

# Naída and Sky: Enhanced User Experience Compared to Previous System

*Global Survey of Upgrade CI Users*

## THE ADVANCED BIONICS HEARING SYSTEM

*The most advanced hearing system to date*

In 2020, Advanced Bionics (AB) launched its most advanced hearing system yet, consisting of the Naída and Sky product families for adults and children, respectively. The AB Hearing System offers cochlear implant (CI) sound processors and dedicated Phonak Link hearing aids (HA) for bimodal listeners. In 2023, the Phonak CROS for unilateral CI users completed the portfolio of two-ear hearing solutions for all recipients.

The current generation, the Naída CI M and Sky CI M sound processors<sup>1</sup>, Naída Link M and Sky Link M hearing aids, and CROS P-13, features the advanced scene classifier AutoSense OS 3.0<sup>2</sup>, which provides enhanced speech intelligibility in challenging listening environments<sup>3</sup>, enhanced sound quality for music<sup>4</sup>, and universal Bluetooth® connectivity, allowing AB CI users to seamlessly connect with the people, places, and things in their world without limitations. A wide range of accessories and customization abilities enables the creation of a truly individualized hearing solution.



## GLOBAL SURVEY

*Gathering feedback from around the world*

An online survey was launched globally in 2020 to gather feedback about the current generation of the AB Hearing System from users and healthcare professionals. Responses were collected between November 2021 and August 2023. The upgrade CI user section of the survey was created for users of the AB Hearing System who were upgraded from any other AB system. Respondents were eligible to participate in the survey between four to eight weeks after being upgraded. There were no restrictions on what part of the AB Hearing System (CI, HA, CROS, or combination thereof) was used by the respondents, nor were there restrictions on the system used prior to the use of the current generation of the AB Hearing System. Both adult and pediatric CI users were targeted.

[1] Please indicate your age group. (select one box only)

<input type="checkbox"/> up to 3 years	<input type="checkbox"/> 13 to 18 years	<input type="checkbox"/> 66 to 80 years
<input type="checkbox"/> 3 to 6 years	<input type="checkbox"/> 19 to 30 years	<input type="checkbox"/> more than 80 years
<input type="checkbox"/> 7 to 12 years	<input type="checkbox"/> 31 to 65 years	

[2] Please indicate which hearing devices you previously used before using the Marvel system. (select one box per column)

LEFT ear	RIGHT ear
<input type="checkbox"/> Naída CI sound processor	<input type="checkbox"/> Naída CI sound processor
<input type="checkbox"/> Harmony sound processor	<input type="checkbox"/> Harmony sound processor
<input type="checkbox"/> Neptune sound processor	<input type="checkbox"/> Neptune sound processor
<input type="checkbox"/> Platinum Sound Processor (PSP)	<input type="checkbox"/> Platinum Sound Processor (PSP)
<input type="checkbox"/> Naída Link hearing aid	<input type="checkbox"/> Naída Link hearing aid
<input type="checkbox"/> Any other Phonak hearing aid	<input type="checkbox"/> Any other Phonak hearing aid
<input type="checkbox"/> Any other brand hearing aid	<input type="checkbox"/> Any other brand hearing aid
<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____
<input type="checkbox"/> no hearing device	<input type="checkbox"/> no hearing device
<input type="checkbox"/> I don't know	<input type="checkbox"/> I don't know

[3] Please indicate on which side you were upgraded to one of the Marvel hearing devices (sound processor and/or hearing aid). (select one box only)

left side  
 right side  
 both sides

[4] Which of the following accessories have you used for streaming with your previous hearing system? (select one box per column)

	Telephone	Music	TV
ComPilot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Naída CI Connect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV Link	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RemoteMic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DECT phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I did not use any accessory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# SURVEY RESULTS

## An improvement over previous systems

Demographics data on respondents' location, age, and device use were collected. Ratings were performed on a comparative scale including the options much worse, worse, similar, better, and much better. Respondents had the option of indicating "I don't know" for items they were unable to rate. The number of respondents making use of this option for each item is indicated in the figures.

## STUDY POPULATION

### An international survey with over 100 participants across all age groups

Overall, 103 responses were collected from 13 countries: Belgium, Chile, China, France, Germany, India, Netherlands, Spain, Switzerland, and the UK. Among the respondents were 82 unilateral CI upgrades (79.6%) and 21 bilateral upgrades (20.4%), resulting in 124 upgraded ears. Most respondents were between the ages of 31 and 80, with the total range covering all ages from < 3 years to > 80 years.



Fig. 1: Responses were collected from countries across the world.

Recipients were most commonly upgraded from the Naída CI Q sound processor (see Fig. 2). For unilateral upgrade users, the most used device on the contralateral (not upgraded) side was a hearing aid (either Naída Link HA, other Phonak HA, or another brand HA, see Fig. 3).

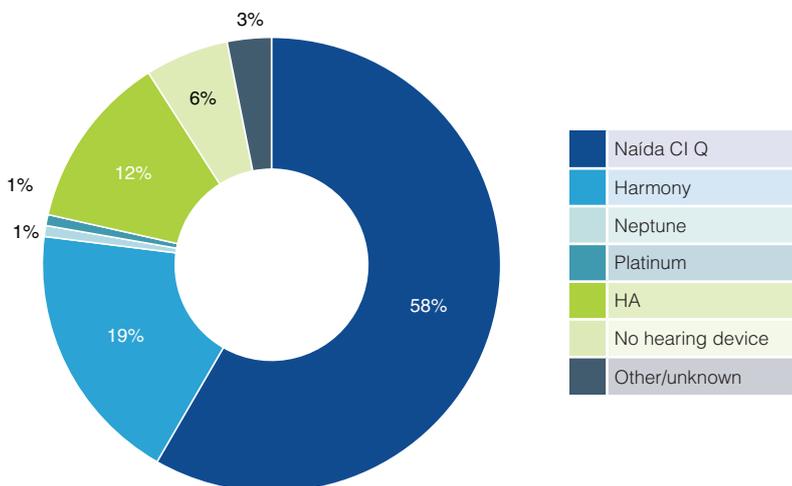


Fig. 2: Previously used system.

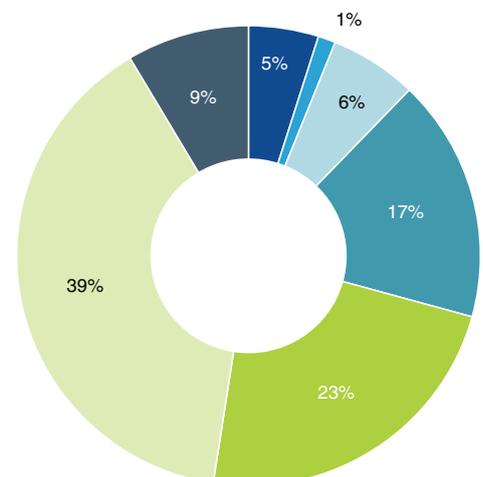


Fig. 3: Contralateral system for unilateral upgrade users.

# STREAMING EXPERIENCE

## Significantly better access to streamed media

Before upgrading to the current generation of the AB Hearing System, most respondents (more than 75%) reported not using any accessories to access TV, phone, or music. While there was no significant difference in overall device use time (eleven hours or more for most subjects for both devices), after being upgraded to the current generation of the AB Hearing System, the frequency of phone calls, music and TV streaming increased significantly (see Fig. 4).

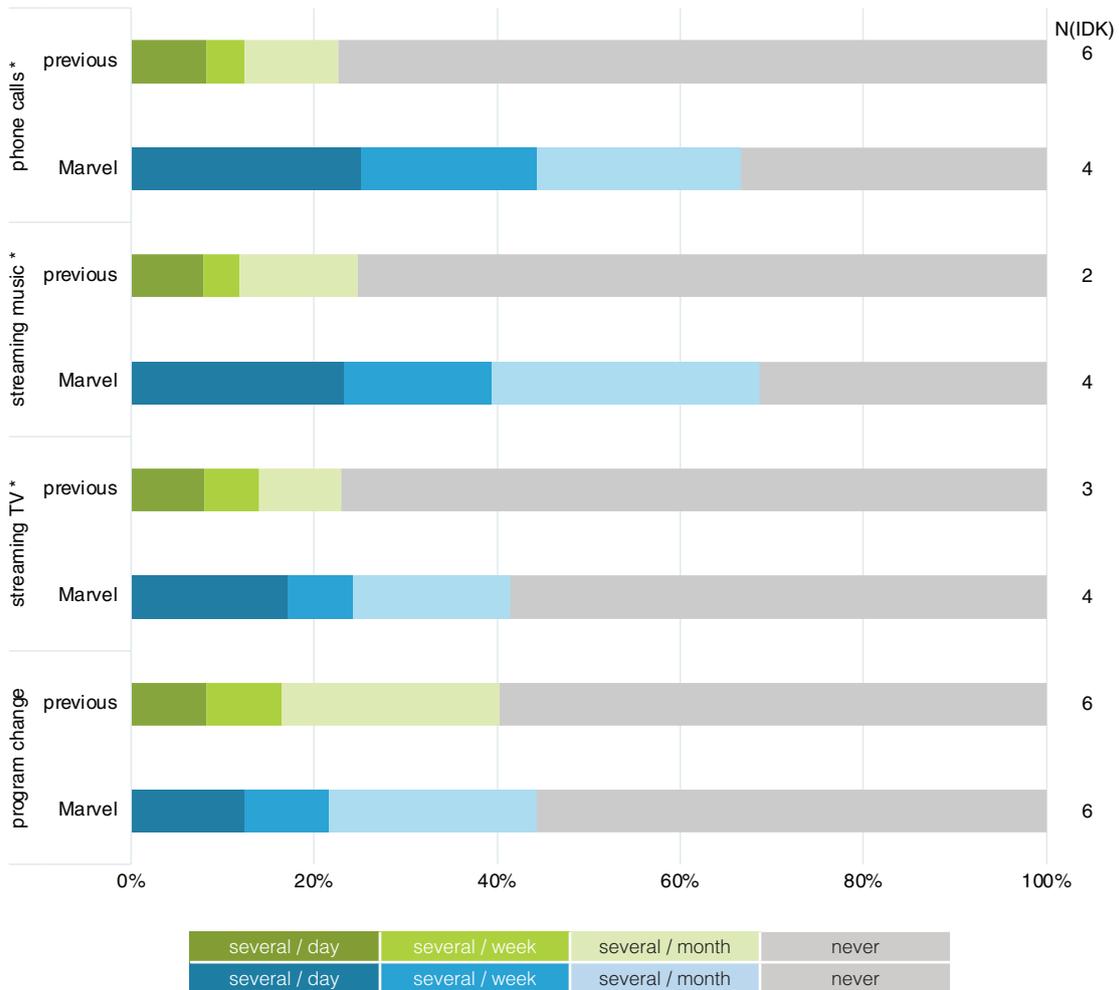


Fig. 4: Streaming frequency for phone calls, music, and TV, as well as program change frequency with the previous (top rows) and current (bottom rows) system. Asterisks indicate items significantly different between the previous system and the current system. N(IDK) indicates the number of respondents who chose the "I don't know" option for each item.

\*Paired Wilcoxon Signed Rank Test.

## COMPARISON TO PREVIOUSLY USED SYSTEM

### *Significantly better sound quality, speech intelligibility, and usability*

Respondents were asked to compare several aspects of their new AB Hearing System to their previously used system on a scale from much worse (0) to much better (10). If respondents could not rate any aspect, the option “I don’t know” could be given.

### Sound Quality And Speech Perception

Results of the rating of several aspects of sound quality are shown in Fig. 5. All aspects were rated as significantly better with the new system\*.

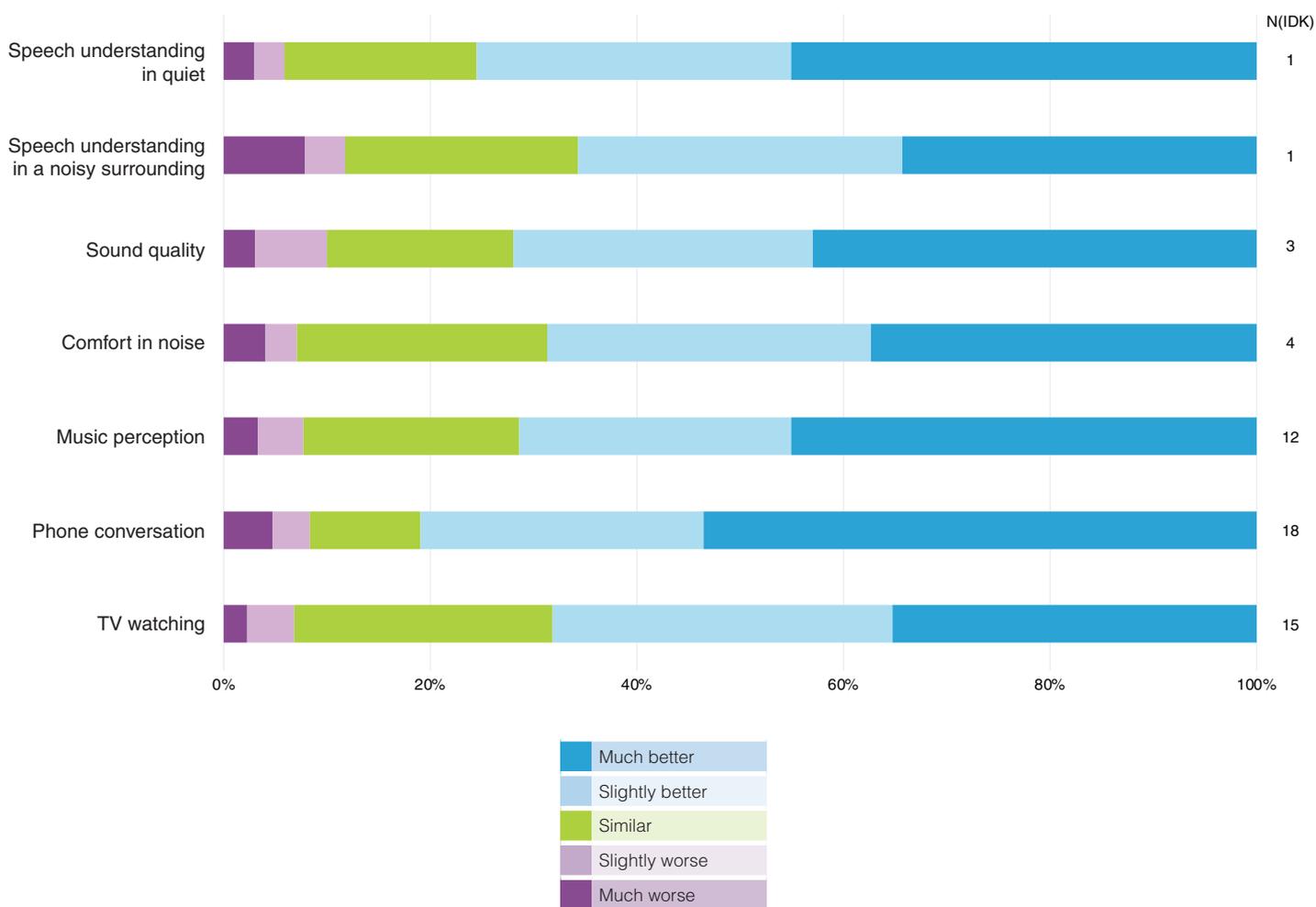


Fig. 5: Ratings of sound quality and speech perception, relative to previous technology. All items were rated as significantly better with the current system. N(IDK) indicates the number of respondents who chose the “I don’t know” option for each item.

\*One-sample Wilcoxon signed rank test.

## Usability and Overall Satisfaction

Results of the rating of several aspects of comfort, aesthetics, and usability are shown in Fig. 6 and Fig. 7. All aspects were rated significantly better with the new system\*.

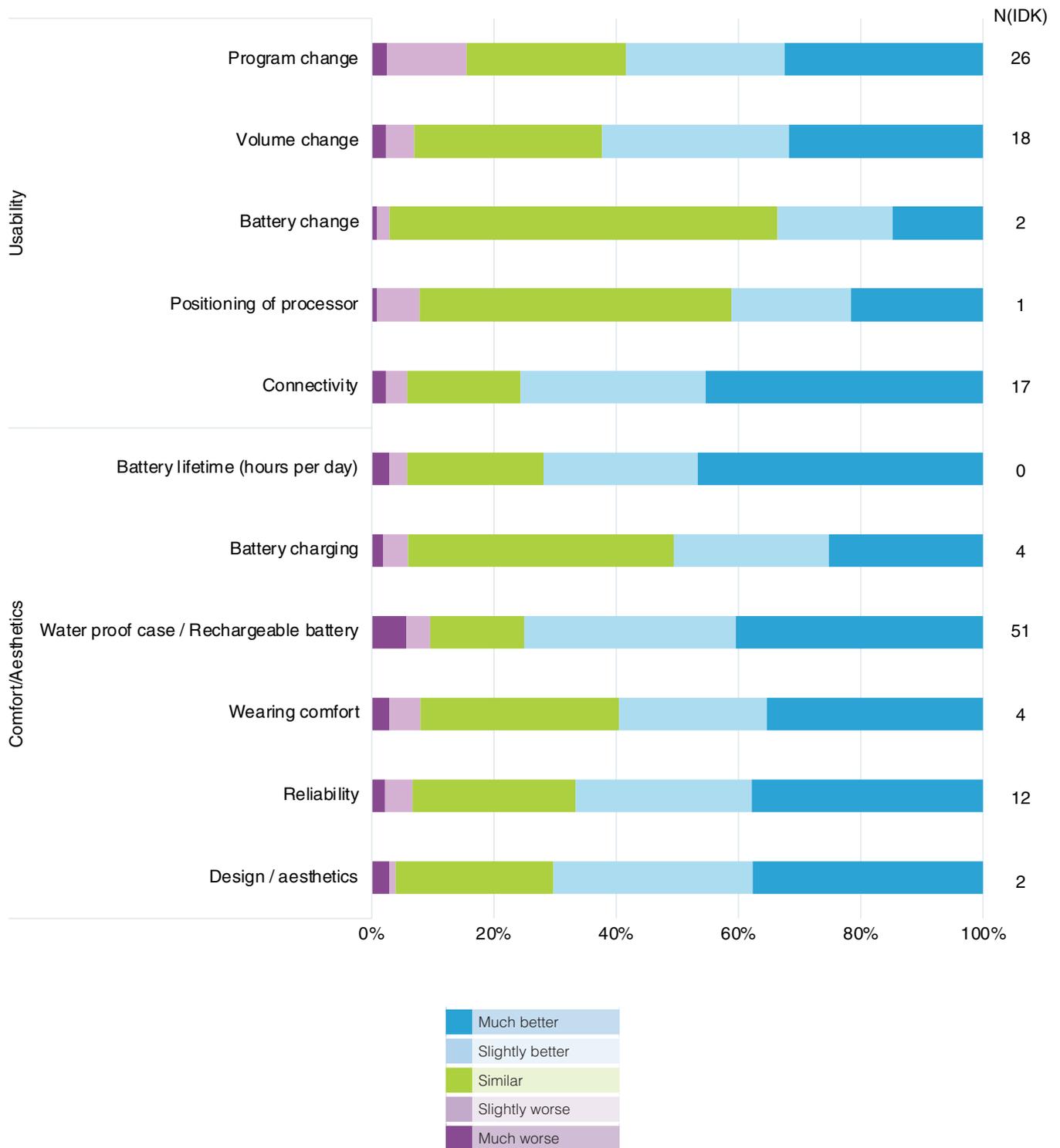


Fig. 6: Ratings of several aspects of usability (top) and comfort and aesthetics (bottom), relative to previous technology. All items were rated as significantly better with the current system. N(IDK) indicates the number of respondents who chose the “I don’t know” option for each item.

\*One-sample Wilcoxon signed rank test.

## SUMMARY

### *A well-received innovation*

The current generation of the AB Hearing System, consisting of dedicated sound processors (Naída CI M and Sky CI M) and hearing aids (Naída Link M and Sky Link M), as well as a CROS device, offers a complete portfolio of two-ear hearing solutions for all recipients. A global survey was launched to gather feedback on this innovative hearing system. This White Paper highlights the responses collected from upgraded CI recipients.

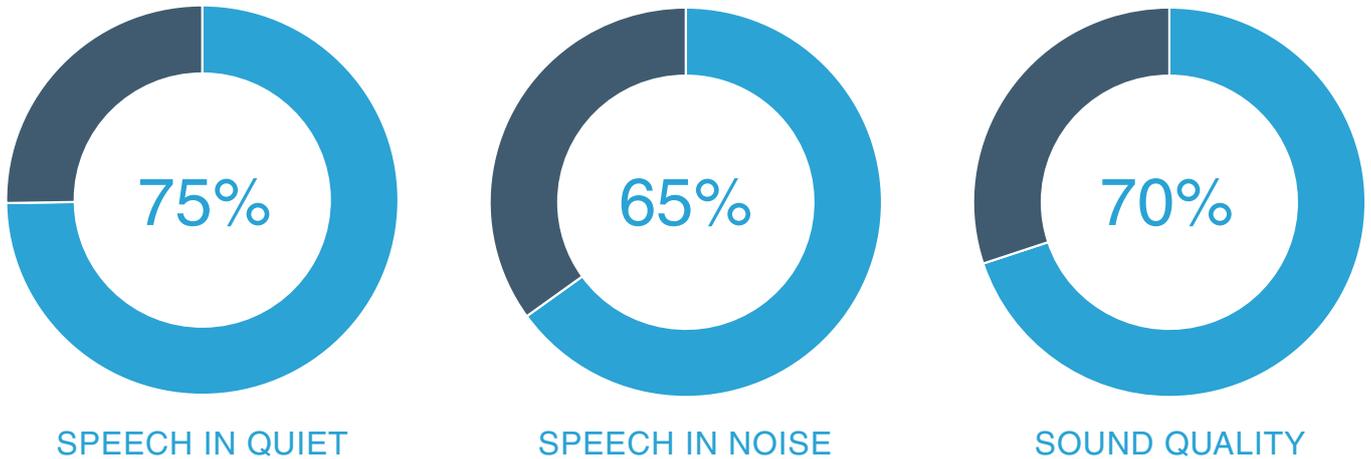


Fig. 6: Percentage of respondents indicating performance with the new AB Hearing System to be better or much better than with the previously used hearing system for speech understanding in quiet (left), speech understanding in noise (center), and sound quality (right).

Compared to the previously used hearing system, sound quality and speech intelligibility with the new Hearing System were rated as significantly better. The domains of comfort, aesthetics, and usability also showed a significant improvement, compared to the previously used system. Thanks to the integrated Bluetooth® capabilities, media streaming duration increased significantly following the upgrade. Overall, the upgrade to the new Hearing System resulted in a significant enhancement of the respondents' listening experience.

## REFERENCES

1. Marvel CI Technology - Leveraging natural ear acoustics to optimize hearing performance, White Paper, Advanced Bionics 2021, 028-Q049-02
2. AutoSense OS™ 3.0 Operating System - Allowing Marvel CI users to seamlessly connect with the moments they love, White Paper, Advanced Bionics 2021, 028-Q029-02
3. Buechner A, Bardt M, Kliesch S, Lenarz T and Brendel M (2024), Enhancing speech perception in challenging acoustic scenarios for cochlear implant users through automatic signal processing, *Front. Audiol. Otol.* 2:1456413, doi: 10.3389/fauot.2024.1456413
4. Agrawal S, Banik A, Nair A, Ajimsha KM, Jagmaag F, Backer S, Sasidharan P, Manoj MP. (2021). Real-world Evaluation of the Marvel CI Sound Processor in Children. 13th Asia Pacific Symposium on Cochlear Implants and Related Sciences. December 8th to 10th. Oral Poster: 28.