

**A BINAURAL APPROACH TO SPEECH
INTELLIGIBILITY**

By

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ABSTRACT

Efficient methods of quantifying speech intelligibility are needed for designing and understanding functional architectural spaces. All current measures of speech intelligibility are monophonic, which excludes consideration of important binaural aspects of human hearing, including dereverberation and decoloration. Acquisition of binaural data has become increasingly 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 the 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 numerical investigations and subjective experience was studied using a synthetic sound field and further indicates the necessity of a binaural approach to measuring speech intelligibility.