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

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Publication date:
2015

Citation (APA):
Hypothsis

It is hypothesized that binaural information is integrated over frequencies in the binaural system to lateralize sounds (Buell & Hafter, 1991; Woods & 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

- Method: spectral weighting function
- Stimuli: spectrally most outer bands receive highest weights
- Stimuli presented via equalized headphones (HDA 200)
- P (pre cursor) - L (target)
- All 11 noise bands contained ITD/ILD information, in the 5 and 6 outer bands were set to uncorrelated noise and in subcondition the 2 outermost bands were removed.

Introduction

Anomalies in normal hearing responses are related to a single source sound in the presence of other sound sources by binaural auditory effects. This is commonly referred to as the canceling effect. It is known that between two, among others, binaural disparities in loud and intensity differences exist on ITD and ILD, respectively, to localize a sound source.

In this report, however, four ITD and ILD information was integrated over frequency bands (Stern et al., 1988). This method does not take binaural interference (McFadden and Pasanen, 1976) into account and might not be applicable to more realistic broadband signals.

Experiment 1: Static condition

10 normal hearing listeners

- Condition: full set, uncorrelated, removed

Experiment 2: Streaming condition

- Condition: all set, target, post cursor

Discussion and conclusions

Results obtained different to what would be expected from the duplex theory

Streaming leads to a increase in weights

- Release from interference?
- Increase in weight only when binaural information available
- All low frequencies for ITD
- All frequencies for ILD

Literature

