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**Cortical mechanisms of speech perception in noise in elderly listeners**

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The present study examines the cerebral hemodynamics (measured by fMRI) associated with listening to speech in noise in elderly listeners with relatively normal peripheral hearing. We asked subjects to identify single words in quiet and in two multi-talker babble noise conditions (+20 and -5 dB SNRs). The behavioral results indicated that subjects performed similarly between the Quiet and +20 SNR conditions, both in accuracy and reaction time, but were less accurate and responded slower in the -5 SNR condition. There were performance-independent and SNR-dependent effects in the brain. A contrast of the +20 SNR and Quiet conditions revealed bilateral (especially left) auditory and prefrontal activation in noise despite equal behavioral performance (performance-independent but noise-dependent activations). As noise increased and behavioral performance decreased (as in the -5 SNR condition), activation in these regions increased. These results reveal a cortical network involving acoustic analysis, working memory, and auditory attention associated with speech perception in noise by the elderly. [Work supported by NIH]