Abstract DGA 2005

Effect of bandwidth and temporal structure on loudness perception

van Beurden, M. F. B., Dreschler, W. A.

Academic Medical CentreClinical and Experimental Audiology

The effect of bandwidth on the loudness of signals with a different temporal structure was measured using a modified adaptive, two-interval, two-alternative forced-choice loudness-matching procedure. Test and reference signals were bandpass-filtered noise signals, spectrally centered at 2 kHz and the reference level was 60 dB SPL.

In a first experiment loudness was measured for 10- and 1000-ms long signals as a function of bandwidth. The test signals had bandwidths of 1600, 3200, and 6400 Hz. The reference signal had a bandwidth of 800 Hz. The average results showed that the magnitude of spectral loudness depends on signal duration in normal-hearing subjects.

In a second experiment, we compared the loudness of pulse trains and continuous signals at two bandwidths, 200 Hz and 3200 Hz. Both test and reference signals had a duration of 1000 ms. Pulse trains differed in pulse and interpulse durations. For both bandwidths the pulse trains were perceived louder than the reference signals, with the larger bandwidth leading to the larger difference. The differences between different pulse trains were not significant.

A possible explanation for the bandwidth dependency of the loudness perception of the pulse trains in experiment 2 can be found in the duration dependency of the spectral loudness summation shown in experiment 1. The short signals in the pulse train display more summation than the continuous long-duration reference signals, leading to a larger level difference at larger bandwidths.

Deutsche Gesellschaft für Audiologie.
Achte Jahrestagung Göttingen, 24. - 26. Februar 2005

Beitrag wird präsentiert am 25.02.2005
um 10.45 Uhr im Rahmen der FS 6.