophysiological studies have found that perception involves broad signal propagation from sensory to association cortex over hundreds of milliseconds following the onset of a detected stimulus. A primary challenge for the neuroscience of consciousness is that parallel cognitive functions co-occur with perception (e.g., working memory) and may partially account for signal that is interpreted as being consciousness-linked. Most studies of consciousness in humans facilitate this limitation by requiring recall of perceptual experiences. Perceptual reports are critical for the experimenter to determine whether stimuli were perceived, yet the neural networks required for report may confound the activity specific to perception. In particular, it is speculated that at least a portion of signal from previous investigations, particularly late activity (>500ms post-stimulus), may be specific to perceptual report. To address the confound of perceptual report, a no-report paradigm is necessary to covertly monitor the percepts of a participant without overt report instead utilizing a physiological measure that acts as a proxy for perceptual report. Previous work from our lab and others shows that in a report paradigm pupil size, blink, and microsaccade rate discriminate between perceived and not perceived stimuli. Importantly, utilizing pupil size alone, a linear-kernel support vector machine (SVM) classifier predicts perception of ***individual*** trials at 75% accuracy on average for all trials and up to 90% accuracy when sampling the most confident third of trials. However, it is unclear if these pupillary, microsaccade, and blink responses are specific to a report paradigm. To test this, we recruited healthy, adult participants to complete a novel no-report paradigm with simultaneous 1000 Hz binocular pupillometry (EyeLink 1000 Plus, SR Research) to determine if pupil size, eye movements, and blinks offer predictive value of percepts in a no-report setting. The no-report paradigm involves task-relevant (reported) and task-irrelevant stimuli (not reported), either of which may or may not be perceived. Preliminary findings show that perceptually-linked pupil changes in the no-report paradigm are similar to those of our report paradigm. Moreover, these trials can be confidently classified utilizing the SVM parameters trained on report paradigm data. These results suggest that pupillometry may be used in conjunction with a neuroimaging and/or neurophysiology approaches and a no-report paradigm to isolate the neural mechanisms of consciousness.

Abstract Citation

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