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Hearing Aid Noise Reduction Modulates Secondary Listening Performance During Driving?

This study investigates how modern noise reduction algorithms in hearing aids influence secondary listening performance and listening effort during driving. A dynamic motion platform driving simulator was used to recreate realistic traffic conditions while maintaining experimental control. Two participant groups, normal hearing and hearing impaired adults, completed a demanding speech based secondary task while driving.

Objective measures included multichannel EEG to capture neural responses to speech under load and auricular EMG to quantify muscular markers of listening effort. A contactless multimodal camera system recorded facial expressions, gaze behavior, and head movements as behavioral indicators of cognitive and emotional strain. Driving performance, secondary task accuracy, and subjective ratings of listening effort were collected in parallel.

The study evaluates how noise reduction on versus off modulates listening effort and performance across hearing status groups, providing evidence relevant for hearing aid design and real world driving scenarios.