

## Effects of cochlear compression and frequency selectivity on pitch discrimination of complex tones with unresolved harmonics - DTU Orbit (08/11/2017)

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Physiological studies have shown that noise-induced sensorineural hearing loss (SNHL) enhances the amplitude of envelope coding in auditory-nerve fibers. As pitch coding of unresolved complex tones is assumed to rely on temporal envelope coding mechanisms, this study investigated pitchdiscrimination performance in listeners with SNHL. Pitch-discrimination thresholds were obtained in 14 normal-hearing (NH) and 10 hearingimpaired (HI) listeners for sine-phase (SP) and random-phase (RP) unresolved complex tones. The HI listeners performed, on average, similarly as the NH listeners in the SP condition and worse than NH listeners in the RP condition. Cochlear compression and auditory filter bandwidths were estimated in the same listeners. A significant correlation was found between the reduction of cochlear compression and the difference between RP and SP pitch-discrimination thresholds. The effects of degraded frequency selectivity and loss of compression were considered in a model as potential factors in envelope enhancement. The model revealed that a broadening of the auditory filters led to an increase of the modulation depth in the SP condition, while it did not have any effect for the RP condition. Overall, these findings suggest that both reduced cochlear compression and auditory filter broadening alter the envelope representation of unresolved complex tones, leading to changes in pitch-discrimination performance.

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