ACOUSTICS2008/1792
Concurrent sound segregation and peripheral frequency resolution

Christophe Micheyl, Michael Keebler and Andrew Oxenham
University of Minnesota, Department of Psychology, 75 E. River Road, Elliott Hall N218, Minneapolis, MN 55455, USA

In everyday environments where multiple sound sources co-exist, listeners often have to follow a harmonic source of interest (e.g., someone's voice) among other such sources (e.g., other talkers). Here, we review psychoacoustical findings suggesting that this form of auditory scene analysis is related to the degree of peripheral "resolvability" of harmonics in the auditory system. We present experimental results, which indicate a systematic relationship between harmonic resolvability and the ability of normal-hearing listeners to "track" (or discriminate) changes in the fundamental frequency (F0) of a target harmonic complex mixed with another (interferer). We show that poor harmonic resolvability is associated not only with poor performance, but also with an inability to take advantage of normally potent cues for concurrent sound segregation, including F0 differences, laterality differences, and onset-offset asynchronies. While it remains unclear whether this relationship is causal, these findings may have important implications for the design of artificial auditory-scene-analysis systems, and for our understanding of the listening difficulties experienced by hearing-impaired listeners in whom peripheral frequency resolution is reduced. [Work supported by NIDCD R01DC05216]