Possibilities and limitations of predicting the results of speech audiometry

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Different models are available that predict speech intelligibility based on the listener"s audiological data (essentially the pure tone audiogram). Predictions of speech intelligibility can be applied for evaluating the consistency of audiometric data, for differential diagnostics, and for predicting the possible benefit of hearing instruments. The speech reception threshold (SRT) in quiet can be predicted very precisely based on the hearing threshold, as audibility is the crucial factor. Predicting speech intelligibility in noise, however, is much more challenging as the listener"s supra-threshold processing abilities are difficult to assess. Furthermore, audiometric measures like the usable auditory dynamic range show no clear relation to speech intelligibility in noise. Different studies showed that the difference between observed and predicted intelligibility in noise is related to an individual component that is constant for a large variety of listening situations. This individual component can be assessed for one reference condition (e.g., the SRT in steady-state noise) and can be used for the individualized predictions for other conditions (e.g. the SRT in fluctuating noise or in binaural listening situations). In this way auditory and cognitive components of speech intelligibility can be separated.