Preference Judgments in the Field and in the Laboratory

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ABSTRACT
There is a certain focus in the hearing-device research community on how realistic laboratory tests should be performed. Another question is how we can collect reliable data in the field. The aim of the current study was to investigate ways to collect detailed information in the field and compare these results with results from commonly used laboratory tests. Two HA settings were compared using a double-blind design. Findings from preliminary analyses:

- The diary helped participants find relevant situations for assessment, and valuable data were collected.
- The questionnaire, exploring a number of situations/activities, was useful, especially for participant who used the diary sparingly.
- The data log validated the other evaluations in the field.
- The Paired Comparison (PC) data from the lab showed similarities with field data (diary and questionnaire) with regard to preference for speech intelligibility and comfort.
- The lab tests used in this study could not explain the participants' general preference, reported in an interview after the field trial.

As a complement to developing more realistic lab studies, we should try to refine our field-trial outcome measures.

FIELD TESTS

Interview Overall Preference
An interview was performed after the field test. Main question: “Which program did you prefer?” Rating of confidence in 5 levels.
9 persons preferred setting A, 11 preferred setting B, with varying degree of confidence.

Diary
Participant-specific examples of predefined situations established before the field trial.

Results
Close to equal preference, but A slightly preferred for live focused listening and B for sound monitoring and passive listening.

Discussion
The diary and its instructions, with suggested general “activities” and participant-specific examples, was an attempt to make the field trial more controlled. It generally worked as intended.
- Assessments in a variety of relevant sound environments, performing various activities. Median 27 entries (range 4-80), often described in detail.
- Participants seemed to make judgments without too much bias from previous comparisons in similar situations.

LAB TESTS

Paired Comparisons (PC)
- 7 sound stimuli, duration about 1 min
- 15 s HA pre-conditioning
- Volume control disabled
- Playback loop until decision made
- Binary choice and magnitude of difference determined
- For each rating attribute, a number of sound stimuli were used
- A and B settings randomized before each sound stimulus presentation

Results
Close to equal overall preference. A better for speech intelligibility, B better for comfort.

Discussion
The paired comparison data showed that setting A was preferred more often for speech intelligibility and setting B was preferred more often for comfort. This finding agreed with the picture from the diary and questionnaire, but the PC data did not correlate with the main interview question about overall preference.

Potential explanations:
- Unrealistic presentation. The participants only listened in the lab, whereas own voice issues affect the results in the field.
- Certain easily identifiable details might have dominated the judgments.
- Focus on small loudness differences could play a larger role in the lab than in the field.

MEASURE RELATIONSHIPS
Correlation analyses were performed using Spearman’s rank correlation coefficient between measures. Significant correlations (p<0.05) are marked in the matrix to the right.

Assuming the reported overall preference after the field trial is the “true preference”, a statistically significant correlation with this outcome was found for 6 out of 7 diary categories and for 6 out of 10 questionnaire questions. In contrast, the data from the lab showed poor agreement with the “true preference”.

METHOD

Participants
- 20 experienced HA users, 8 females, 12 males
- Average age 74 years

Hearing aids
- Research RIC hearing aids
- Custom (15 people) or standard (5 people) domes with varying vents/openness
- Directional microphones
- SII-based noise reduction
- Two settings, A and B (average coupler gain shown to the right for three input levels

Speech test HINT
- Adaptive SNR, sentence scoring
- Female talker (0º)
- Noise from three loudspeakers
- Two noise levels: 55 and 70 dB SPL

Similar results, but A significantly better than B for 55 dB SPL noise level.

Discussion
The speech results were very similar and there is no reason to think that this difference will play a large role for the overall preference expressed in the interview.

SUMMARY
Based on the results we will:
- Refine the way we collect data in the field, in particular how “situating situations” or “activities” should be grouped and presented to the participants.
- Revisit the way we make Paired Comparisons in the laboratory.

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