

LONG-TERM OUTCOMES OF OVER THE COUNTER HEARING AIDS

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Background

- Hearing loss is one of the most prevalent disabilities in older adults
 - 2/3 of Americans 70+ years have hearing loss, hearing aid (HA) adoption rates remain low because of cost (Goman & Lin, 2018; Powers & Rogin, 2019)
 - Untreated hearing loss can adversely affect adults' relationships, jobs, health, increase loneliness and isolation, and decrease quality of life (Ciorba et al, 2012)
- August 2017, Congress passed the Over-the-Counter Hearing Aid (OTC HA) Act
 - Promote affordable, accessible, and quality HA use for underserved adults (Nanof, 2020; Urbanski et al., 2020; FDA, 2021)
 - Currently, the US Food and Drug Administration (FDA) are working to publish regulations (NIDCD, 2020)

Previous Research

- Clinical implications for understanding long-term outcomes of hearing aids for making appropriate recommendations and counseling
- Traditional HAs have stable long-term outcomes (several weeks to several years) (Humes et al., 1996; Surr et al., 1998)
- OTC HAs can be effective short-term (e.g., six weeks or less) (Sacco et al., 2016; Humes et al., 2017)
- Little to no research on long-term outcomes of OTC HAs (three months or more)

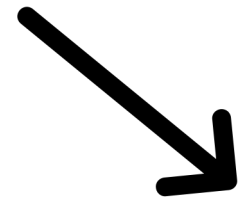
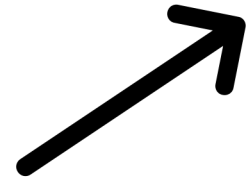


Objectives

- Current study is part of a larger study
- Purpose
 - To explore long-term outcomes of OTC HAs
 - To determine how these outcomes change over time

Hypotheses

1. Long-term outcomes of OTC HAs will improve over time as people learn how to use/troubleshoot HAs better and become more comfortable with maintenance and use
2. Long-term outcomes will worsen over time as issues arise that people cannot easily fix on their own, they lack support/counseling/knowledge of hearing care professionals to help, or they have unrealistic expectations for HAs
3. Long-term outcomes will stabilize over time, as people's experience plateaus, similar to outcomes of traditional HAs



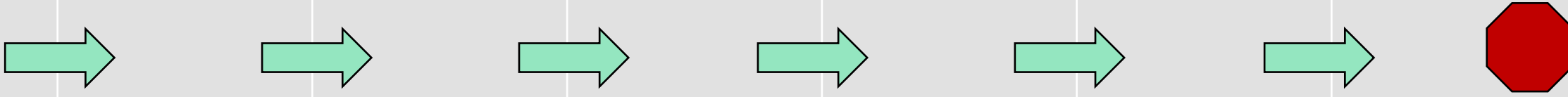
Methods

- Recruited 11 males and 11 females, with at least mild hearing loss (58-84 years old)
- 15 participants completed the study due to COVID-19 pandemic
- 7 lab visits over the course of twelve weeks
 - completed audiology questionnaires, speech in noise testing, and other measures
- Use commercially available HAs with no professional assistance
 - Use provided educational handouts and HA materials
- After HA fitting, outcomes were measured at 1 week, 6 weeks, and 12 weeks



Experimental Design Timeline

VISIT 1	VISIT 2	VISIT 3	VISIT 4	VISIT 5	VISIT 6	VISIT 7
Hearing test for qualification, consent, unaided Real Ear Measures (REM), unaided questionnaires, Connected Speech Test (CST) speech in noise testing, unaided smartphone surveys 3 days return to lab in 1 week	HA kiosk selection, questionnaires, smartphone surveys for 1 week, return to lab in 1 week	Aided REM, questionnaires, HA datalogging (to see how many hours HA are used), return to lab in 4 weeks	Aided REM, aided CST, smartphone surveys for 1 week, return to lab in 1 week	Aided questionnaires, HA datalogging, return to lab in 5 weeks	Aided REM, aided CST, smartphone surveys for 1 final week, return to lab in 1 week	Aided questionnaires, HA datalogging, HA use task, interview and Q&A, complete compensation form



The diagram illustrates the experimental design timeline across seven visits. Green arrows indicate the progression from one visit to the next. A red octagon is positioned at the end of the timeline, likely representing the end of the study or a final data point.

Results: Retrospective Questionnaires

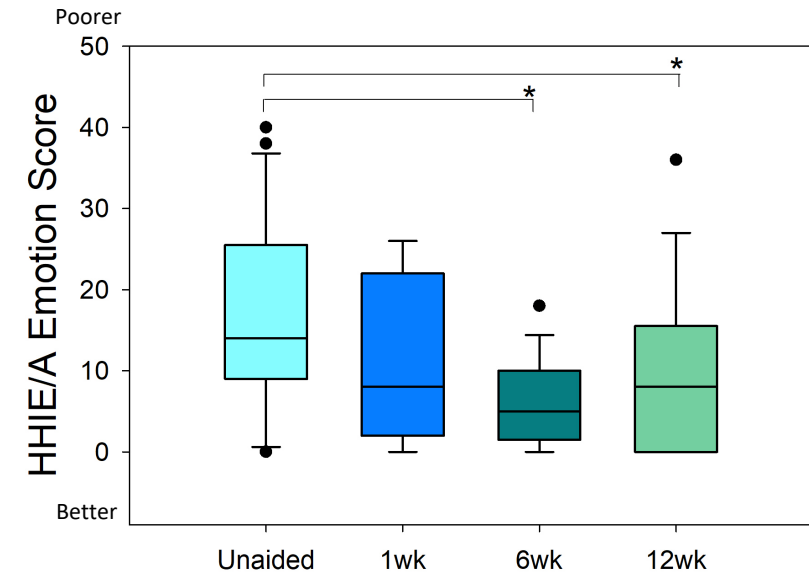
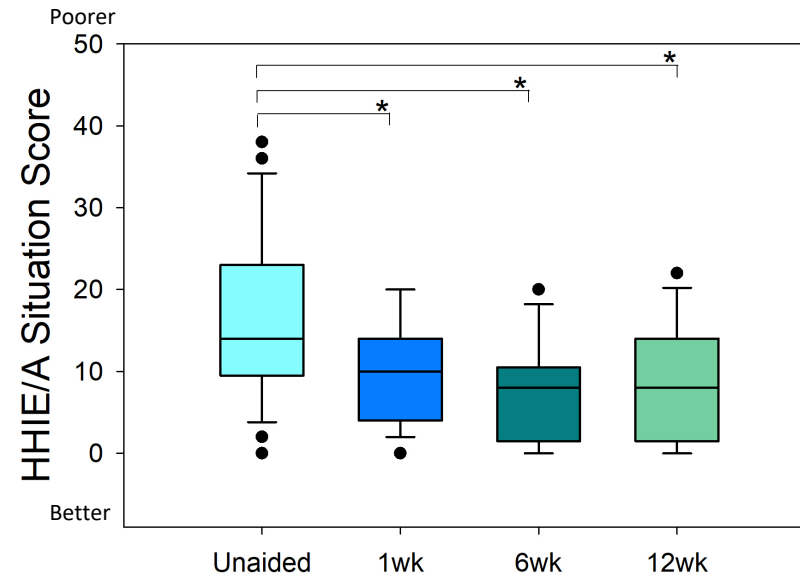
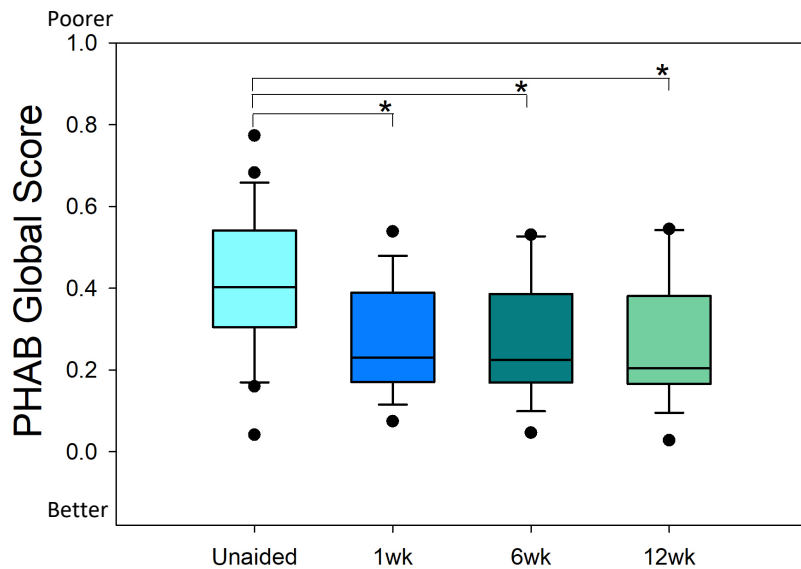
Profile of Hearing Aid Benefit (PHAB)

- Measure ease of communication, background noise, and reverberation

Hearing Handicap Inventory for Elderly/Adults (HHIE/A)

- Measures perceived emotional and situational difficulty from hearing loss

- For the above questionnaires, unaided scores were significantly different from aided scores over time
- No significant differences across aided weeks
- Asterisks (*) mark significance on graphs below



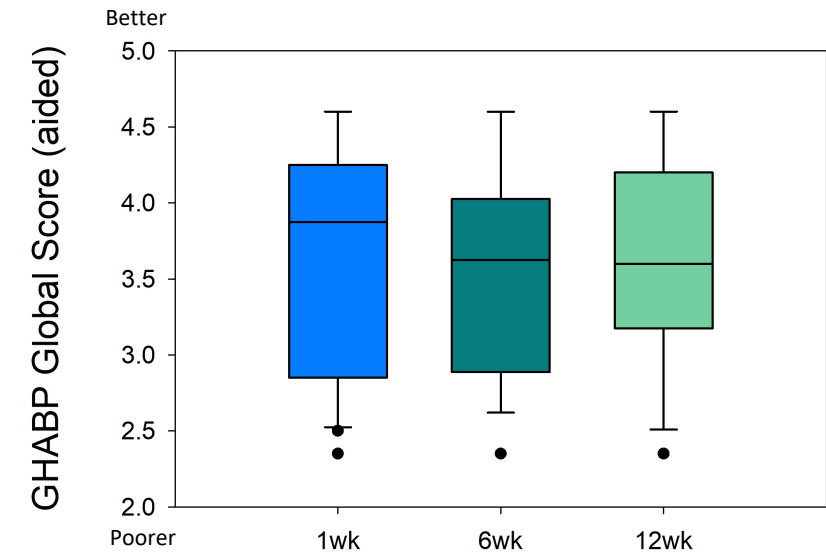
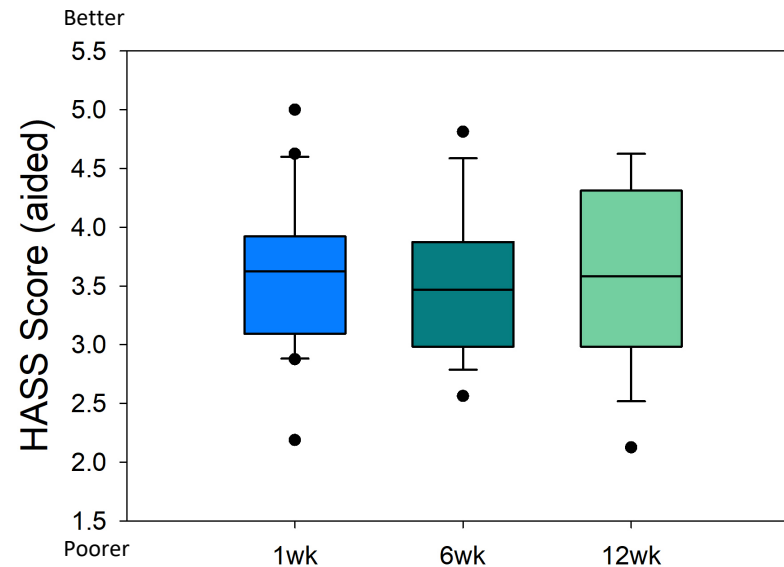
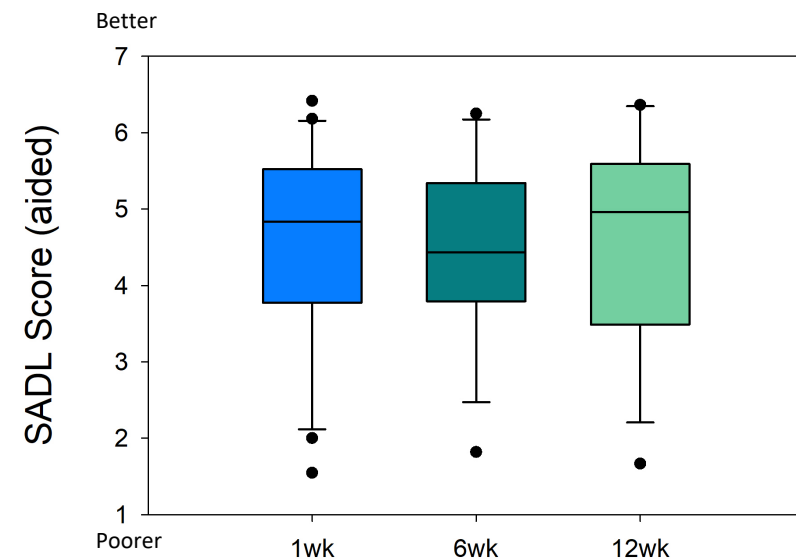
Results: Retrospective Questionnaires

Satisfaction with Amplification in Daily Life (SADL) & Hearing Aid Satisfaction Survey (HASS)

- Measures subjects' satisfaction with the OTC HAs overtime

Glasgow Hearing Aid Benefit Profile (GHABP)

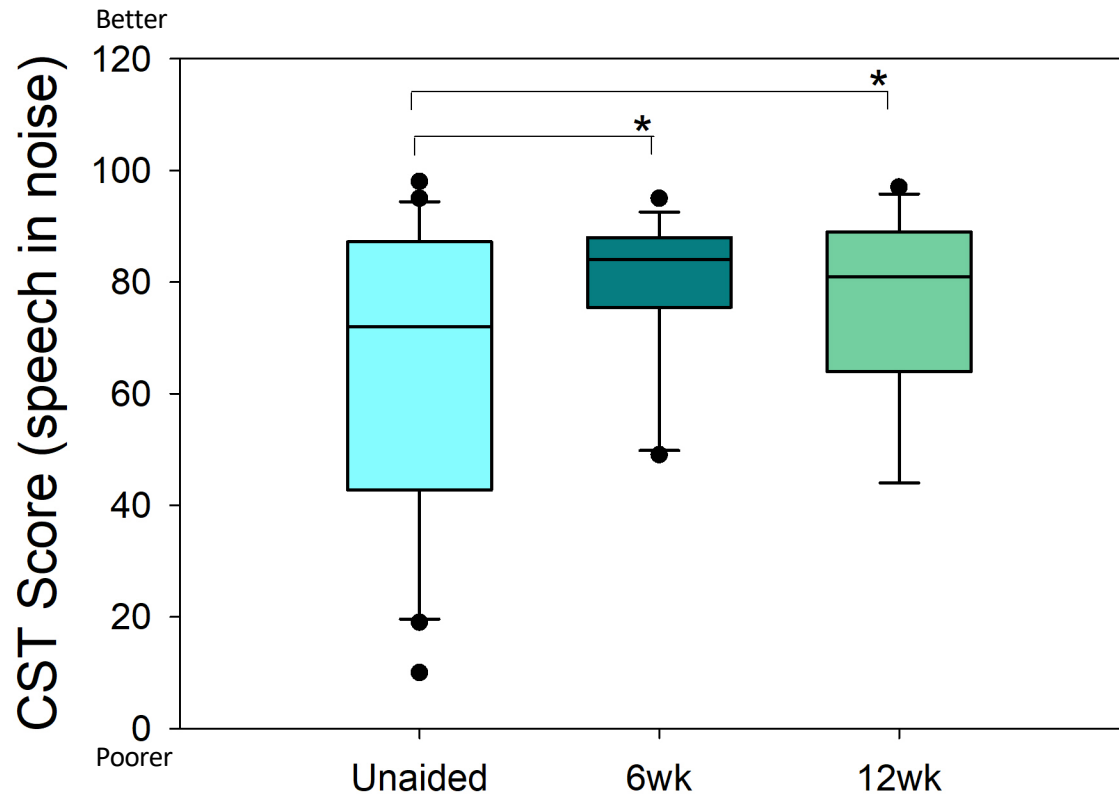
- Measures HA users' listening experience for TV listening, small conversation in quiet, conversation in noise, and group conversation
- For the above questionnaires, no significant differences across aided conditions



Results: Laboratory Testing

Connected Speech Test (CST)

- Measures speech understanding in background noise
- Unaided and aided scores differed significantly
- No significant difference between sixth and twelfth week aided scores
- Asterisks (*) mark significance on graph below



Conclusion

- Using OTC HAs provided improved outcomes compared to not using any HAs at all
- Outcomes were stable across time, up to 3 months
- Limitations: small sample size, a lack of diversity (SES, education level, race)
- Research is needed to further understand extended long-term (years) outcomes of OTC HAs
- Evidence can inform consumers of what to expect when pursuing OTC HAs and can assist health care professionals when recommending OTC HAs as a treatment option to those in need



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