Reduction of listening effort with binaural algorithms in hearing aids: an EEG study

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Objective

The aim of this study was to investigate whether binaural algorithms implemented in hearing aids can reduce subjective listening effort measured by event-related brain potentials (ERPs). The binaural algorithm DuoPhone was compared to an individual SNR setting in TDT (LowSNR) with two SNR conditions: Moderate to severe hearing loss (see figure 1)

Methods

For the ERP measurement, the setup was as follows: subjects were seated in a soundproof chamber and underwent a 2-back-task. An auditory stimulus was presented binaurally and a target word was signaled by a noise burst. The subjects were instructed to e.g. determine whether a target word was present or not. ERP amplitudes of the target words were measured with respect to baseline and compared to baseline. The ERP amplitudes were measured in the spectrum of the alpha frequency band. Statistical analysis: the activity in the spectrum of the alpha frequency band is (statistically) significantly lower with on than without lowSNR (time slot: 660 – 920 ms)

Results

The binaural algorithm DuoPhone is able to increase the capacity of the working memory and to reduce the cognitive load/listening effort: activity in alpha frequency band

Discussion

The binaural algorithm DuoPhone...