Investigating the influence of hearing loss and hearing aid use on emotional states in everyday listening situations using ecological momentary assessment

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Design

Research Questions
1: In what situations, and for what specific emotions, do hearing aids have systematic positive or negative effects?
2: Are there general differences between reported emotional states of people with and without hearing loss, or are these particular listening situations where the groups diverge?

Ambient Hearing aid(s) restore valence/arousal to “normal” levels

No difference between people with and without hearing loss

Results: Valence & arousal

Valence

Baseline positive affect

Discrete emotions

End of day survey: Difference between hearing aid and no hearing aid group

Conclusions

Valence & Arousal

• Hearing loss without amplification is linked to worse reported valence and arousal.
• No significant effect of situation type.
• Significant link to hearing handicap (HHIE/A), Trait emotion (PANAS), Single item hearing ability question

Discrete emotions

• Choice of 16 discrete emotions (half positive/negative).
• When wearing hearing aids the proportion of positive emotions increased by up to 26%.
• This was most evident for traditionally challenging listening situations.

Psychosocial variables

• Hearing loss without amplification is linked to worse daily social connection and pleasant interactions. Also more negative perceived impact of hearing ability on emotions.
• No difference between people with and without hearing loss for trait positive and negative affect.

Other key results

End of day survey: Difference between hearing aid and no hearing aid group

Percentage difference in positive versus negative discrete emotions across all situations with and without hearing aid use.

3 month gap

35 people with hearing loss

Hearing and trait emotion questionnaires

10 days of EMA

First ever hearing aid(s) fitted

Follow-up of hearing aid use

Next: EMA before and after first hearing aid fitting

Smartphone survey questions

Morning survey (Spm)

How are you feeling this morning?

What is your outlook for the day ahead?

Were you wearing your hearing aid(s) yesterday?

Daytime survey (ad instants)

Do you currently do you have hearing loss or hearing aid use today?

How intense was the emotion?

To what extent do you think your ability to hear had an impact on your emotions?

End of day survey (Spm)

How positive or negative have your feelings towards your interactions with others been today?

How socially connected have you felt today?

How pleasant have your interactions with others been today?

Situations

Participants with and without hearing loss, and when wearing and not wearing hearing aids, report similar patterns of listening situations. Hearing aids used less for group conversations than one on one.

Research Questions

1: What effect does first ever hearing aid fitting have on the affective experience of everyday life?
2: Is greater affective benefit associated with continued use of hearing aid(s) after one year?

End of day survey: Difference between hearing aid and no hearing aid group

Participants with and without hearing loss, and when wearing and not wearing hearing aids, report similar patterns of listening situations. Hearing aids used less for group conversations than one on one.

Participant characteristics

Study participants: N=46

<table>
<thead>
<tr>
<th></th>
<th>Normal hearing group</th>
<th>Hearing loss group</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>Age (average years)</td>
<td>63.10</td>
<td>61.10</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>Baseline positive affect</td>
<td>17.6 (3.5)</td>
<td>18.0 (3.8)</td>
</tr>
<tr>
<td>Baseline negative affect</td>
<td>11.6 (4.4)</td>
<td>9.0 (5.3)</td>
</tr>
</tbody>
</table>

Baseline questionnaires:
Social activity level (SAL), Social participation restrictions (SPARQ), Hearing handicap (HHIE/A), Trait emotion (PANAS), Single item hearing ability question

Percentage difference in positive versus negative discrete emotions across all situations with and without hearing aid use.

End of day survey: Difference between hearing aid and no hearing aid group

How do your feelings towards your hearing aids changed during this study?

A lot more positive 7
No change 12
A lot more negative 0

Changing feelings towards hearing aid(s)

When asked how people’s feelings had changed towards their hearing aid(s) after the study, nobody felt better about their hearing aid(s).

Valence

Hearing aid use

Hearing loss

A lot more positive

More negative

More negative

A lot more positive

Radio/music

NH

0.006

No significant difference between people wearing hearing aids and normal hearing group.

Radio/music

69.15
0.03
20

1 way conv

Energy

Music

1 way conv

TV

11 (4.6)

Baseline positive affect

Discrete emotions

End of day survey: Difference between hearing aid and no hearing aid group

When not wearing hearing aids, report similar positive affect to those who wear hearing aid(s).

Hearing loss without amplification is linked to worse reported valence and arousal.

No difference between people with and without hearing loss, or are these particular listening situations where the groups diverge?

When wearing hearing aid(s), compared to not wearing, results in significantly higher social connection, pleasant interactions and perceived impact of hearing ability on emotions. There was no effect on energy.

How have your feelings towards your hearing aids changed during this study?

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