

REAL-WORLD RELEASE TIME PREFERENCE: IS IT REAL?

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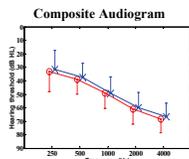
INTRODUCTION

Most research about the effectiveness of hearing aid release times is inconclusive: studies often find no difference between short and long release times. However, a field trial in the Hearing Aid Research Lab (HARL) indicated that hearing aid users do express a clear subjective preference for short or long release times after using both. This study explored whether hearing aid wearers' self-reported performance and benefit were consistent with the release times they preferred in the real world.

METHODS

A. Subjects

- **Participants:** 24
- **Age:** 41-89 (mean=71.8, SD=11.5)
- **Gender:** 7 females and 17 males
- **Hearing aid:** Oticon Adapto BTE
- **Fitting:** Bilateral fitting with short (40 ms) and long (640 ms) release times
- **Field trial:** Four weeks for each release time and self-report measures were given during the 4th week of each trial
- **Subjective preference after completion of both trials:**
 - 15 preferred long release time
 - 9 preferred short release time



B. Self-report measures

- Three standard questionnaires were used in this study:
- The Abbreviated Profile of Hearing Aid Benefit (APHAB)
 - Hearing Aid Performance Questionnaire (HAPQ)
 - Device Oriented Subjective Outcome Scale (DOSO)

| | Number of items | Scoring | Subscales |
|---|--------------------------------------|---|--|
| APHAB (Cox et al., 1995) | 24 | A 1-99% scale corresponds to the amount of trouble a hearing user has | Ease of communication (EC) Reverberation (RV) Background noise (BN) Aversiveness (AV) |
| HAPQ (Gatehouse et al., 2006) | 26 | A 10-point scale in which a higher score indicates better performance | Speech variations Environmental sounds Intense sounds |
| DOSO (Cox et al., 2009) | 28 (40 for both equivalent forms) | A 7-point scale in which a higher score indicates better performance | Speech cues Listening effort Pleasantness Quietness Convenience Use |

RESULTS

- Three research questions were answered:
- Do self-report measures reveal a difference between short and long release times?
 - Do hearing aid users report better performance in a self-report measure with the release times they preferred in the real world?
 - What item content was indicative of real-world preference?

Data reduction

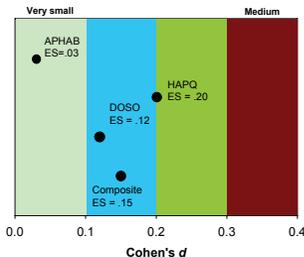
A composite score was calculated by averaging the subscales of *Speech variation, Environmental sound, Intense sound, Speech cues, Listening effort, and Convenience*, according to the result of a principal component analysis.

A. Do self-report measures reveal a difference between short and long release times?

- **Analyses:** GLM within-subject design in SPSS, and Effect size
- **Results:** The overall mean scores for the short and long release times were not significantly different at a .05 significance level in any of the 3 questionnaires or the composite score.

In addition, the difference between short and long release time was examined for each questionnaire by calculating effect size. Effect size analyses have the advantages of focusing on the magnitude of the result and being independent of sample size. A common approach is to compute the difference between means divided by the pooled standard deviation (Cohen, 1988). A positive effect indicates better performance with the long release time.

Effect sizes for comparisons between short and long RTs



The effect size of APHAB reveals a very small effect, while the effect size of the HAPQ, DOSO, and composite score reveal a small effect. These effect sizes are unlikely to have clinical significance in amplification practice.

- ❖ The analyses indicated that there was no clear overall subjective advantage for either short or long release times. There was a very small (negligible) effect suggesting preference for long release time.

B. Do hearing aid users report better performance in a self-report measure with the release times they preferred in the real world?

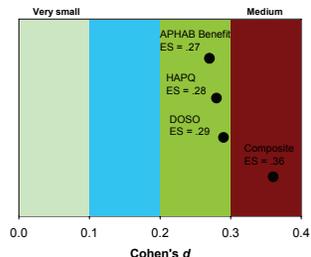
The subscale scores were regrouped and the scores were compared for the preferred and non-preferred release times identified by subjects at the conclusion of the study. Identical analyses were employed. A positive effect indicates better performance with the preferred release time.

Results: The overall mean scores for the preferred release times were significantly higher than those for the non-preferred release times:

APHAB Benefit score ($p = .027$)
DOSO ($p = .004$)
Composite score ($p = .009$).

A trend which indicated a preferred over non-preferred release time was observed in HAPQ ($p = .066$).

Effect sizes for comparisons between preferred and non-preferred RTs



The effect sizes of APHAB, HAPQ, and DOSO reveal a small-to-medium effect, while the effect size of the composite score reveals a medium effect. In terms of probability of superiority (Grissom, 1994), it is estimated that there is about a 60% probability that a hearing aid wearer using his/her preferred release time will have a subjective outcome that is better than a hearing wearer using his/her non-preferred release time.

- ❖ The analysis of questionnaire results obtained during the field trial confirmed the validity of the binary preference choice made by hearing aid wearers at the end of the study. The observed effects are probably material in contributing to the overall success of the amplification system.

C. What item content was indicative of real-world preference?

More detailed analyses focusing on each subscale were carried out on the 3 questionnaires.

- ❖ The results revealed that
 - own voice sounding natural
 - speech comfortable and clear
 - loud sounds managed comfortably

were the main issues related to release time preference regardless of whether short or long processing was chosen.

DISCUSSION

- There was no overall difference in outcome between short and long release times. This finding suggests that the benefit from short or long release time varies across individuals according to numerous influential factors, either internal (e.g., cognitive ability) or external (e.g., environment), or both.
- The results revealed that the subjective scores for the preferred release times were higher than those for the non-preferred release times, indicating that the subjects' final preferences were grounded in valid real world experiences. This finding also supports the conclusion that hearing aid users typically are able to distinguish between short and long release times in daily life.
- Some subscales were more sensitive to different release times. They were: Reverberation, Background noise, Aversiveness, Speech variation, Environmental sound, Speech cues, Pleasantness, and Convenience.
- In this study, a hearing aid wearer seemed find his/her preferred release time superior in a large proportion of questionnaire items, regardless of whether the short or long release time was preferred. Thus, it was not possible to identify any particular focus areas that were more salient for those who selected a given release time.

CONCLUSION

Results in this study indicate that hearing aid wearers do show preferences for particular release times in the real world. Responses to the three standard questionnaires employed in this study were consistent with the subjects' real-world release time preference regardless of whether they chose the short or long release time.

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