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Perceptual learning of distorted speech with and without feedback

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Abstract: Adjusting to idiosyncrasies of individual speakers and dialects is necessary for spoken language comprehension. We investigated adult listeners perceptual learning using sinewave-vocoded speech as a model of adapting to distortions of the acoustic speech signal. The degree of perceptual learning elicited by feedback-driven training is equivalent to a training paradigm with no external feedback, but for which the severity of the acoustic distortion is incremented gradually. We hypothesize that the learning observed in these two conditions may engage distinct mechanisms differentially reliant on external feedback versus internally-generated error signals. As predicted from this perspective, exposure to severe acoustic distortions without external feedback does not result in learning. Incremental introduction of acoustic distortions may elicit an internal error signal that adjusts the mapping from acoustic signal to lexical item whereas abrupt introduction of a severe distortion may fail to elicit error signals necessary to drive learning.