

BRAIN OSCILLATIONS - INDICATORS FOR SERIAL PROCESSING IN INEFFICIENT VISUAL SEARCH?

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The electroencephalographic (EEG) N2pc component, originally suggested as neurophysiological correlate of visuospatial shifts of attention, seems rather related to target detection and distractor suppression. This reopens the debate of whether a shifting focus of attention, and thus serial processing, exists in inefficient visual search. Reasoning that search rate (in ms/item) for target absent (TA) trials should indicate the speed with which attention can be shifted for a given search type, we here investigated whether repetitive EEG frequency components correlate with search rate in an inefficient search task. Search rate was about 67ms/item for target present (TP) trials and 186ms/item for TA trials. Wavelet analysis of response-locked EEGs revealed significant differences in EEG beta-frequency bands (12-21Hz) between TP and TA conditions, moving in time from frontal to central electrodes, presumably related to decision making. More importantly, low frequency modulations (~7Hz) of response-locked EEG gamma-frequency bands (44-75Hz) over posterior electrodes correlated with search rate for TA trials. Given that gamma-oscillations are thought to be related to visual processing and attention, such EEG modulations might indeed reflect a shifting focus of attention, and thus serial processing, in inefficient visual search; however, alternative interpretations will also be discussed.