

# Phonak Field Study News.

## Adaptive Phonak Digital (APD) 3.0 is the preferred first fit compared to a key competitor device

Results of a study examining spontaneous acceptance of APD 3.0 in a group of new hearing aid users revealed that 93% preferred Phonak Infinio over a key competitor.

Stewart, E., Adler, M., & Seitz-Paquette, K. August, 2024.

### Key highlights

- APD 3.0 offers new frequency response curves designed to enhance general sound quality in all programs.
- Spontaneous acceptance of APD 3.0 was investigated among 15 new hearing aid users in a single-blinded study conducted at the Phonak Audiology Research Center (PARC).
- 93% of participants with no previous hearing aid experience chose Phonak Infinio with APD 3.0 over that of a key competitor device.
- In rating overall sound quality, 12 out of 15 participants indicated that the Phonak Infinio devices sounded "good" or "excellent" at first fit.

### Considerations for practice

- Based on the findings of the present study, it is expected that clients fit with Phonak Infinio will experience exceptional sound quality from the first moment.
- HCPs can feel confident that their clients will be satisfied when using the first fit as recommended by Target 10.0 fitting software.
- Good spontaneous acceptance means less fine-tuning required by HCPs, allowing more time for other tasks such as counseling.
- APD 3.0 enhances overall sound quality while preserving audibility and listening comfort.

## Introduction

### Adaptive Phonak Digital (APD): a brief history

In 2005, Phonak first launched the proprietary fitting formula known as Adaptive Phonak Digital (APD), which was designed to provide adequate audibility while maintaining listening comfort – that is, to accommodate the end user's dynamic range based on their individual audiogram.<sup>1</sup> In the years since, the development of APD has continued in line with improvements to the signal processing strategies and addition of various programming features available in Phonak products.

First released on the Paradise platform in 2020, APD 2.0: (1) introduced an adaptive compression speed to optimize speech understanding as well as comfort in noise, (2) offered linearized high-level gain for a more natural sound quality and improved clarity for loud speech, and (3) included a new pre-calculation for mild-moderate hearing losses.<sup>2</sup>

Now with the launch of Phonak Infinio comes APD 3.0, which includes new frequency response curves designed to enhance general sound quality in both streaming and environmental programs. These response curves are based on the target frequency response that a sample of trained listeners most preferred in consumer audio headphones.

To confirm the benefit of the new frequency response curve for speech inputs, two studies were conducted at Sonova Innovation Center Toronto (ICT) to compare APD 2.0 with APD 3.0 using objective and subjective measures. Participants in these studies performed equally well with both frequency response curves (APD 2.0, APD 3.0) on a measure of speech intelligibility, but preferred APD 3.0, rating noise as significantly less intrusive and overall comfort significantly higher. These studies confirmed that APD 3.0 provides an optimal balance between speech clarity and comfort.

### PARC study: new hearing aid users

In a study conducted at the Phonak Audiology Research Center (PARC) in early 2024, first fit acceptance of APD 3.0 was investigated in a group of new hearing aid users. Overall preference, as well as loudness and sound quality ratings, were assessed for Phonak Audéo Sphere™ Infinio devices, compared to a key competitor. Results of this study were used to guide expectations regarding clients' first impressions of APD 3.0 sound quality in a clinic setting.

## Methodology

### Participants

Participants were 15 adults (7 male, 8 female) aged 43 to 76 years ( $m=69\pm9.6$ ). Participants were all first-time hearing aid users (i.e., had never owned hearing aids) with bilateral sensorineural hearing loss of varying degrees (Fig. 1).

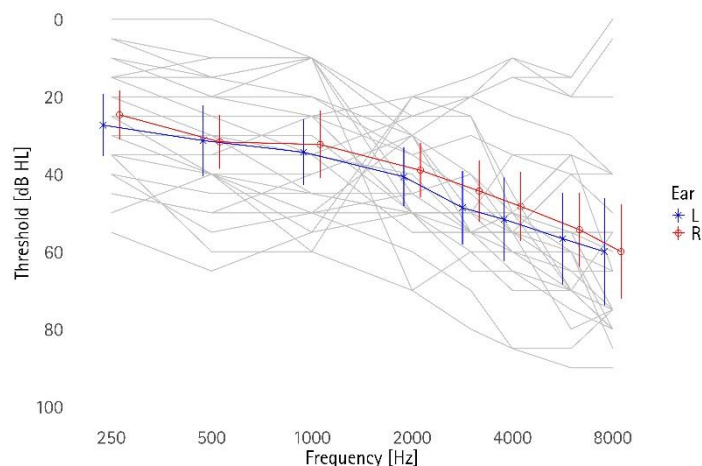


Figure 1. Average (95% CI) pure tone thresholds for participants' left (x) and right (o) ears. Individual audiograms are indicated by the gray lines.

### Hearing Aid Fitting/Programming

Participants were fit with Phonak Audéo Sphere Infinio receiver-in-canal (RIC) devices as well a key competitor RIC device. Hearing aids were programmed to participants' most recent audiogram (no more than 6 months prior to study enrollment) according to first-time user gain settings prescribed by the respective manufacturer fitting software, and fit using the recommended non-custom acoustic coupling. A feedback test was completed for each set of devices prior to administering spontaneous acceptance measures. No fine tuning was applied. The participants were blinded as to which device they were wearing. The Phonak devices were referred to as "Hearing Aid A," while the competitor was indicated by "Hearing Aid B." Hearing aid order (A, B) was randomized across participants.

### Stimuli and Acoustic Set-Up

The stimulus used to assess spontaneous acceptance of the investigational devices ("Speaker's Voice" condition) consisted of a narration spoken by a male talker with a standard American English accent presented through a loudspeaker positioned at 0° azimuth 1m from the participant (Fig. 2).

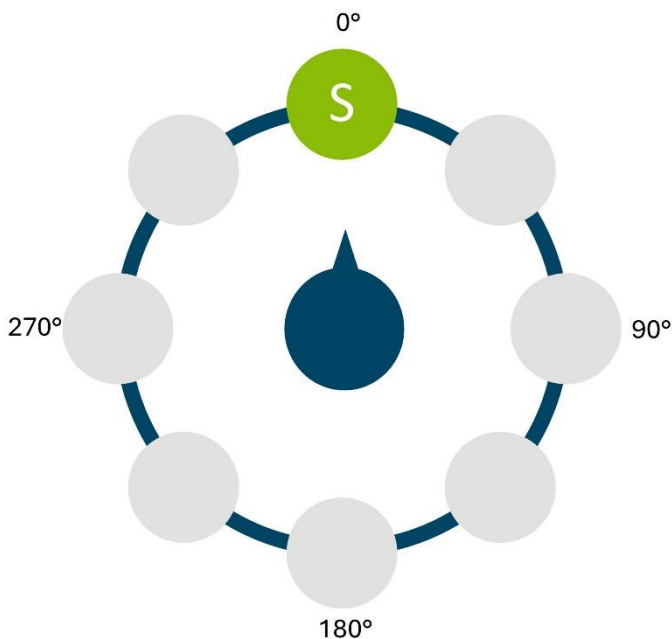


Figure 2. Acoustic set-up for spontaneous acceptance assessment. Speech (S) was presented from 0° azimuth for the "Speaker's Voice" condition. (No noise was used for this measure).

To assess spontaneous acceptance in the "Own Voice" condition, participants were given a written speech passage to read aloud.

### Procedure

Participants were asked to provide loudness ratings for the speaker's voice and for their own voice. Furthermore, participants were asked to rate their subjective satisfaction for speaker's loudness, speaker's sound quality, own voice loudness, own voice sound quality, and overall satisfaction on a scale from 0 ("very unsatisfied") to 100 ("very satisfied"). Lastly, participants were asked to rate the overall sound quality of the hearing device on a five-point scale from "bad" to "excellent." After both hearing devices were rated, the participants were asked which hearing aid they preferred, "Hearing Aid A" or "Hearing Aid B" and had the option to write comments.

### Results

The majority (73–93%) of these 15 first-time hearing aid users reported the loudness of the speaker's voice and their own voice as being "Just Right" to "Rather Loud." These results suggest that the acoustic set-up and methodology used in the present study to assess spontaneous acceptance was representative of a typical clinical experience for clients who are new to amplification.

Further, participants' numeric ratings indicate higher satisfaction in terms of loudness, particularly for their own voice, with Phonak compared to the competitor (Fig. 3).

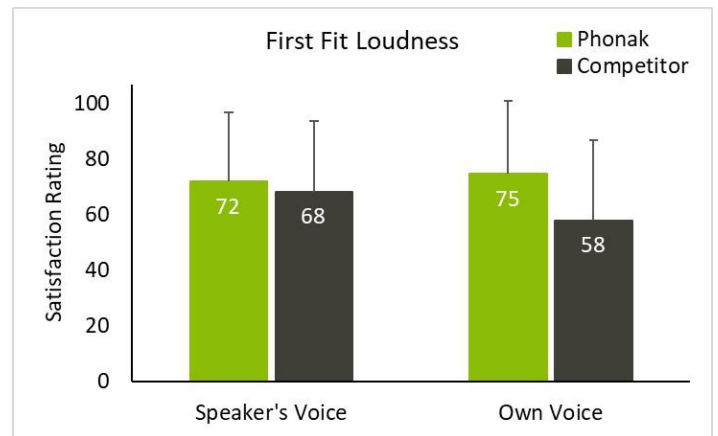


Figure 3. Average (+1 SD) loudness satisfaction ratings for "Speaker's Voice" and "Own Voice" conditions with Phonak Audéo Sphere Infinio and key competitor device.

When asked to give a categorical rating of overall sound quality, 12 of the 15 participants indicated that the Phonak Audéo Sphere Infinio sounded "good" or "excellent" at first fit, with no participants rating Phonak lower than "neutral." Ratings for the competitor device, by contrast, were more varied. While most (n=8) participants thought they also sounded "good" at first fit, only one participant rated the competitor hearing aids as "excellent," while two participants gave a rating of "poor" (the 2nd-lowest rating). Categorical sound quality ratings showed good agreement with sound quality satisfaction ratings (Fig. 4).

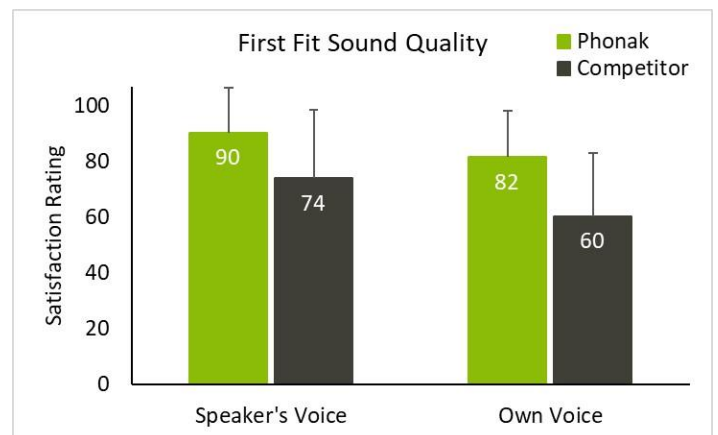


Figure 4. Average (+1 SD) sound quality satisfaction ratings for "Speaker's Voice" and "Own Voice" conditions with Phonak Audéo Sphere™ Infinio and key competitor device.

Finally, when asked to select which device they preferred based on their first-fit experience, the overwhelming majority of participants, 93%, chose the Phonak Audéo Sphere Infinio RIC over the competitor device (Fig. 5).

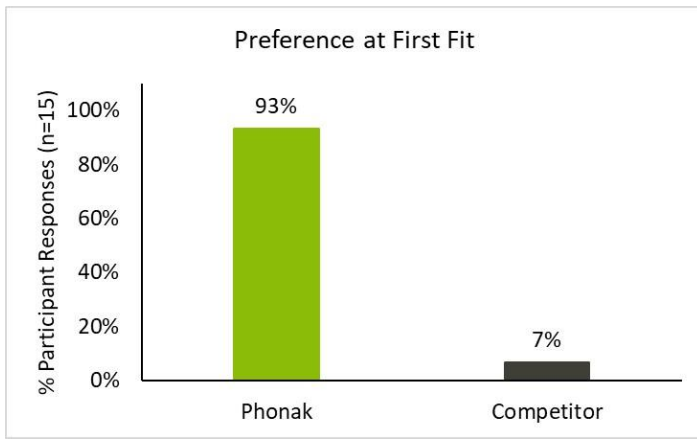


Figure 5. Percentage of participants preferring Phonak Audéo Sphere Infinio over key competitor device at first fit.

## Conclusion

The results of this study of new hearing aid users demonstrate that the Phonak Audéo Sphere Infinio devices deliver exceptional sound quality from the first moment. Further, these findings serve as evidence of the continued improvements to the APD fitting strategy. The participants in this study not only rated the Phonak devices highly on measures of spontaneous acceptance, they also commented that the sound was "comfortable," "familiar" and "natural." Thus, APD 3.0 achieves the intended enhancement to overall sound quality while preserving audibility and listening comfort.

## References

1. Latzel, M. (2013). Adaptive Phonak Digital Compendium. Technical Paper, available at [www.phonak.com/evidence](http://www.phonak.com/evidence)
2. Wright, A. (2020). Adaptive Phonak Digital 2.0: Next-level fitting formula with adaptive compression for reduced listening effort. Phonak Field Study News, available at [www.phonak.com/evidence](http://www.phonak.com/evidence)

## Authors and investigators

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Elizabeth is a Senior Research Audiologist in the Phonak Audiology Research Center (Sonova US). Her educational background includes a Doctorate of Audiology from the University of Kansas Medical Center and a PhD in Speech and Hearing

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### Internal investigator/Author

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Megan is a Research Audiologist with Sonova. She joined Sonova in 2008 and previously worked in Technical Support as part of the Customer Success Team and with US Validations. Her prior Audiology work history

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### Principal investigator

Kevin Seitz-Paquette, Au.D.



Kevin is the director of the Phonak Audiology Research Center (PARC), located in Aurora, IL. Kevin earned his Au.D. at Northwestern University, and a master's degree in Linguistics from Indiana University. His team evaluates

both emerging and released products to demonstrate the benefits of Phonak technology for the patient and professional.