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Title:

The role of high-frequency envelope fluctuations for speech masking release

Authors: Søren Jørgensen and Torsten Dau

Abstract:

The speech-based envelope power spectrum model [sEPSM; Jørgensen and Dau (2011), Jørgensen *et al.* (2013)] was shown to successfully predict speech intelligibility in conditions with stationary and fluctuating interferers, reverberation, and spectral subtraction. The key element in the model was the multi-resolution estimation of the signal-to-noise ratio in the envelope domain (SNR_{env}) at the output of a modulation filterbank. The simulations suggested that mainly modulation filters centered in the range from 1 to 8 Hz contribute to speech intelligibility in the case of stationary maskers whereas modulation filters tuned to frequencies above 16 Hz might be important in the case of fluctuating maskers. In the present study, the role of high-frequency envelope fluctuations for speech masking release was further investigated in conditions of speech-on-speech masking. Simulations were compared to various measured data from normal-hearing and hearing-impaired listeners [Festen and Plomp (1990), Christiansen *et al.* (2013)]. The results support the hypothesis that high-frequency envelope fluctuations (>30 Hz) are essential for speech intelligibility in conditions with speech interferers. While the sEPSM reflects effects of energetic and modulation masking in speech intelligibility, the remaining unexplored effect in some conditions may be attributed to, and defined as, “information masking.”