Using hearX® in Add Health Wave VI

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Add Health
The National Longitudinal Study of Adolescent to Adult Health

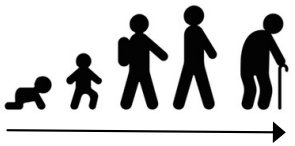
Add CAPS
Add Health Cognitive Assesment, Physical, and Sensory Function

A Team Project

- **MPI:** Robert Hummer, Director
- **Team:** Cherese Parker, Tim Monbureau, Rebecca Stebbins, Mary Jane Hill, Farizah Rob, Aanya Bahl, Kamaryn Tanner, Maya Krishnamoorthy, Jasmine Lo, Devdatt Golwala, Youngjoon Bae, Chantel Martin, and Denis Leang
- **Consultants:** Jennifer Manly, David Bennett, Brenda Plassman, John Batsis, **Nicholas Reed, and Clarice Myers**
- **NIH Program Official and Project Scientist:** Amelia Karraker and Emily Hooker

Add CAPS Partners and Service Providers

Add Health: An Innovative Study of Life-course, Health, and Aging among Americans



Prospective, Longitudinal Design of Individuals in Grades 7-12 Clustered in 132 Schools, 1994-95

Intergenerational Insight (including linked parent data)

Nationally Representative Cohort (N=20,745)

Innovative Sampling Design, Biosocial and in-depth health measures

Multilevel Data Collection

New: Cutting Edge Multimode Early Midlife Cognitive, Physical, and Sensory Function

*Wave VI ages 39 to 51 years, with an average age of 44 years

Wave VI Sample Design

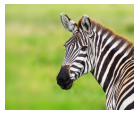
All Eligible Add Health Participants
N=19,081

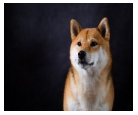
Sample 1 (N=9,366)
Web Survey and
In-Person for Non-response

TESTMYBRAIN

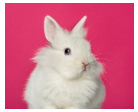
Sample 2 (N=2,613)
In-Person Survey and Add CAPS Protocol

TESTMYBRAIN





Broom
Sun
Window
Flower
Shirt



hearX

Total Wave VI
N=11,979

TESTMYBRAIN

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Add CAPS
Add Health Cognitive Assesment, Physical, and Sensory Function

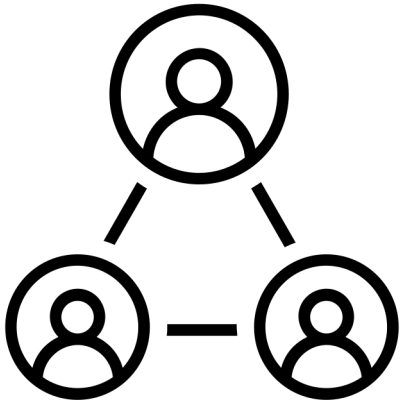
Planning for Audiology Research in Add Health

- Contracts in place for hearX
- Audiology consultants were key
  - Protocol development, staff training, and implementation
  - Data QC program development and implementation to detect implausible audiometric results
- Special thank you to Nick Reed and Clarice Myers for serving as the Add Health Wave VI Audiology consultants

Source: OpenAI. *ChatGPT*, version GPT-5, OpenAI, 2025, https://chat.openai.com/

Participant Eligibility for Hearing Assessment

- Participants were eligible to participate if they met the following criteria:
  - ✓Sample 2 interview completed in-person
  - ✓No current ear infection
  - ✓ No current ear pain
  - ✓No use of hearing aid(s)
  - ✓ No use of cochlear implant(s)



- hearTest via a portable Android-based audiometer (hearX®, USA Inc., Boston, MA)
- hearTest results produced a Pure Tone Average (PTA) for each ear
- Only works with Android device supplied directly from hearX
  - limited options for adding other programs

Source: hearX® – hearTest product page
https://hearxgroup.com/products/heartest

Audio Testing Range in Add Health

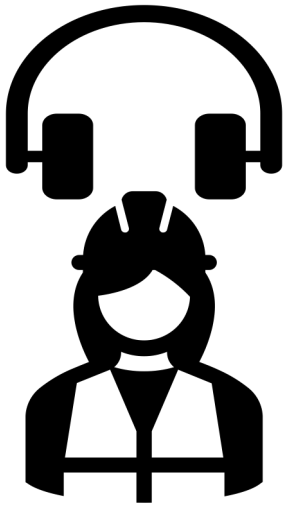
- Full frequency range of 125 – 8,000 Hz available. The following frequencies were used in our study
  - 500 Hz
  - 1000 Hz
  - 2000 Hz
  - 4000 Hz
  - 8000 Hz

- Five Saves Time!

Add Health Participant Perspectives

This is neat! How's my hearing?

Why is the interviewer standing behind me?



Should I take my hat off?

What are the sources of noise in my house?

High Response Rates for hearTest Assessment

Group	N	%
Total Participants in Sample 2	2,613	-
Eligible for Hearing Test	2,476	94.8%
Completed	2,439	98.5%

Equipment Considerations

Annual headphone calibration is required

Handles on the hearX® case broke easily

Interviewer Input and Duration Recorded

Issue	Number	Percentage (HearX Eligible, N = 2476)
Administration or Instruction	19	0.77%
Technical Issues	17	0.69%
Interruption	4	0.16%
Fatigue or Low Effort	1	0.04%
Pain or Physical Impairment	3	0.12%

- Duration: 3 mins 30 seconds on average for hearX

Platform Flags are Common in the Field

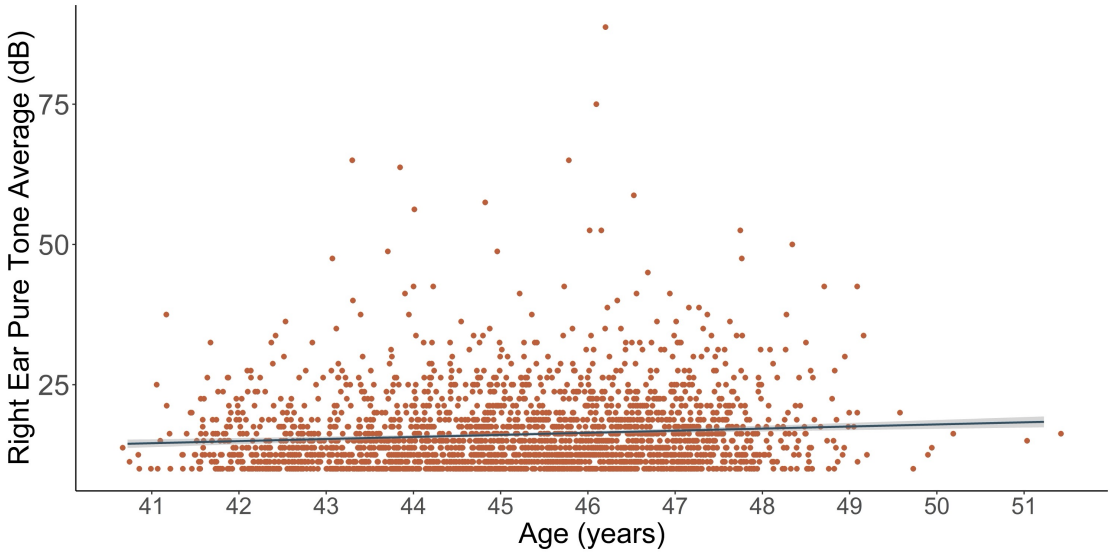
- Noise flags generated from the platform are common at the lowest frequency, but expected in a dynamic setting

Frequency	Left Ear	Right Ear
500 Hz	1180 (48 %)	1217 (50 %)
1000 Hz	505 (21 %)	499 (20 %)
2000 Hz	9 (0.4%)	14 (0.5%)
4000 Hz	12 (0.5%)	15 (0.6%)
8000 Hz	59 (2.4%)	60 (2.4%)

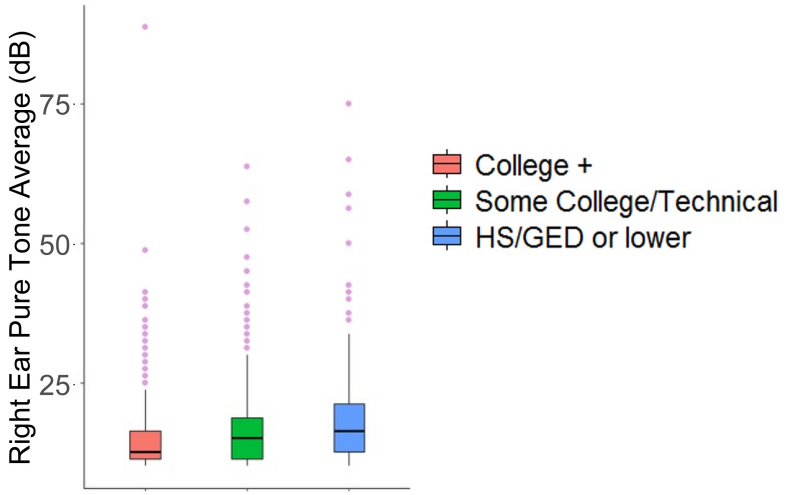
Hearing Scores by Age and Education, Add Health

(N=2,439)

Age



Education



- Correlated positively with self-reported hearing scale (r=0.25, p < 0.0001)

Summary

- hearTest was a well-accepted assessment in Add Health
  - Excellent response rates
  - Few concerns
- Training interviewers to use hearTest was straightforward
  - Minor issues included case breaking and noise in households
- The data fall within the expected ranges and correlations

Acknowledgements

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Thank you and Questions