Investigating the effect of different background noise signals on speech recognition threshold.

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Objectives: This study investigates the effect of different background noise signals on digit triplets recognition threshold.

Background: Speech-in-noise tasks generally involve energetic or informational masking. Energetic masking happens when the background noises contain energy in the same frequency band as the target speech. In contrast, informational masking occurs when the listener is unable to differentiate the target speech because of the distracting background noise information.

Methods: This study included twenty adults (18 – 30 years old) with normal audiograms. Speech recognition threshold (SRT) was measured with the Canadian adapted version (CDTT; Ellaham et al, 2016) of the Digit Triplet Test (Smits et al, 2004). The CDTT includes digit triplets recorded with both a female (FV) and male voice (MV). SRTs were measured in three noise conditions: with a steady speech spectrum noise (SS) as well as 4-talker and 8-talker babble noises (BB4 & BB8).

Results: The average SRT measured with the FV stimuli was -12.04 dB, -8.9 dB and -8.27 dB in the SS, BB4 and BB8 conditions respectively, and -12.28 dB, -10.1 dB and -8.96 dB with the MV stimuli.

SRTs measured in presence of the SS noise yielded the best thresholds compared to the other noise conditions, for both the FV and MV recordings. A significant effect ($p<0.05$) of noise condition was found. Post-hoc comparisons conducted with the data obtained with the MV stimuli revealed significant differences of SRTs between each pair of scores, but no significant difference was noted between the BB4 and BB8 conditions for the SRT measured with the FV stimuli.

Conclusions: Although more data is needed to better understand the performance on speech-in-noise tasks, these results support conducting speech intelligibility testing in both energetic and informational noise as it may target different auditory and cognitive skills.