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Contribution of near- and suprathreshold hearing deficits to speech recognition

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ABSTRACT

This study addresses the contribution of audibility and suprathreshold deficits to speech recognition in quiet, stationary, and speech-modulated noise. The relative importance of these deficits for different frequency ranges of hearing was determined by measuring speech recognition using broadband speech and noise, but also high- and low-pass filtered versions of these stimuli. Audibility was assessed using pure tone thresholds and speech reception thresholds (SRT) in quiet. Three listener groups were considered to parse out hearing deficits: young (yNH) and older normal-hearing (oNH) listeners and hearing-impaired (HI) listeners. oNH and HI listeners performed equally poor in stationary noise where yNH listeners showed significantly better SRTs in both noise conditions. Since audibility did not correlate with SRTs in stationary noise but with modulated noise, and SRTs in stationary and modulated noise correlated with each other, a common mechanism (not audibility) must affect speech recognition in noise. Furthermore, our results suggest that performance in the broadband condition cannot be explained by the low frequency mechanisms since all groups performed similar in the low-pass conditions whereas the oNH and oHI group performed equally bad in high-pass condition. Instead, we found evidence for a contribution of high frequency envelope coding mechanisms to broadband performance

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