

Cue dependent spatial release from masking in the presence of large interaural delays

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Abstract

When trying to understand factors that determine spatial release from masking (SRM) in subjects using hearing aids (HA) or cochlear implants (CI), processing latencies of these devices are often overlooked. In asymmetric treatment of hearing loss these latencies can lead to a change of the reference ITD (i.e. the ITD at 0° azimuth) of several milliseconds. To understand the influence of these changes in reference ITD on SRM we measured SRM in normal hearing subjects with reference ITD of 0, 1.75, 3.5, 5.25 and 7 ms using the Oldenburg Sentence Test (OlSa). Further the available cues for spatial separation of target and masker were manipulated to measure the effect of reference ITD on SRM with only interaural level differences (ILD), interaural time differences (ITD) or both cues available. A rising reference ITD shows significant detrimental impact on SRM measured with ITD present and with ITD and ILD present. When only ILD are present a rising reference ITD does not lead to a significant reduction in SRM. To further understand this phenomenon a binaural model for speech understanding was applied to the data.