Legit innovations for teens

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Agenda

1. Learnings from schools: evidence of challenge
2. Building features around needs: evidence based design
3. Features that work: evidence of benefit

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All students sat facing the teacher and

district rules forbid teachers from loitering in downtown ice cream stores, dressing in bright colors, dying their hair, and even traveling beyond city limits without permission from the school board.

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Common Core adopted by 45 states

- **Teaching teamwork.** The Common Core State Standards identify collaboration and teamwork as a 21st century skill to be taught. we're moving into a collaborative culture of continuous learning within networked communities. teachers give it life in the classroom by using team contracts, peer collaboration rubrics, and work ethic rubrics to turn group work into effective teams.

Table 1. **Summary of Skills in the CCSS**

Skills strongly/ largely reflected in the CCSS	Skills requiring an academic foundation articulated by the CCSS with technical elements outside the scope of the CCSS	Skills that could be reflected in CCSS-aligned instruction	Skills not covered by the CCSS
Communications skills Teamwork/ collaboration skills Problem-solving skills Reasoning skills The application/ extension of core content in various situations Use of data Research skills Time management skills Use of technology (in ELA/literacy)	External and internal work-based communications skills Job-seeking skills The application/ extension of core content in nonroutine ways	Motivation/self-discipline skills Study skills Adaptability skills "Enjoyment" of learning Recognizing strengths and weaknesses	Conflict resolution skills Technology-based project management skills Mentoring skills Career planning and exploration Ethical reasoning Quality control systems and practices Workplace safety and health Emergency procedures and response techniques

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Focus on the teacher

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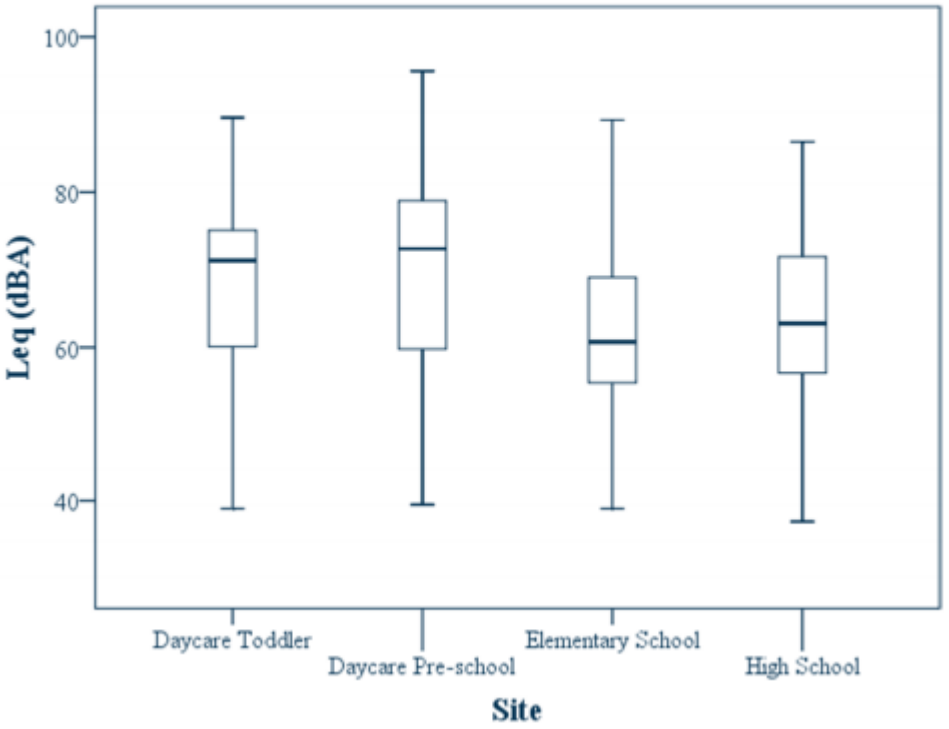
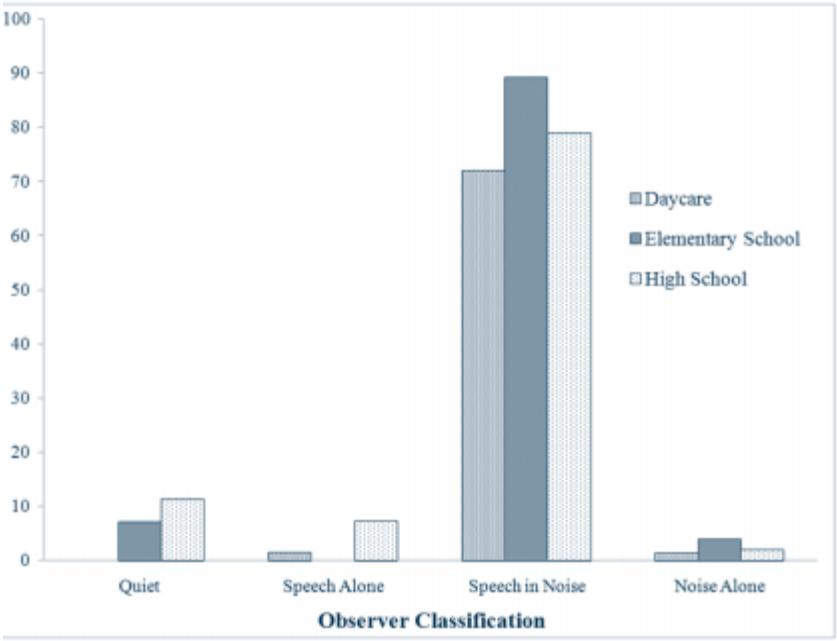
Cruckley, Scollie, Parsa (2011)

Figure 4. Boxplots depicting the L_{eqA} data for each observation site.



re 5. Proportion of time spent in each sound environment, as classified by the observer for each site.



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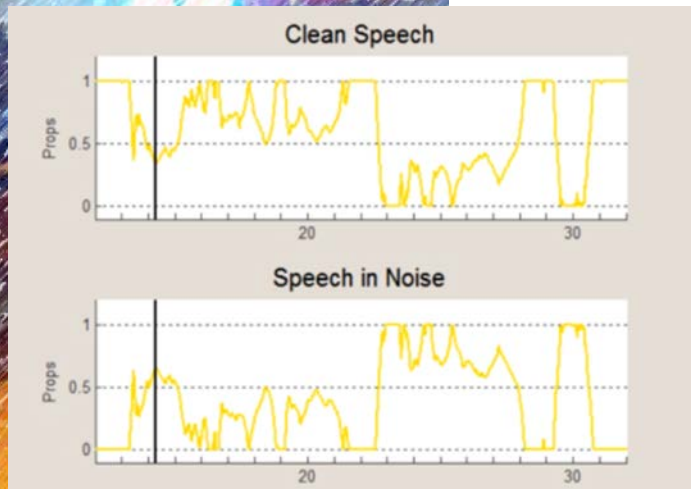
Classroom listening study- Feilner, 2015

- 9-15 years old
- Mainstream class environment
- Audio and video recordings throughout the day
- Observed Automatic classification and behavior of HIs
- Student interviews regarding hearing performance throughout the day



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Findings

Far less frontal instruction

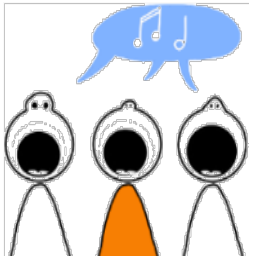
More interaction as students got older

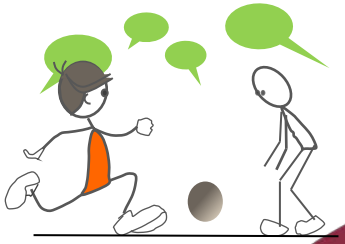
Multi-media

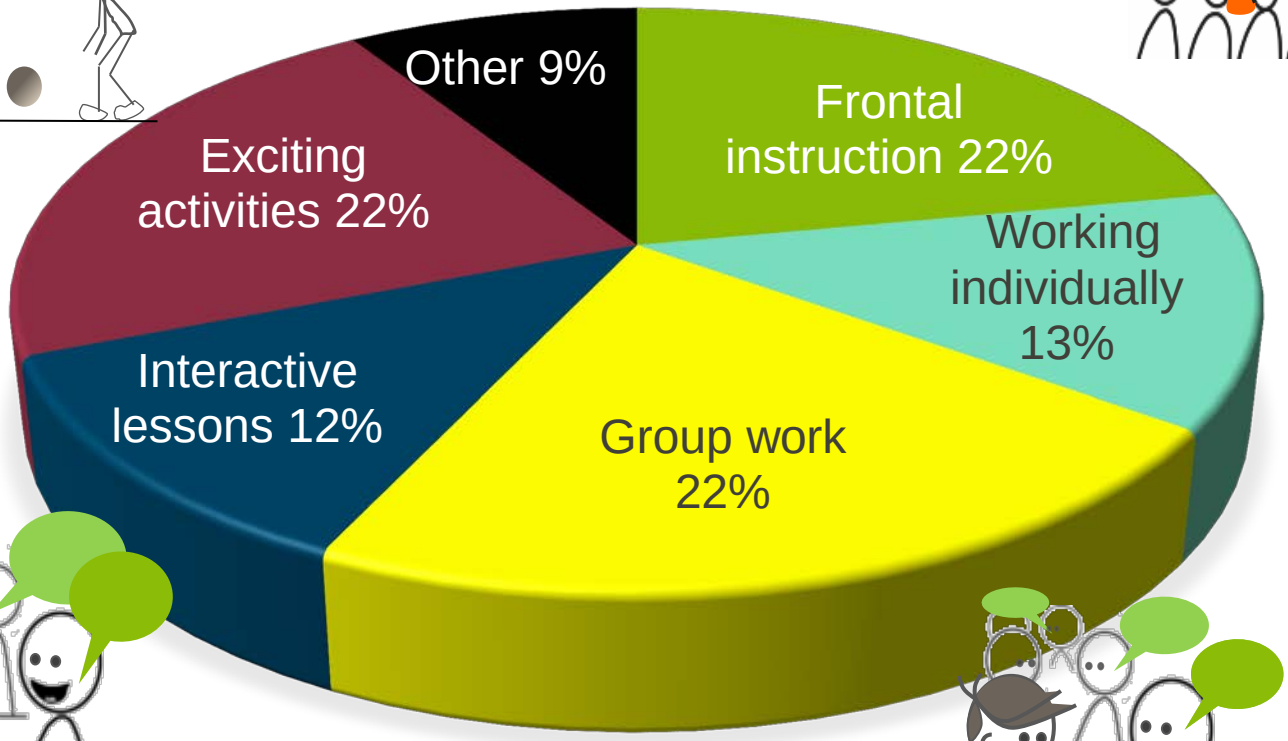
Hearing difficulties correlated more with teaching style than acoustics

Group work in particular reported as unsatisfactory

Acoustics of a child's school day







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Real challenges for teens with HL in school

- **CCSS**

Schools are purposefully moving toward more collaborative styles of learning

- **Cruckley, Scollie, & Parsa and …**

Acoustics are such that basic amplification unlikely to yield adequate hearing performance for most of the day

- **Feilner**

Traditional wireless microphones designed to address only 22% of the typical school day

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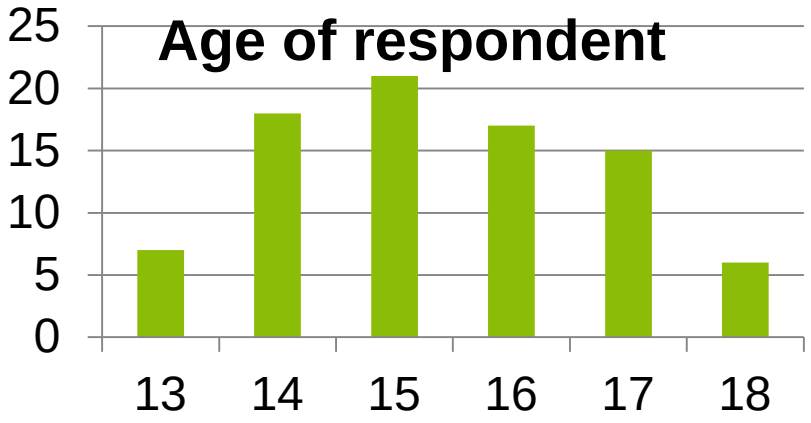
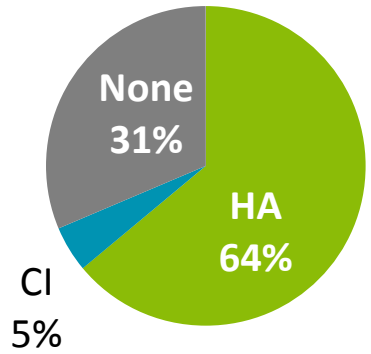
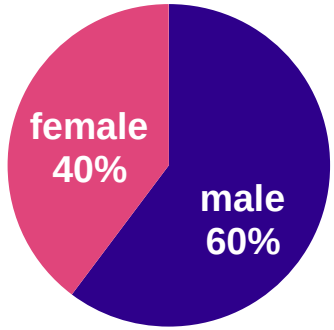
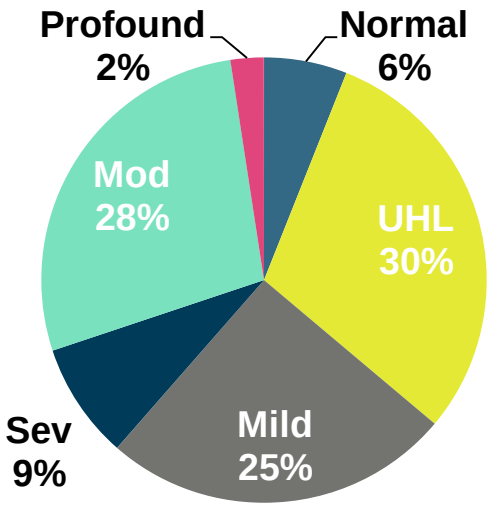
Given these challenges, what do teens think?

86 teenage students completed survey

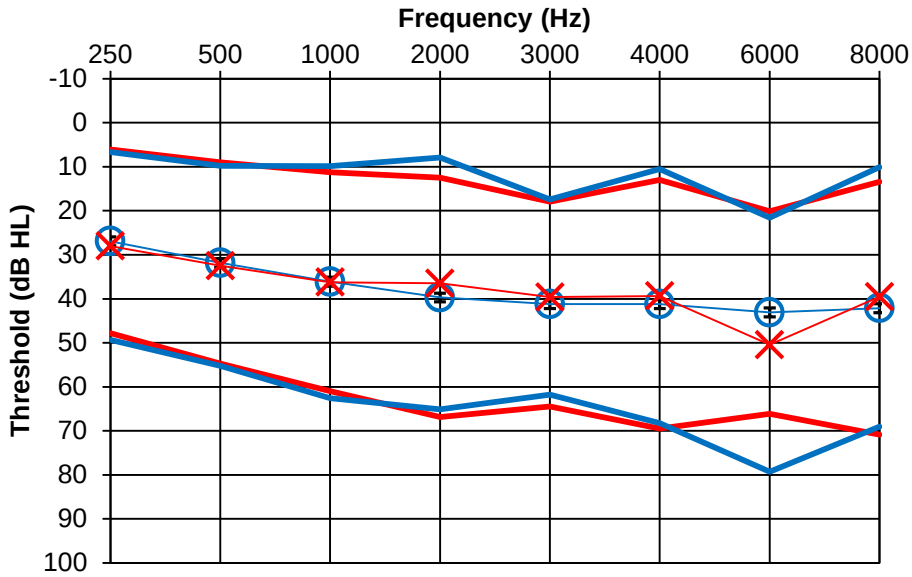








Average Audiometric Thresholds



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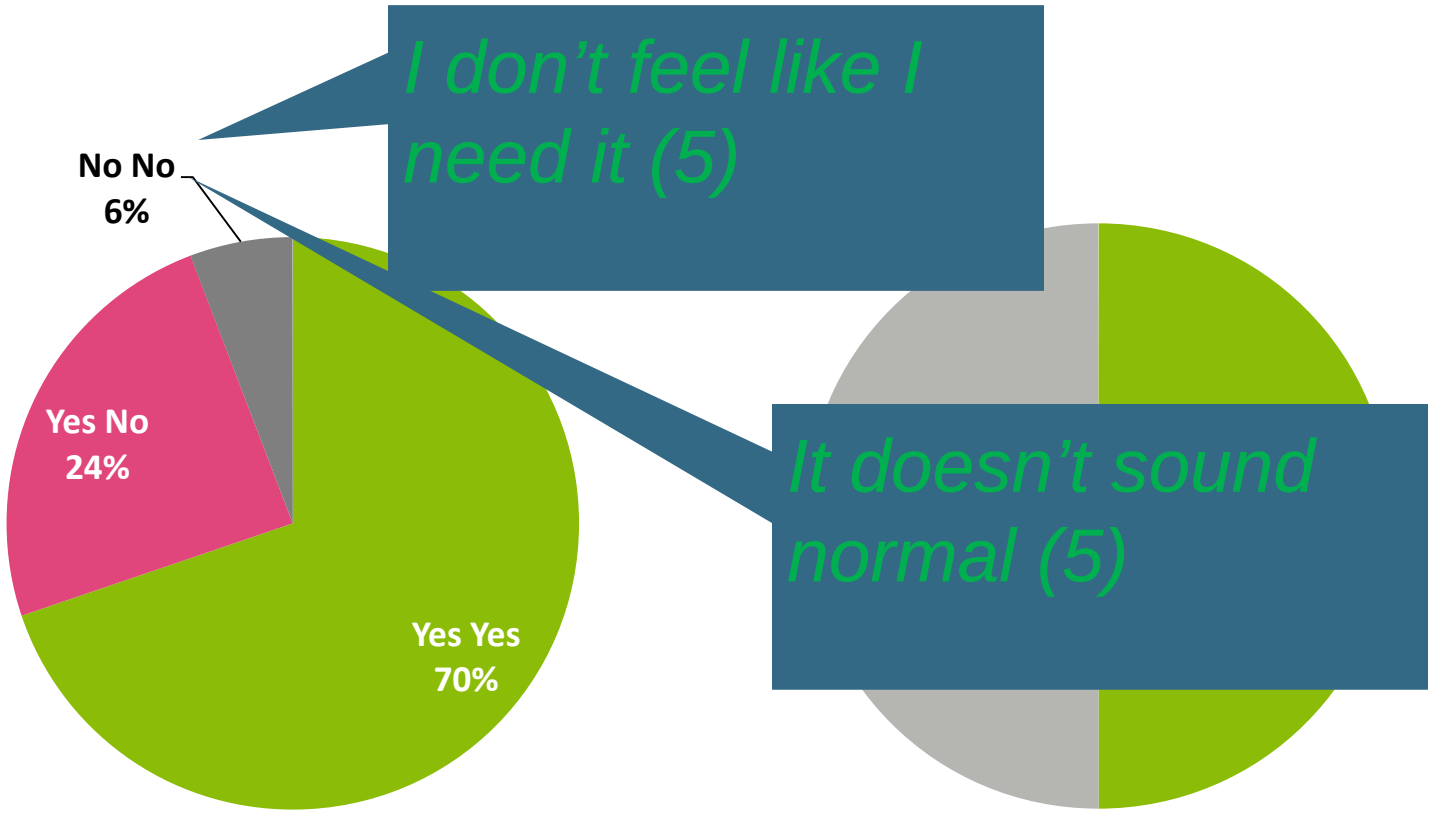
Use profiles



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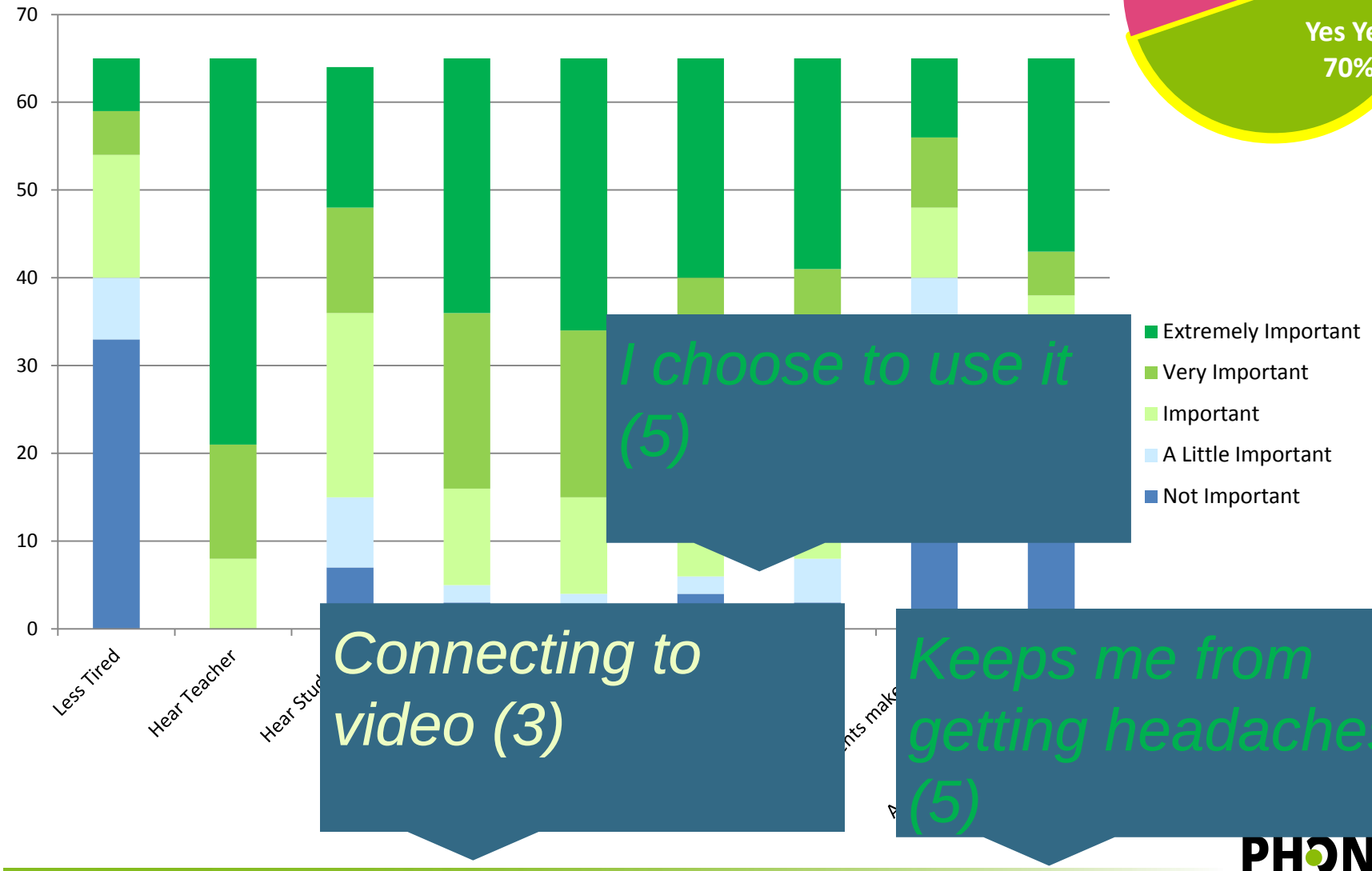
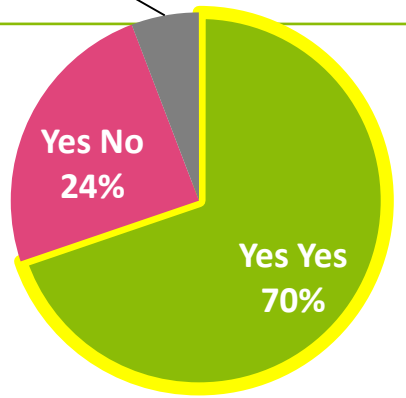
Reasons for Use





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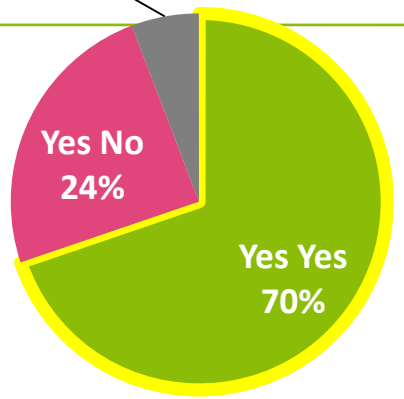
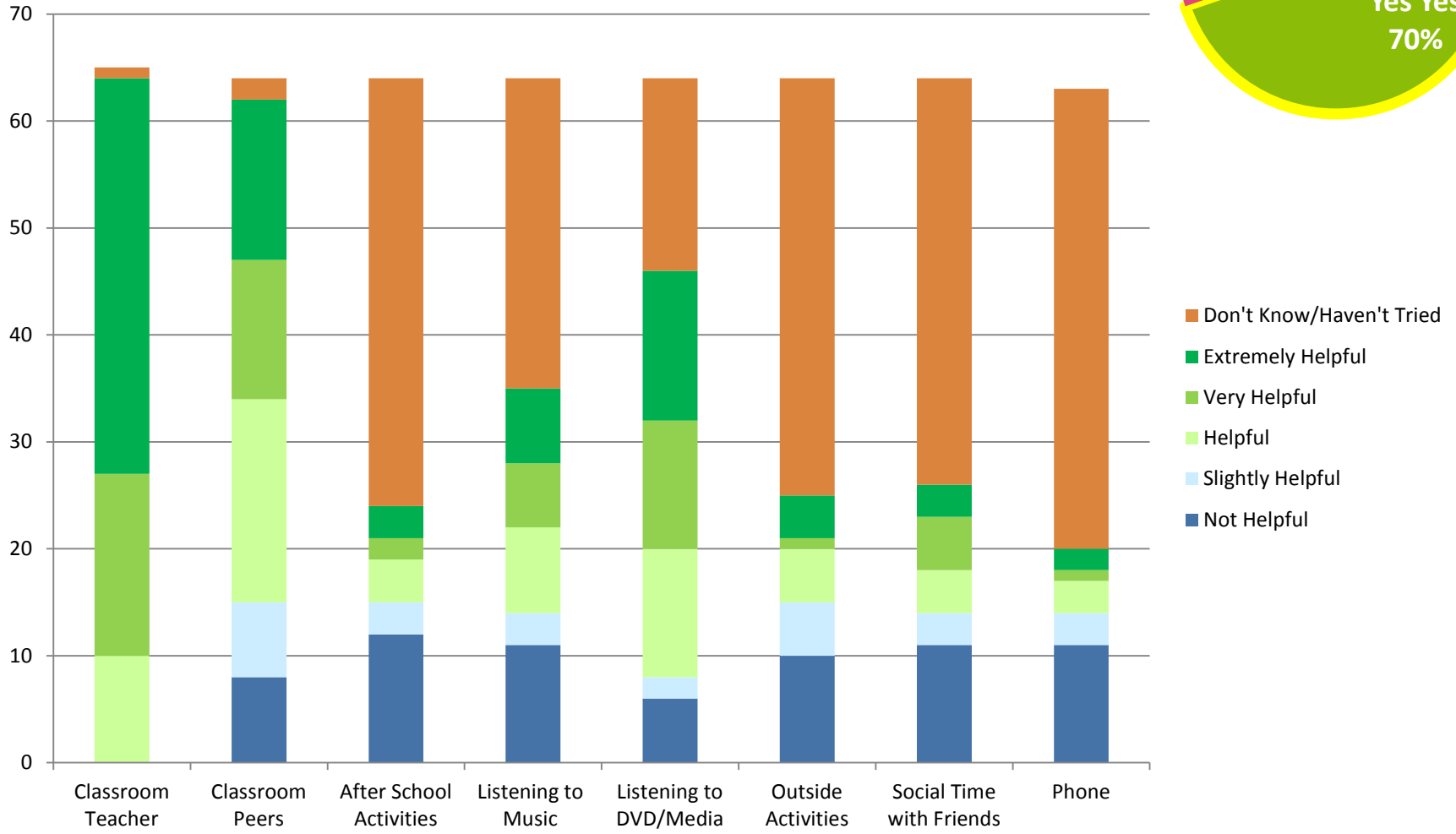
Benefit by situation





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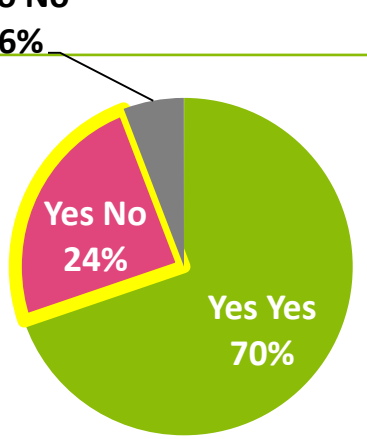
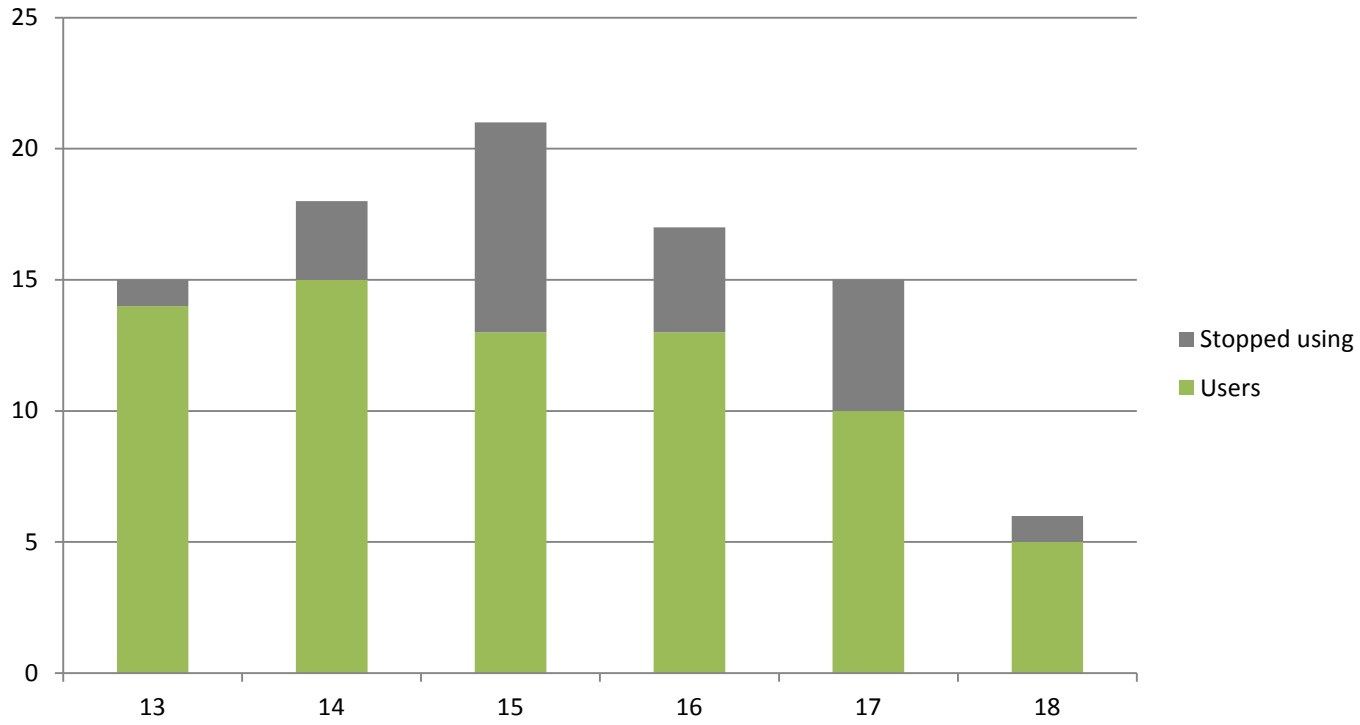
Students who ceased using wireless products

- N=22





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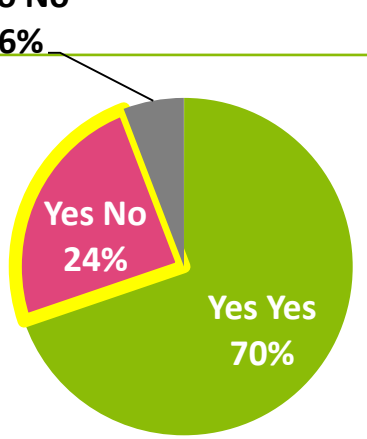
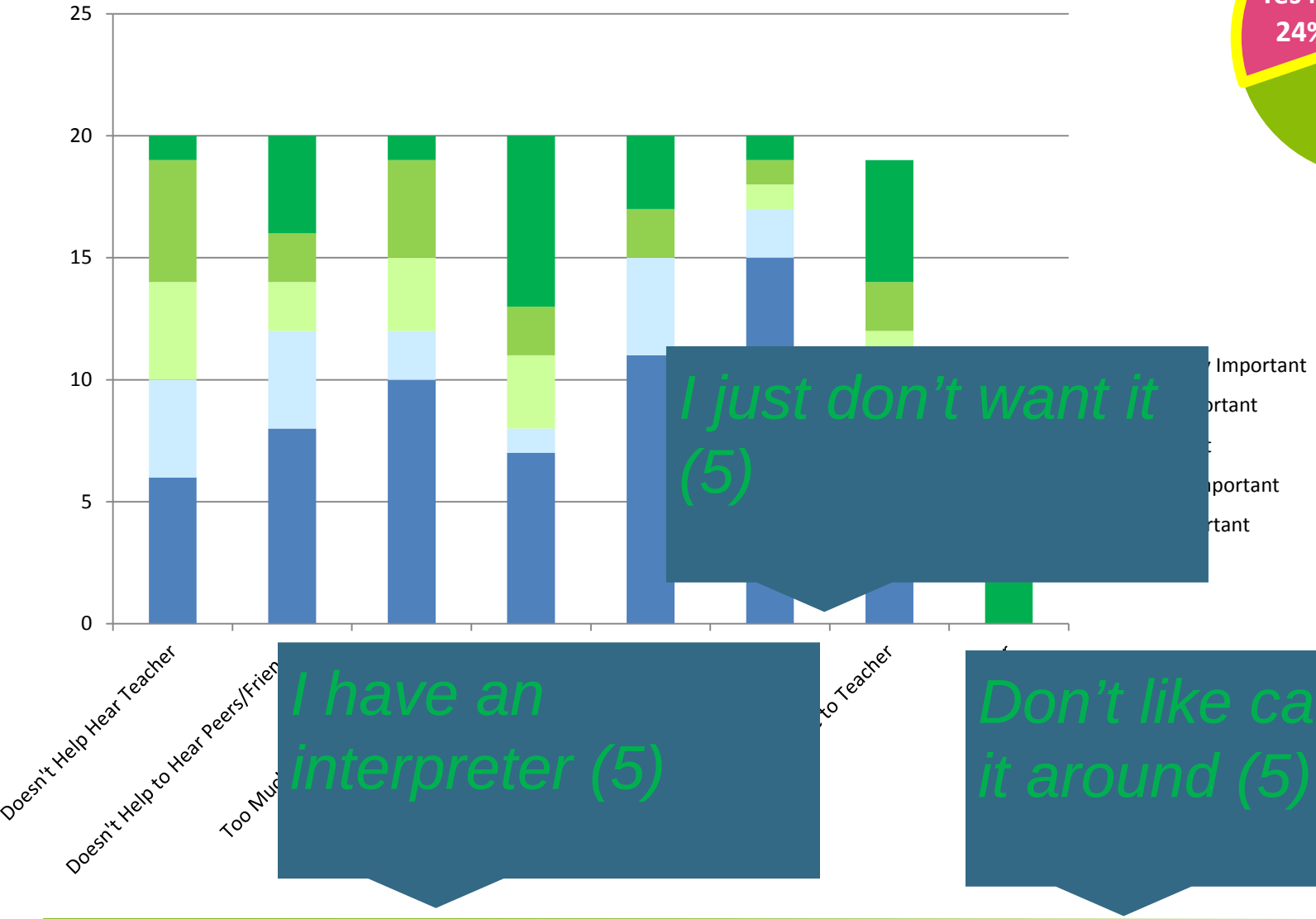
Reasons for non-use among former users





I just don't want it (5)

I have an interpreter (5)

Don't like carrying it around (5)

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Findings

Users for teacher access, confidence, SPIN, grades

Strongest benefit by users were 1. teacher 2. peers 3. media

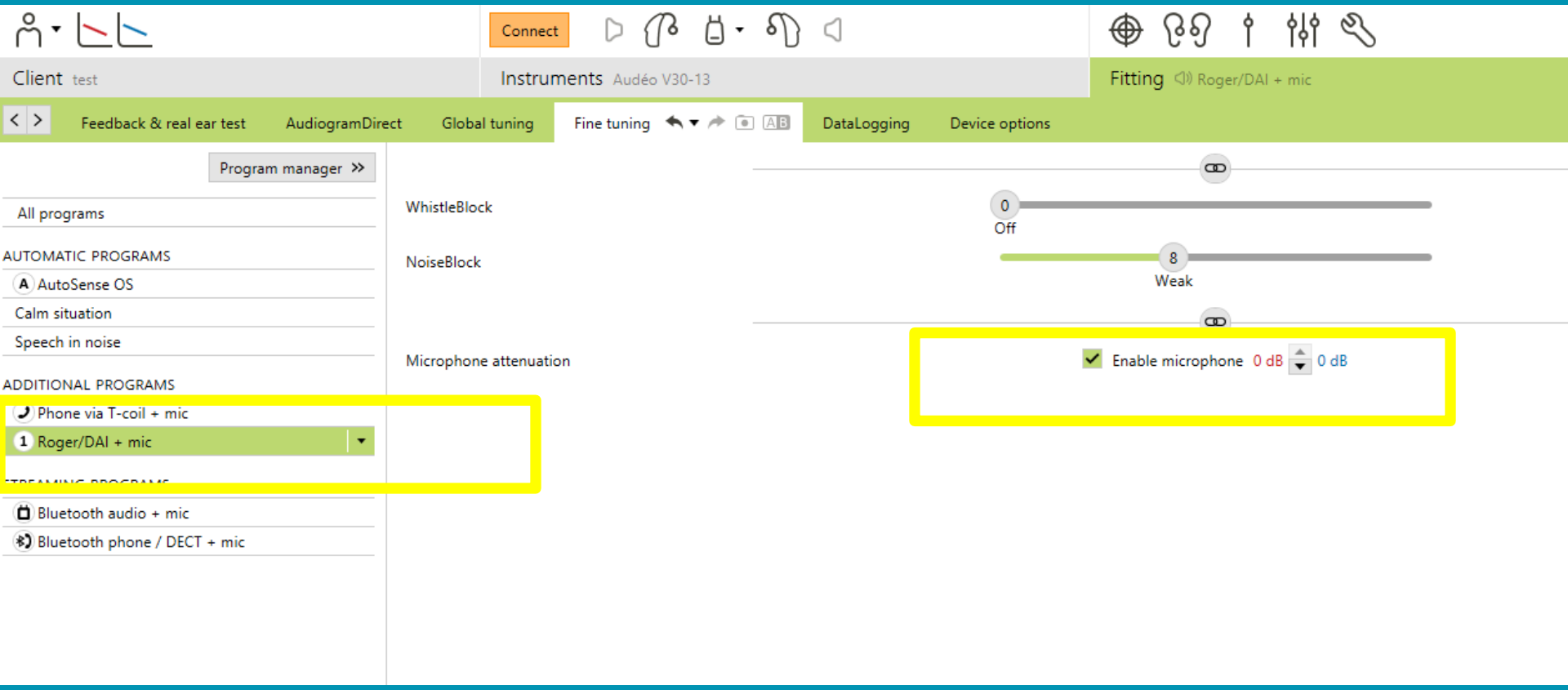
24% of teens became non-users

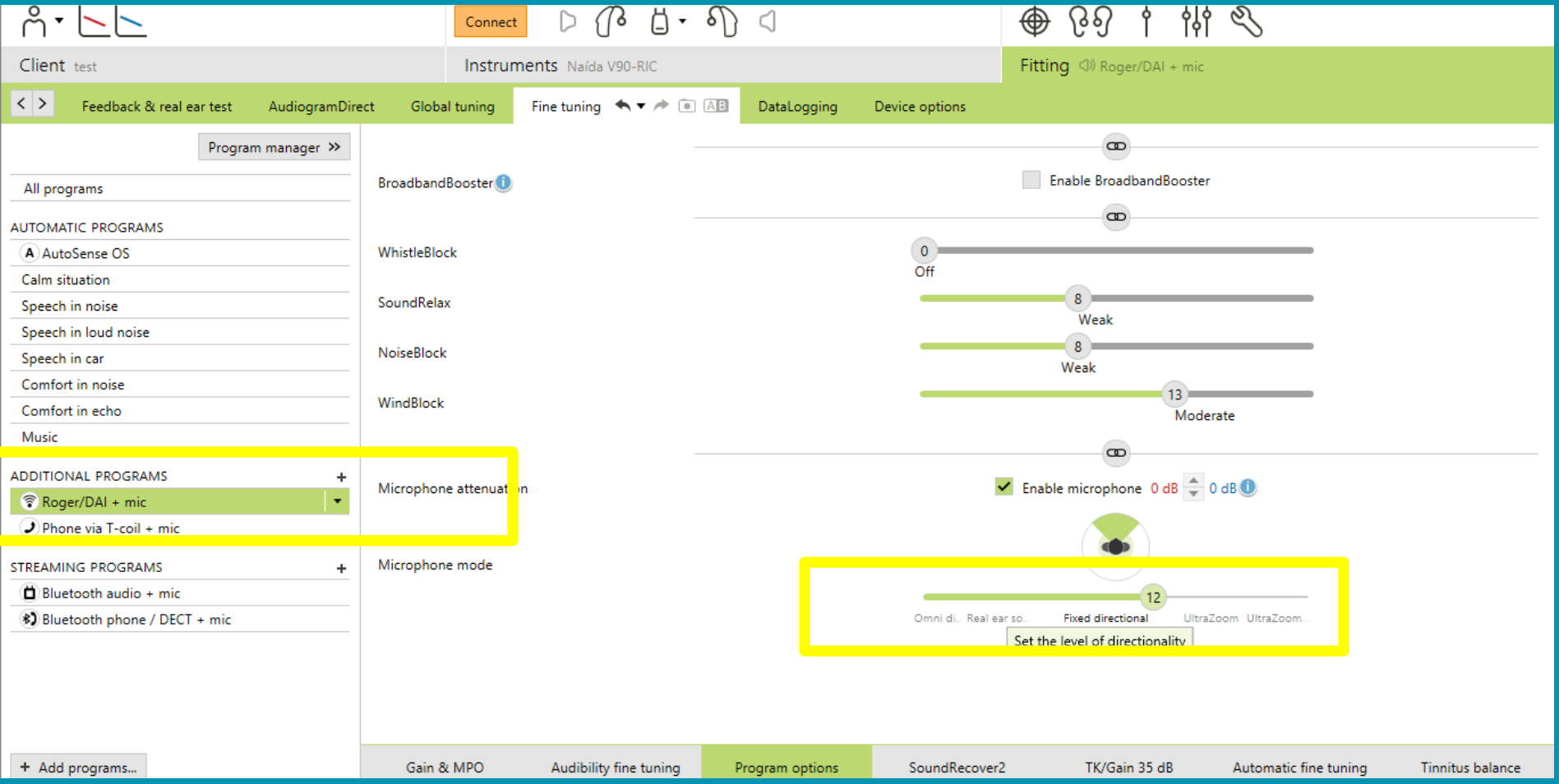
Users used it because **they** wanted to

Reasons for non-use1. look/feel 2. doesn't help teacher 3. doesn't help peers

Opportunity for innovation

Roger +DM


Connect
Client test
Instruments Audéo V30-13
Fitting Roger/DAI + mic
Feedback & real ear test
AudiogramDirect
Global tuning
Fine tuning
DataLogging
Device options
Program manager
All programs
AUTOMATIC PROGRAMS
AutoSense OS
Calm situation
Speech in noise
ADDITIONAL PROGRAMS
Phone via T-coil + mic
Roger/DAI + mic
Bluetooth audio + mic
Bluetooth phone / DECT + mic
WhistleBlock
0
Off
NoiseBlock
8
Weak
Microphone attenuation
Enable microphone 0 dB 0 dB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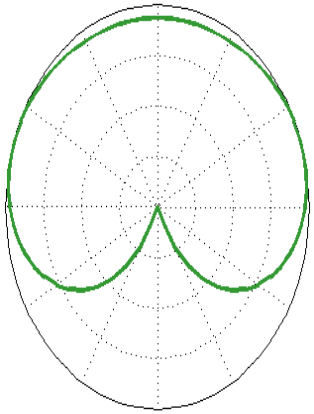
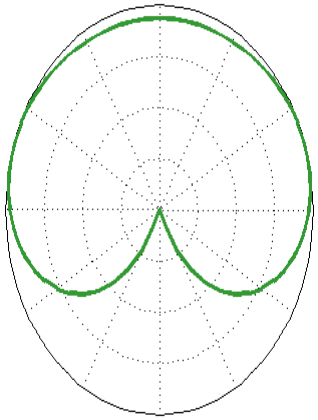
Device options
Program manager
All programs
AUTOMATIC PROGRAMS
AutoSense OS
Calm situation
Speech in noise
Speech in loud noise
Speech in car
Comfort in noise
Comfort in echo
Music
ADDITIONAL PROGRAMS
Roger/DAI + mic
Phone via T-coil + mic
STREAMING PROGRAMS
Bluetooth audio + mic
Bluetooth phone / DECT + mic
+ Add programs...
BroadbandBooster
Enable BroadbandBooster
WhistleBlock
0
Off
SoundRelax
8
Weak
NoiseBlock
8
Weak
WindBlock
13
Moderate
Microphone attenuation
Enable microphone 0 dB 0 dB
Microphone mode
12
Omni di...
Real ear so...
Fixed directional
UltraZoom
UltraZoom...
Set the level of directionality
Gain & MPO
Audibility fine tuning
Program options
SoundRecover2
TK/Gain 35 dB
Automatic fine tuning
Tinnitus balance

Fixed versus adaptive directionality

Fixed directional beamformer





UltraZoom

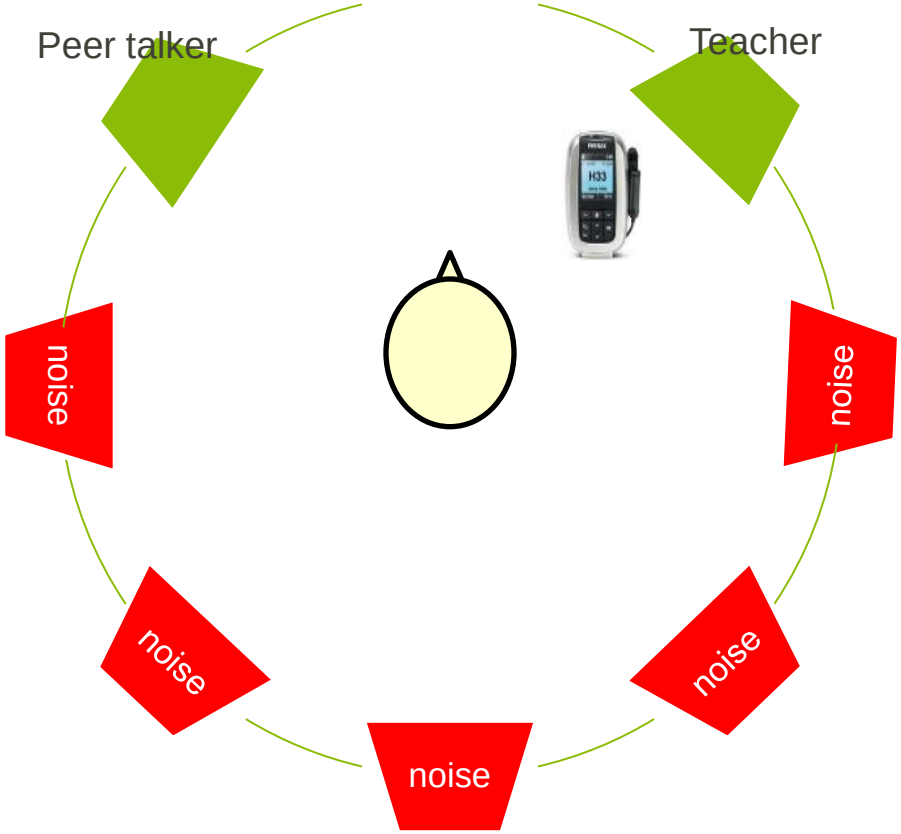
N=15

Age 7-17

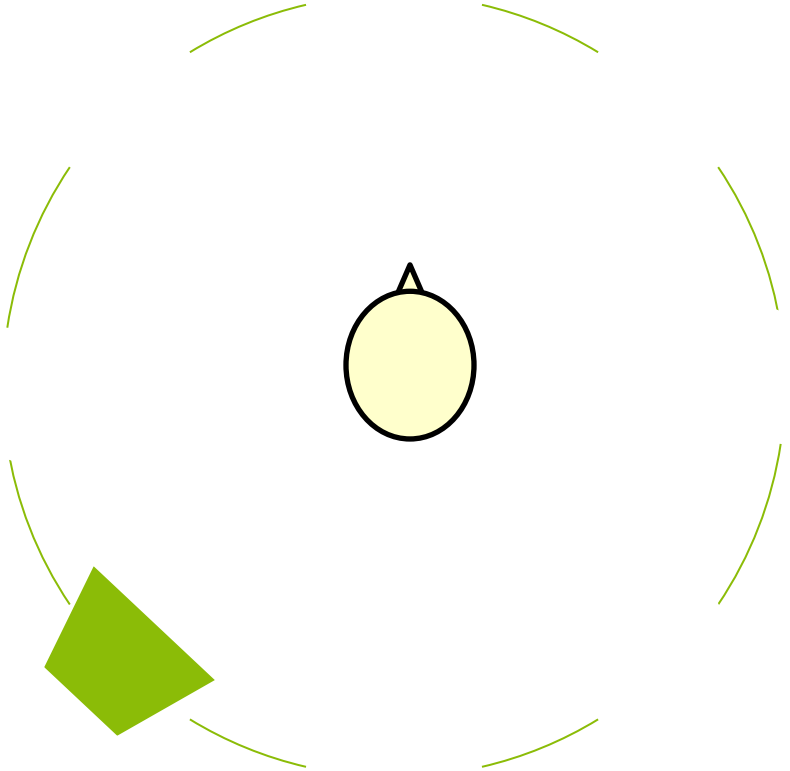
Mild to Moderately severe SNHL

Roger DM test scenes

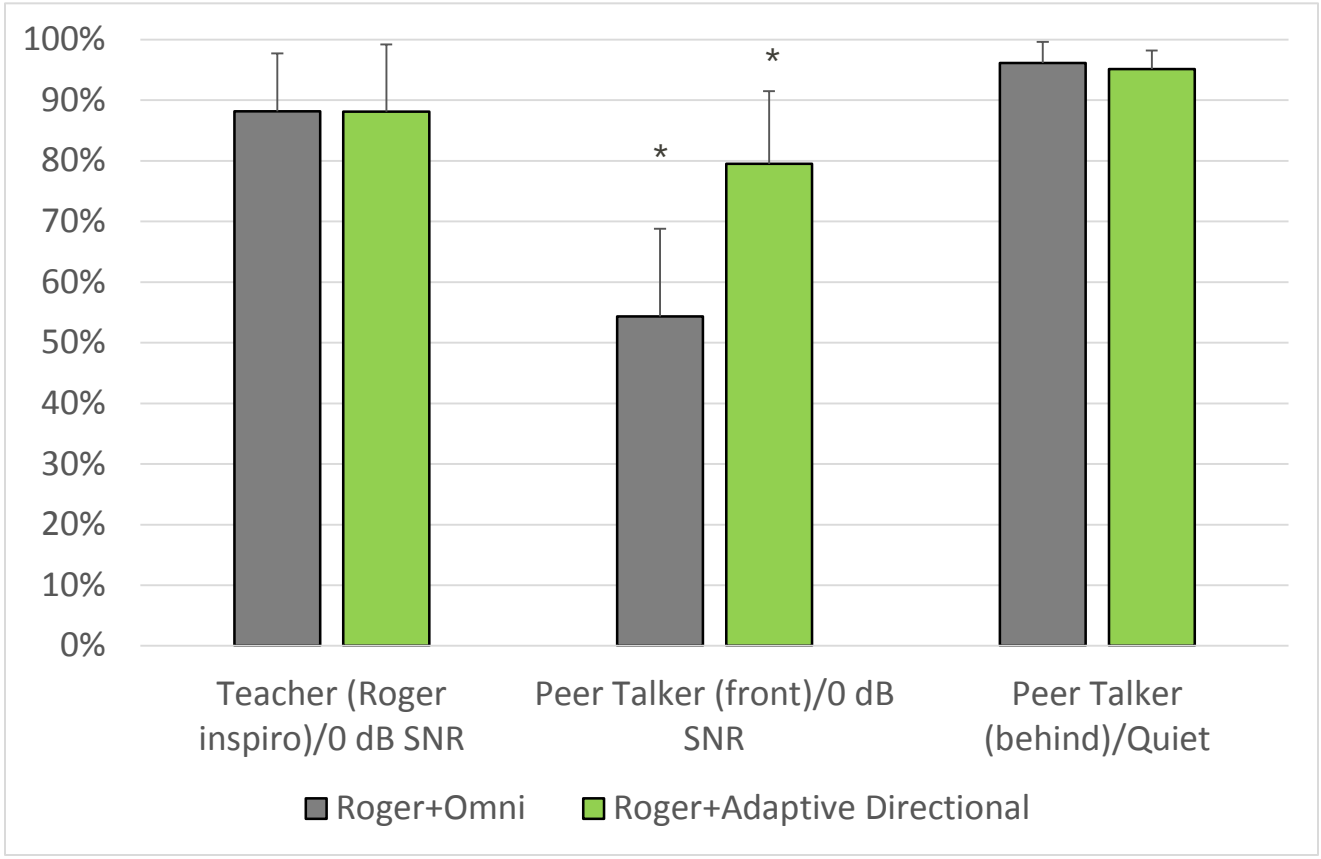
Teacher and Peer talker in noise (65/65)



Peer talker from behind in quiet



The adaptive directional mic significantly improves understanding of peers



Error bars = 1 S.D.

p=.003

N=15

Wolfe, in prep, 2016

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Roger TouchScreen Mic
Small group mode

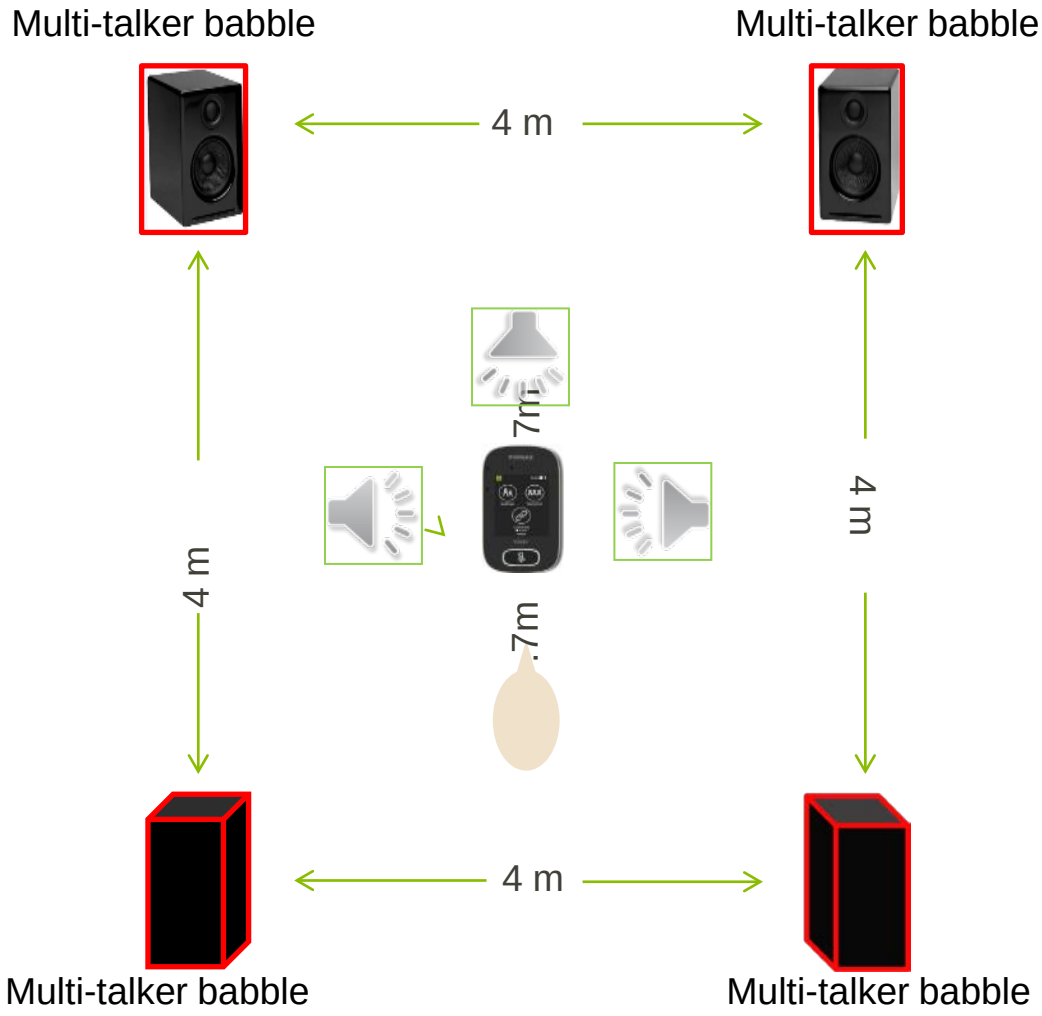
N=13

Adults

Mild to Moderately severe SNHL

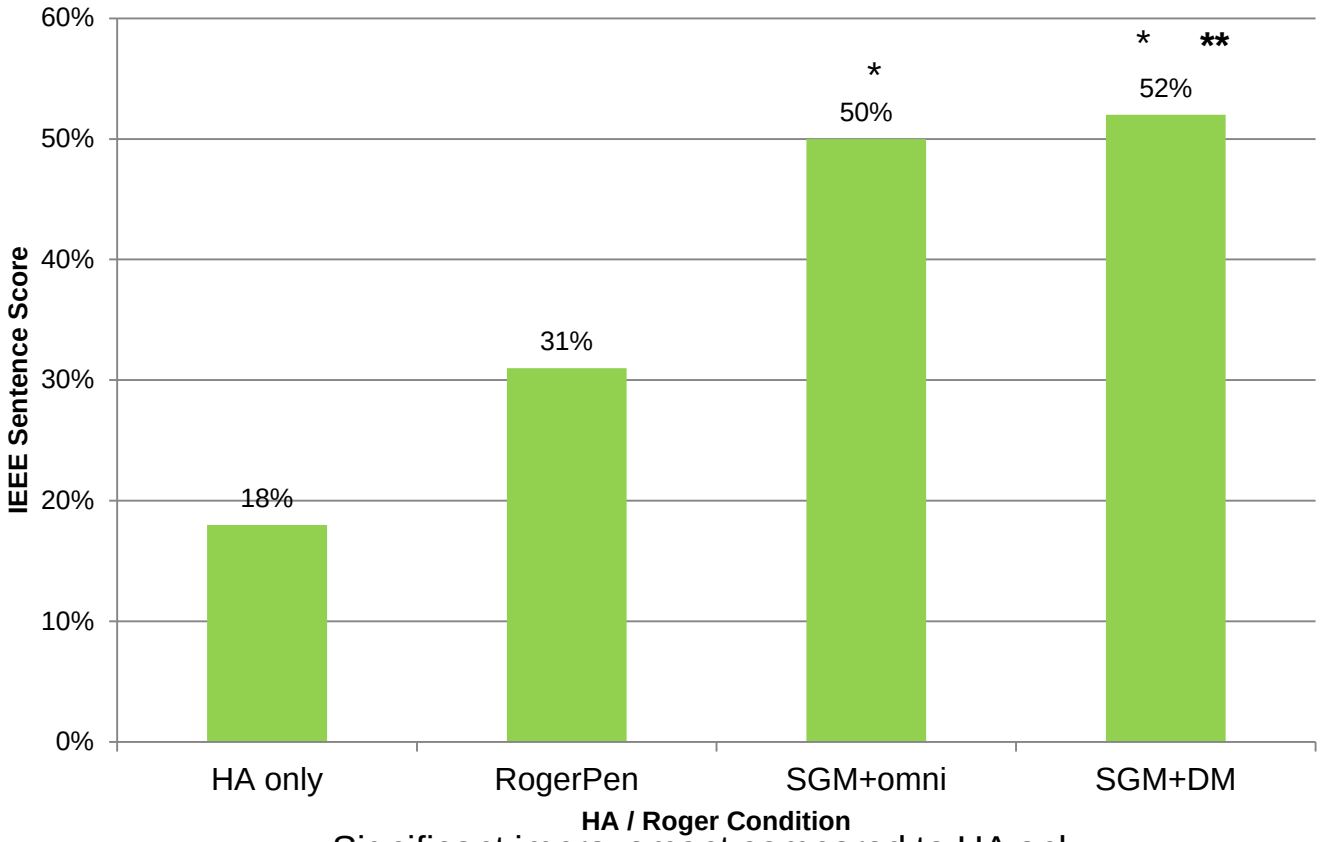
Fitted with Sky V UP devices and Roger X receivers

Objective: speech perception testing



- Multi-talker babble (**noise**) was presented at 4 corner speakers, simulating a classroom with multiple working groups such as a team project or lab exercise
- IEEE sentences (**targets**) were randomly presented from 0, 90, and 270 degrees simulating a group of 4 near-field students engaged in group work around a table
  - 20 sentences from each of the three speakers
  - Calibrated to 70 dB
- To avoid floor and ceiling effects, signal to noise ratio was between +/- 6 based on individual performance
- Listener was scored on word correct for IEEE sentences arriving from all angles

Speech perception results show significant improvement with Roger Touchscreen small group mode



- Significant improvement compared to HA only

** Significant improvement compared to HA+Roger Pen

p= <.05

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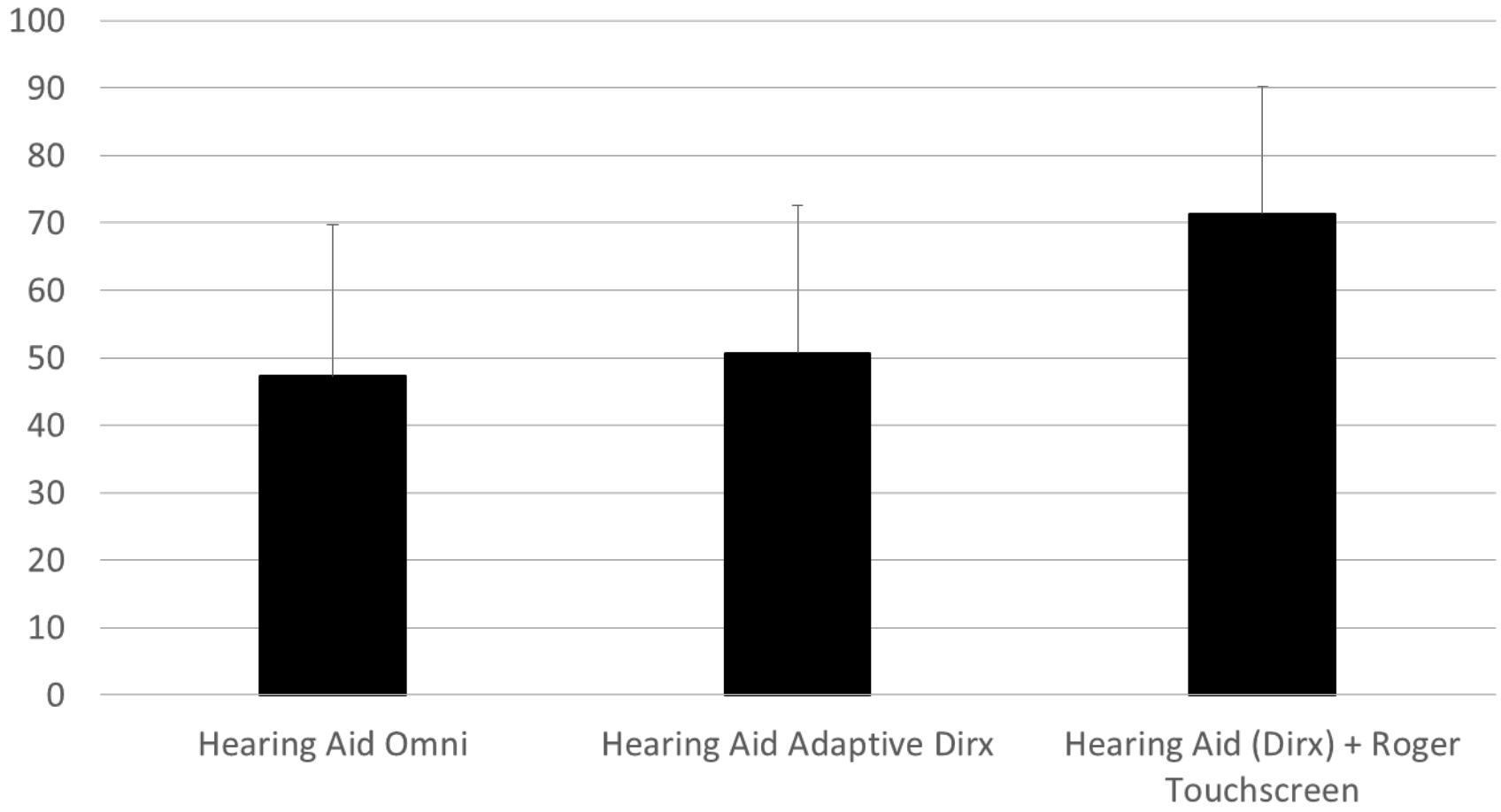
Small group work conditions

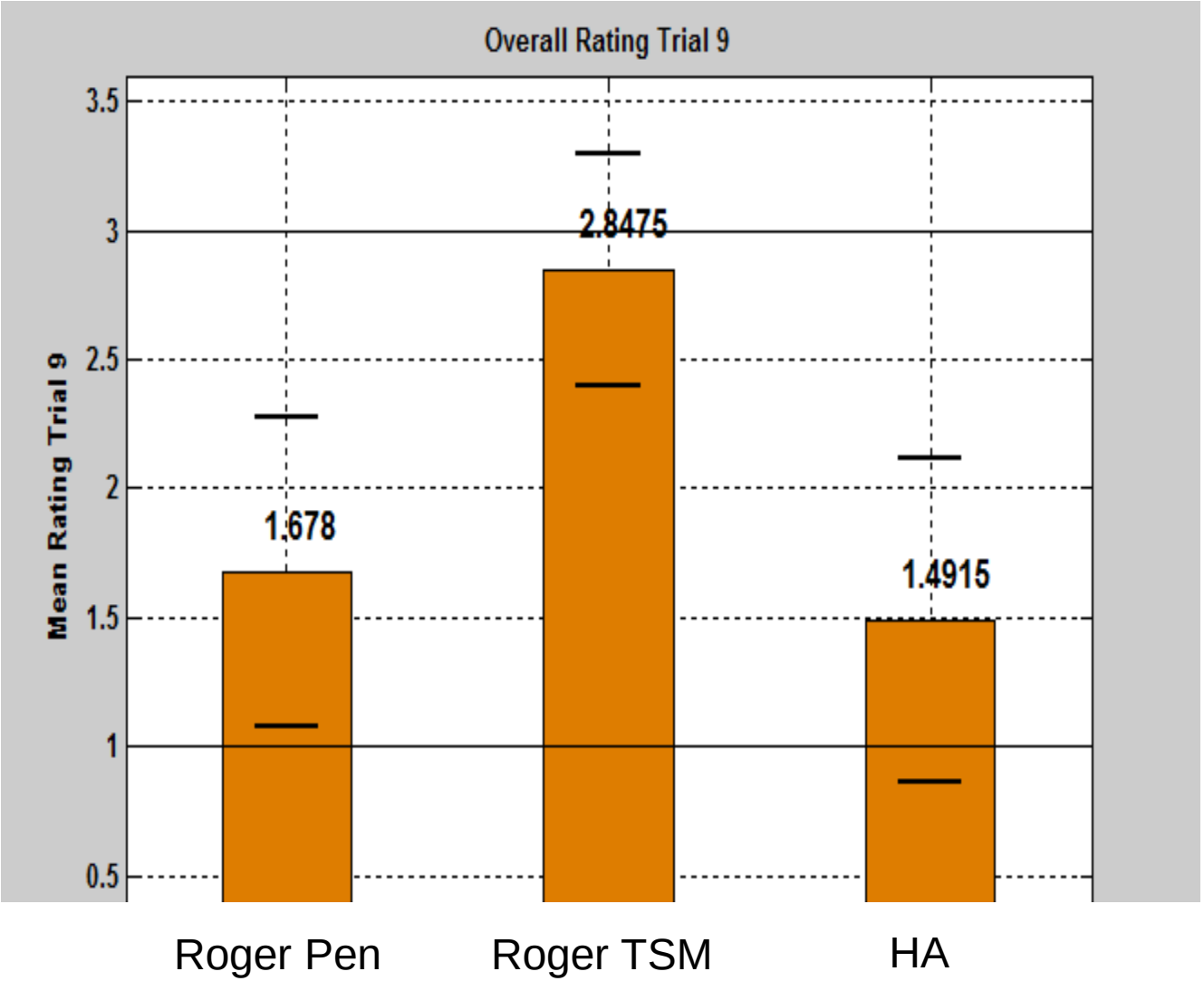


Wolfe, in prep, 2016

n = 12

Roger Touchscreen –small group mode

N=68



In summary

- Classroom listening is becoming increasingly diverse
- Opportunities in classroom hearing performance have been identified by subjective and objective research
- The use of directional microphones in combination with remote microphones improves understanding of near field talkers
- The use of the multi-microphone small group mode in the Roger TouchScreen mic improves understanding of multiple near field talkers in noise

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Acknowledgements

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