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**Speech perception in fluctuating noise with signals compensated
for hearing loss**

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For speech reception in noise normal-hearing listeners gain from masker modulations up to about 12 dB depending on rate, duty cycle, and depth of the modulations. Listeners with sensorineural hearing loss need a better signal-to-noise ratio to improve signal quality as a compensation for their auditory deficits. Generally, a larger compensation is needed for fluctuating interferences leading to reduction or even absence of release from masking for modulated maskers. With the Speech Intelligibility Index adapted for modulated maskers, SII_{mod} [Rhebergen and Versfeld, *J. Acoust. Soc. Am.* 117, 2181-92 (2005)] it is shown that these elevated thresholds are needed to compensate not only reduced hearing sensitivity but also impaired auditory and non-auditory processing. After frequency-dependent compensation for hearing loss as offered by a hearing aid, more of the speech is presented at impaired frequency regions. As a consequence the effect of a hearing aid on speech intelligibility will be less than predicted by SII_{mod}. Speech reception thresholds in noise are affected by peripheral spectro-temporal processing (bottom-up) and by cognitive processing capabilities, like working memory (top-down). Effects of cognitive processing on speech perception are found especially in fluctuating noise as this masker presents a more complex and demanding environment than steady noise.