Effects of externalized preferred music on the brain’s name-discrimination response

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Background: Normally, sounds we hear are located in the space around us and acoustically filtered by the head and torso of the listener and by the reverberation producing variations in interaural cues across time. Headphone listening is not subject to these effects and gives the impression that the sound originates from within the head. Enhanced auditory quality, through externalisation of the sound leads to a deeper meaning associated with the stimuli (Raake & Blauert, 2013) and an increased level of presence, emotion, and spatial perception (Brinkman, Hoekstra, & Egmond, 2015). Surprisingly little is known about the impact of auditory externalization on brain processes. Furthermore, how the effects of externalisation translate to acoustic stimuli with autobiographical context, personal relevance and emotion, such as preferred music remains unknown. The use of autobiographical stimuli are especially important in neurological pathology, like Disorders of Consciousness (DOC; patients showing no or limited signs of consciousness) where these stimuli lead to improved diagnostic accuracy. Enhanced realism created through sound-externalization is expected to improve attentional brain-processes both in healthy subjects as well as patients with DOC. Methods: Hd-EEG ERP analysis of the own-name paradigm (Perrin, Garcia-Larrea, Mauguire, & Bastuji, 1999) following four contexts: externalized preferred music, internalized preferred music, externalized neutral sound and internalized neutral sound. Results: Within healthy subjects, ERP P3b peaks show shorter latency for externalized conditions. The P3a component is present during music and externalized conditions, but not during internalized sound conditions. Conclusions: The own-name seems to be processed quicker when presented in a more realistic (externalized) context. Furthermore, attention related components were present during more realistic autobiographical conditions (externalized and preferred music conditions).