

Electrophysiological measurement of attention following neutral, noninformative cues

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In spatial cueing paradigms, used to study attention, a consistent finding has been that performance is enhanced by the provision of valid advance information regarding the likely position of a target stimulus. In addition to valid and invalid trials, these paradigms often contain neutral trials in which the cue provides no information about the impending location of the target. Although it is assumed that attention is not oriented, orienting processes following a neutral, noninformative cue have never been studied systematically. The current study aimed at answering the question if attention is oriented following a neutral cue.

A spatial endogenous cueing task was used in which half the trials were neutral, with double arrow cues (<>) having 50% predictive validity for targets in the left or right hemifield. In the other half, cues to the left (<<) or to the right (>>) had 80% predictive validity. In addition to reaction time, EEG was measured, because from earlier studies it is known that both event-related brain potentials (ERPs) and event-related desynchronization (ERD) can function as continuous measures of covert shifts of attention.

Lateralized attention effects were present during the trials where attention was directed to the left or to the right. These attention effects were confirmed by reaction time results that showed a difference between validly and invalidly cued trials. During the neutral trials, nonlateralized attention effects explained part of the variance in reaction times. In addition, sequential analyses showed guessing behavior to the left or to the right following a neutral cue that depended on the direction of the cue in the previous trial.

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