

Evidence to support automation in on-ear and remote hearing solutions.

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EAA 2023

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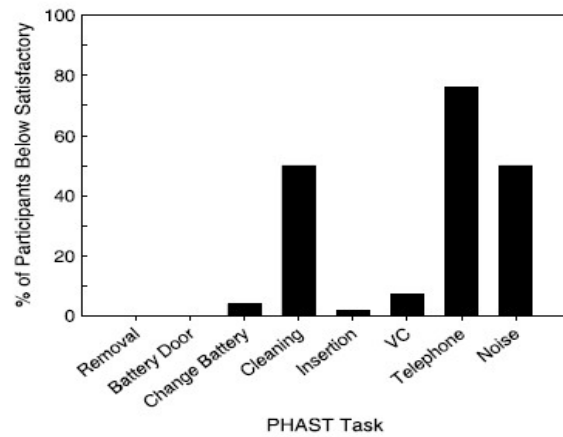
Presenter disclosures

- Financial: I am employed by Phonak.
- Non-financial: I have no relevant non-financial relationships to disclose.

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Challenges with manual programs

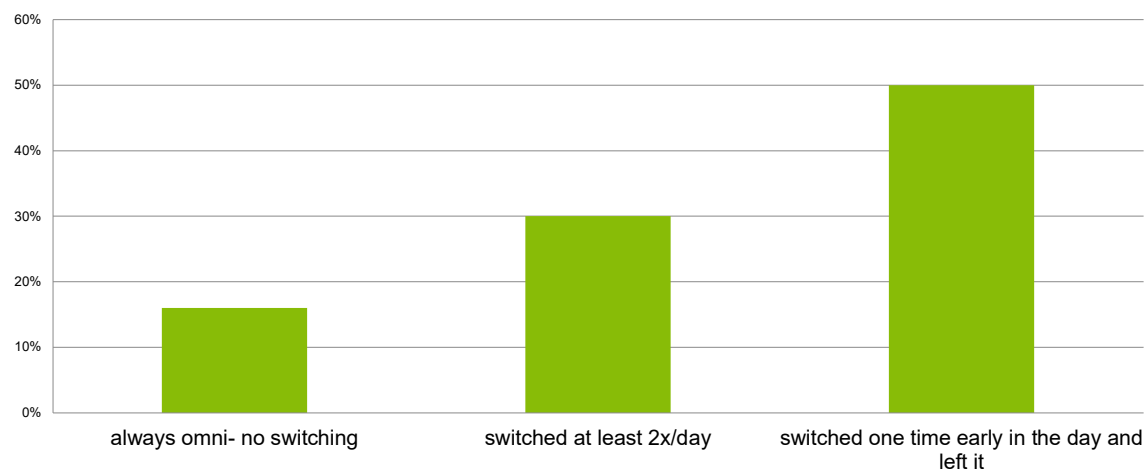
Figure 3. The percentage of participants scoring below satisfactory for each PHAST skill task. VC = volume control.



Doherty, Karen A., and Jamie L. Desjardins. "The practical hearing aids skills test--revised." *American Journal of Audiology*, vol. 21, no. 1, June 2012, pp. 100+. *Gale Academic OneFile*, link.gale.com/apps/doc/A293544496/AONE?u=maine_oweb&sid=googleScholar&xid=ca700790. Accessed 8 June 2023.

3

Manual switching for 24 children aged 11-17

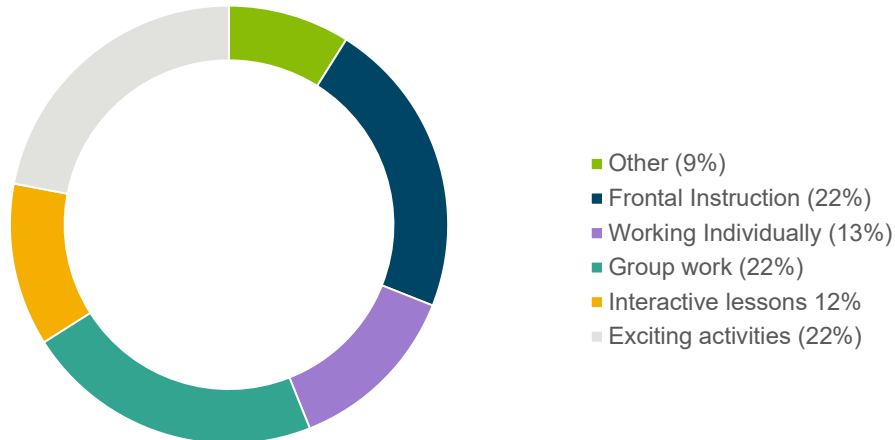


Ricketts, A Sound Foundation Through Early Amplification 2010

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Schools are dynamic environments

Acoustics of a child's school day



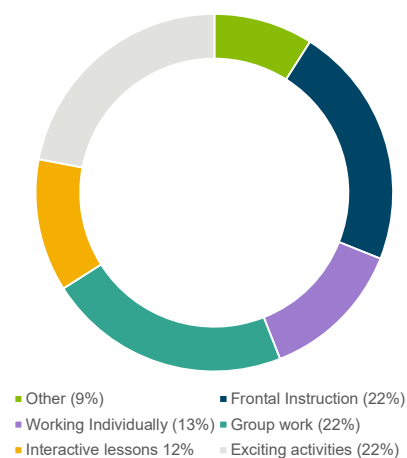
Fellner, M., Rich, S., & Jones, C. (2016) Automatic and directional for kids. Phonak Insight. retrieved from <https://www.phonak.com/en-us/professionals/audiology-hub/evidence-library>, retrieved June 8, 2023.

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Schools are dynamic environments

Acoustics of a child's school day

- **Frontal Instruction**—hearing performance reported as “mostly satisfying”
- **Working individually**—not associated with listening problems
- **Group work**—unsatisfactory listening situation
- **Exciting activities**—class breaks, recess, sports, choosing partners for group work, getting ready for lunch, recess, specials, etc.



Fellner, M., Rich, S., & Jones, C. (2016) Automatic and directional for kids. Phonak Insight. retrieved from <https://www.phonak.com/en-us/professionals/audiology-hub/evidence-library>, retrieved June 8, 2023.

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Schools are dynamic environments: Interviews with students

Group and interactive lessons are the most difficult to understand their peers.

That's 1/3 of a student's day where they continue to struggle to interact and understand well.

Exciting activities when other children are shouting or yelling causes discomfort.

Feliner, M., Rich, S., & Jones, C. (2016) Automatic and directional for kids. Phonak Insight. retrieved from <https://www.phonak.com/en-us/professionals/audiology-hub/evidence-library>, retrieved June 8, 2023.

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What happens when children do not have access to audibility or are uncomfortable?

- Withdraw from activity
- Misunderstand instructions
- Listening fatigue
- Remove devices
- Listening break

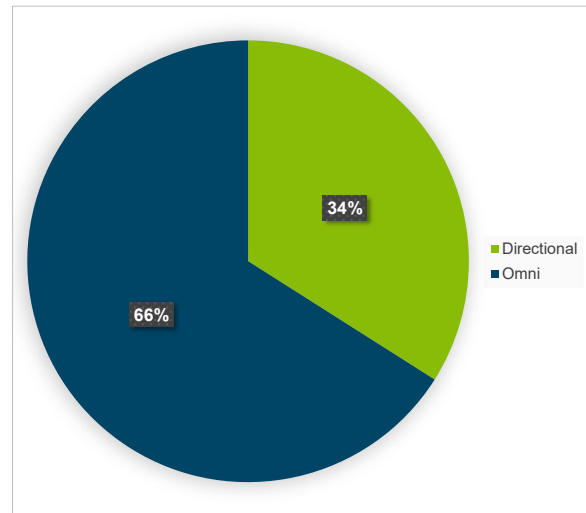
8

The need for different microphone modes in school

Average number of switches needed per hour to maintain the appropriate microphone mode:

3.4

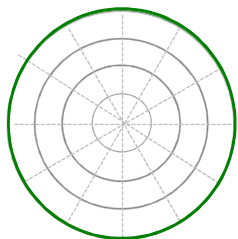
Range: 1 to 22



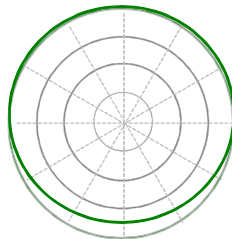
Ricketts T.A., Picou E.M., Galster J.A., Federman J., & Sladen D.P. (2010). Potential for Directional Hearing Aid Benefit in Classrooms: Field Data. A Sound Foundation Through Early Amplification: 143-152.

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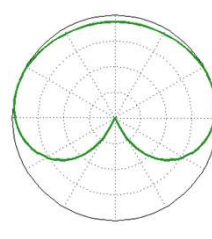
Monaural and binaural signal processing in hearing aids



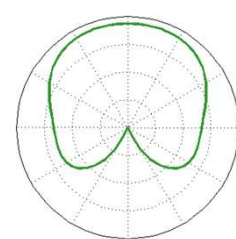
Omni



Real ear sound



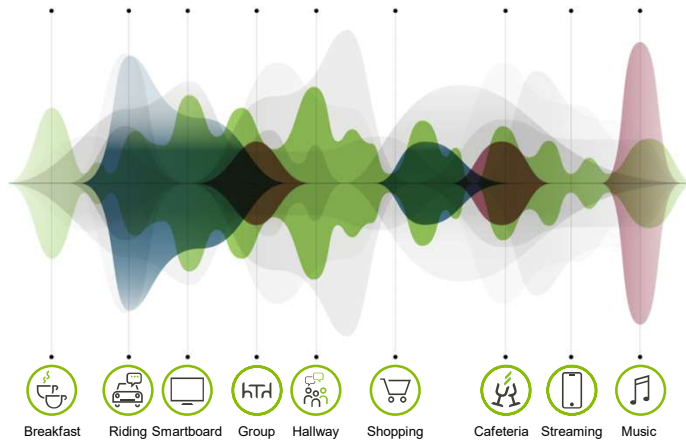
UltraZoom



StereoZoom

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Automation in hearing aids



AutoSense Sky OS

Orchestrating speech intelligibility and comfort features

700 scans per second

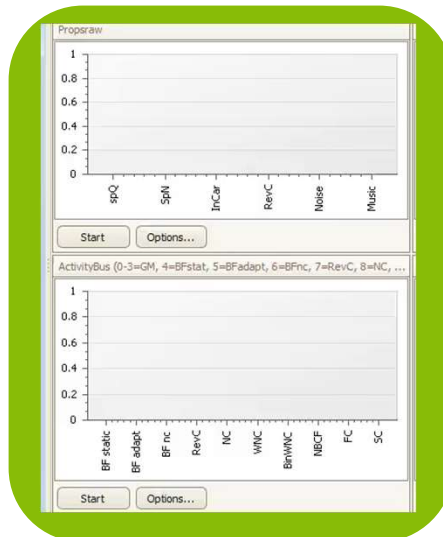
for real-time adjustment to the environment

Improves comfort and speech understanding

Accurate and precise

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Automation of AutoSense Sky OS

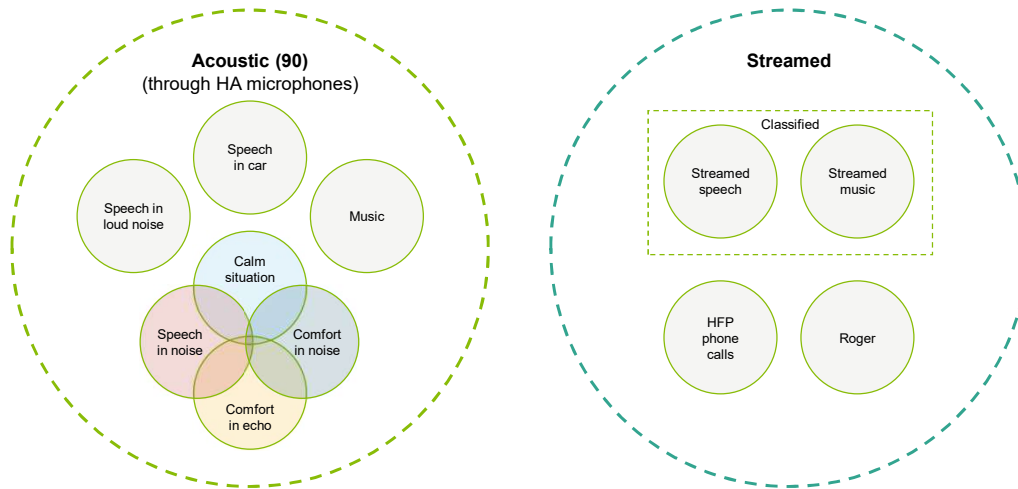


accurate detection

precision processing

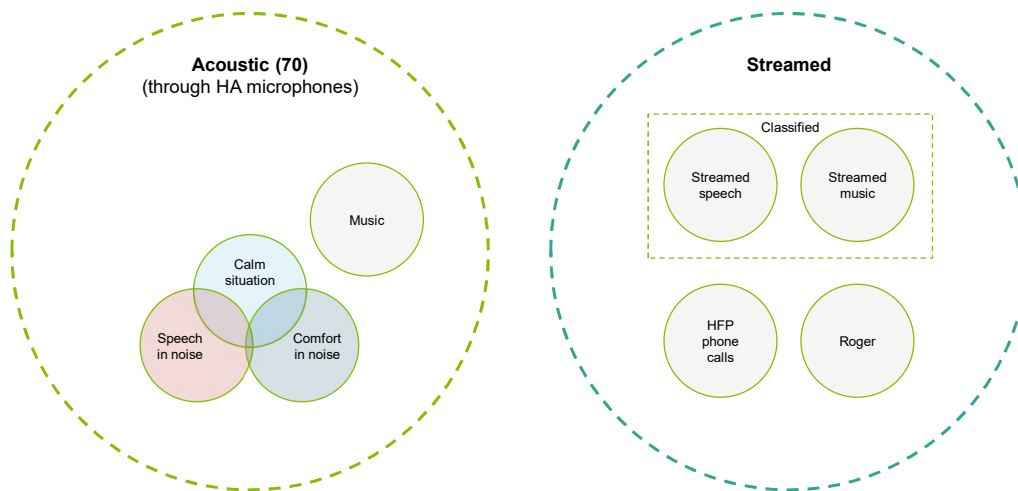
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AutoSense Sky OS: Automation for acoustic and streamed signals



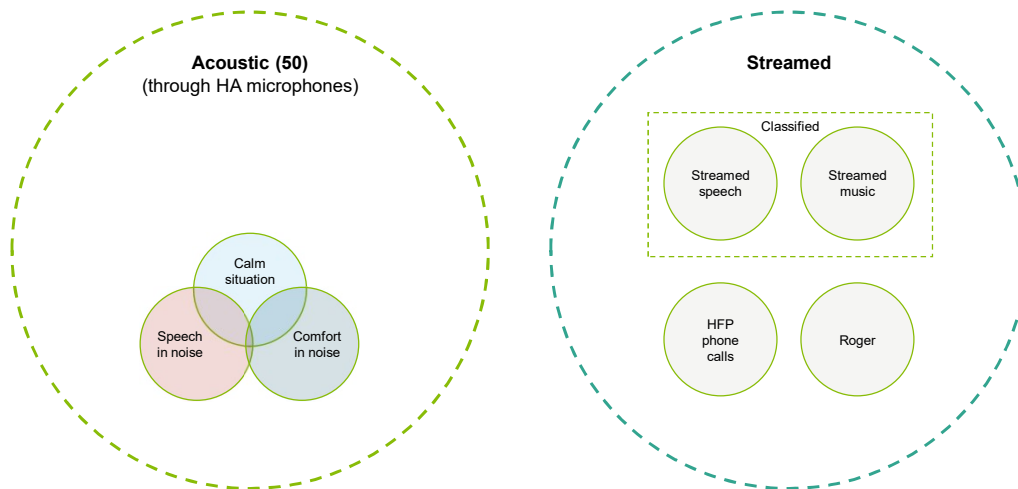
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AutoSense Sky OS: Automation for acoustic and streamed signals



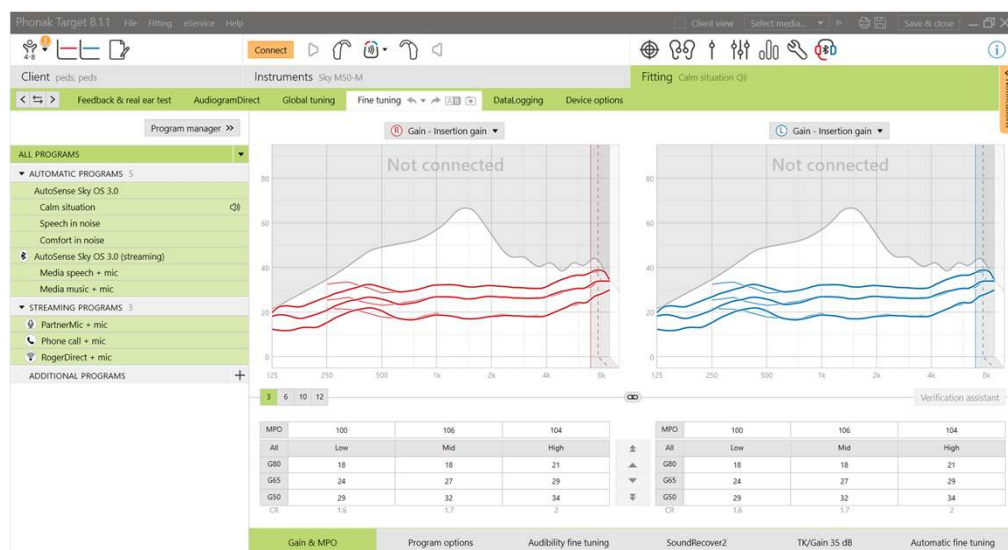
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AutoSense Sky OS: Automation for acoustic and streamed signals



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A look at automation via Target fitting software



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A day in the life

40%

of speech in a child's typical day comes from a distance of over six feet and/or with 'overlapping' noise



Mulla, I., & McCracken, W. (2014). Frequency modulation for preschoolers with hearing loss. *In Seminars in Hearing*, 35, (3), 206-216. Thieme Medical Publishers.

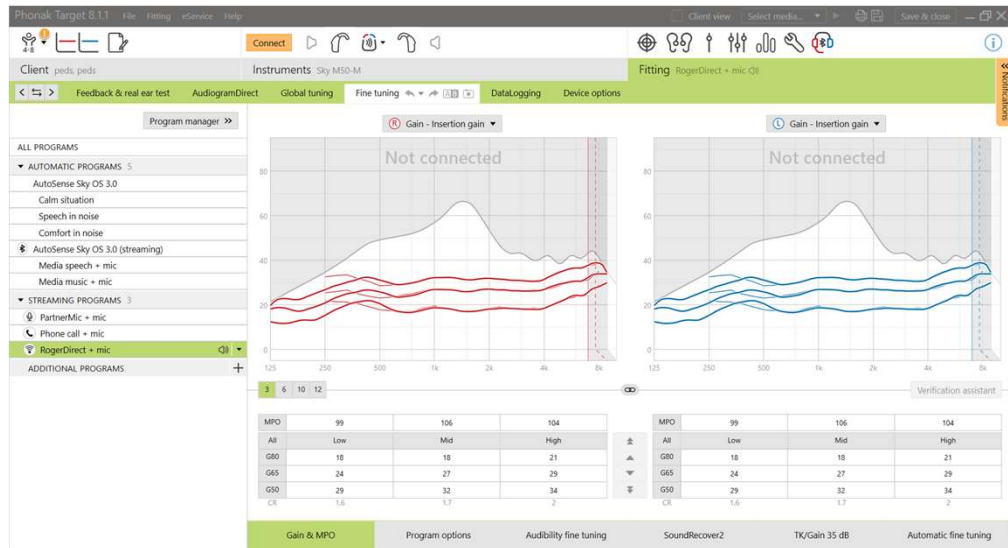
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Automation of Roger



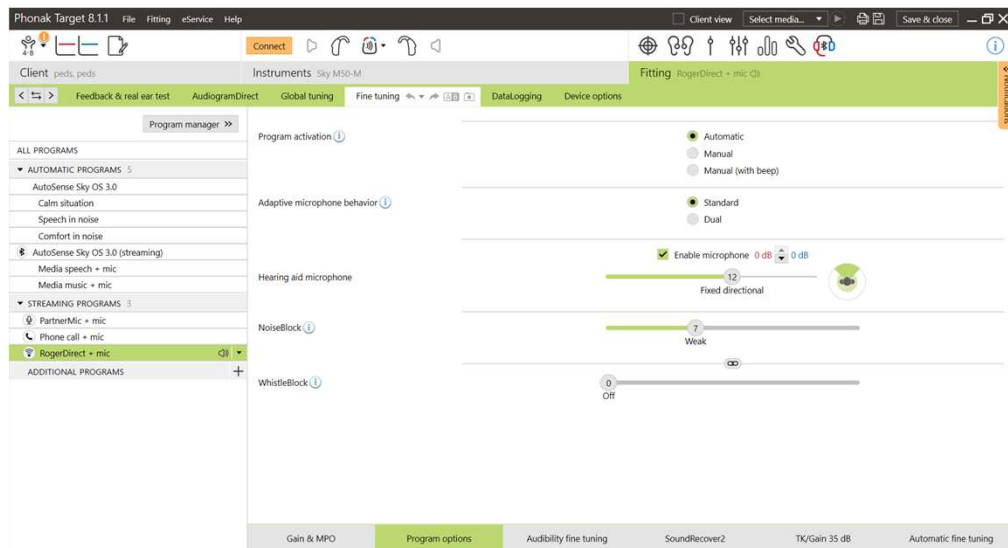
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A look at automation via Target fitting software



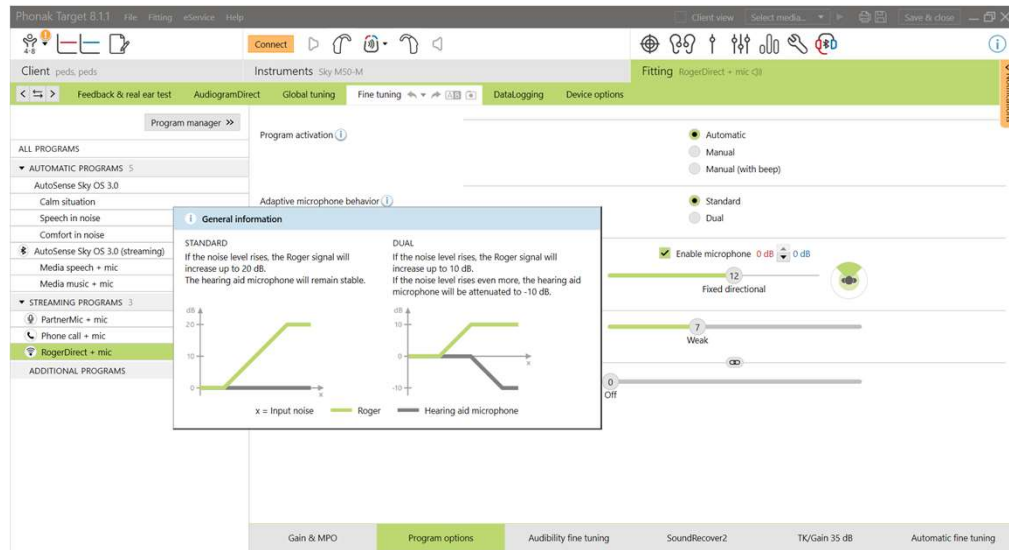
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A look at automation via Target fitting software



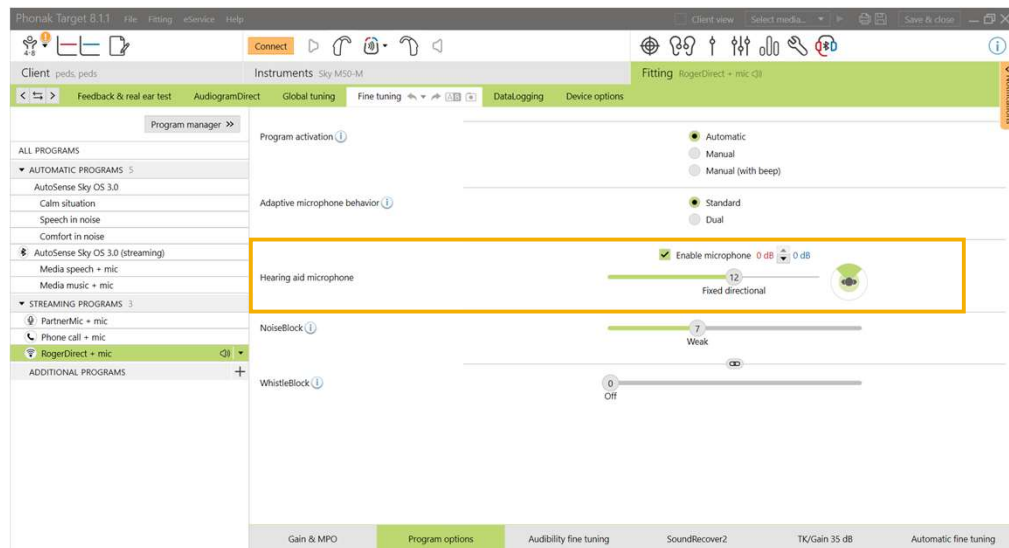
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A look at automation via Target fitting software



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A look at automation via Target fitting software



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Roger+Directional

- Adaptively activated
 - Based on noise level and presence of speech
- Fixed directional beamformer
- Near-field benefit

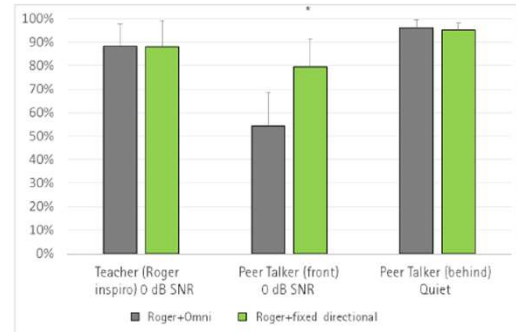
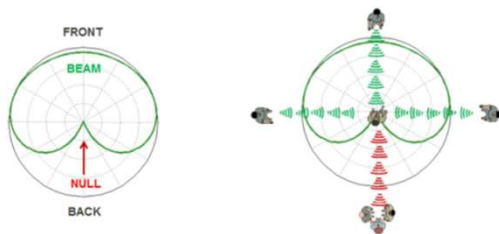
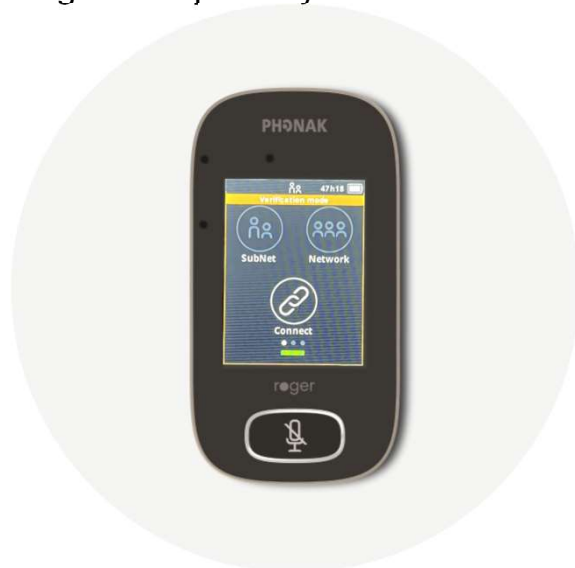


Figure 5. The average speech recognition scores for the Roger+Mic_{Omni} mode and Roger+Mic_{directional} modes in each of the three conditions.

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Hearing aid automation can affect your Roger transparency measures

Activate Verification mode in Roger Touchscreen Mic
 [Settings], [Verification mode], [Activate]



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Hearing aid automation can affect your Roger transparency measures

Activate Verification mode in Roger Select




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Hearing aid automation can affect your Roger transparency measures

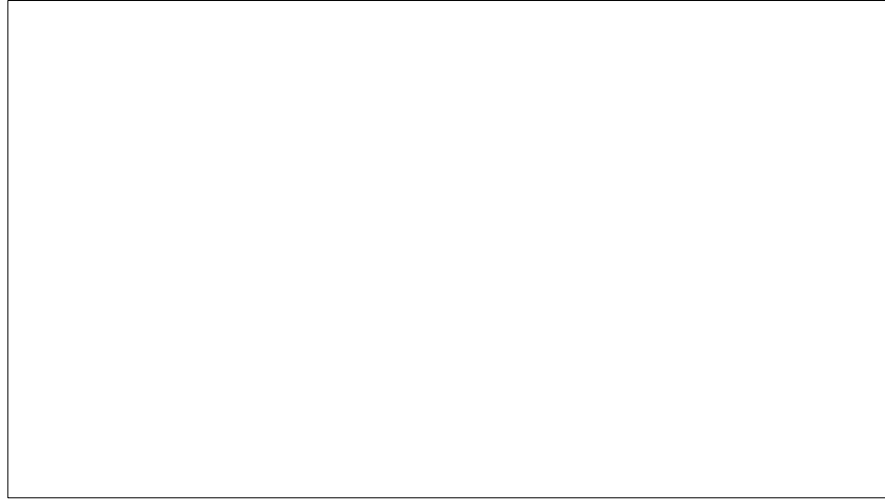
Activate Verification mode in Roger On



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While we're here, let's review how to adjust Easy Gain (Select and On)

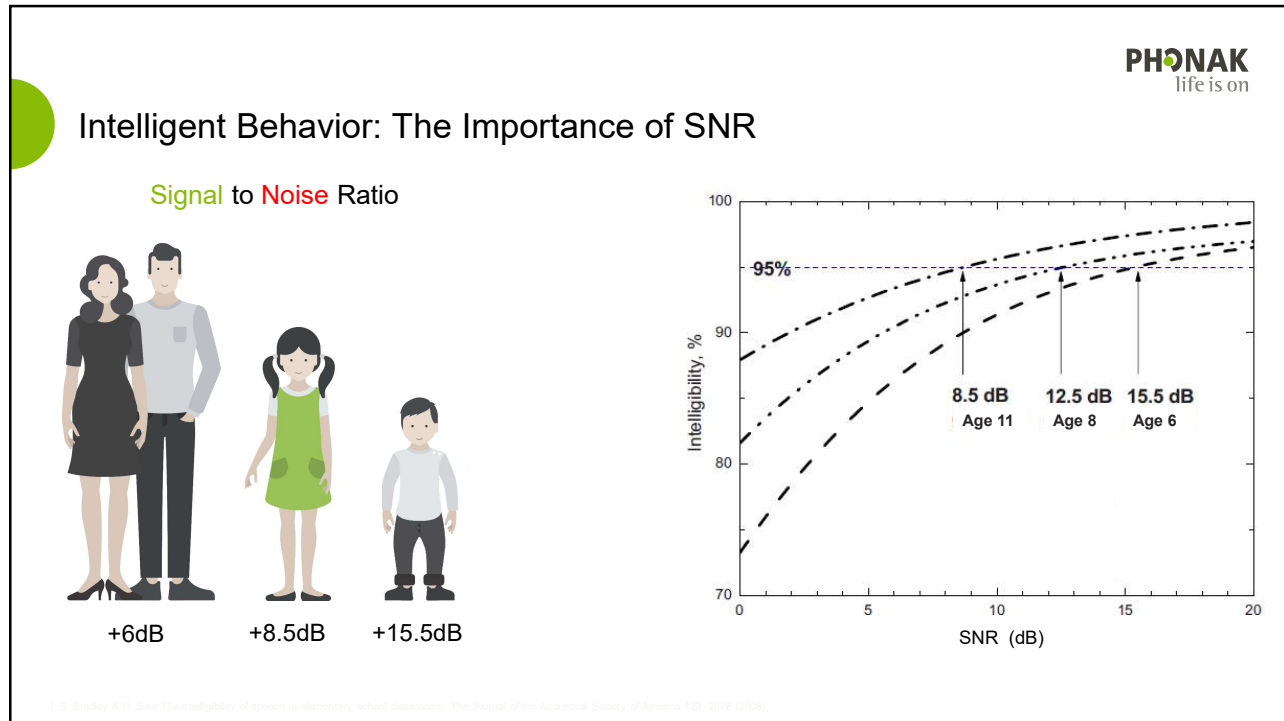


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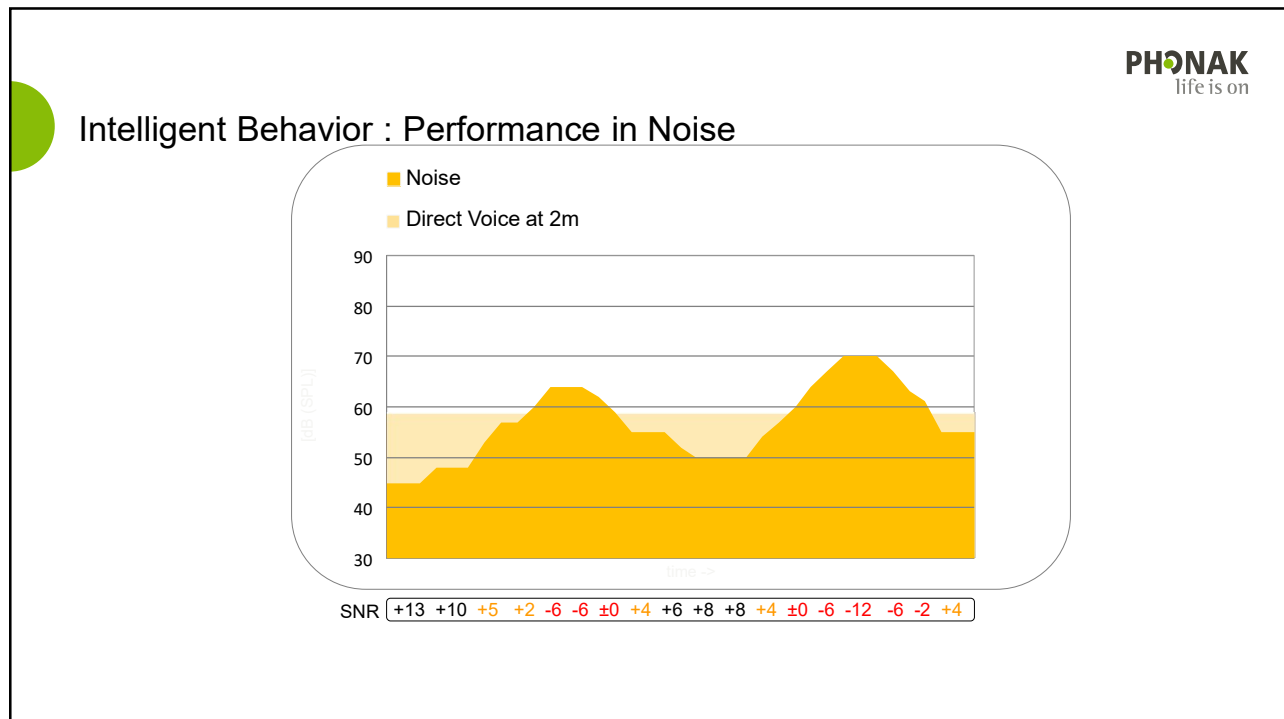
Automation with Remote Mics



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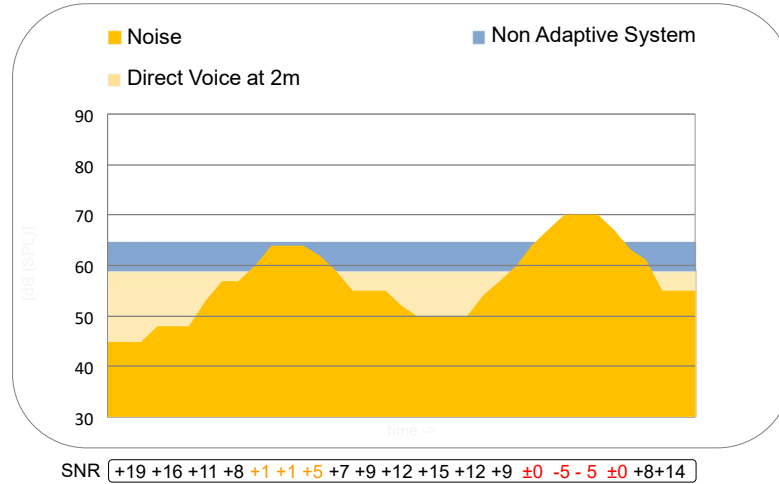


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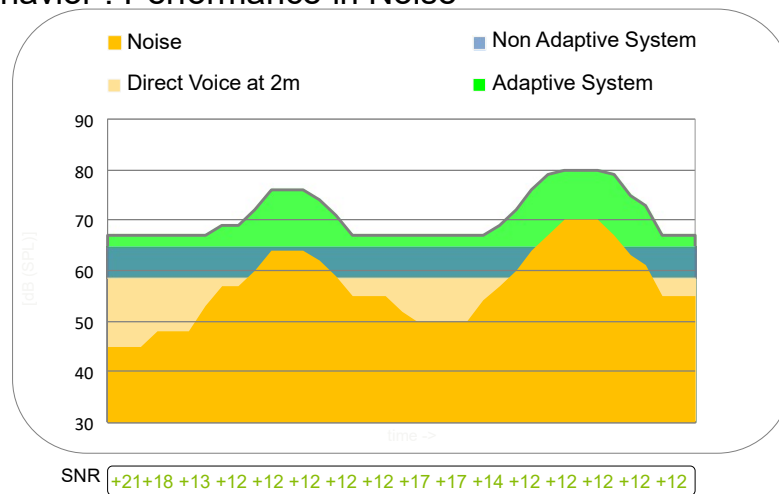
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Intelligent Behavior : Performance in Noise



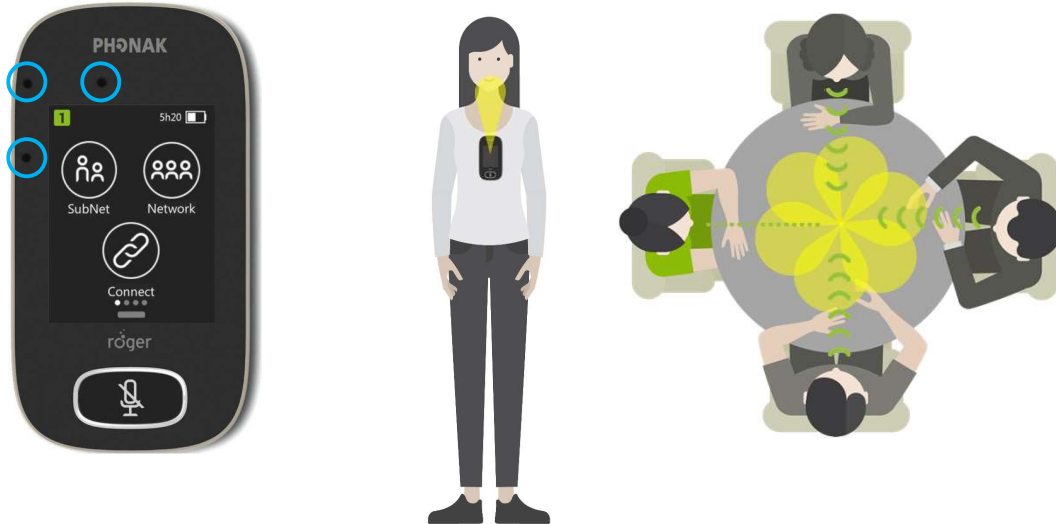
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Intelligent Behavior : Performance in Noise



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Intelligent Behavior : Signal Optimization



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Intelligent Behavior : Signal Optimization



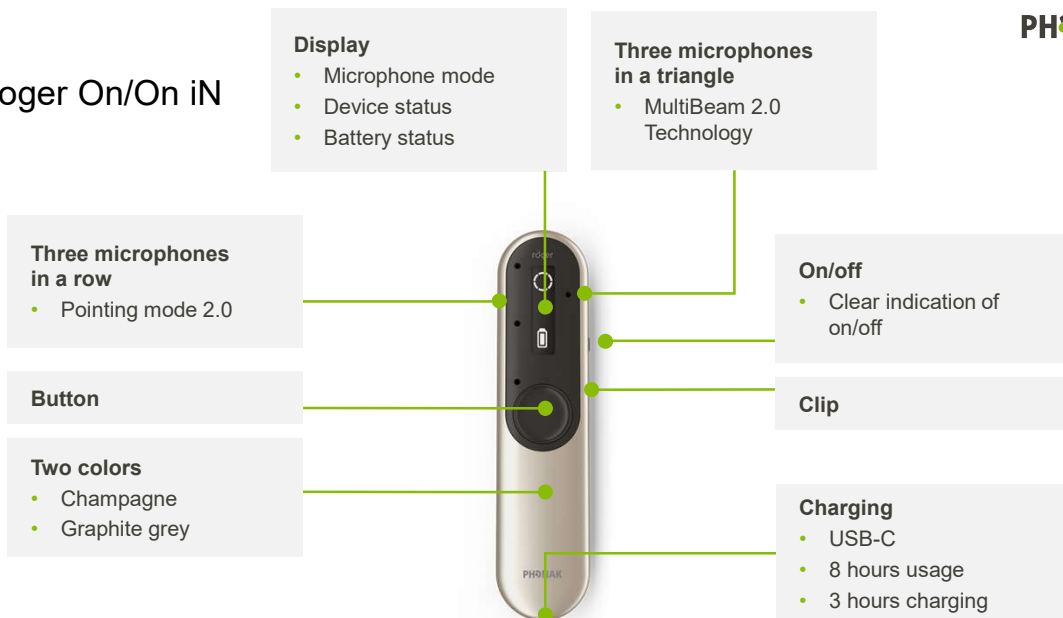
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Intelligent Behavior : Voice Detection



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Roger On/On iN



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Automatic switching to the situation



Presenter mode
with orientation-independent in
presenter mode



Pointing mode 2.0
with three microphones



Table mode
with MultiBeam 2.0 Technology



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Streaming TV and Multimedia



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Automation

- Allows for appropriate setting(s) to be chosen, automatically
 - Noise-cleaning features
 - Beamforming technology
 - Roger/Remote Mic

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Together, we
change lives

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