

The Effect Of Environmental Noise On Speech Recognition Threshold Results Obtained With The Canadian Digit Triplet Test

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Objectives: To determine the maximum environmental noise level in which the Canadian Digit Triplet Test (CDTT) can be administered without affecting results when used for speech screening in public areas.

Background: A Canadian English and French version of the digit triplet test has recently been developed by the University of Ottawa and Toronto (Ellaham et al. 2016, Canadian Acoustics 44(3), 220-221) using the ICRA test development guidelines (Akeroyd et al. 2015, Int. J. Audiol. 54, 17-22). A list of 24 digit triplets (e.g., 5-2-8) is presented in a 65-dBA masking noise and the listener is asked to enter the digits heard on a keypad. The test uses an adaptive procedure to find the speech recognition threshold defined as the signal/noise ratio at which 50% of triplets are correctly identified. The test requires little practice and can be administered in less than 5 minutes, making it ideal for speech screening.

Methods: French speaking adults with normal hearing were tested with the French male and female voices of the CDTT using supra-aural (Radioear DD45) and circum-aural (Radioear DD450) earphones while immersed in environmental noise at different levels (none, 60, 70 80 dBA). Two cohorts of 16 participants were tested, one in noise from a crowded shopping centre and the other from a busy hospital pharmacy.

Results: Recognition thresholds were unaffected by shopping centre noise up to 60 dBA of noise when using the supra-aural earphones, and up to 70-80 dBA when using the circum-aural earphones, consistent with the difference in attenuation between the two earphone sets. Testing in the pharmacy noise is ongoing.

Conclusions: Use of supra-aural earphones is adequate for testing in quiet offices and public areas with noise levels not exceeding 60 dBA. In busy public areas with noise levels up to 75 dBA, use of circum-aural earphones is needed.