Behavioral and objective measures of the precedence effect

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Psychoacoustical experiments

Aim: Define the three windows of perception.

Stimuli

1. Echo-threshold test: define the echo-threshold for monaural and binaural stimulation.
2. ITD-threshold test: define the minimum internal time difference (ITD) for the precedence window.
3. ITD-interposition test: specify the perception of the lead-lag pair as a function of the inter-click interval (ICI).

Results

- Mean echo-threshold occurs for an ICI of 4.5 ms (binaural stimulation).
- Similar thresholds for monaural and binaural stimulation.
- Fusion mechanism NRT dependent on binaural processes, in agreement with [2].

CEOAes

Aim: Investigate monaural lag-suppression at a peripheral stage of auditory processing.

Stimuli

Double Click (DC): ICI of 4 ms (binaural stimulation).

Results

- The binaural ABRs did not allow any additional contribution of binaural processes to the monaural lag-suppression.
- The CEOAEs show a reduction in suppression obtained in the ABR results might be due to the higher frequency content.

ABRs

Aim: Compare ABRs to monaural and binaural stimulation to investigate whether binaural processes contribute to lag-suppression at brainstem level.

Stimuli

Monaural and binaural stimuli.

Results

- The suppression obtained in the ABR results might be due to the higher frequency content.
- The binaural processes did not add any substantial contribution to monaural and peripheral suppression at the brainstem level, in agreement with [2].

Conclusions

The results show that BM lead-lag interactions are the main source of lag-suppression up to the brainstem. This suggests the existence of a peripheral and a binaural component to the linear peripheral lag-suppression. Further research is needed to understand the mechanisms underlying these interactions.