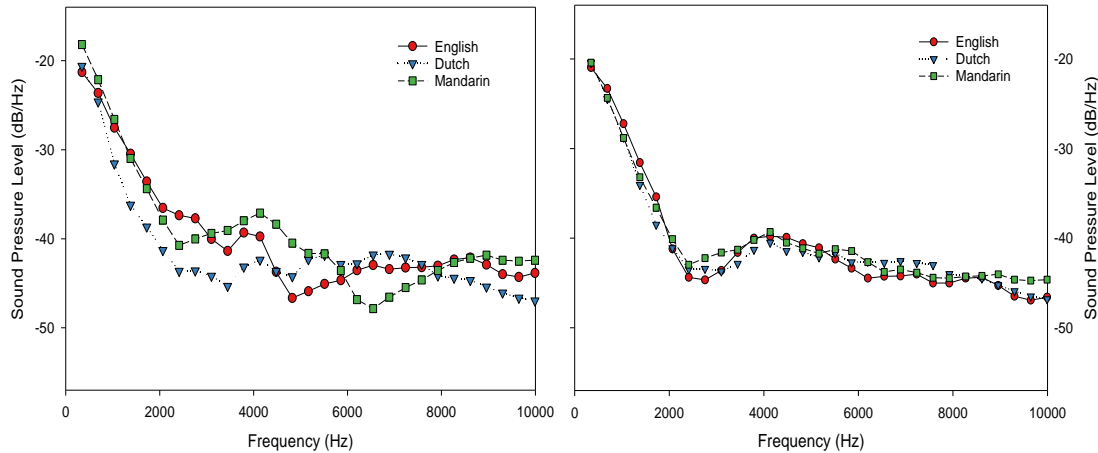


Supplemental Data File:

In order to account for the spectral differences between maskers, we manipulated the long-term average speech spectrum (LTASS) of all two-talker babble tracks as a means of reducing unequal amounts of energetic masking between conditions. The figure below plots the LTASS of all three maskers before (left panel) and after (right panel) the normalization.

Supplemental Figure - Long term average speech spectrum (LTASS) for each language masker before (left panel) and after (right panel) normalization.



The left panel of the figure shows substantial spectral differences in the higher frequencies (6-8 kHz), specifically for the Mandarin masker. LTASS normalization eliminated these differences by adjusting each masker LTASS to match the average LTASS. This normalization procedure was implemented in Praat (scripting acquired from Dr. Susanne Brouwer and originally created by Dr. Chun Liang Chan) and involved first computing the LTASS separately for each masker speech wave file. The LTASS for a given wave file was then computed by breaking up the file into windows of 2048 samples. The fast fourier transformation was then taken of each window and the mean was subsequently taken across all windows. After that, the average LTASS across all masker files was computed and each masker file LTASS was adjusted to the average LTASS. Following this manipulation, informal listening tests with native English and native Dutch listeners on the original and the spectrally transformed sound files to ensure that the stimuli maintained their naturalness after signal processing. The results of these tests showed that normal-hearing listeners could not reliably distinguish between the original and normalized sound files. This was not surprising since the amount of spectral manipulation was relatively small.