Title: Searching for auditory targets in external space and in working memory: electrophysiological mechanisms underlying perceptual and retroactive spatial attention

Authors: Laura-Isabelle Klatt, Stephan Getzmann, Edmund Wascher, Daniel Schneider

PII: S0166-4328(18)30641-7
DOI: https://doi.org/10.1016/j.bbr.2018.06.022
Reference: BBR 11479

To appear in: *Behavioural Brain Research*

Received date: 14-5-2018
Revised date: 18-6-2018
Accepted date: 21-6-2018

Please cite this article as: Klatt L-Isabelle, Getzmann S, Wascher E, Schneider D, Searching for auditory targets in external space and in working memory: electrophysiological mechanisms underlying perceptual and retroactive spatial attention, *Behavioural Brain Research* (2018), https://doi.org/10.1016/j.bbr.2018.06.022

Searching for auditory targets in external space and in working memory: electrophysiological mechanisms underlying perceptual and retroactive spatial attention

Laura-Isabelle Klatt*, Stephan Getzmann, Edmund Wascher, & Daniel Schneider

Leibniz Research Centre for Working Environment and Human Factors, TU Dortmund

* Address of correspondence:
Laura-Isabelle Klatt, M.Sc.
Leibniz Research Centre for Working Environment and Human Factors
Ardeystraße 67
44139 Dortmund
Germany
Tel.: +49 / 231 1084 260
E-mail: klatt@ifado.de

Abstract

Attention can be shifted within internal representations maintained in working memory. These retroactive processes are particularly inherent to the processing of auditory information that is especially transient over time and thus, requires us to continuously maintain, attend to, and integrate information in working memory. Using EEG recordings, the present study investigated the neurophysiological mechanisms underlying selective spatial attention in a retroactive as opposed to a perceptual auditory search task. Two kinds of sound stimuli were employed: a horizontal sound array consisting of two natural sounds presented simultaneously in the left and right hemispace and a central single target sound. The target sound was provided either after (retroactive search) or before the presentation of the sound array (perceptual search). In both search conditions, participants completed a sound localization and a sound detection task, indicating the position (left or right) or the presence versus absence (yes or no) of a particular target sound. Analyses revealed a lateralization of alpha power oscillations (8-12 Hz) over parieto-occipital scalp in both perceptual and retroactive sound localization tasks, but not in respective sound detection tasks, suggesting auditory alpha