Are we on target with our pediatric hearing aid fittings?

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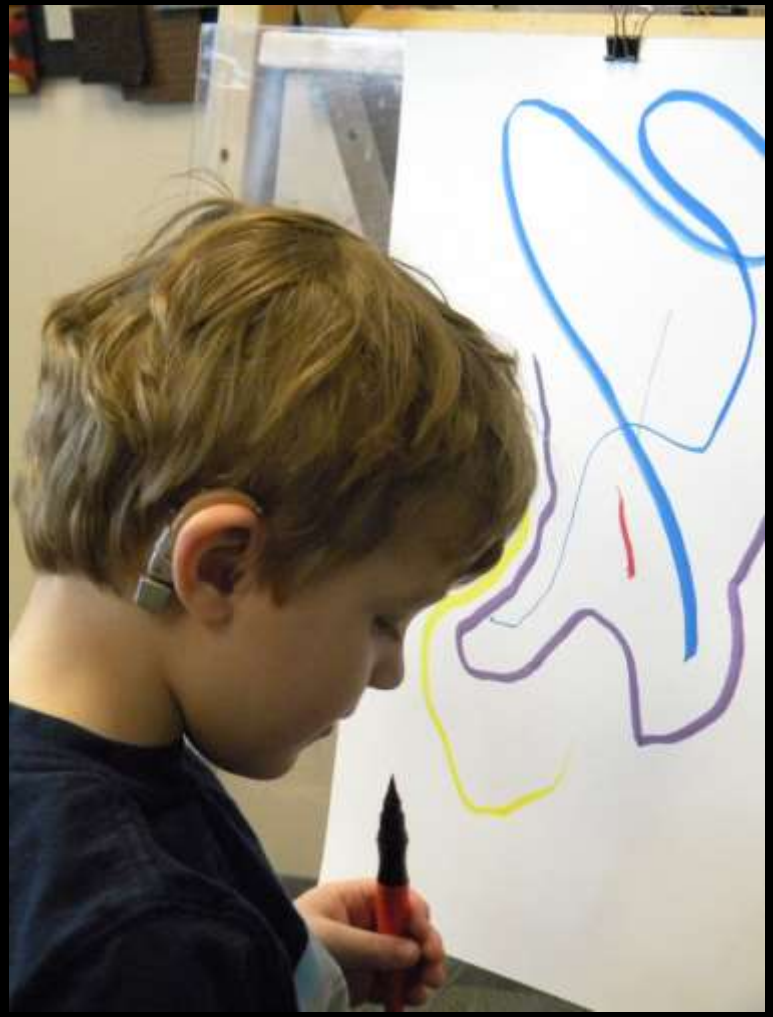
Audibility is crucial

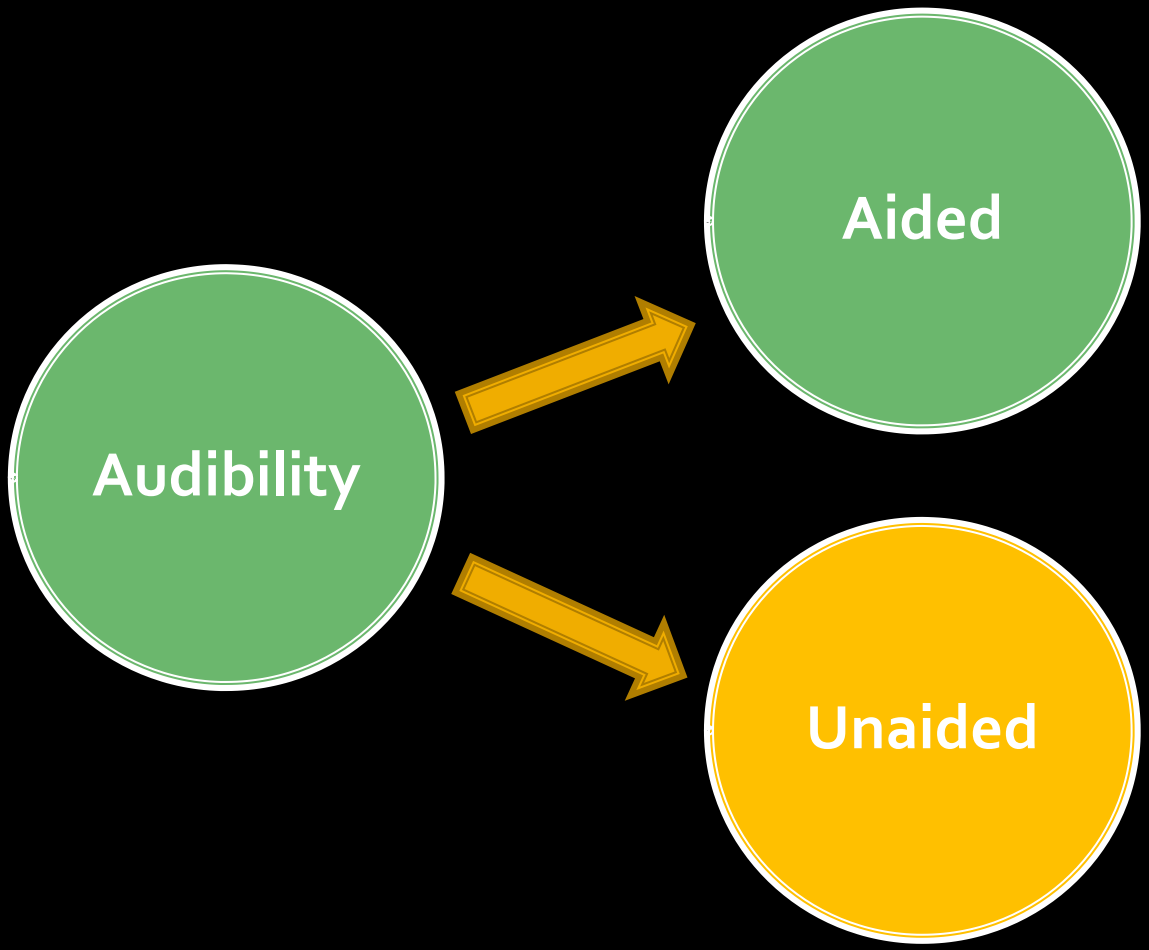
Audibility is variable

- Child factors
  - Degree of hearing loss
  - Ear canal growth
  - Hearing aid fitting
- External factors
  - Distance
  - Noise
  - Reverberation
  - Context

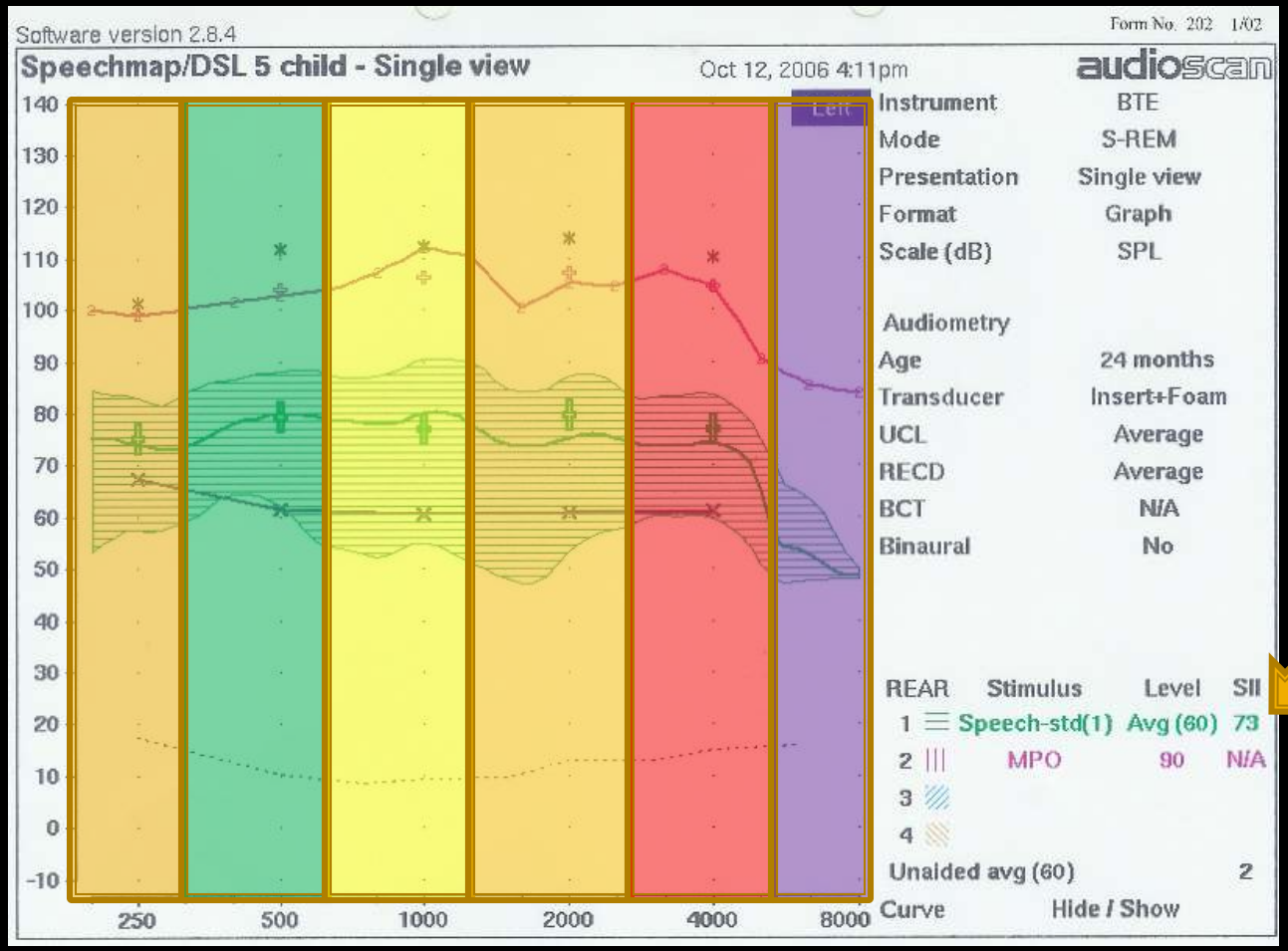


How can we maximize audibility?

Two components of auditory experience


Aided
Audibility
Unaided

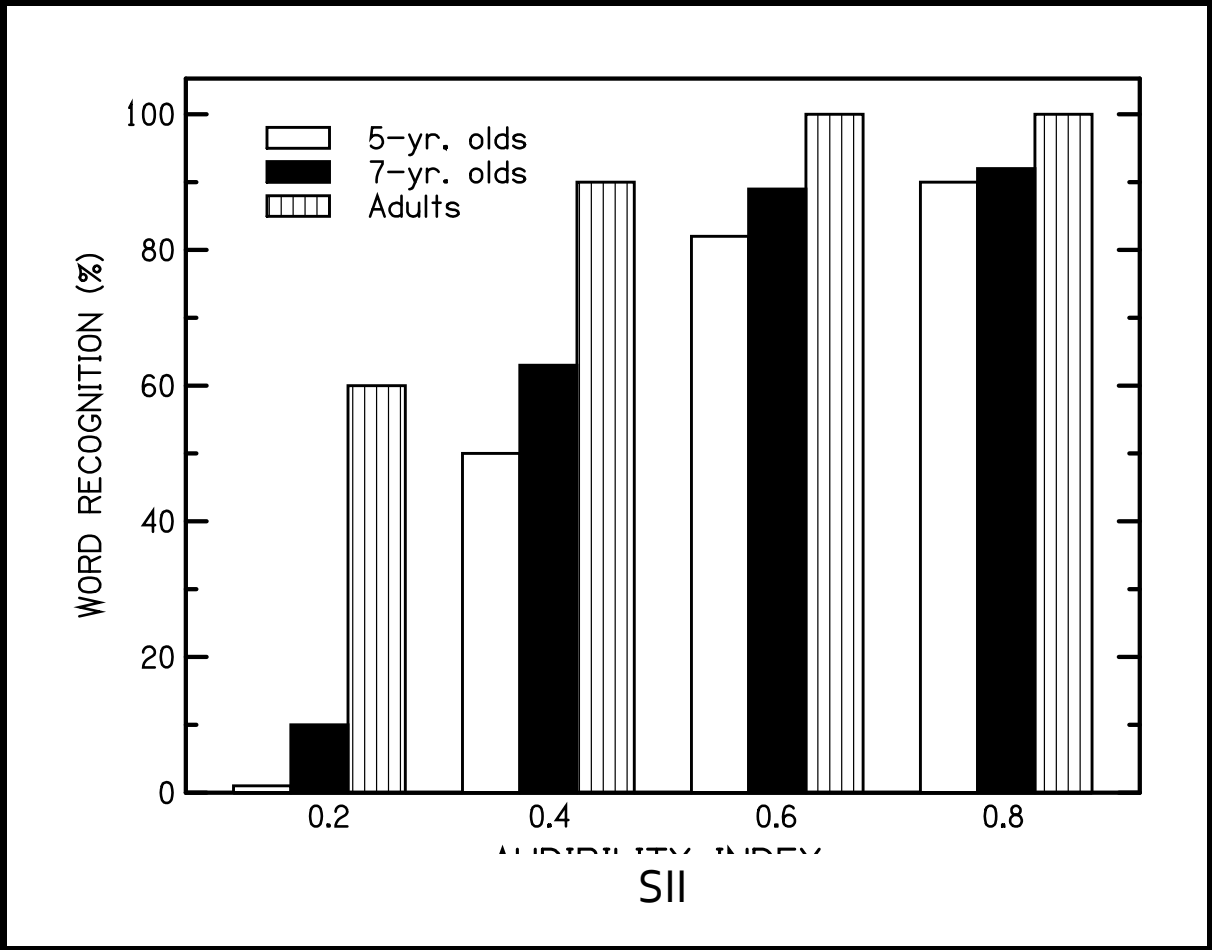
Speech Intelligibility Index (SII)



For each band – Audibility x FIW = weighted audibility

SII = Sum of weighted audibility of all frequency bands

Audibility and speech recognition by age



Stelmachowicz et al. 2000

Speech Intelligibility Index

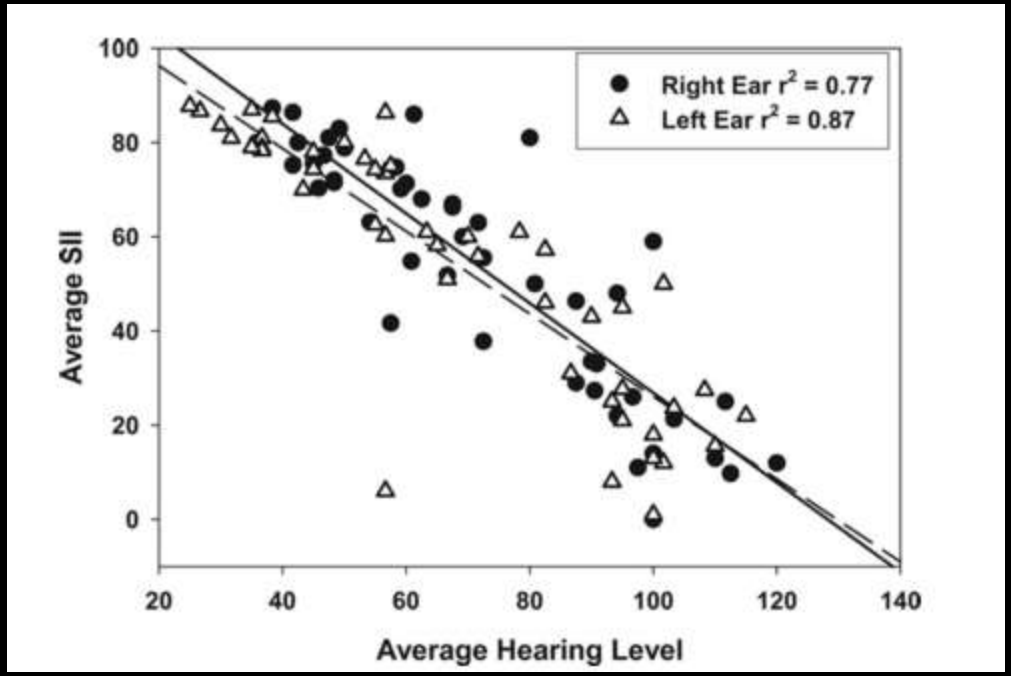
- Estimate of aided or unaided audibility
- Can be applied to transfer functions to predict speech recognition *

* Some restrictions may apply

  - Transfer functions may have been developed on adults with normal hearing.

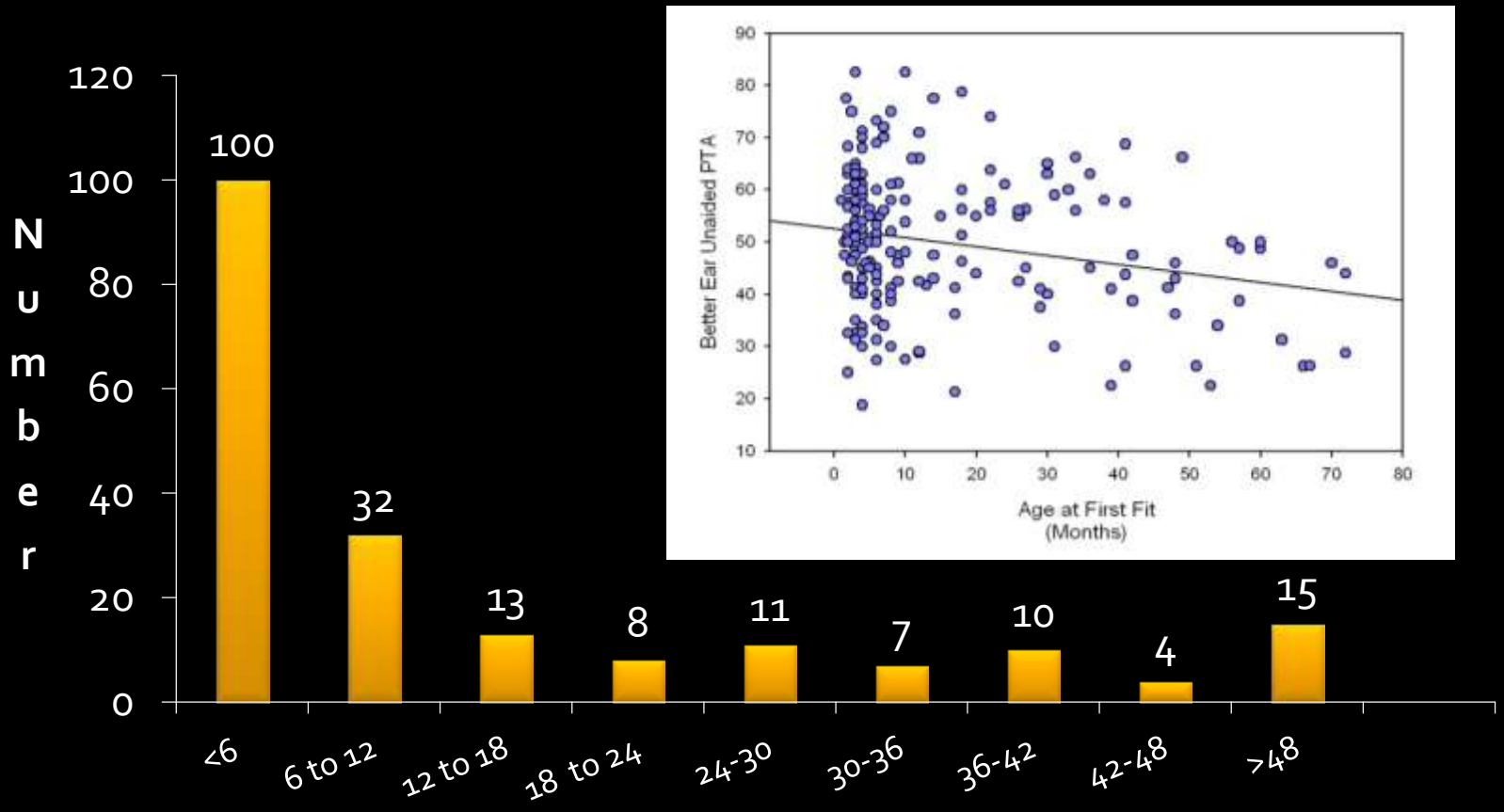
Audibility in previous studies

- Audibility is related to degree of hearing loss
- Hearing aid use is assumed to be full time

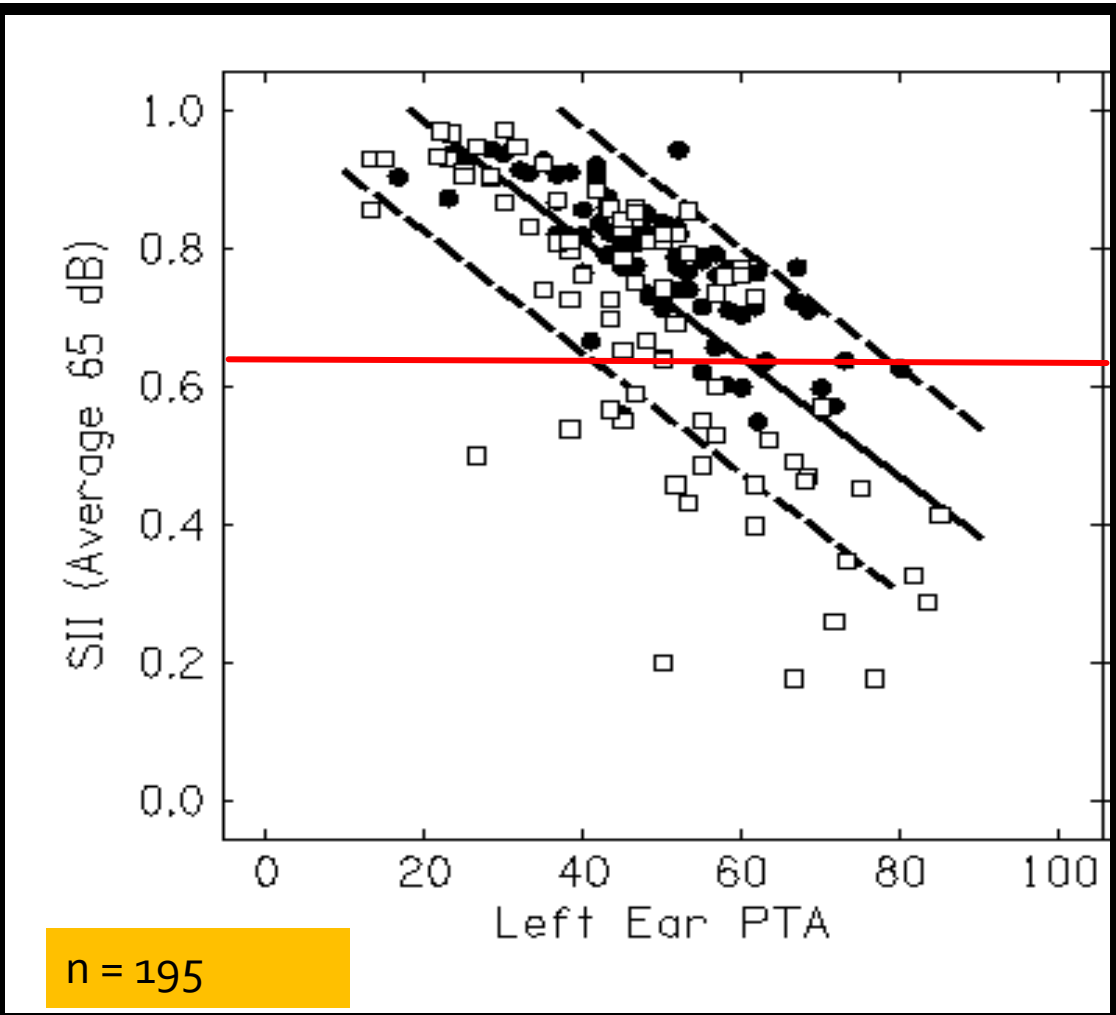


Sininger et al. 2010

Age at First HA Fit



How well are HAs fit?



n = 195

Normative range from Bagatto et al. 2011

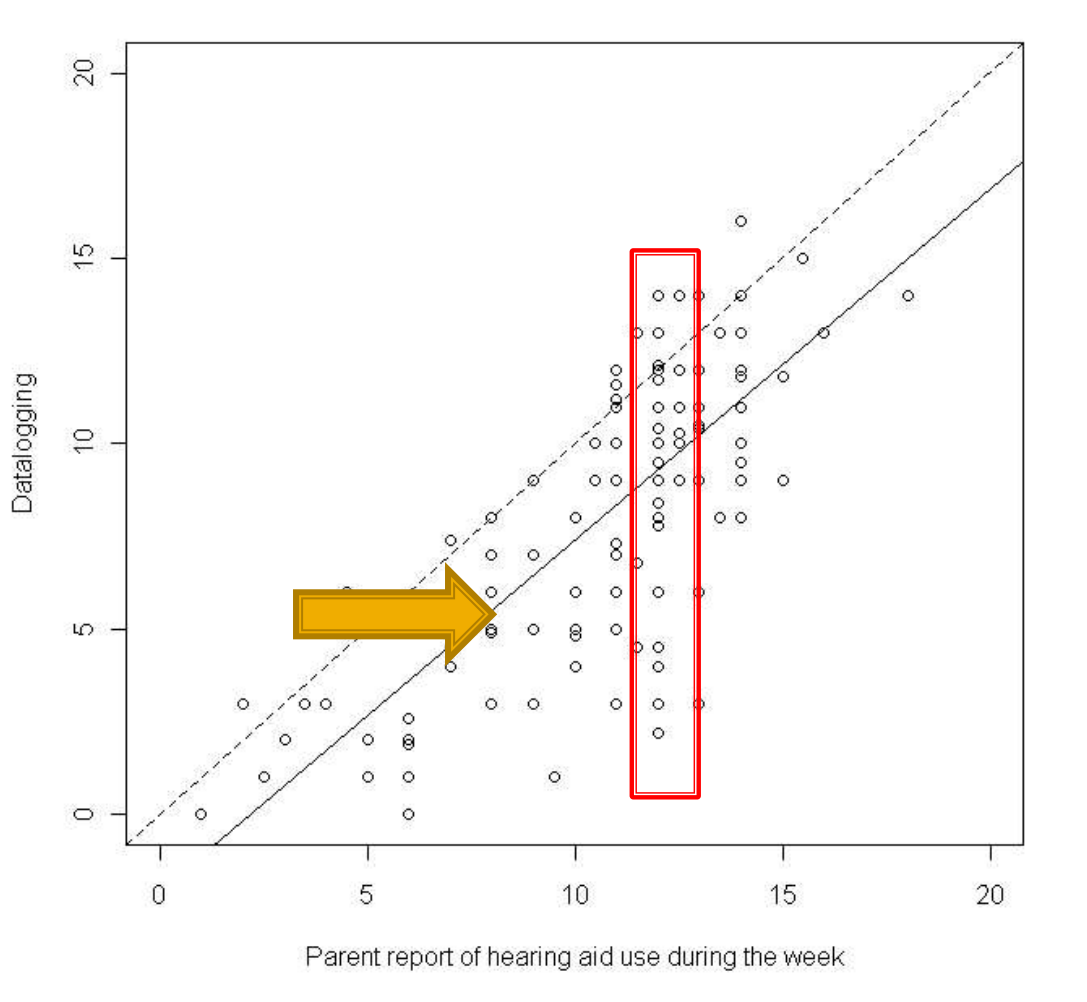
Open squares = > 5 dB deviation from DSL

Filled circles = < 5 dB deviation from DSL

26% of ears < 0.65 SII

McCreery, Bentler & Roush, 2013

Hearing aid use



Parent report = 10.84 hours

Data logging = 8.3 hours

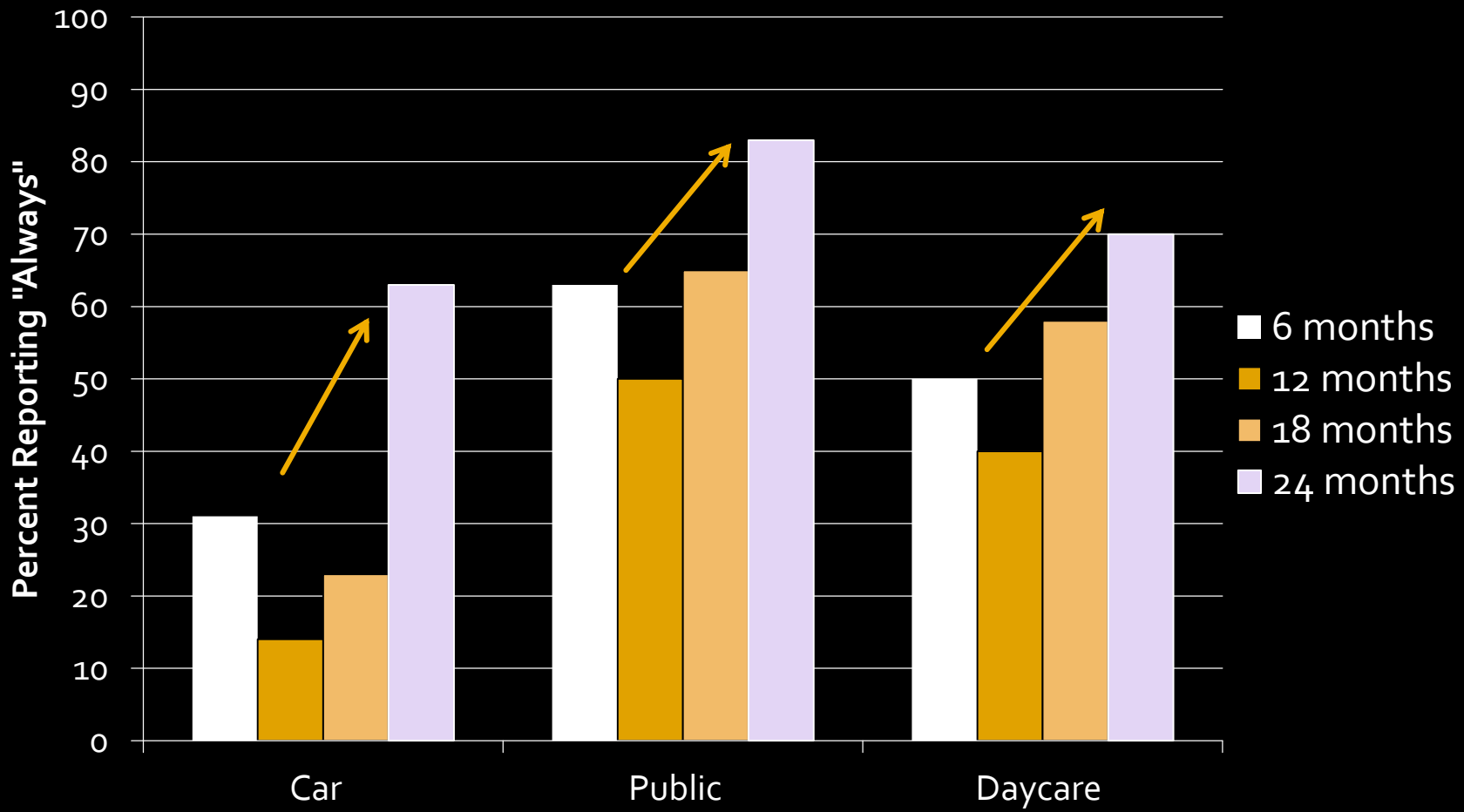
Difference = 2.6 hours
Range = 2-10 hours

Predicted by age
-Younger age = larger prediction error

Walker et al, *LSHSS*, 2012

Hearing aid Use: Age and Setting

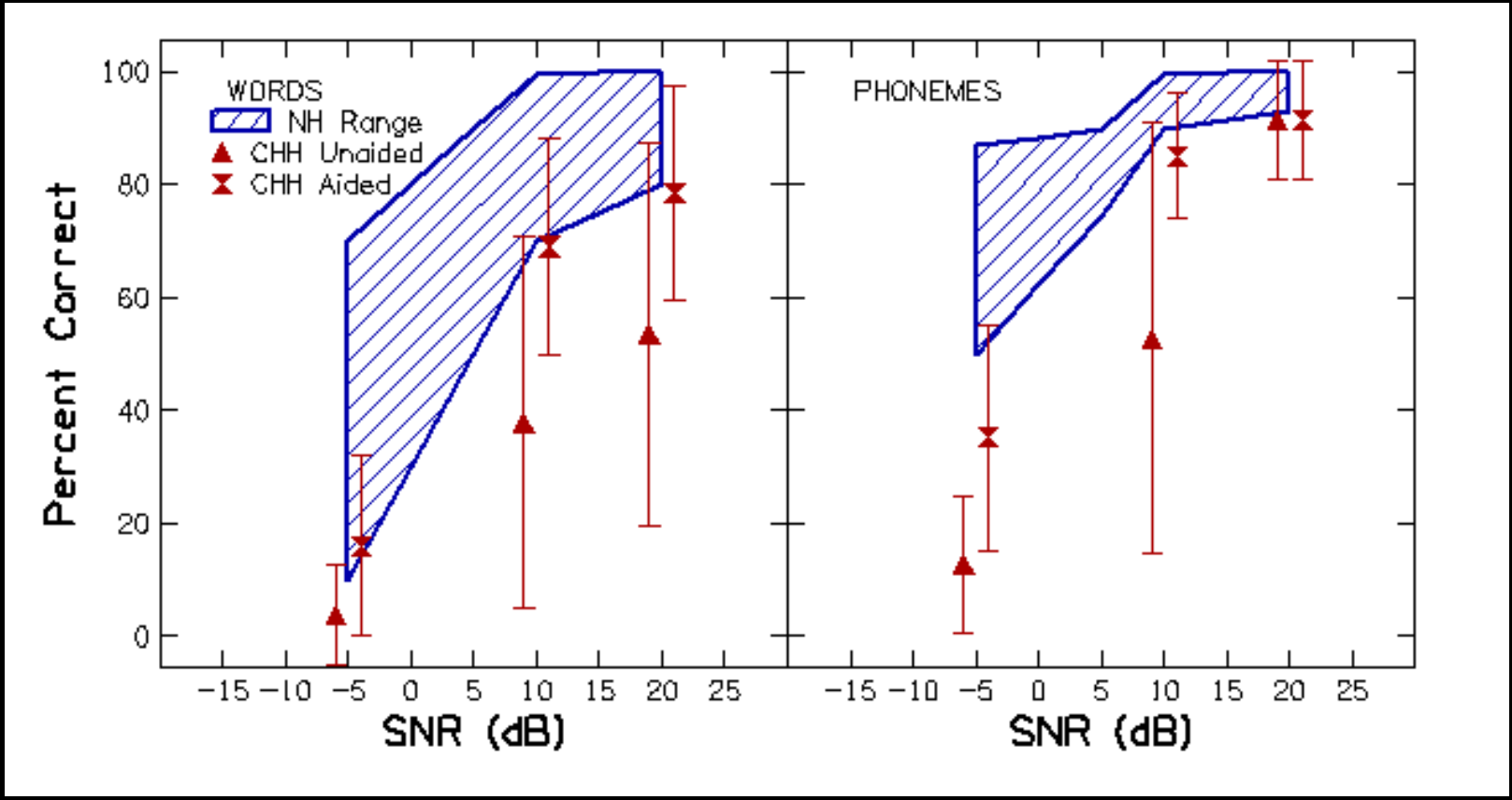
Walker, et al., *LSHSS* 2012



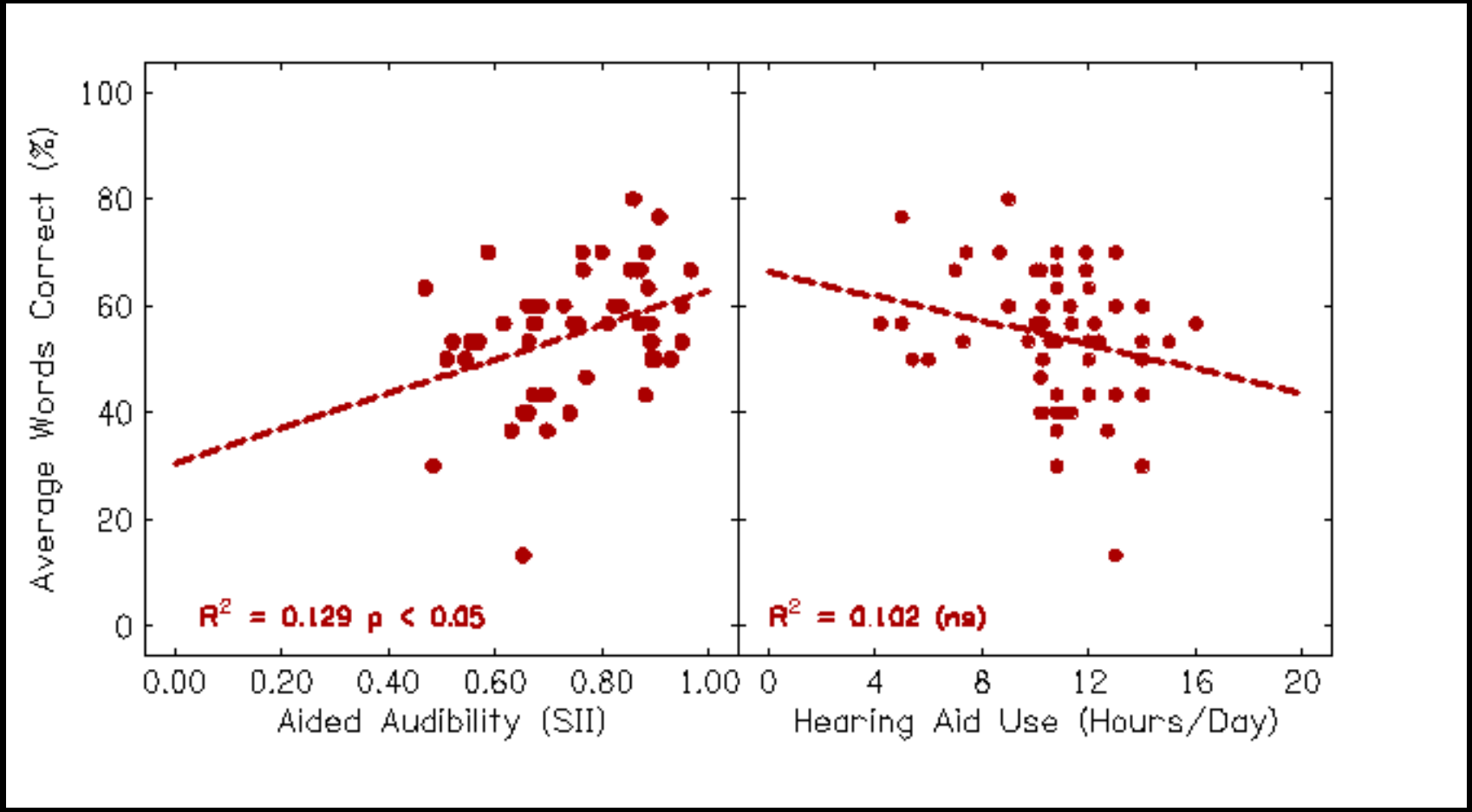
Hearing aid use

- Parent report and data logging are similar
  - Agreement improves as child gets older
- Significant variability in data logging for parents reporting "full-time use"
- Ask specific questions about use
  - How many hours?
  - What situations are easiest/most challenging?

Effects on speech recognition in noise

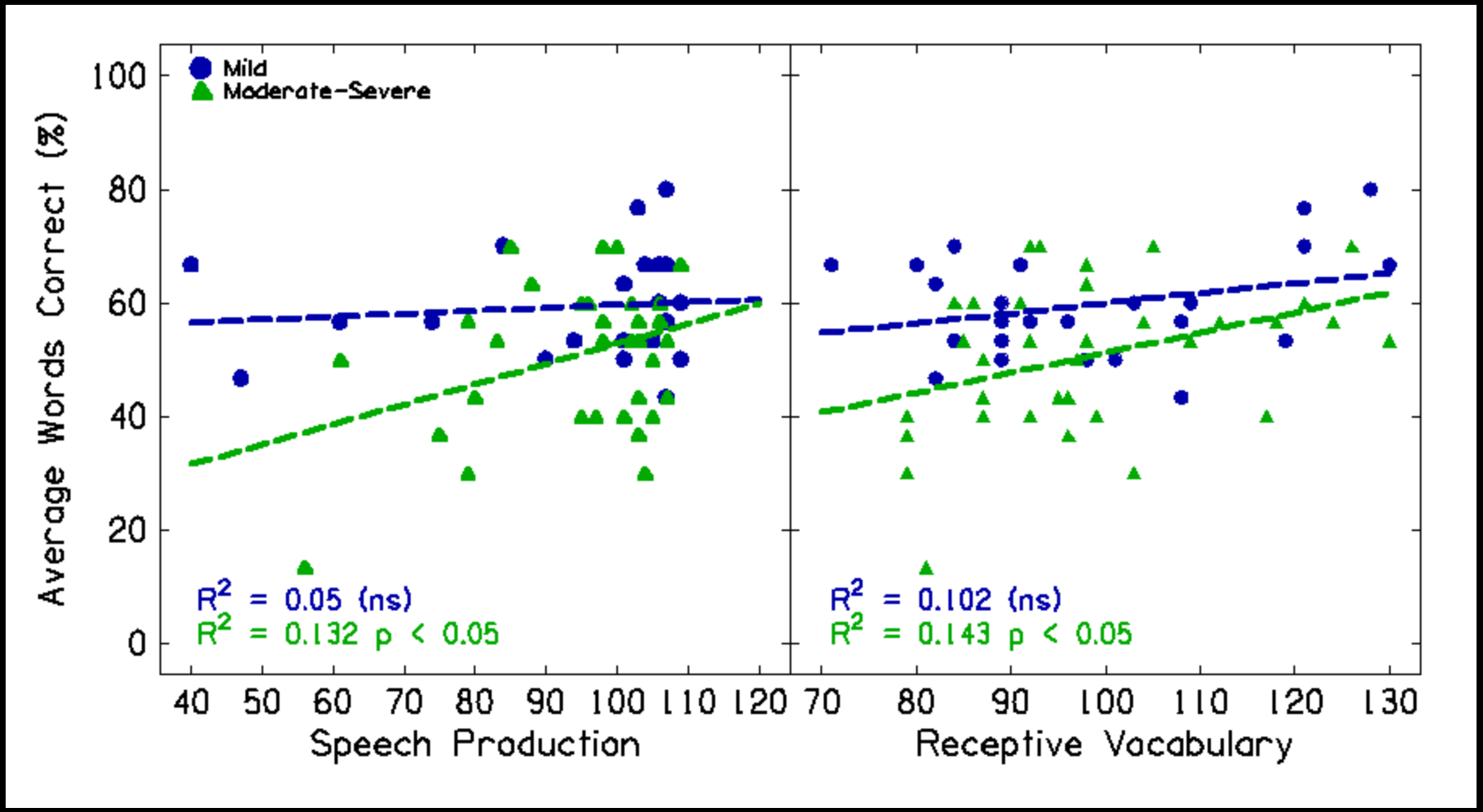


Effects of audibility and use



Controlling for Unaided SII

Effects of degree of hearing loss



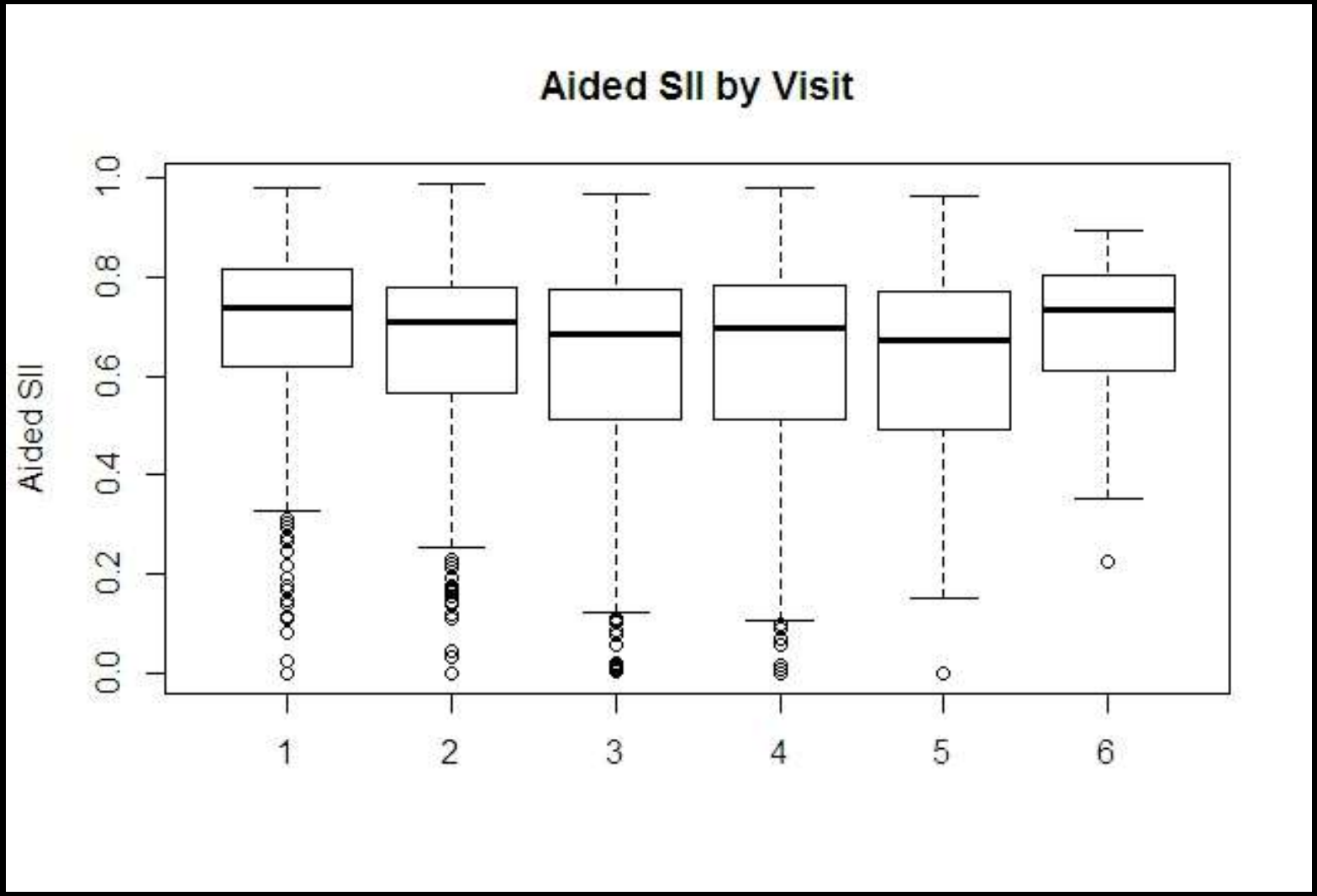
Key Points

- Increasing audibility with hearing aids helps speech understanding in background noise
- Hearing aid use is confounded by degree of hearing loss
- The relationship between word recognition in noise and language depends on degree of hearing loss

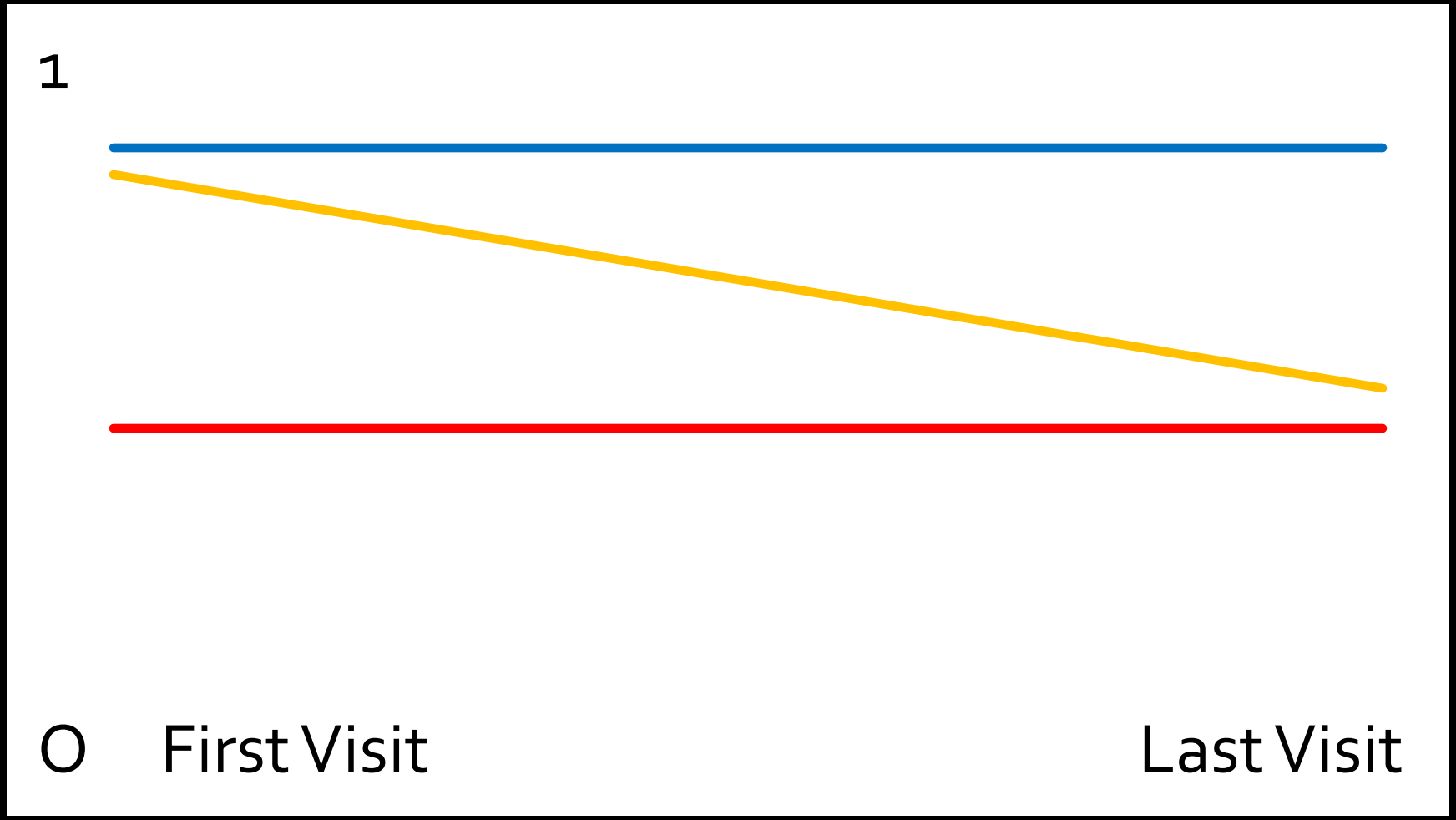
What about changes over time?

- Audibility
  - Ear canal growth
    - Thresholds
    - Hearing aid output
- Hearing aid use
  - Increasing use with age

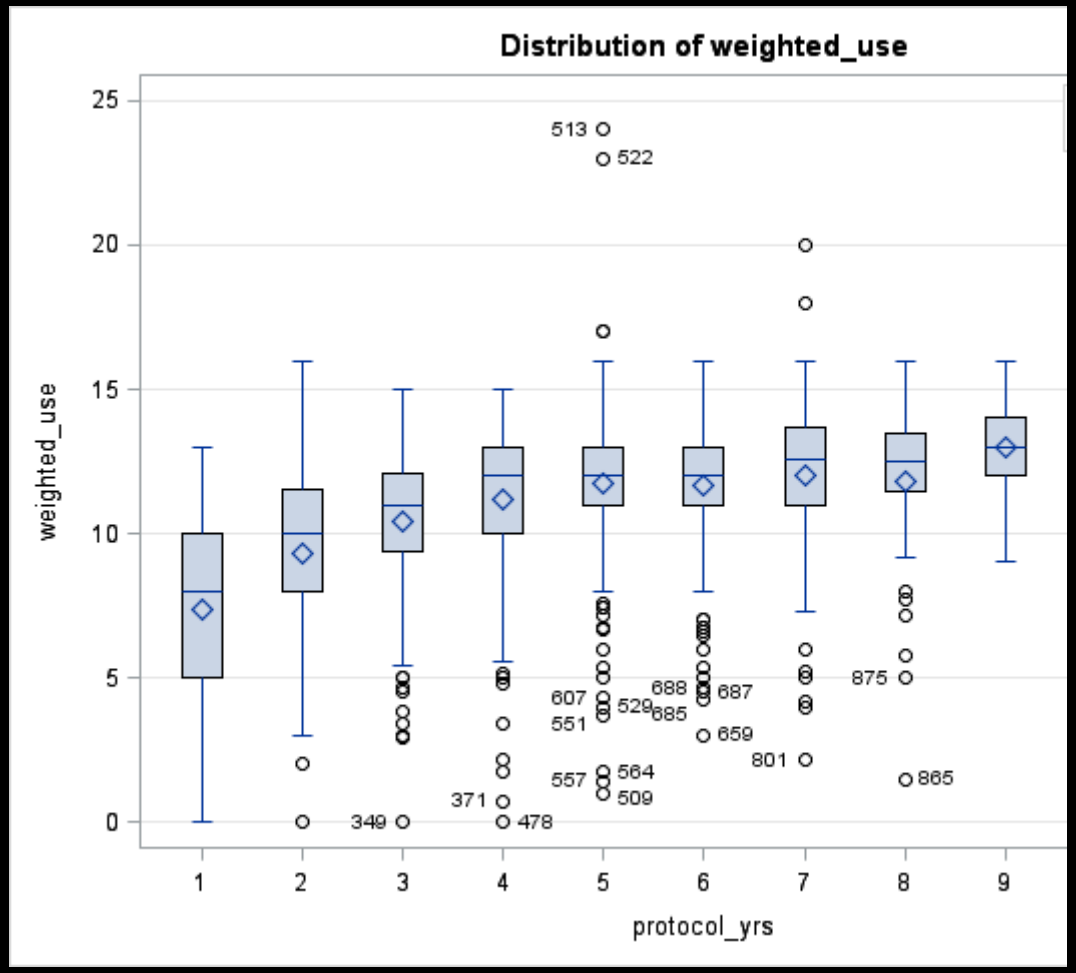
Audibility



Audibility Clusters

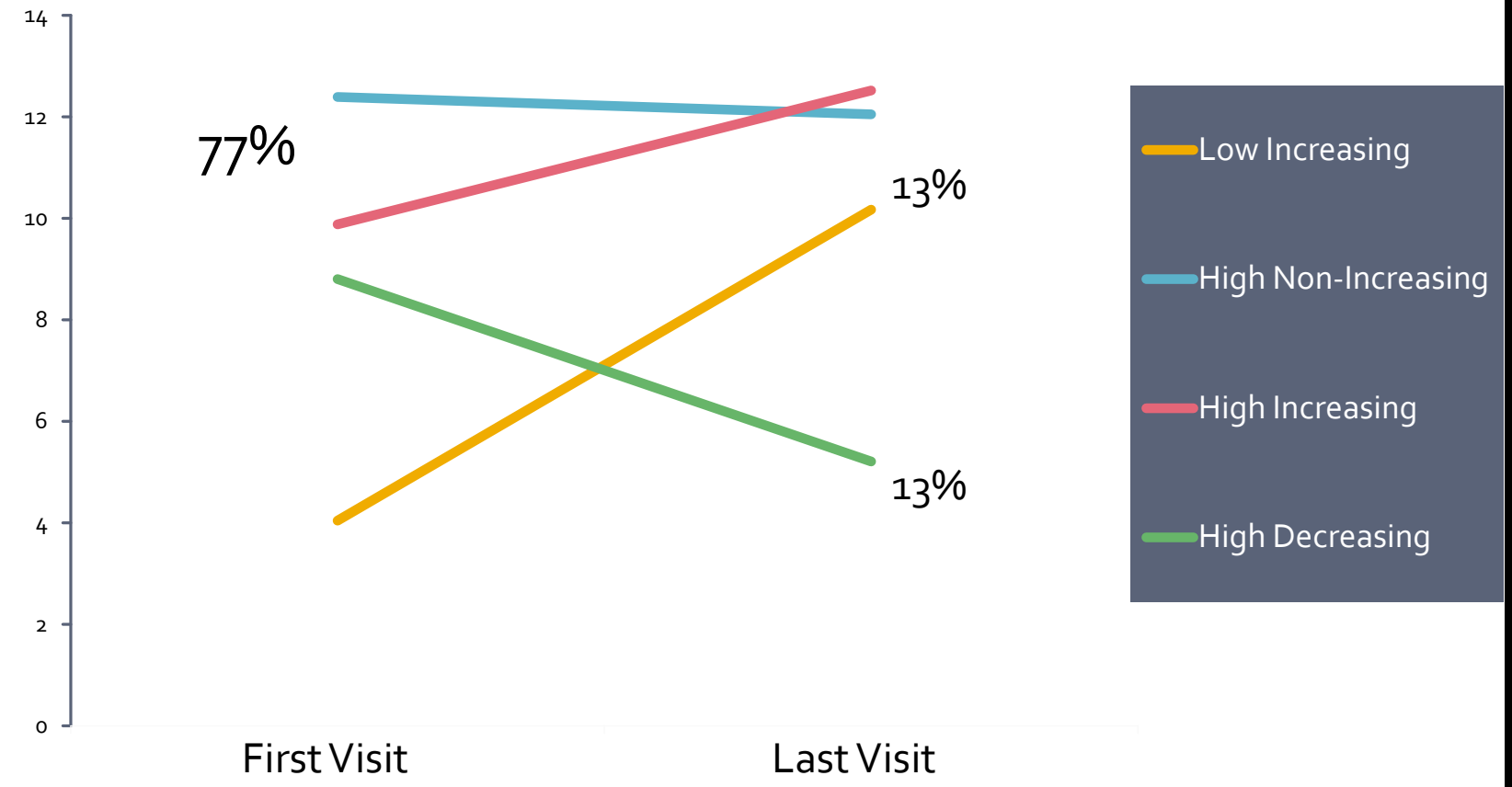


Hearing aid use



Hearing aid use over time

- Entire group (n = 279)



Future questions

- How do audibility and hearing aid use affect outcomes?
- How does early auditory experience influence listening and learning at school age?

Thank you!