OBJECTIVES

- Comparison of aided and unaided subject behavior with different hearing aid (HA) microphone modes in the free field and in the laboratory (Glaser and Strauss, 1967; Lindemann, 2014; Pleissner, 1975; Schmitz, 1994-1980).
- Examination of ecological validity, behavior patterns and benefit of hearing aids with a mixed method study (Paluch et al., 2017).
- Qualitative data were gathered in two specific situations (road traffic and restaurant) and by three modes (unaided, omni and directional microphone mode) in the free field. Lab evaluations with realistic virtual audio-visual scenes are planned.
- Quantitative data were collected via closed-ended questionnaires in the street situation as well as in the cafeteria situation. Results are shown here.

SUBJECTS

8 adults with normal hearing (NH), years 51-72 (years ♀ 64.3), ♂ 73.3
7 adults with hearing impairment (HI), unaided, years 64-72 (years ♀ 68.3, ♂ 71.3)
7 adults with hearing impairment (HI), aided, years 63-72 (years ♀ 67.7, ♂ 73.3)

Fig. 1: PTA in dB HL, NH
Fig. 2: PTA in dB HL, HI unaided
Fig. 3: PTA in dB HL, HI aided

Fig. 4: First Setting: Road traffic situation in everyday life.
Fig. 5: Second Setting: Cafeteria situation in the advanced lab.

MIXED METHOD SETUP

<table>
<thead>
<tr>
<th>Everyday life (done)</th>
<th>Advanced lab (planned)</th>
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</thead>
<tbody>
<tr>
<td>Sitz. 1 Road Traffic</td>
<td>Sitz. 2 Cafeteria</td>
</tr>
<tr>
<td>Sitz. 2 Cafeteria</td>
<td>Sitz. 1 Road Traffic</td>
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</tbody>
</table>

Normal hearing
hearing impaired, unaided and fitted with hearing aids
experienced hearing aid users

Quantitative data were collected via closed-ended questionnaires in the street situation as well as in the cafeteria situation. Results are shown here.

Fig. 6: Box plots of questionnaire data: street situation (volume). 1 = very quiet, 3 = moderate, 5 = very loud.
Fig. 7: Box plots of questionnaires data: street situation (localization). 1 = very good, 3 = moderate, 5 = very poor.

Fig. 8: Box plots of questionnaire data: cafeteria situation (annoyance). 1 = not at all, 3 = moderate, 5 = highly annoyed.
Fig. 9: Box plots of questionnaire data: cafeteria situation (overall). Same 5-point scale as in Figs. 6-8. Additional scaling for speech intelligibility (1 = very good, 3 = moderate, 5 = very poor) and distraction (1 = not at all, 3 = moderate, 5 = highly distracted).

CONCLUSIONS

Qualitative data

- In everyday life different behavioral patterns could be identified.
- First time users behaved differently relative to normal hearing subjects and experienced hearing aid users. There was a strong bodily relation to localized objects in the environment.
- Experiments in an advanced laboratory are planned with a new annotation scheme (Glaser and Strauss, 1967; Lindemann et al., 2014). The focus is on the influence of torso and head movements. Different behavior patterns can thus be quantified (Meis et al., 2017).

Quantitative data

- The quantitative data support the outcome of the qualitative data. On the one hand, first time users experienced environmental objects louder and were more annoyed by them. On the other hand, they localized them better. This may explain their strong relation to sound sources via body movements.
- Nevertheless, through qualitative investigations a finer distinction was achieved.
- Differences between street and cafeteria environments remained open.

REFERENCES


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