

The role of listener-specific factors in binaural sound reproduction.

Piotr Majdak

Austrian Academy of Sciences

Millions of people use headphones every day for listening to music, watching movies, or communicating with others. Nevertheless, sounds presented via headphones are usually perceived inside the head and not at their actual natural spatial position. This unnatural perception is an inherent limitation as it may unconsciously require more cognitive load and result in faster fatigue and feeling uncomfortable in social interactions. Under precisely controlled laboratory conditions of headphone listening, especially involving listener-specific head-related transfer functions (HRTFs), virtual sounds can be indistinguishable from natural sounds. Listener-specific HRTFs are required for a perfect auditory illusion but other factors like room reverberation, head and source movements, attention, perceptual adaptation, or input from other modalities like vision and proprioception may interact with the need for such HRTFs. In this contribution, we discuss recent findings and open research questions related to the degree of realism achieved by sound reproduction via headphones with a particular focus on the role of listener-specific HRTFs.