# Exposure-induced and training-induced learning of distorted speech: Does learning fail those who need it most?

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Speech perception improves substantially with practice, but the role of perceptual learning (PL) in speech processing remains debated. One hypothesis is that PL serves to rapidly normalize the perception of non-optimal (e.g., accented, rapid) speech. This study was designed to test a facet of this hypothesis, that rapid perceptual learning of degraded speech is weaker in populations with difficulties in speech perception, in this case older adults and older adults with age-related hearing loss. Rapid PL was observed in older adults with normal hearing (NH, n=52) and in those with hearing loss (HL, n=36). However, the magnitude of learning in the two groups of older adults was smaller than in young adults (YA, n = 55) even when starting performance was equated across groups (Cohen's d = 1.5, 0.7 and 0.4 in the YA, NH and HL groups respectively). Additional training yielded learning in all three groups. Nevertheless, like rapid learning, practice-induced learning and its generalization to untrained time-compressed tokens were weaker in the two groups of older adults than in the young adults. We suggest that aging contributes to declines in perceptual adjustments to distorted speech with an additional smaller effect for hearing loss. Further training is not sufficient to offset this decline.