Using Steady-State Visual Evoked Potentials to Study Allocations of Attention

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Abstract:
Studies of the neural mechanisms of visual selective attention have typically relied on recording brain responses elicited by brief presentations of individual stimuli or arrays of stimuli. While this approach has been very informative in revealing mechanisms of attention to transient stimuli, it has difficulties examining more realistic situations in which multiple stimuli are continuously present and attention must be directed to some subset of those stimuli. One approach for assessing the allocations of attention to several continuously presented stimuli is to present each stimulus at a different flicker frequency and to record the steady-state visual evoked potentials (SSVEP) to each stimulus. The SSVEP is a continuous oscillatory response of the visual cortex that has the same fundamental frequency as the driving stimulus and is increased in amplitude when that stimulus is attended. SSVEPs can be separated in frequency space, thereby allowing for a continuous measure of the allocation of attention to each of several ‘frequency-tagged’ stimuli. Using this approach, SSVEP recordings have shed light on mechanisms of spatial and feature-selective attention and visual search.

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