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Listening in Dips: How Competitive Talkers Shape Acceptable Noise Level and Masking Mechanisms

Understanding the Acceptable Noise Level (ANL) is essential for optimizing auditory comfort in noisy environments. This study investigates the impact of varying numbers of competitive talkers in speech babble noise on ANL among normal-hearing listeners, examining both forward and backward noise conditions.

Forty participants underwent ANL testing across eight conditions, with competitive talkers ranging from 2 to 10, alongside a 12-talker baseline. Results indicate that fewer talkers (e.g., 2-talker babble) enhance listening in dips through increased spectro-temporal fluctuations, while higher talker numbers reduce these advantages, leading to greater noise intolerance.

The findings also highlight the distinct roles of informational and energetic masking, particularly in backward noise conditions, where masking is influenced by noise intelligibility. These insights provide valuable guidance for clinicians, emphasizing the importance of tailoring auditory assessments and hearing aid programming to individual noise tolerance profiles. This research offers a foundation for advancing clinical practices and auditory technologies in complex listening environments.