

ACOUSTICS2008/697 Binaural enhancement of speech intelligibility metrics

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Efficient methods of quantifying speech intelligibility are needed for designing and understanding functional architectural spaces. All current measures of speech intelligibility are based on monaural impulse response, which excludes consideration of important binaural aspects of human hearing, including dereverberation and decoloration. Acquisition of binaural data has increasingly become common practice, using dummy heads or in-ear microphones, making the development of binaural intelligibility measures especially timely. The need for such a measure is illustrated by calculations of speech transmission index (STI) with a single energy-based impulse obtained through combination of binaural data channels. Each method of combination produces significantly different STI values that illustrate the impact of orientation and location on intelligibility calculations.

The relationship between such estimation variation and subjective experience must be studied to determine the research direction for a much needed, uniquely binaural speech intelligibility measure. The aim of this research is then to provide a guide to be used in comparing values obtained by the various methods. The project will then involve measurements of psychoacoustic metrics for speech intelligibility by objective methods as well as determination of speech intelligibility by subjective methods using tests with binaural recording and playback listening.