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Effects of hair on wind noise characteristics

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Wind noise has been a problem for hearing aid and cochlear implant users engaging in sports and outdoor activities. Previous wind noise studies were mostly conducted with manikins without hair. As most people have hair, the purposes of this study were to examine effects of hair on wind noise characteristics and to derive wind noise reduction strategies. Two models of behind-the-ear hearing aids with the same casing were programmed to have flat frequency responses in the omnidirectional and directional microphone modes when they were worn on a manikin in a sound field. All other signal processing algorithms were turned off (i.e., the hearing aids were acting as microphones not signal processors). The manikin was then placed in the testing section of an acoustically treated wind tunnel. Thirty-second wind noise samples were recorded at the hearing aid outputs when the manikin was bald (BALD), with short hair (SHORT), and with shoulder-length hair (LONG). The wind velocities were 0, 2.5, 4.5, 9.0, and 13.5 m/s. Recordings were made at the upper dynamic range of the sound card without overloading it. Wind noise levels were analyzed in 1/3 octave bands from 100 to 8000 Hz. Results indicated that hair significantly reduced wind noise levels compared to BALD, but LONG did not always yield lower wind noise levels than SHORT. Consistent with previous results, directional microphones did not always yield higher wind noise levels than omnidirectional microphones. Wind noise reduction strategies and future studies will be discussed.

Biography

King Chung is an Associate Professor of Audiology at Northern Illinois University. She has been leading students onto humanitarian research and service trips every summer. Past destinations include Taiwan, Hong Kong, Brazil, China, and Cambodia. A researcher at heart, she publishes information on the hearing systems in the visited countries/regions and the hearing status of individuals tested during the trips to raise the awareness of the great demand for hearing services in different countries. The long term goal is to facilitate the provision of frequent and high quality hearing services to underserved and unserved populations around the world.

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