Influence of individual factors and acclimatization on the perception of noise reduction settings

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Influence of individual factors and acclimatization on the perception of noise reduction settings

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INTRODUCTION

- Speech understanding in noise (SN) is important but demanding for hearing-impaired persons
- Amplification and noise reduction (NR) are supposed to help, but hearing aid (HA) users can respond very differently to them
- The relation between preference for and performance with NR algorithms is not clear (e.g. Neher 2014; Serman et al. 2016), nor is the influence of auditory acclimatization and HA experience on these outcomes
- We investigated these aspects in novice and experienced users over time, i.e. initially (t1), after 6 weeks (t2), and after 12 weeks (t3) of HA use

MATERIAL & METHODS

Participants, HA settings and setup

Tab 1: Means and ranges for age, PTA4 and HA experience for three experimental groups.

<table>
<thead>
<tr>
<th>Experimental group</th>
<th>Novices (N = 21, 9)</th>
<th>Experienced users (N = 20, 6)</th>
<th>Controls (N = 16, 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>µ</td>
<td>min</td>
<td>max</td>
<td>µ</td>
</tr>
<tr>
<td>Age [yrs]</td>
<td>70</td>
<td>56</td>
<td>79</td>
</tr>
<tr>
<td>PTA4 [dB HL]</td>
<td>37</td>
<td>27</td>
<td>52</td>
</tr>
<tr>
<td>HA experience [yrs]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Novices and experienced users fitted bilaterally with Signia Pure 7px devices according to NAL-NL1 – 3 dB at 0. Controls continued using their own HAs
- Additional subdivision according to preferred NR strength (assessed at t1): Strong NR (N = 24) vs. weak NR (N = 9) vs. indifferent (N = 8); no differences in terms of age, PTA4 or HA experience among these groups
- KEMAR recordings made with HAs in the experimental setups; stimulus presentation via equalized Sennheiser HD200 headphones

RESULTS

Influence of HA experience and acclimatization (Novices, Experienced users, Controls for Visit t1 to t3)

- Spatially dynamic SN task, performance: Visit × group, F(1,4) = 2.6, p < .05 (Fig. 1).
- Spatially dynamic SN task, preference: Visit × HA condition, F(1,4) = 2.5, p < .05
- LST recall: All p > .05
- PTA4 as covariate: p < .05 for all performance measures

CONCLUSIONS

- Influence of HA acclimatization and experience on performance with HAs
- Novices and (re-fitted) experienced users improved on spatially dynamic SN task, while Controls remained at the initial performance level
- Experienced users seem to be able to compensate for their worse PTA4 compared to novices after 12 weeks of HA use
- Change vs. stability of initial NR preference during HA acclimatization: different treatments might be indicated
- Users with initial preference for strong NR potentially show loudness normalization (slightly increased preference for weak NR (P1) and decreased preference for strong NR (P4)); decrease of NR strength
- Weak NR group show stable preference pattern; keep parametrization

REFERENCES


