

Older Adults' Preferences for Hearing Aid Processing

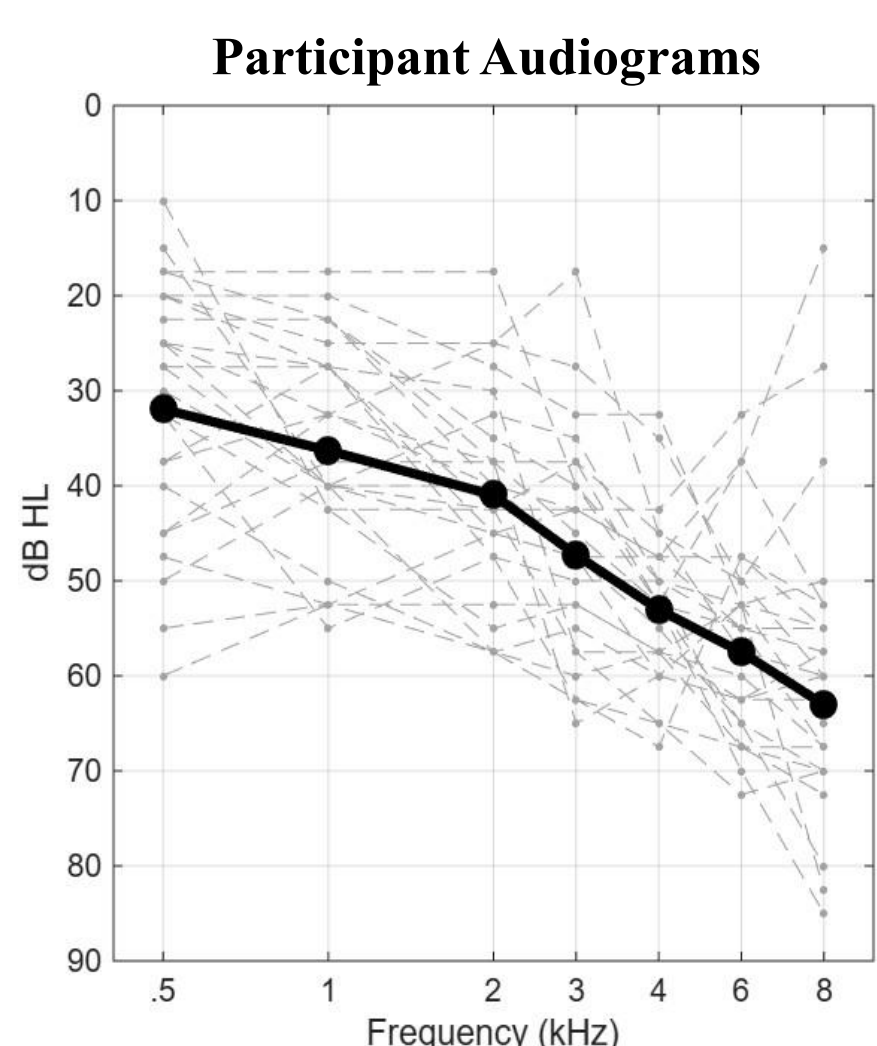
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Introduction

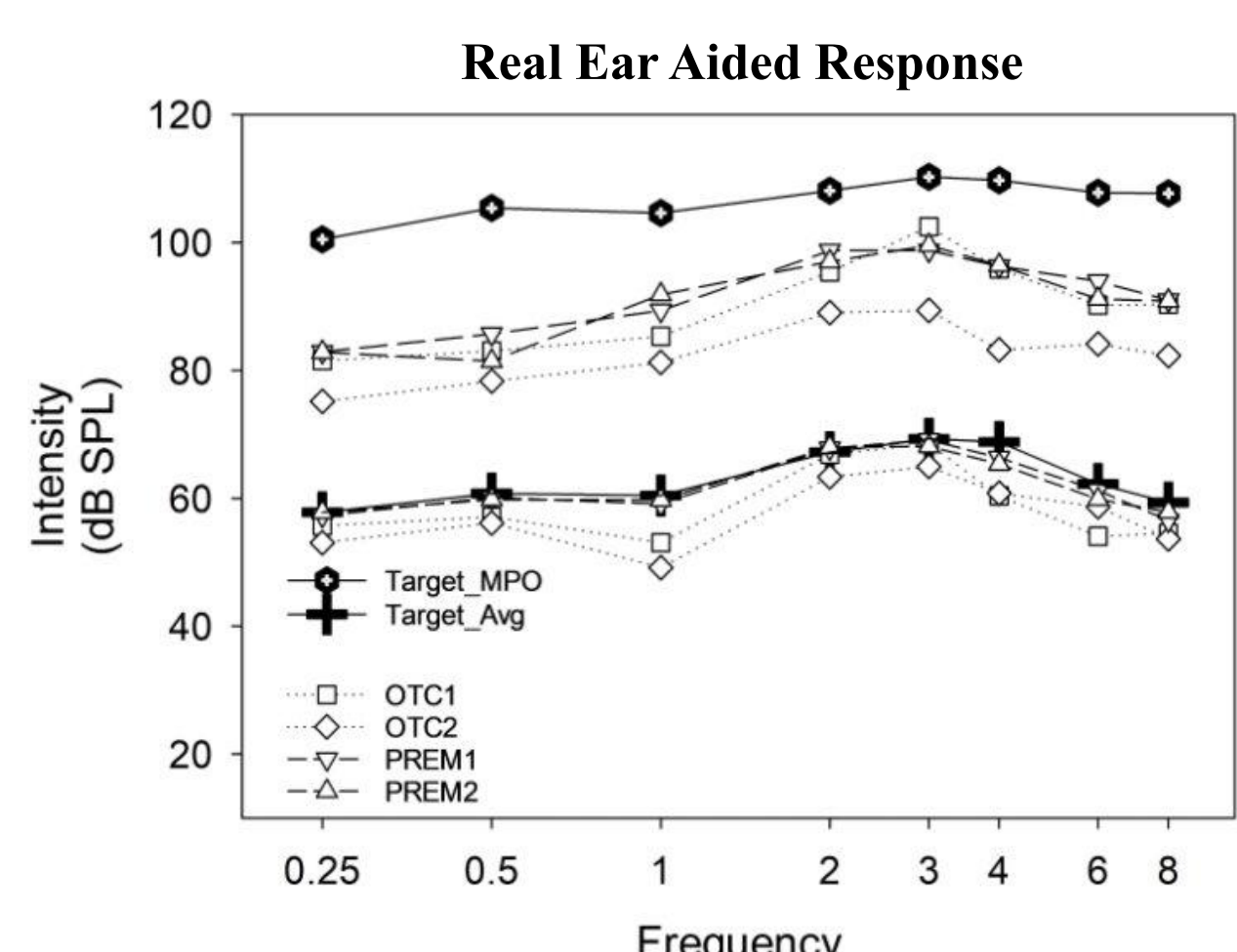
In 2022, over-the-counter (OTC) hearing aids (HAs) were made available to sell directly to consumers. Some research shows that consumers have comparable benefit for speech understanding with OTC devices versus prescription devices (De Sousa et al., 2023). However, there is little research on patient preferences for the two options. The current study sought to determine whether adults with sensorineural hearing loss (SNHL) prefer auditory signals processed by OTCs or by premium-level, prescription HAs. Additionally, recent research suggested that there are specific aspects of sound that influence preference (Bannister et al., 2024). To extend this area of investigation, a secondary aim was to document the characteristics of the presented sounds that these participants deemed important in making their own preference judgements. Finally, we explored how cost and appearance of HAs impacts participants' willingness to purchase.

Methodology



Participants
26 adults with mild to moderate SNHL. (Females = 14, Mean age = 72 years, 11 experienced HA users).

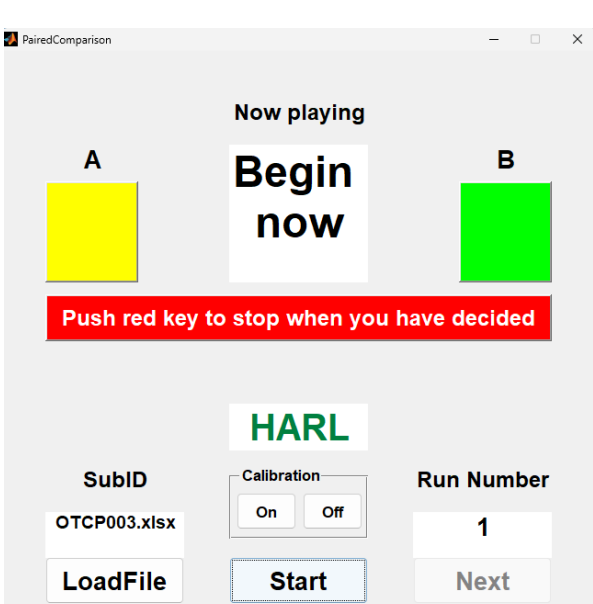
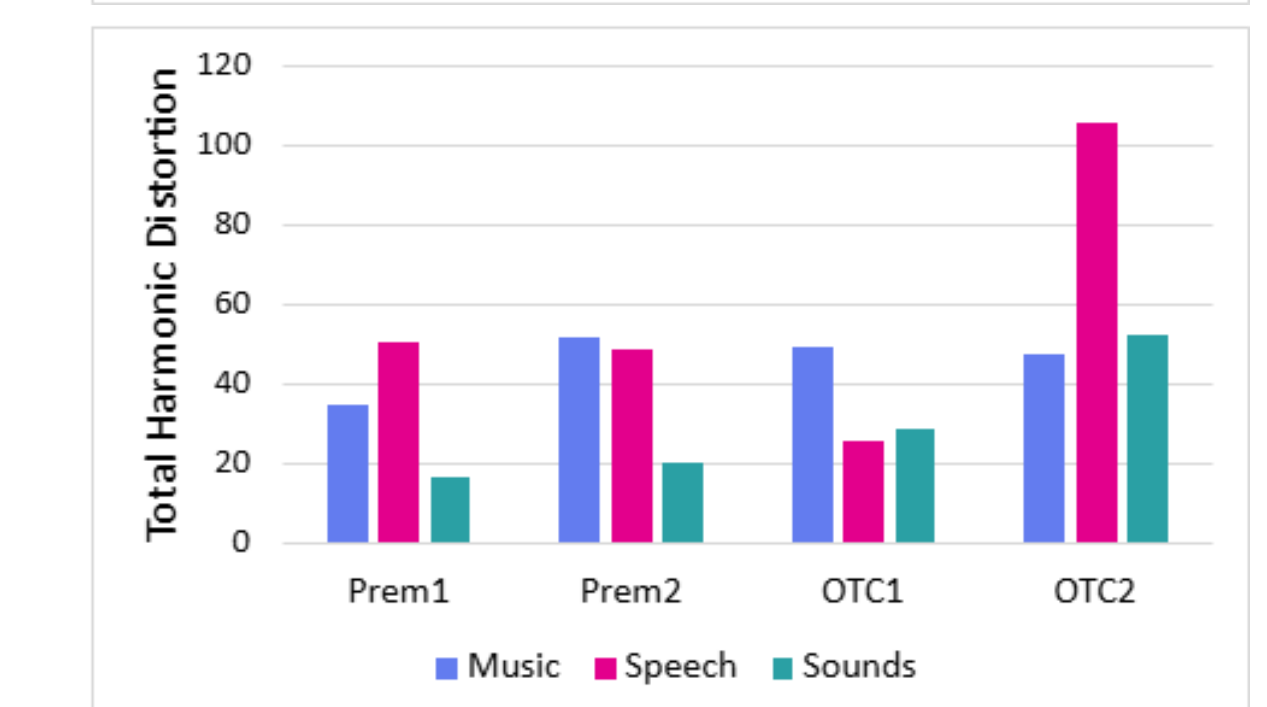
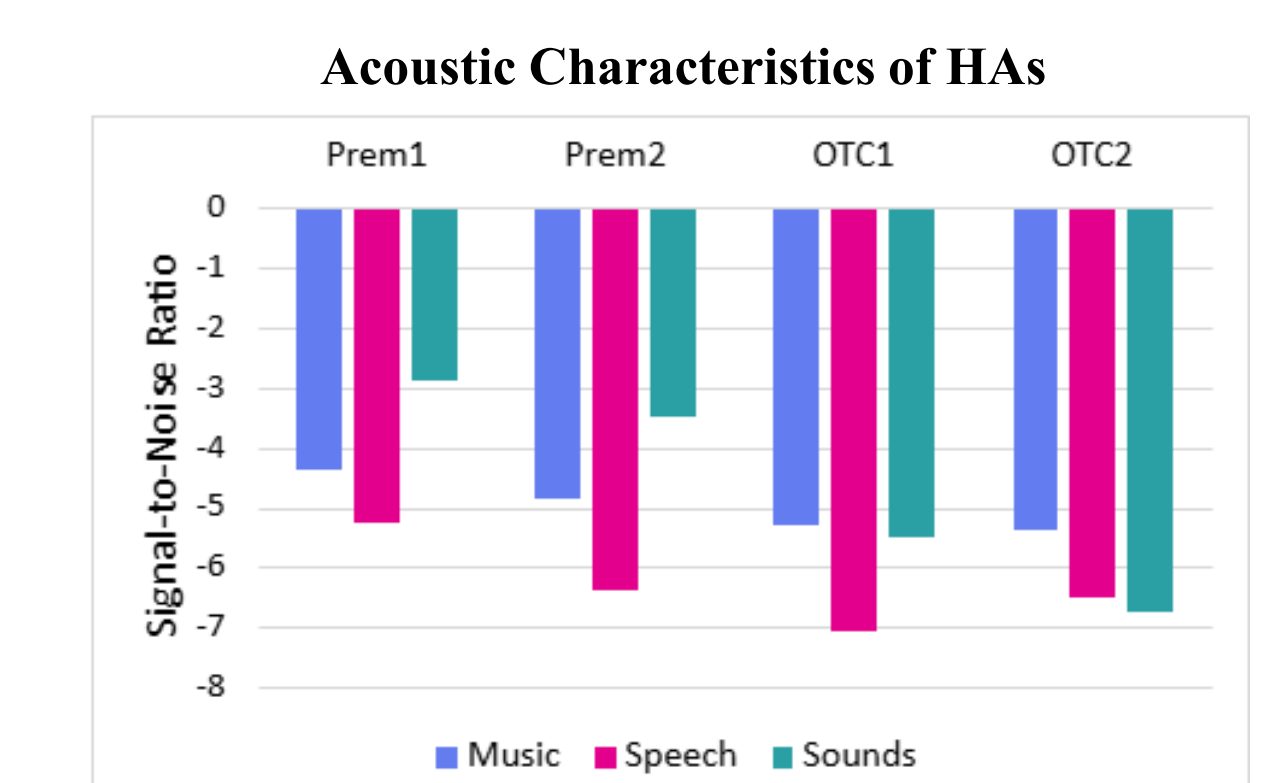
Session 1
Two brands of prescription HAs were programmed to each participants' hearing loss using a validated prescription (NL2) and verified in the real ear. Two brands of self-fitting OTC HAs were programmed and real-ear outputs were documented.



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Between Sessions
The four pairs of programmed HAs were fit on an acoustic manikin (KEMAR) to create recordings of three sound environments: speech in noise, non-speech sounds, and music. Acoustic properties of the HA recordings were assessed and documented.

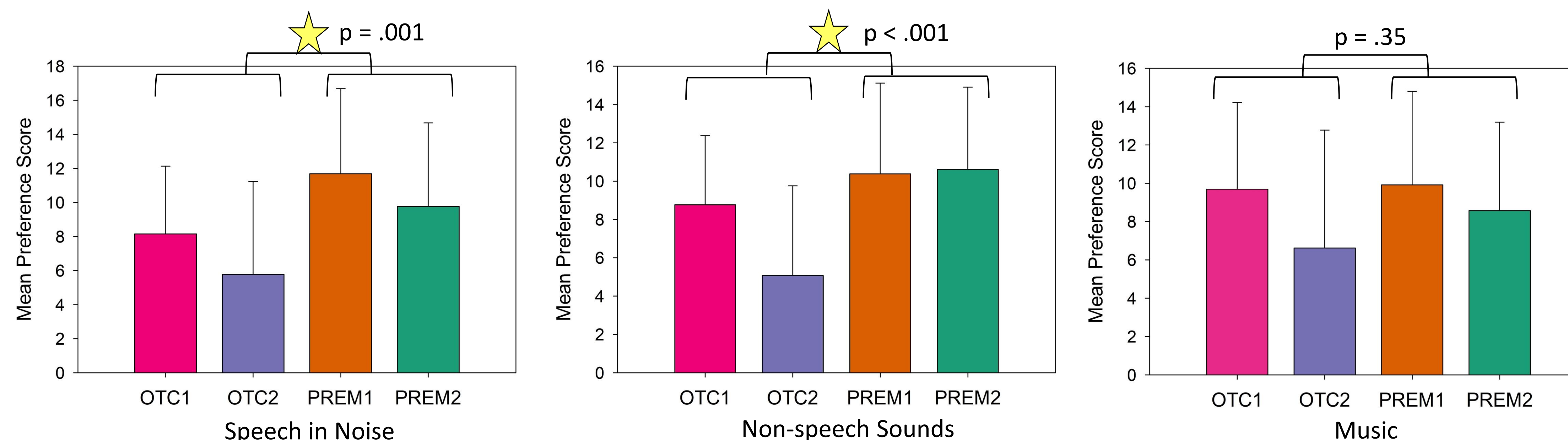


Session 2
Participants made pairwise comparisons of recordings in a round robin tournament and provided feedback on their preferences. They also indicated their device appearance preferences and their purchase likelihood (given cost).

Results

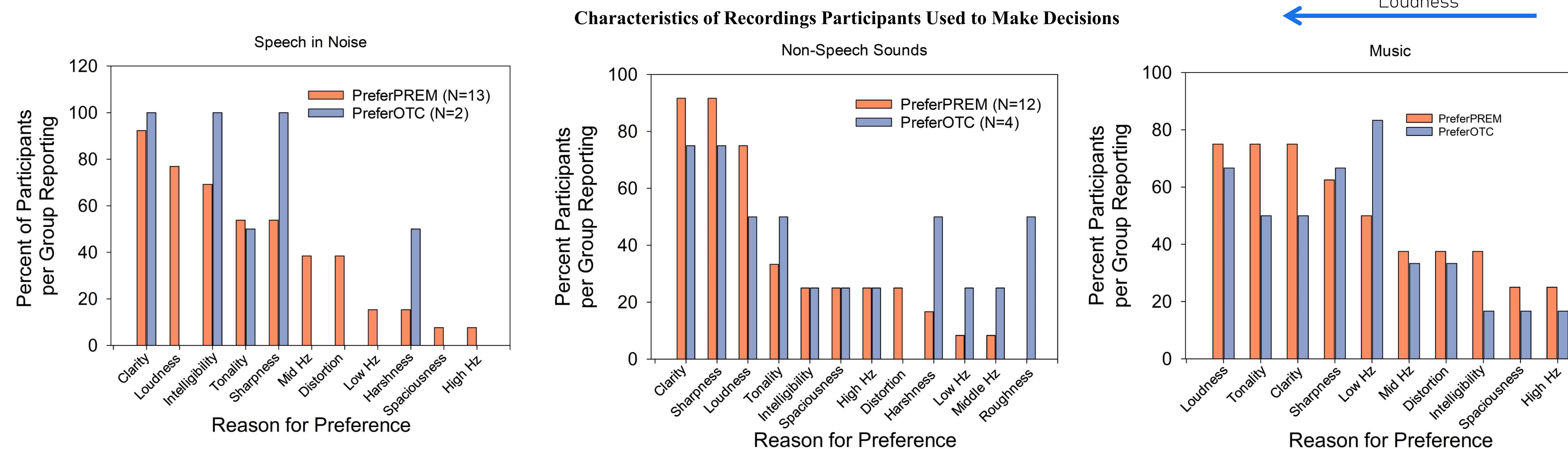
Question 1: Do adults with mild to moderate, sensorineural hearing loss prefer prescription HAs or OTCs?

Preference scores were used to compute each HA's total number of comparison wins, ties, and losses. Values were assigned as follows: Win: 3, Tie: 1, Loss: 0. Scores were computed for each participant, with each device, in each sound environment with a potential score range of 0-18. One-way repeated-measures analyses of variance (ANOVAs) showed a statistically significant preference for prescription HAs for speech in noise and non-speech sounds. For the music stimulus, there was no difference in preference for prescription HAs versus OTCs.



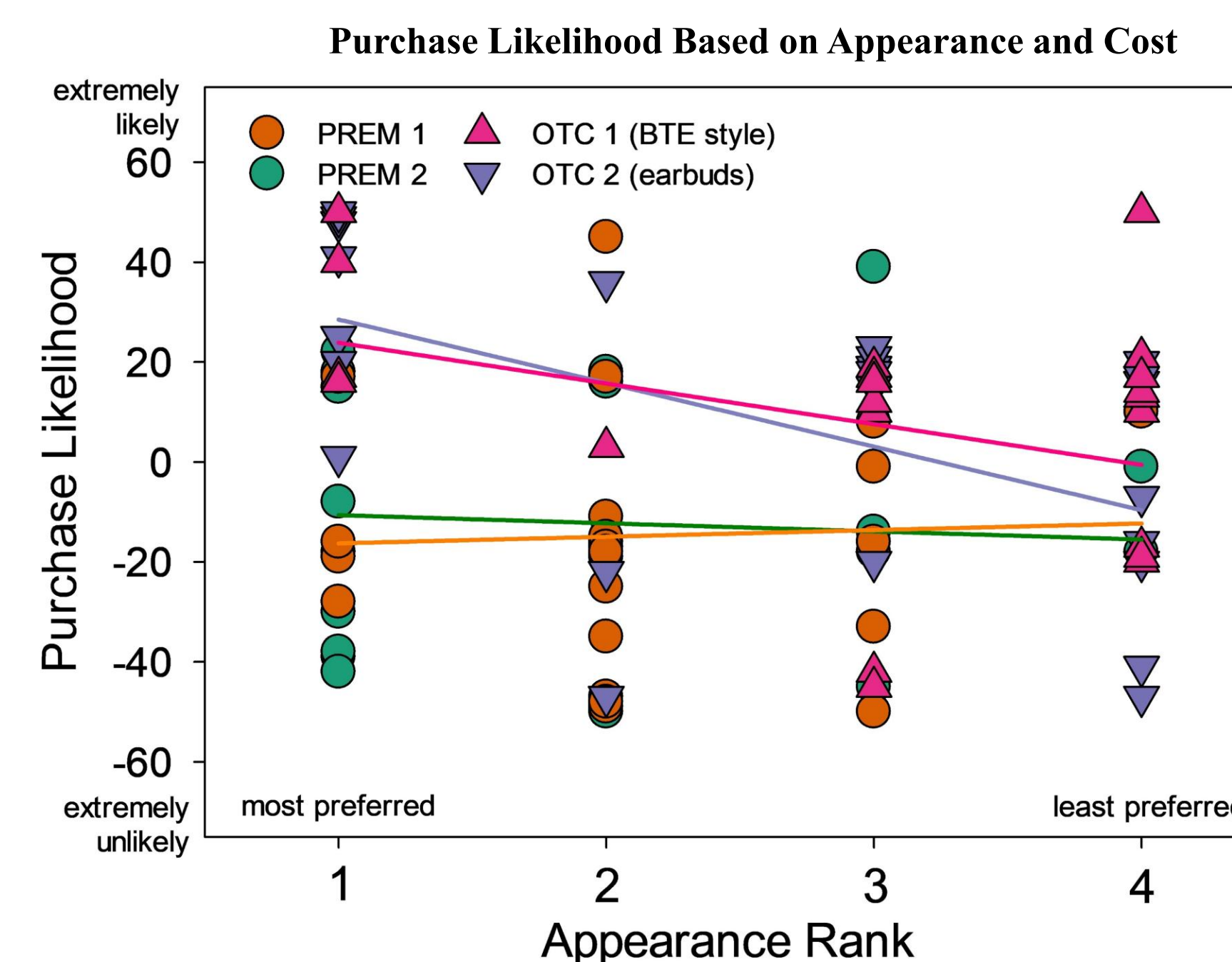
Question 2: What aspects of sound did participants use to make decisions about preferences?

MDS models were used to relate preference ratings to acoustic differences between devices. Participants relied mainly on loudness and clarity for speech-in-noise decisions; loudness, brightness, clarity, and individual factors for non-speech sounds; and clarity plus harmonic richness for music. Self-reports aligned with these patterns: clarity for speech, clarity/sharpness for non-speech, and loudness, tonality, and clarity for music. Visual comparisons of consistent OTC vs PREM preferers revealed subtle differences in the cues they emphasized.



Question 3: How do HA cost and appearance influence participant preferences?

Participants ranked the appearance of the devices. Rankings differed significantly (Friedman $\chi^2(3) = 13.7, p = .003$). Prem2 was most preferred, and OTC1 the least. After disclosing the device costs (\$200-600 for OTCs, \$3,000-4,000 for prescription HAs), participants indicated their purchase likelihood. Participants were most likely to purchase OTC2 and least likely to purchase Prem1 (Friedman $\chi^2(3) = 8.8, p = .03$). Appearance was only modestly related to purchase likelihood for the OTC devices OTC2 $\rho = -.6, p = .002$; OTC1 $\rho = -.3, p = .19$. Cost had a stronger independent effect on this relationship for the premium prescription devices ($\rho = -.06, p > .05$ for both). Participants often favored the look of higher-priced devices but were less willing to purchase them at their listed price.



Q & A

Q1: Did adults with mild to moderate, SNHL prefer prescription HAs or OTCs?

A: Although participants often preferred premium prescription HAs when listening to understand speech and nonspeech environmental sounds (likely because of their more advanced signal-processing features) preferences were not uniform. Many listeners preferred the OTC devices or indicated no strong preference, reflecting substantial individual differences in how people value loudness, clarity, and overall sound character in different environments. Music preference did not differ by HA type, consistent with the idea that simpler processing is often preferred for music listening.

Q2: What aspects of sound did participants use to make decisions about preferences?

A: Listeners relied on different acoustic cues depending on the listening environment. For speech in noise, decisions centered on loudness and clarity to support understanding. For non-speech sounds, preferences reflected a broader set of spectral characteristics and an additional perceptual factor not captured by measured acoustic variables, suggesting listeners were probably responding to something more subjective. For music, there was a trade-off between the clarity offered by the PREM devices, and richer harmonic coloration produced by the OTC devices. Self-reported reasons for preferences included all aspects of sound previously identified by Bannister et al. (2024) as contributing to sound judgments. Subtle differences in which cues were emphasized by those with consistent preferences for PREM or OTC devices suggest that listeners draw on similar acoustic information but prioritize it in different ways that shape their preferences.

Q3: How did HA cost and appearance influence participant preferences?

A: For OTC devices, more attractive appearance was somewhat associated with greater willingness to buy, but for premium devices, cost dominated the decision. Overall, listeners often preferred the look of higher-priced devices but were less inclined to purchase them at their listed price, underscoring the strong independent influence of cost on real-world decision making.

Conclusions

Taken together, these findings show that HA preferences are highly individualized. Listeners weigh acoustic cues, personal listening priorities, appearance, and cost in different ways. Premium devices offer very sophisticated processing, including AI-based sound classification, yet even if the classifier correctly identifies the context and applies appropriate adjustments, the listener may not prefer the resulting sound. These results highlight the need for flexible, individualized counseling that helps people choose devices and hearing aid programming approaches that match what they value most.

Acknowledgements

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References

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