

Look Mom, No Hands!

The benefits of a dedicated operating system for children



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Phonak
A Sonova brand

PHONAK
life is on

**Automatic Technology is
Essential for Optimal Hearing
Performance with Adults**



Adults frequently have trouble manipulating their HAs¹



Well-trained adults often do not select the listening program that leads to best hearing performance²



Manual controls do not always provide access to the number and sophistication of parameters available in an automatic operating system

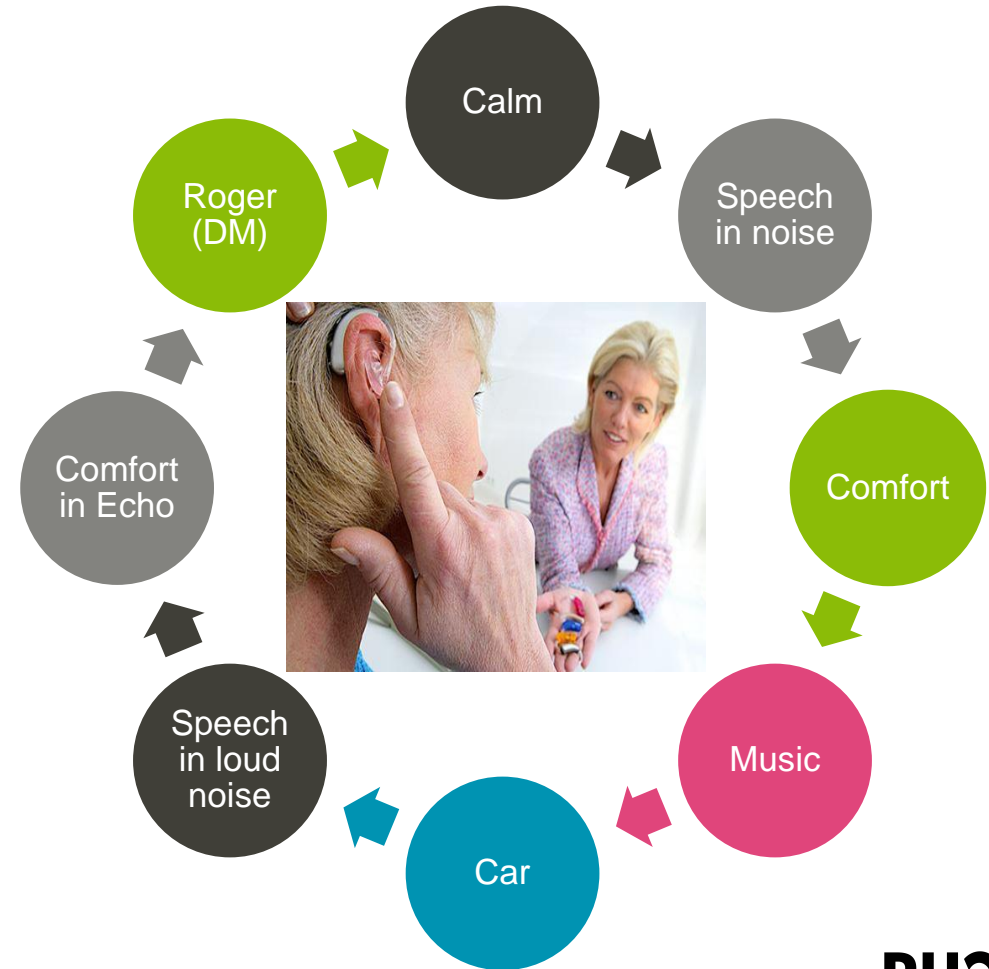


Children do not reliably access multiple programs throughout the school day³

1. Desjardins JL, and Doherty KA. (2009). Do Experienced Hearing Aid Users Know How to Use Their Hearing Aids Correctly? *American Journal of Audiology*. 18 (June):69-76.
2. Uebelacker, E., Tchorz, J, & Latzel, M. (2015, June). Phonak. *Field Study News: AutoSense*. Benefit of the next generation of technology automation.
3. 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.

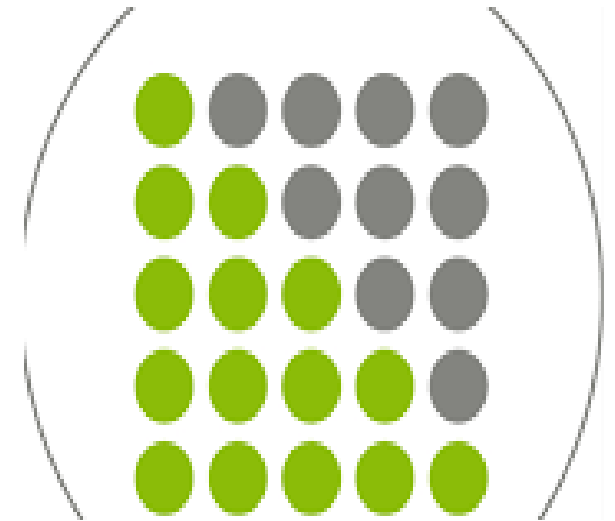
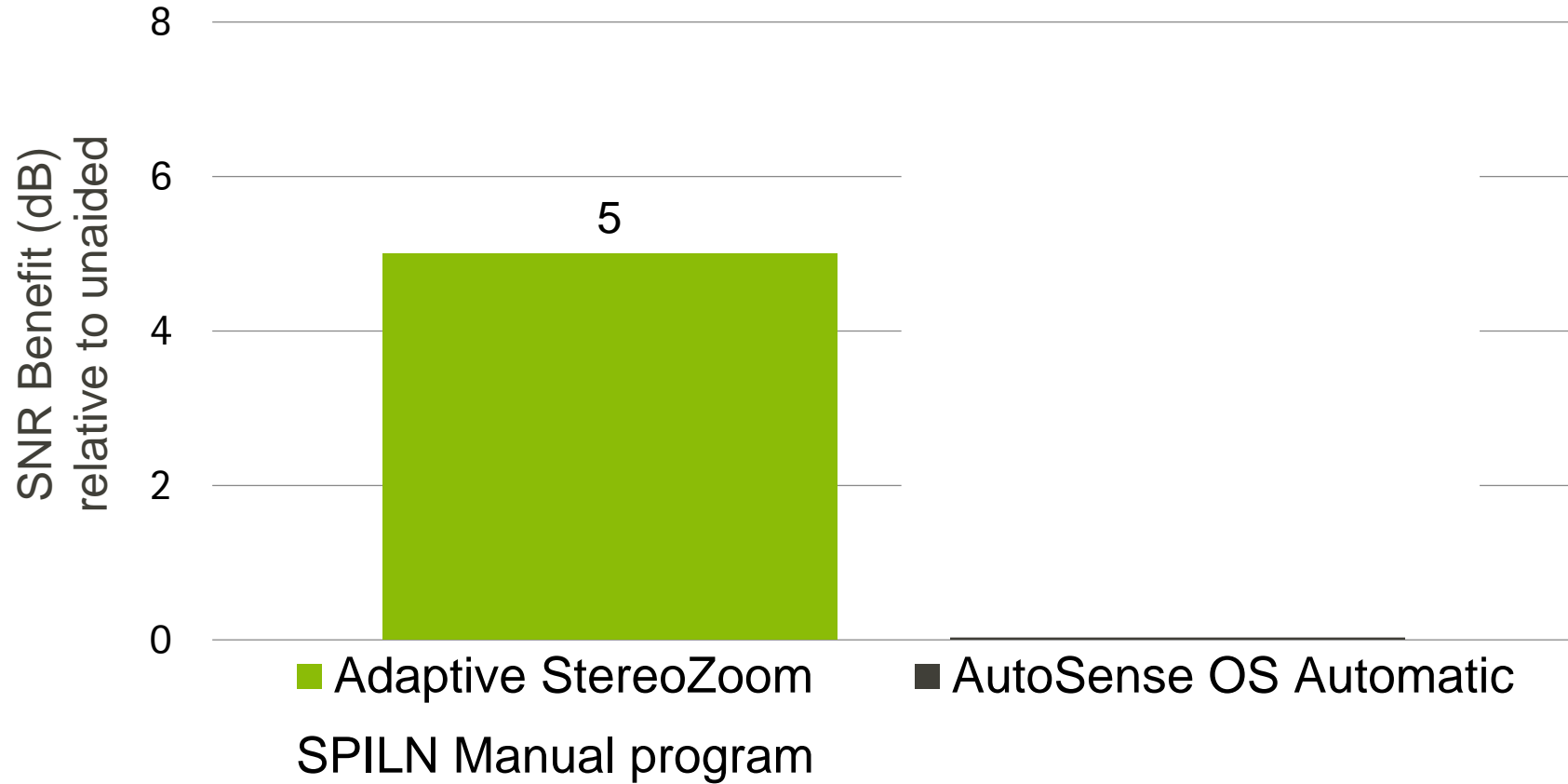
**Automatic Technology must
deliver trustworthy results**

- 31-feature extraction
- Identifies what proportion of different acoustic classifications
 - Smoothing process



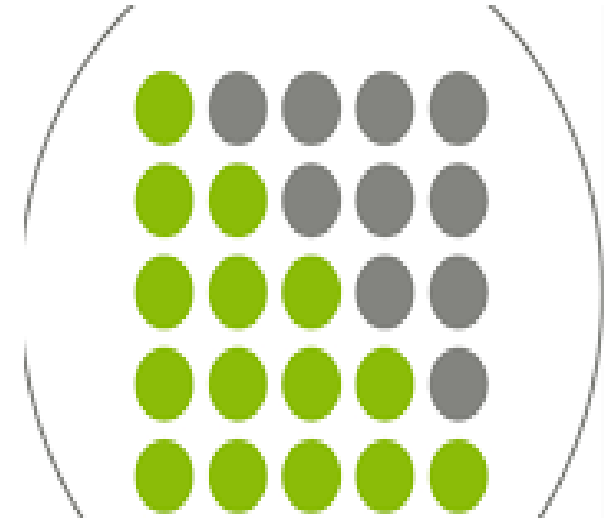
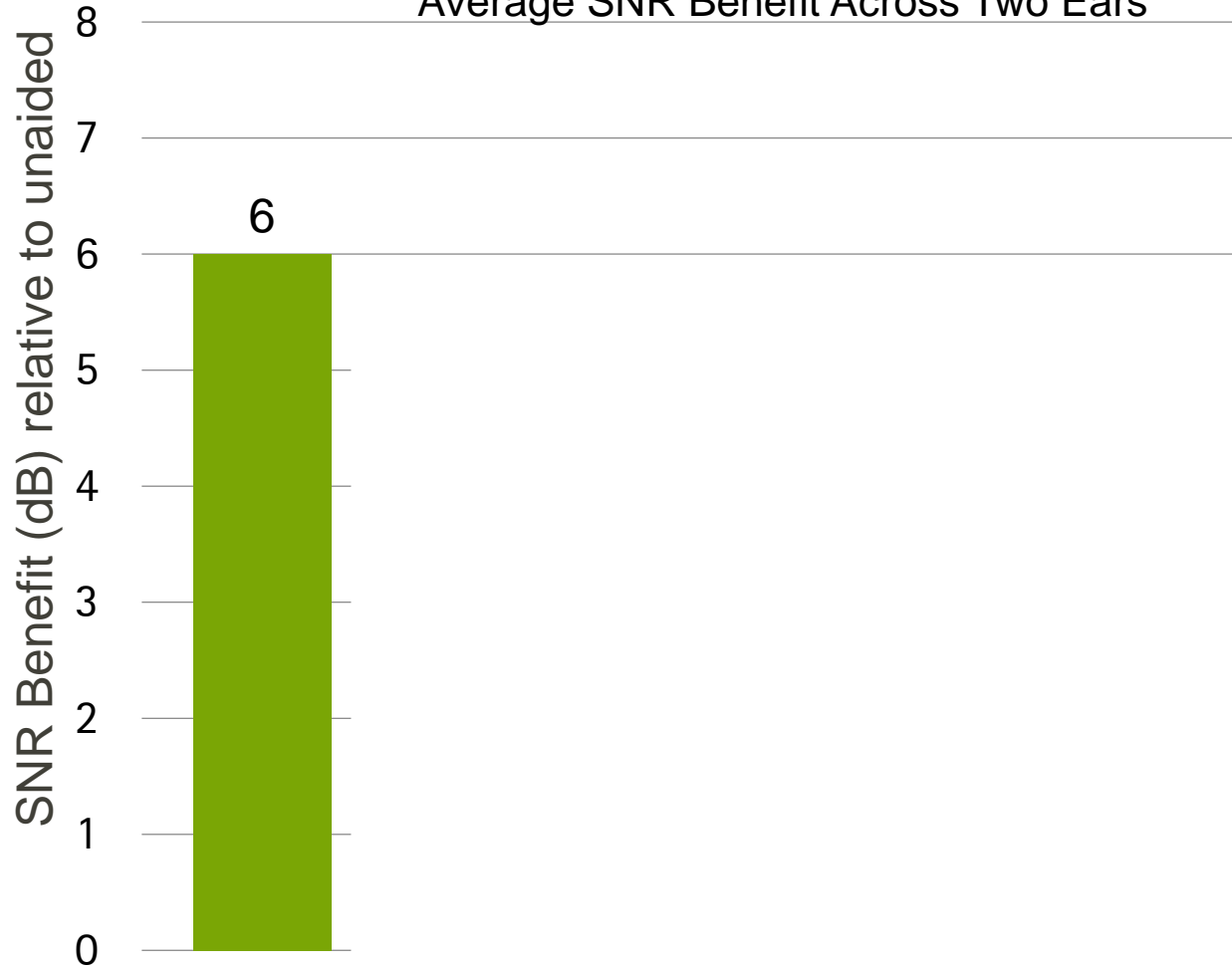
Automatic and Manual equivalency in basic scenes?

Average SNR Benefit Across Two Ears



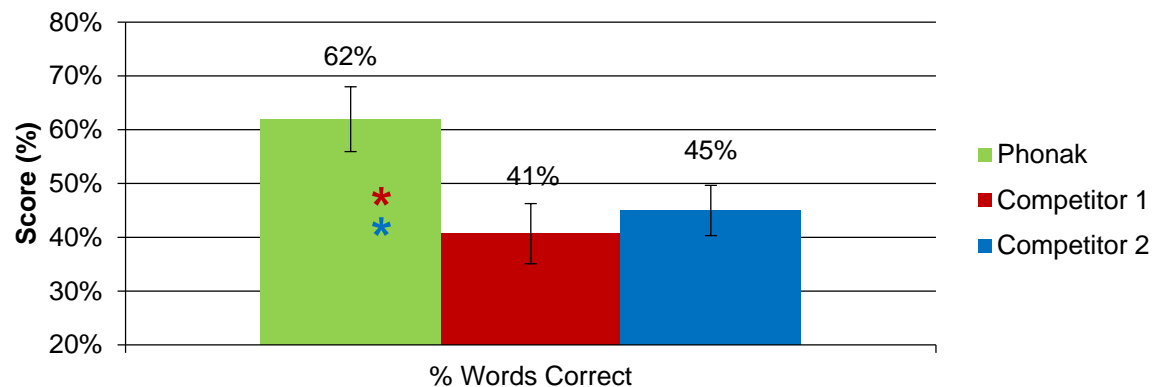
Automatic and

Average SNR Benefit Across Two Ears

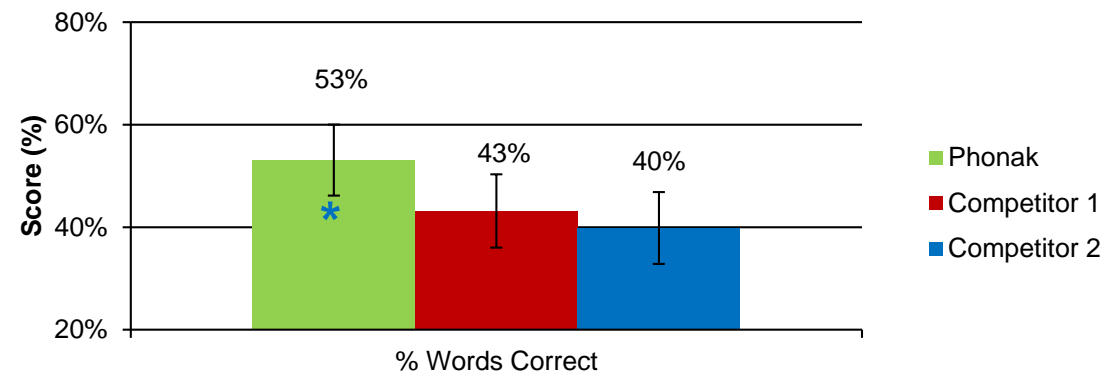


Phonak clearly outperforms competition

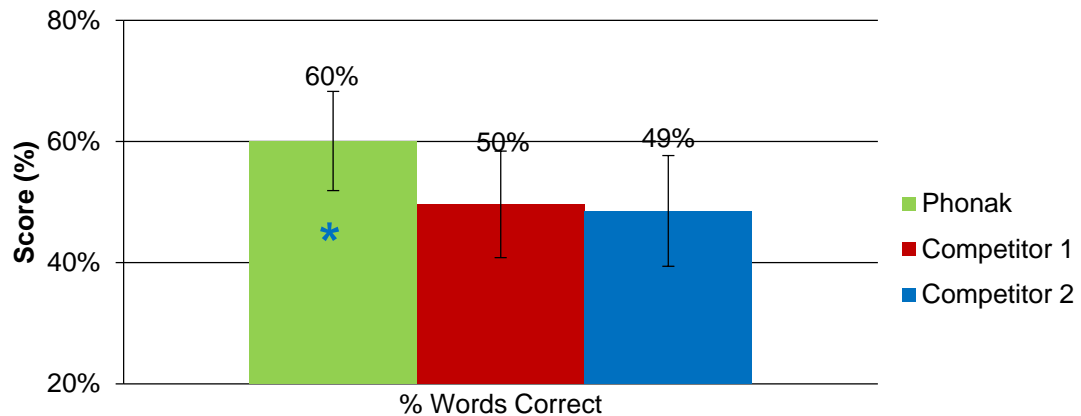
% Words Correct- Poor acoustics



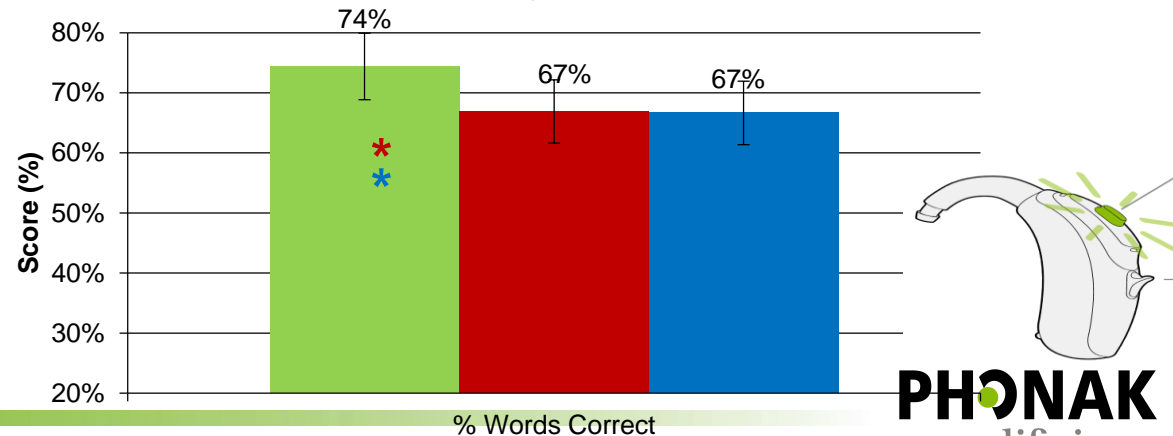
% Words Correct- Car



% Words Correct- Soft Sentences



% Words Correct- Bustling coffee shop



9/28/2018

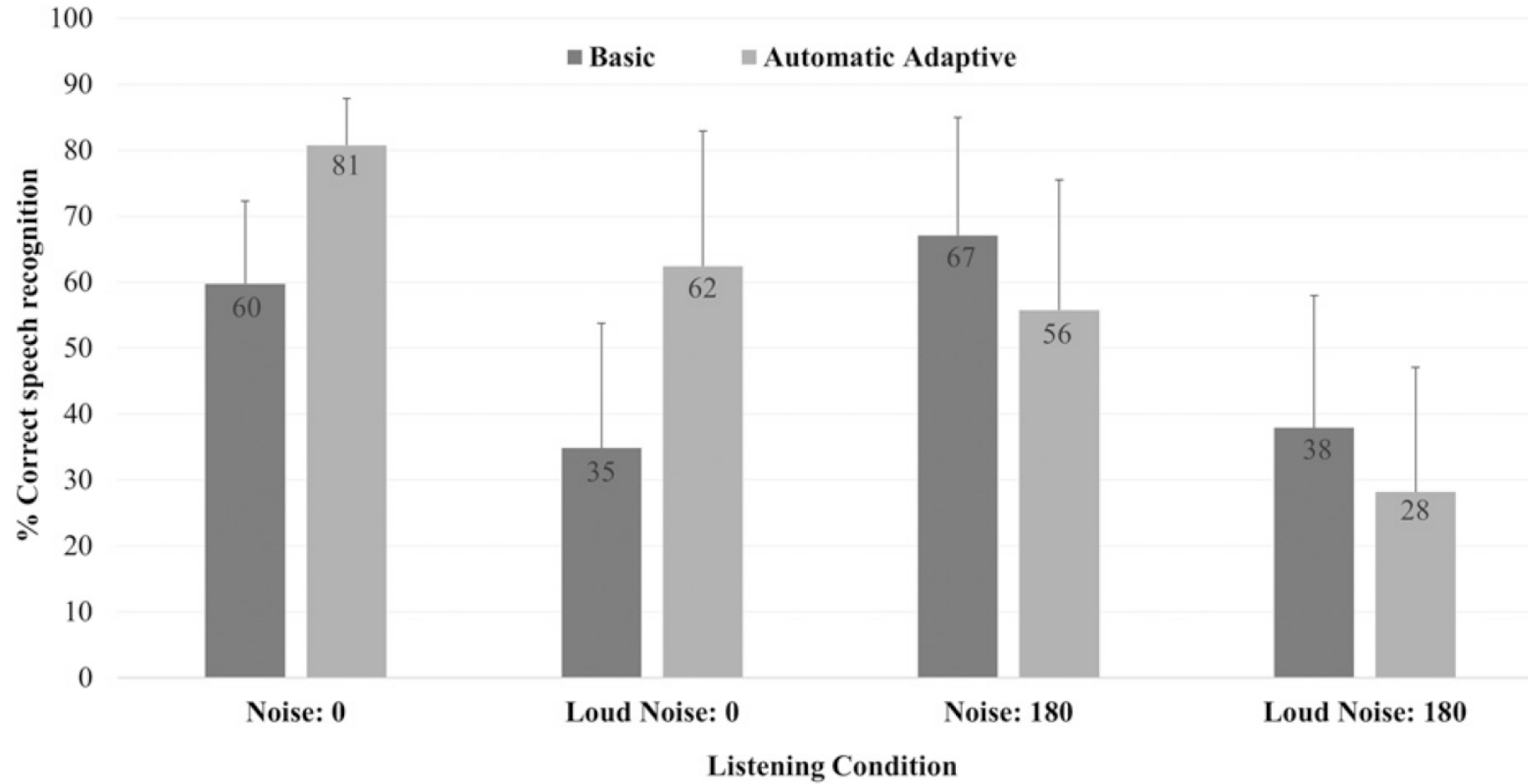
Automatic Noise Management Technology in Children



*: $p < .05$

n = 10

The directional trade off

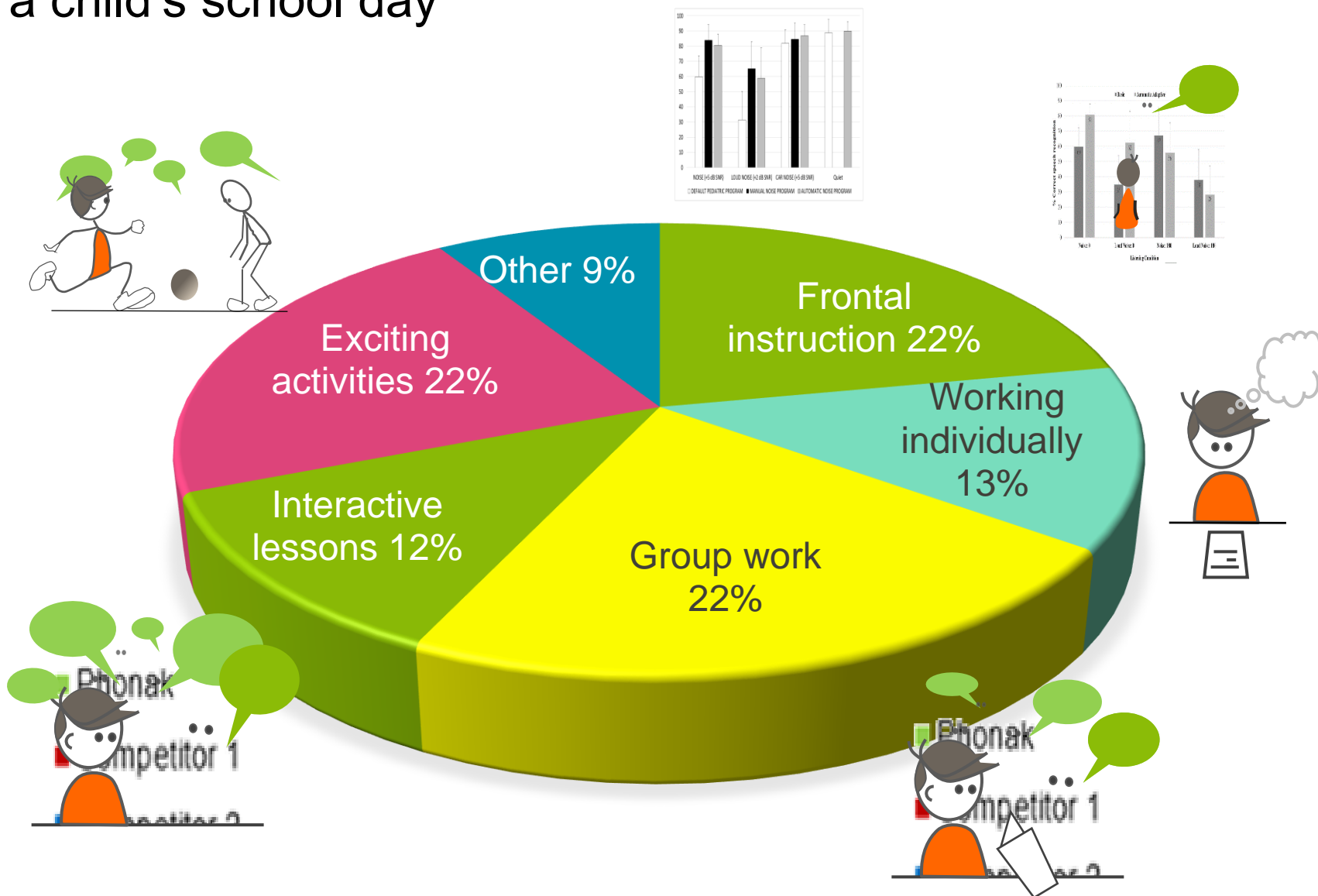


Automatic Noise Management Technology in Children: Speech Intelligibility Rating

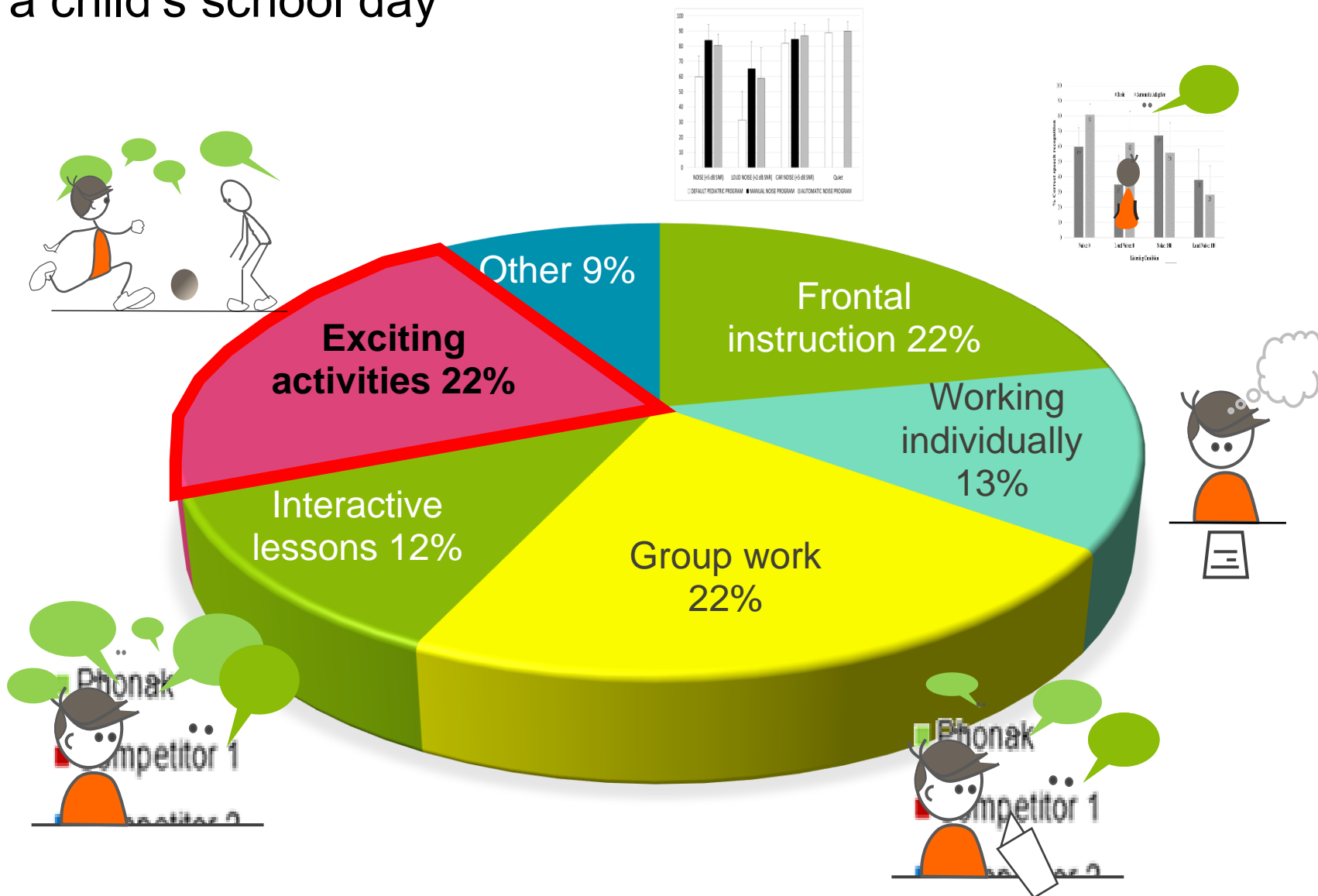
Speech Intelligibility Rating

**Automatic operating systems worn
by children must be developed
considering the acoustics and
unique challenges experienced by
children**

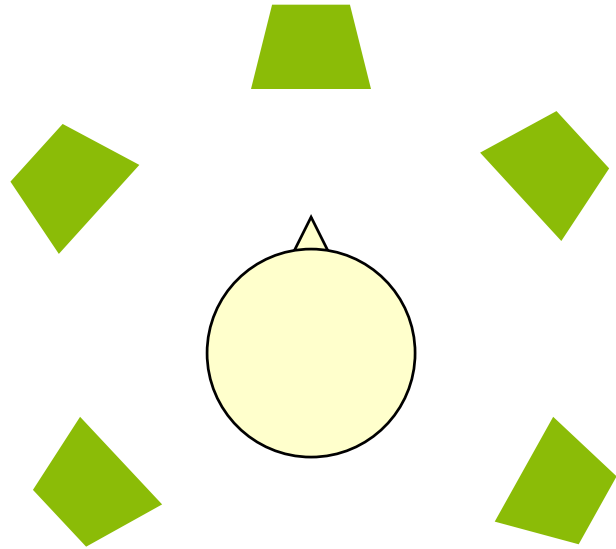
Acoustics of a child's school day



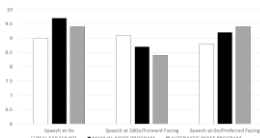
Acoustics of a child's school day



Subjective ratings



- N=15
- Age 7-17
- Mild-moderately severe SNHL
- Yelling scene from children's schoolyard played continuously at 75dB
- Subjects were asked 5 questions on touch screen monitor
- Presented in a double-blinded, computer-based, paired comparison task
- Subjects toggled between Program A/B, randomized with each question



Subjective test example

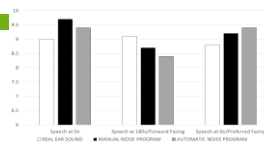
Would you turn down the volume of your aids if listening to this in the real world?

- » Definitely no (5)
- » Probably no (4)
- » Not sure (3)
- » Probably yes (2)
- » Definitely yes (1)

» Program A

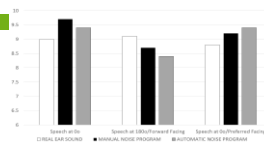
- » Definitely no (5)
- » Probably no (4)
- » Not sure (3)
- » Probably yes (2)
- » Definitely yes (1)

» Program B

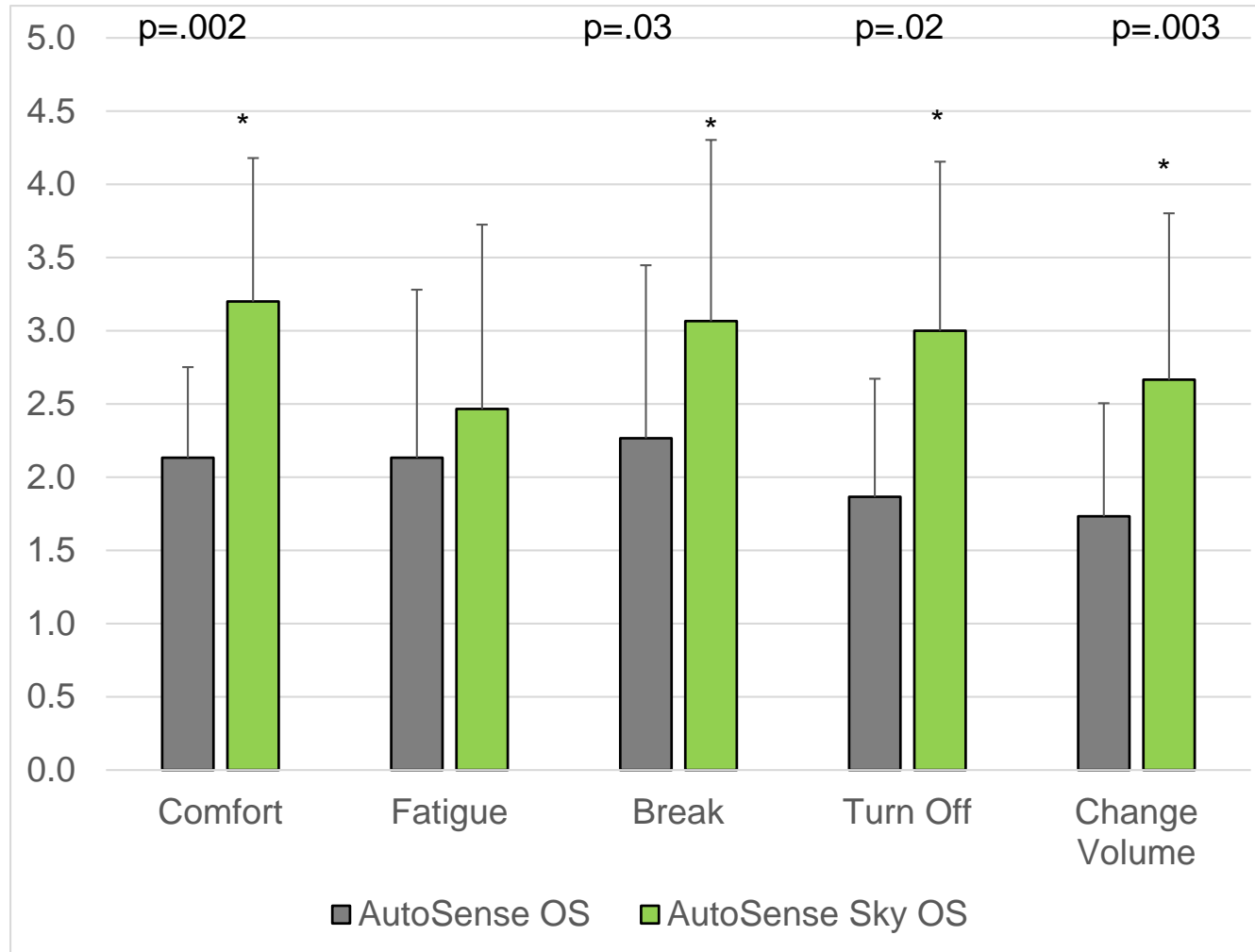


Subjective listening

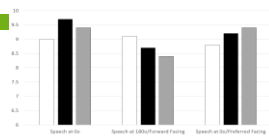
1. After Listening to this scene for a while, would you need a listening break?
2. How much does this scene tire out your ears?
3. How comfortable is it for you to listen with your hearing aids in this scene?
4. Would turn your HAs off when listening to situations like this in the real world?
5. Would turn your down the volume of your aids when listening to situations like this in the real world?



Children consistently preferred the pediatric automatic



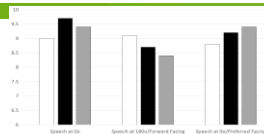
N=15



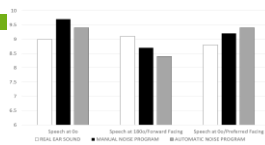
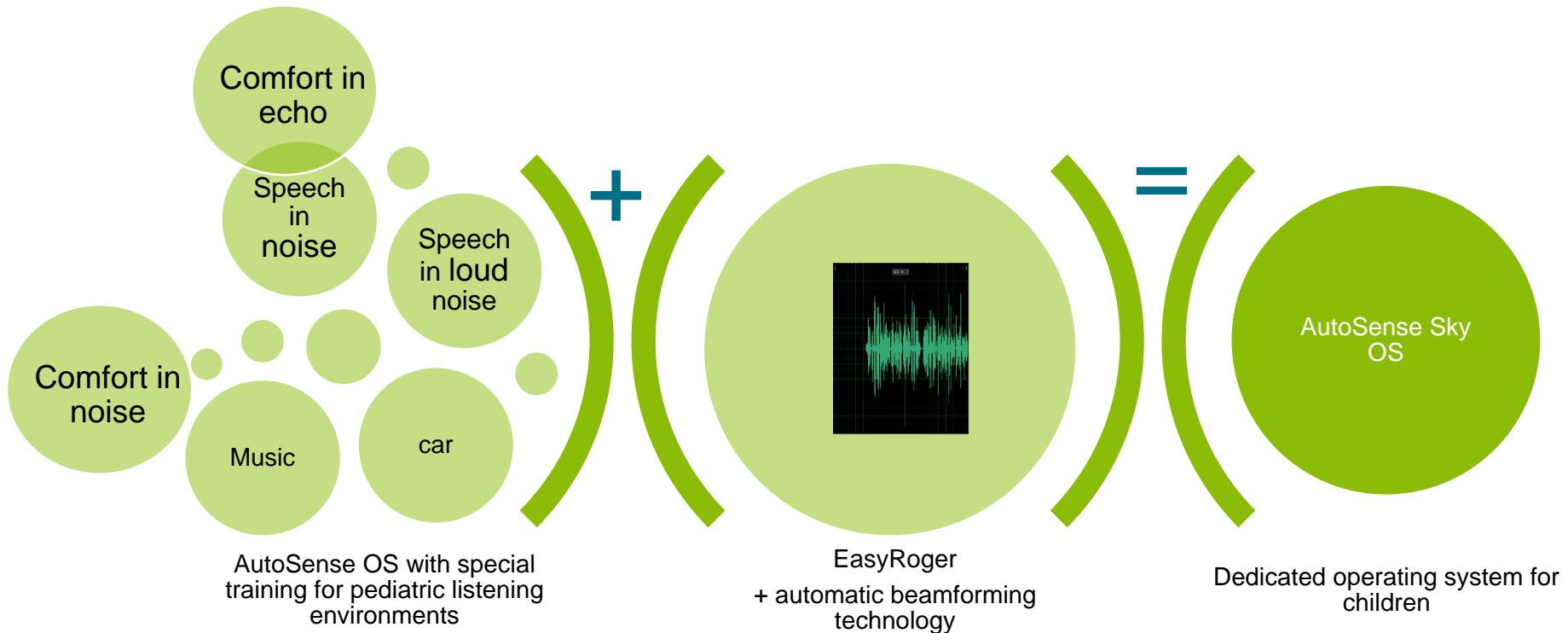
Error bars = 1 S.D.

Roger Ready

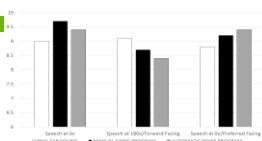
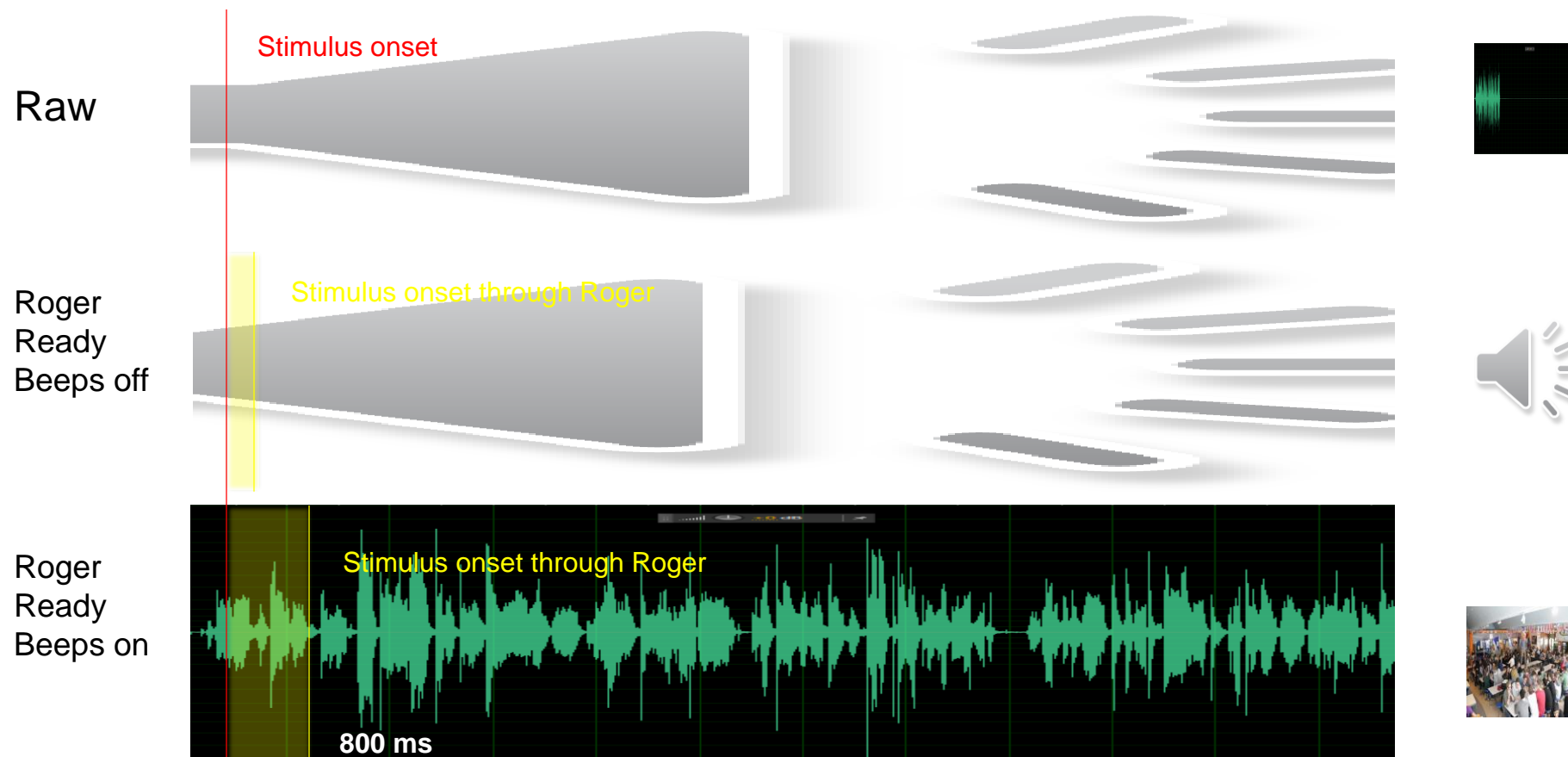
AutoSense OS



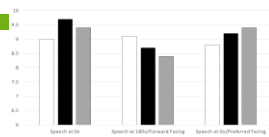
Additionally, children need automatic access to a Roger mic



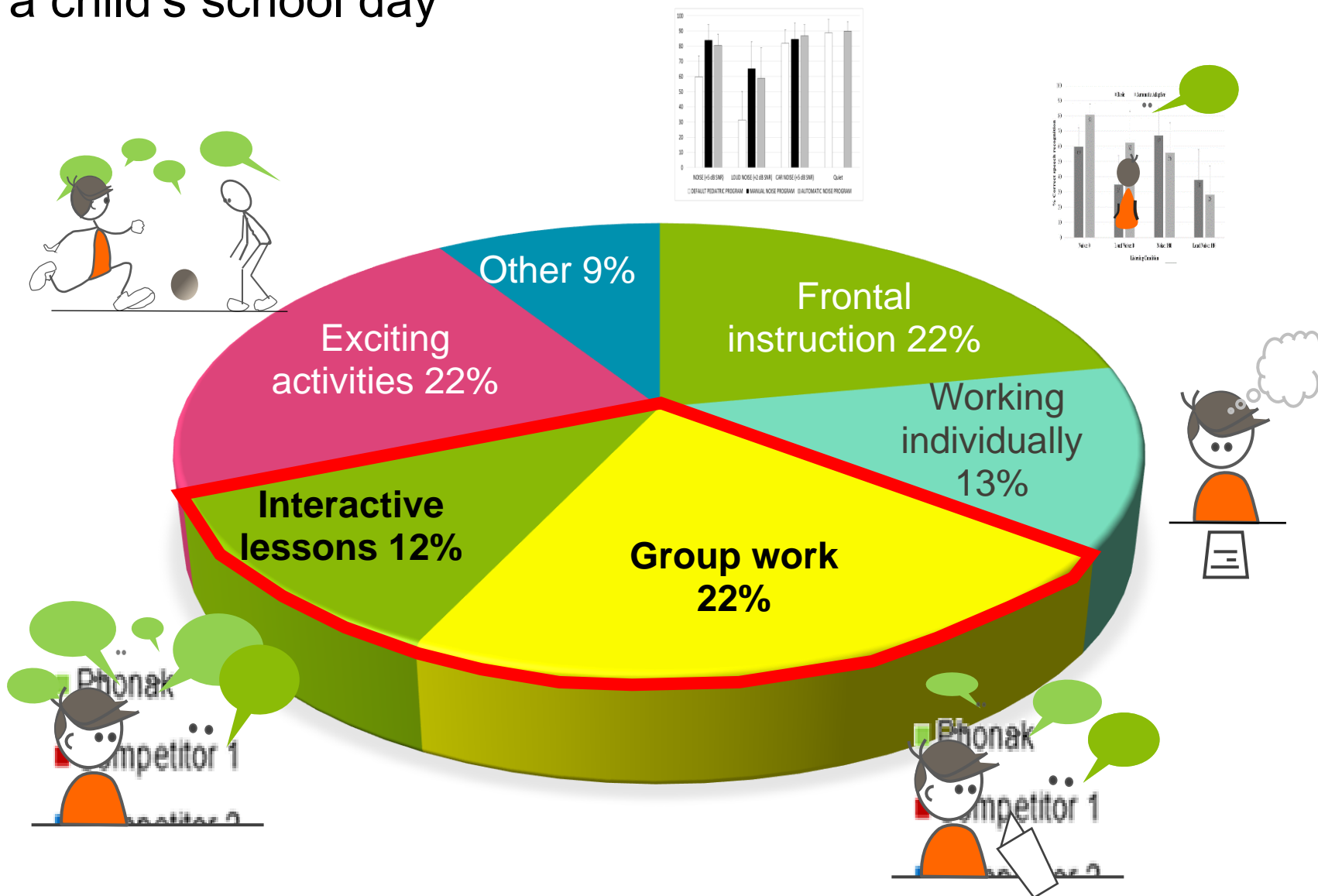
Recordings



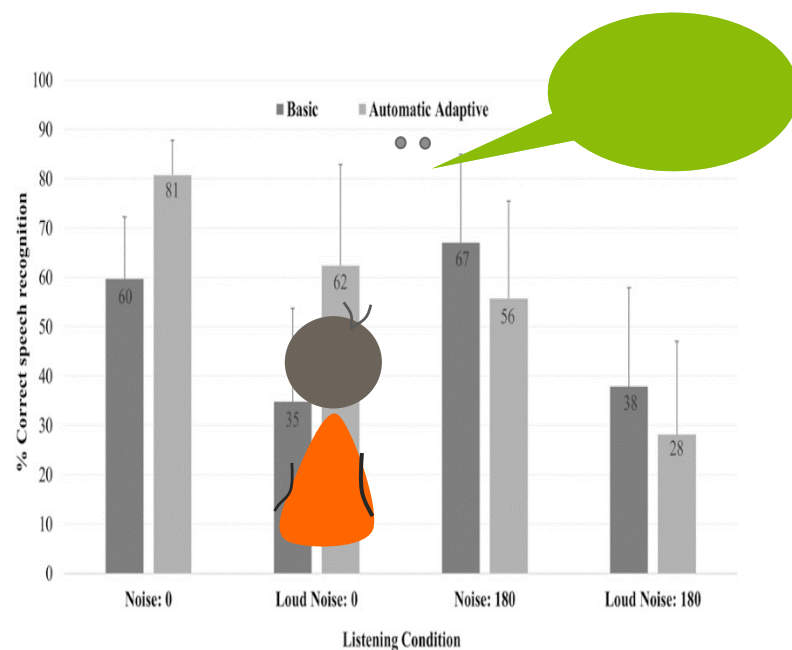
When Roger input has ceased for 50 sec, the system will seamlessly leave Roger+M and revert back to AutoSense Sky OS



Acoustics of a child's school day



Compromise

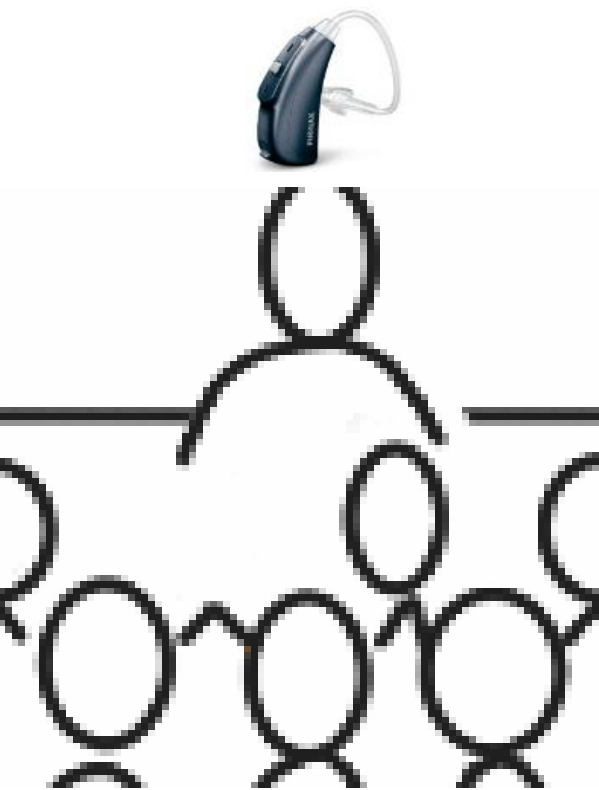


Frontal instruction with Roger



Near field speech in noise with BF

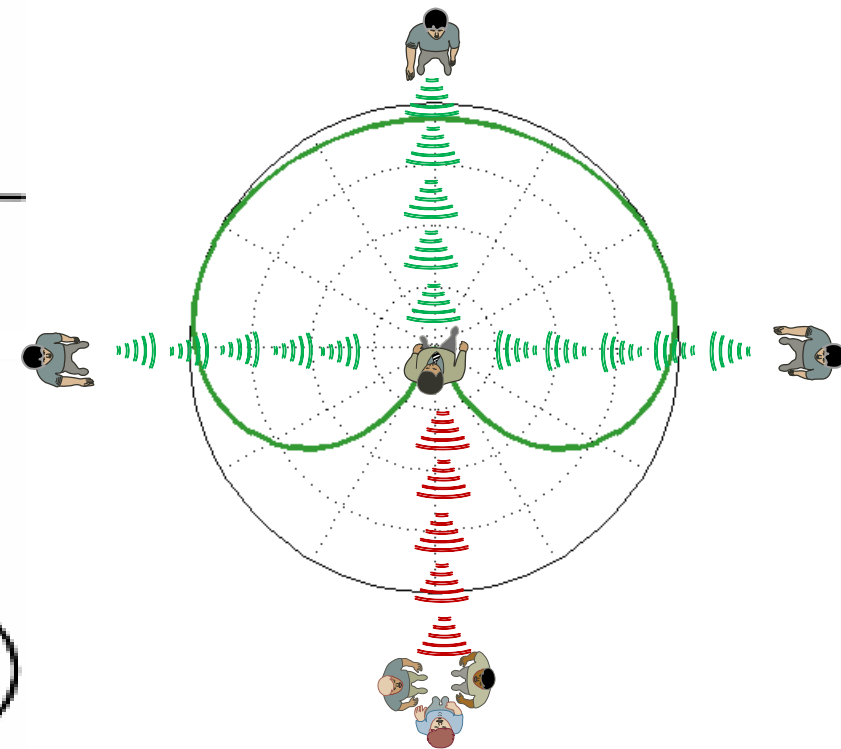
Fixed beam former to preserve lateral inputs



UltraZoom



No suppression of lateral inputs





Roger +DM

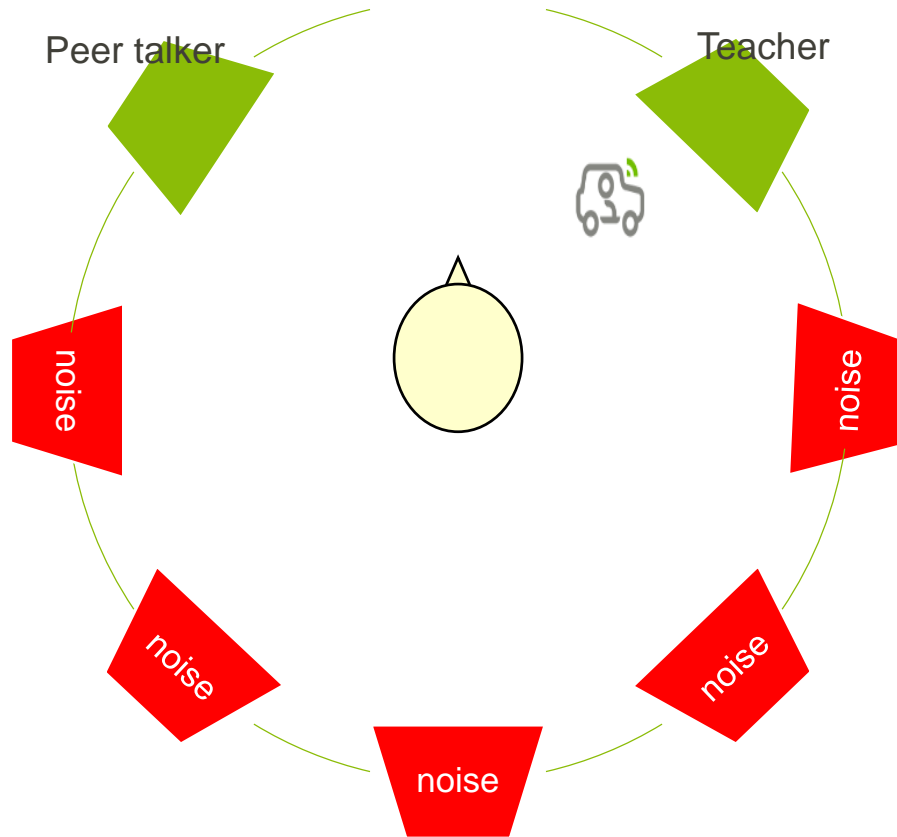
N=15

Age 7-17

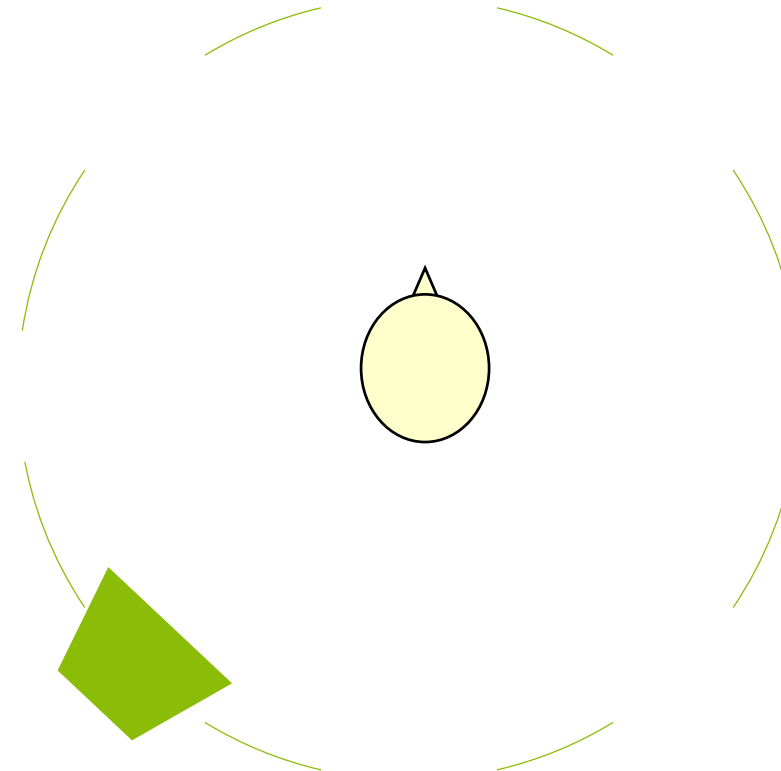
**Mild to Moderately
severe SNHL**

Roger DM test scenes

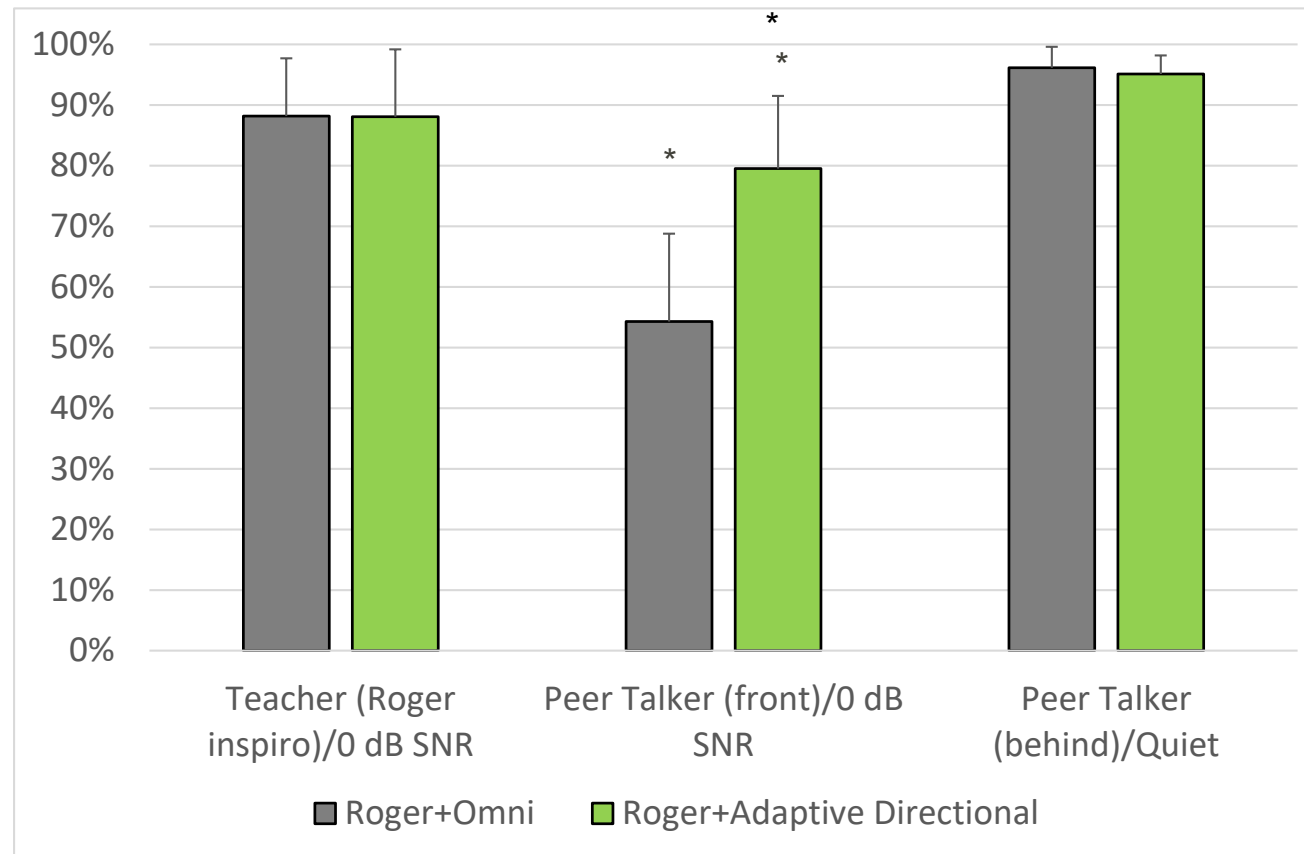
Teacher and Peer talker in noise (65/65)



Peer talker from behind in quiet



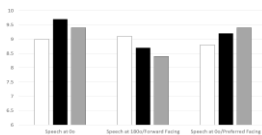
The adaptive directional mic significantly improves understanding of peers



Error bars = 1 S.D.

p=.003

N=15



Conclusions

- **Automatic noise management** technology has been proven **preferred and beneficial** for pediatric listeners
- **AutoSense Sky OS** provides more comfort to support hearing aid acceptance and use in the most **exciting** environments of the day
- **Roger + DM** combines the advantages of automatic noise management with remote microphone technology for improved access to **near and far field talkers**
- **Easy Roger** allows for seamless and instantaneous switching between **RM and hearing aid automatic**.

**Together,
we change lives**