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Investigation of the Naída Marvel CI Classification System and Bluetooth Streaming

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INTRODUCTION

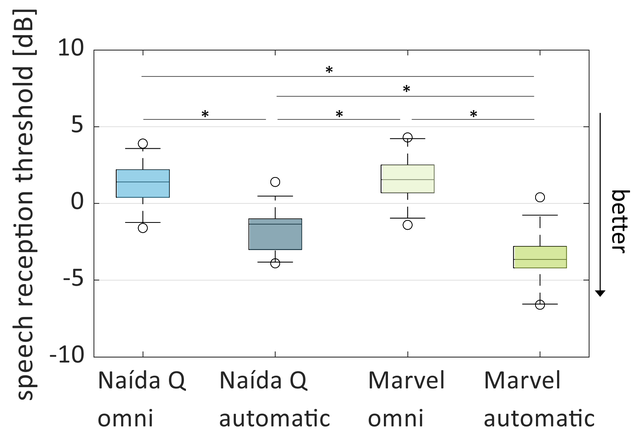
The Marvel hearing system combines a Naída / Sky CI™ M sound processor and a Naída / Sky™ M hearing aid. To improve listening in challenging hearing situations as well as to relieve cochlear implant (CI) users from taking an often difficult decision to choose the most optimal program when entering into a new listening situation, an automatic scene classification system, named AutoSense OS™, as well as an automatic feature enabling beamformers into the directions front, back and the two sides, named Speech in 360°, have been implemented in the latest generation of CI sound processor, the Naída Marvel CI. Further on, direct Bluetooth streaming allows for a clear sound and easy wireless connection between the hearing devices and any Bluetooth capable streaming device.

AUTOSENSE OS™

AutoSense OS is continuously analyzing incoming sounds and activating one out of seven classes, including different microphone and noise reduction settings. In a clinical study in Hanover, speech perception was tested with adult CI users, in India children were asked to rate their experience with the new hearing devices in everyday life.

Clinical Study - Hanover

- N = 10 adults (bimodal, bilateral)
- German matrix test (50% correct SRT)
- Multi-talker babble noise (70dB)
- S_0 $N_{0,\pm45,\pm90,\pm135,180}$
- Naída Q omni/automatic vs. Marvel omni/automatic

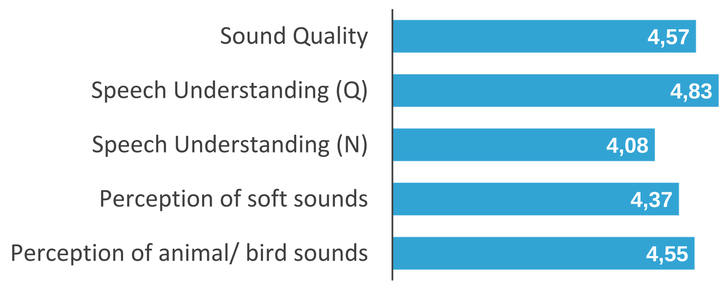


Outcomes

- Significant improvement with automatic features compared to omni-directional microphone on the same device
- Significant improvement with Marvel automatic vs. Naída Q automatic

Clinical Study – Mumbai and Calicut

- N = 15 children and young adults
- Hearing performance questionnaire
- Rating scale: 1 (very poor) to 5 (very good)
- Marvel hearing system with automatic program
- Rating one month after upgrading



Outcomes

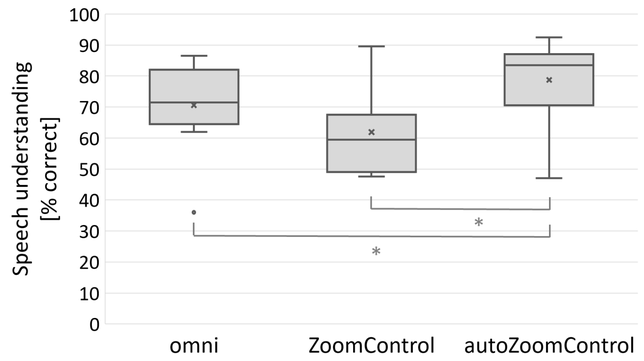
- Very positive feedback in general
- Sound quality, audibility and speech perception were rated highly (above 4 out of 5) after one month of device use

SPEECH IN 360°

Speech in 360° enables the beamformer into four directions: front, back, left right, either via manual switching (ZoomControl, comparable with Naída Q) or automatically when detecting a signal (autoZoomControl, new on Marvel). In a clinical study in Geneva, speech perception was tested with adult CI users.

Clinical Study - Geneva

- N = 11 adults (bimodal, bilateral)
- French matrix test (individual SNR)
- Speech shaped noise (65dB)
- $S_{0,\pm90,180}$ (random), $N_{0,\pm90,180}$
- Marvel omni, ZoomControl (manual), autoZoomControl (automatic)



Outcomes

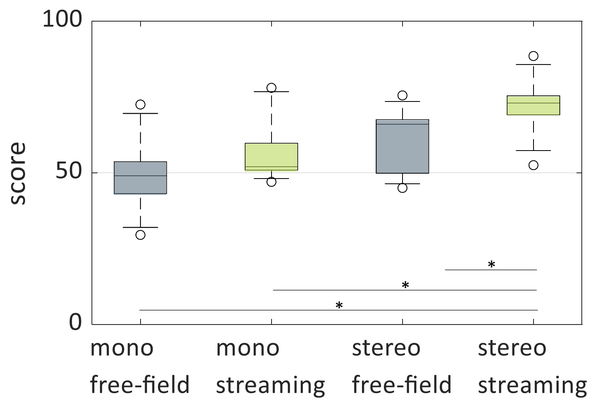
- Similar speech perception with omni-directional microphone and ZoomControl (manual switching)
- Significant improvement with Marvel automatic ZoomControl compared to omni and ZoomControl

STREAMING

The Marvel hearing system offers direct Bluetooth (BT) streaming for all common audio sources or phones as well as streaming via AirStream™ technology (e.g. Phonak TV connector). Via the AB remote app the mixing ratio of omni-directional microphone and streaming signal can be individually set. In clinical studies in Hanover and Geneva, music enjoyment as well as speech understanding via streaming were tested in adult CI users.

Clinical Study - Hanover

- N = 10 adults (bimodal, bilateral)
- Rating of music enjoyment for 20 music samples
- Free-field presentation 0° or ±30°, streaming via TV connector
- Mono / stereo signal in free-field / via streaming

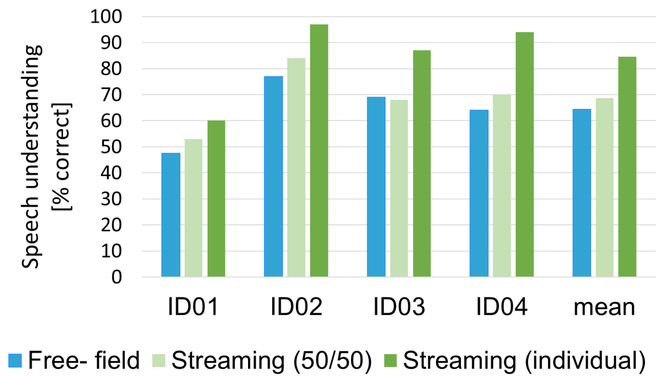


Outcomes

- Significantly better music enjoyment scores for stereo presentation compared to mono, while streaming
- Highest rating for music enjoyment when streaming a stereo signal

Clinical Study - Geneva

- N = 5 adults (bimodal, bilateral)
- French matrix test (fixed SNR, % correct)
- Speech shaped noise (65dB)
- Free-field presentation 0°, streaming via TV connector, $N_{0,\pm90,180}$
- Free-field, streaming 50/50 (fixed microphone mixing ratio) / individual



Outcomes

Best speech understanding for all individual subjects with streamed signal while changing the environmental balance individually via the AB remote compared to the fixed ratio between streaming and microphone input, 50% each.

SUMMARY

AutoSense OS and Speech in 360°, both switch automatically into the optimal program and increase speech understanding. Streaming options allow for improved music enjoyment and speech understanding on the phone.

May 20 - 21, 2021 • Virtual Meeting

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