MILD BILATERAL HEARING LOSS: SPEECH RECOGNITION

REFERENCE	DESIGN	RECRUITMENT	CASE DEFINITION	SUBJECTS	ASSESSMENT TOOLS	RESULTS	AUTHOR'S CONCLUSIONS
Crandell, CC. Speech recognition in noise by children with minimal degrees of sensorineural hearing loss. Ear Hear. 1993;14:210 –16.	Case-matched control. *Main Question:* To examine the effects of commonly reported classroom SNRs* on the sentence recognition of children with minimal degrees of SNHL.*	All selected from patient files of a center for communication disorders in Dallas.	*Minimal Degree of SNHL:* PTA* .5, 1, 2 kHz,* 15–30 dB* HL* in at least one ear. No air-bone gap >10 dB at any frequency; normal middle ear function; sentence recognition of 90% or better in quiet on Bamford-Kowal-Bench Standard Sentence test. *Controls:* PTA .25–8 kHz, ≤15 dB.	Total: N = 40 With hearing loss: N = 20 Controls: N = 20 Ages 5–15 years. Groups matched for age; average age 9 years, 1 month. Normal development and IQ. No significant medical problems.	*Speech Stimuli:* Bamford-Kowal-Bench Standard Sentence test used to assess sentence recognition. *Competing Noise:* Multibabble recording from Speech Perception in Noise test. *Listening Tasks:* Assessed 1 ear at a time; speech at 65dB SPL;* SNRs of +6, +3, 0, -3, and -6 dB. Child repeated each sentence.	Children with mild SNHL had poorer scores than controls across most listening conditions. Analysis of Variance showed differences were statistically significant (p <.01). Post-hoc analyses showed significant differences were at SNRs ranging from +3 to -1dB. Performance decrement between the two groups increased as the listening environment became more adverse.	Educational implications of these data, such as acoustical modification of the classroom and/or the utilization of FM* systems, are discussed.

* SNRs = signal-to-noise ratios;   SNHL = sensorineural hearing loss;   PTA = pure tone average;   kHz = kilohertz;   dB = decibel;   HL = hearing level;   SPL = sound pressure level; FM = frequency modulated

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Needleman, AR, Crandell, CC. Speech recognition in noise by hearing-impaired and noise-masked normal-hearing listeners. J Am Acad Audiol. 1995; 6:414–24.	Case-matched control. *Main Purpose:* To determine whether diminished speech perception is the result of reductions in auditory sensitivity or secondary distortions accompanying the loss of pure-tone sensitivity. The speech-recognition abilities of listeners with mild to moderate degrees of SNHL* were compared to normal-hearing individuals with simulated hearing losses.	Not specified	*Controls:* <15dB* .25–8 kHz.* *Hearing Loss:* Thresholds given for each frequency, but specific criteria for hearing loss not used. *All subjects:* Normal middle ear function. Acoustic reflexes from .5–2 kHz. Excellent word recognition in quiet. Native speaker of American English. Good health with no history of chronic illness or disease.	Total: N = 30 With hearing loss: N = 10 Controls: N = 20 With hearing loss: Mean age 40.2 years (21–54 years). Controls: Mean age 27.3 years (22–39 years).	Normally hearing subjects were given simulated hearing losses that were matched to each subject with hearing loss. All speech stimuli presented in background of speech-spectrum noise. Speech perception assessed by predictability-high sentences. The sentences were developed to permit separate assessment of a listener's ability to use linguistic and acoustic information.	Subjects with hearing loss had poorer sentence recognition scores than did masked controls.	Results indicate that subjects with hearing loss exhibited greater susceptibility to noise than noise-masked controls, suggesting that factors other than the loss of pure-tone sensitivity have degraded performance; this indicates the presence of a secondary distortion affecting perception.

* SNHL = sensorineural hearing loss; dB = decibel; kHz = kilohertz