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Examining “Informational Masking” in Cochlear Implant users.

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The processing of spectral and temporal cues as well as amplitude changes is restricted in Cochlear Implants. Cochlear Implants yield satisfactory understanding when communication takes place in silent environments, but with the addition of noise or competing talkers the identification and discrimination of speech gets worse (Stickney et al, 2004).

“Informational Masking (IM)” describes the disturbances that context has on the detection and discrimination of target components in a complex sound. These disturbances are not only attributable to “Energetic Masking (EM)” which occurs when spectral energy of a signal overlaps with the energy in a target signal, since additional information is irrelevant for the listener and therefore interfering (Brungart, 2001).

In this study the “Oldenburg sentence-test (OISa)” was used to examine to what extent a target signal can be understood if it is masked with a simultaneously presented speech masker. The OISa seems suitable because of several reasons. On one hand the special structure of the OISa permits defining a keyword for marking the target phrase. On the other hand the sentences are composed of several recordings, so that it is impossible to make distinctions based on prosodic cues (Wagener et al, 1999).

The speech maskers differ from the target phrases in target-masker ratio (TMR) and fundamental frequency (F0). The speaker of the target phrases had a fundamental frequency of 100 Hz. By stepwise varying this frequency the speech maskers showed an F0 up to

180 Hz. In order to keep the number of parameters small, the characteristics of the vocal tract were not changed. The second manipulated parameter was the TMR which showed values from 0 dB to 20 dB in steps of 5 dB.

The aim of the study was to point out the difficulties CI-users have to face in a multitalker situation and which factors yield a release from IM.

It is hypothesized that CI recipients benefit more from changes in TMR than in F0 since their spectral resolution is restricted. The results will be discussed on Cochlear Implant users with normal hearing persons serving as controls.

Literatur:

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