Spectral Weighting of Binaural Cues: Effect of Bandwidth and Stream Segregation

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Publication date:
2015

Citation (APA):

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It is hypothesized that binaural information is integrated over frequencies in the binaural system to lateralize sounds (Buell and Hafter, 1991; Woods and Colburn, 1992) using a spectral weighting function. Furthermore, it is hypothesized that this weighting is not fixed but can vary depending on the signal properties and on the acoustical context of the sound.

**Method and Stimuli**

- **Weights derived with a logistic regression analysis**
- **Binary output (left/right lateralization)**
- **Probability described as a random variable**
- **Number of participants in each condition**
- **Stimuli presentation via equalized headphones (f(t)=200(t-500))**
- **Auditory filtering of stimuli**

**Results different to weights obtained by Stern et al. (1988)**

- **Peripheral weights increase for all frequencies for ILDs**
- **At low frequencies for ITD**
- **At all frequencies for ILD**
- **Release from interference?**
- **Content on only one spectral side leads to high weight**
- **Effects of bandpass filtering**

**Discussion and conclusions**

- **Results defined different to what was expected from the duplex theory**
- **Spectrally most outer bands play a special role**
- **Weighting of frequency bands depends on spectrally near content**
- **Content on only one spectral side leads to high weight**
- **Increase in weight only when binaural information available**
- **At all frequencies for ITD**
- **At all frequencies for ILD**

**References**

3. McFadden, D. & Pasanen, E. G. (1976). Anecdotally, normal hearing listeners can attend to a single sound source in the presence of other sound sources by forming auditory objects. This is commonly referred to as the duplex theory.