Léger et al. (2011) reported deficits in the identification of consonant in noise by hearing-impaired listeners (cf. audiograms on the right) using stimuli filtered into low- or mid-frequency regions, for which audiometric thresholds were normal or near-normal. The deficits could not be fully explained in terms of reduced audibility, temporal-envelope processing or frequency selectivity.

However, previous studies indicate that the listeners may have had auditory filters broadened by a factor of about 1.3, despite having normal or near-normal audiometric thresholds in the tested regions. The present study aimed to determine whether the speech-perception deficits could be explained by such a small reduction of frequency selectivity.

The identification of low-pass (<1.5 kHz) or band-pass (1-3 kHz) filtered consonants was measured using the same method as in Léger et al. (2011). Scores were measured in quiet, and in the presence of a low-pass or band-pass filtered speech-shaped noise at a signal-to-noise ratio of -3 dB. Noise was either: (1) unmodulated; (2) temporally modulated, by applying a square wave amplitude modulation with a duty cycle DC=50% or DC=25%; (3) spectrally modulated, by passing the noise through an auditory filterbank and setting to zero the output of 1 filter out of 2 (1ERBN/2), 2 adjacent filters out of 4 (2ERBN/4) or 3 adjacent filters out of 4 (3ERBN/4).

Mean identification scores were significantly reduced only for spectral-smearing algorithm (Baer and Moore, 1993). The smearing factors used to simulate such a small reduction of frequency selectivity were 1.3. However, previous studies indicate that the listeners may have had auditory filters broadened by a factor of about 1.3, despite having normal or near-normal audiometric thresholds in the tested regions. The present study aimed to determine whether the speech-perception deficits could be explained by such a small reduction of frequency selectivity.

Various amounts of reduced frequency selectivity were simulated using a spectral-smearing algorithm (Baer and Moore, 1993). The smearing factors used to simulate such a small reduction of frequency selectivity were 1.3. However, previous studies indicate that the listeners may have had auditory filters broadened by a factor of about 1.3, despite having normal or near-normal audiometric thresholds in the tested regions. The present study aimed to determine whether the speech-perception deficits could be explained by such a small reduction of frequency selectivity.

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