Abstract EFAS/DGA 2007

Making AGC work: variable presentation level speech testing

Khajehnouri, Y. (1, 2), Büchner, A. (2), Lenarz, T. (2)

Advanced Bionics Medical University Hannover

Background: Speech tests virtually always present material at a fixed presentation level. Even when psychometric functions are measured blocks of words or sentences are presented at the same level. Since subjects may adjust their hearing aid or cochlear implant processor to optimize audibility such tests do not represent real-life listening situations. The Automatic Gain Control system is not exercised.

Methods: A new approach to speech testing was developed. Sentences were presented randomly at either 55, 65 or 75 dB SPL. Competing speech shaped noise was used to estimate Speech Reception Threshold across a block of 30 sentences. SRT scores were compared to the conventional HSM sentence test. A series of questionnaires targeting loudness, speech and music quality was delivered. Two groups of six subjects were tested: Advanced Bionics Auria or, Cochlear Corporation 3G or Freedom users. Both groups had equivalent HSM scores being good or excellent performers.

Results: SRT outcomes from the roving level test ranged from – 0.8 dB to over +20 dB speech to noise ratio (SNR). Testing on the fixed presentation level test found scores around 50% correct for SNRs between +5 and +10 dB, all subjects showing relatively similar scores on this measure. While testing is still ongoing, it appears that the 3G or Freedom users struggled more with the roving level. Loudness was generally reported to be satisfactory in everyday life. Despite subjects scoring well in the conventional test, questionnaire responses pointed to problems when listening in noise.

Conclusions: The roving level test was found to be much more difficult than a traditional fixed level test. The new test may better probe everyday listening experience and appears to support the usefulness of processing a larger acoustic dynamic range. Traditional tests may overestimate the ability of cochlear implant users to cope in noisy real life situations.