Effect of auditory status on visual processing of emotion cues in adolescents

Andrea Warner-Czyz, Julia Evans, Lyn Turkstra, Delaney Evans, Meredith Scheppale, and Abigail Suen

1The University of Texas at Dallas; 2McMaster University

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Recruitment

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Data collection, entry, and analysis

- *Christine Evans, Hannah Pourchot Neale, Chen Song, Kathryn Wiseman*

Participants and their families
How to communicate
Social issues in children and adolescents with hearing loss

Less socially accepted

Greater difficulty making friends

Fewer relationships and social activities

More social isolation

5 times the rate of social exclusion in adolescents with vs. without hearing loss

Altshuler et al., 1976; Anmyr et al., 2015; Brown et al., 2015; Davis et al., 1986; Huber et al., 2015; Knutson et al., 1997; Meadow & Trybus, 1979; Meserole et al., 2014; Moeller, 2007; Warner-Czyz et al., 2009; Warner-Czyz et al., 2018; Wiefferink et al., 2012.
Possible reasons children and adolescents with hearing loss have more peer problems

Speech and language
- At age level?

Speech perception
- Esp. in noise

Social competence
- Turn-taking, eye contact

Dammeyer et al., 2013; Most et al., 2016; Kouwenberg et al., 2012; Nicholas & Geers, 2003; Punch & Hyde, 2011; Rinaldi et al., 2013; Tobey et al., 2013; Tye-Murray, 2003.
Possible reasons children and adolescents with hearing loss have more peer problems

“Read” speaker’s thoughts and feelings
Signals turn exchange
Conveys interest to a speaker

Social competence

Turn-taking, eye contact

Dammeyer et al., 2013; Most et al., 2016; Kouwenberg et al., 2012; Nicholas & Geers, 2003; Punch & Hyde, 2011; Rinaldi et al., 2013; Tobey et al., 2013; Tye-Murray, 2003.
Visual emotion recognition in adolescents with CIs and hearing peers

Warner-Czyz, Evans, Turkstra, Schepple, Song, & Evans, 2019.
Visual emotion recognition in adolescents with CIs and hearing peers

Response accuracy  
Response time to correct trials

Warner-Czyz, Evans, Turkstra, Scheppele, Song, & Evans, 2019.

TH = Typical hearing; CI = Cochlear implant.
Fixations on areas of interest during a visual emotion recognition task (static)
Participants \( (n = 58) \)

34 adolescents with CI
- Mean chronologic age: 13.3 years \((SD = 2.2 \text{ years})\)
- Mean age at first CI: 2.7 years \((SD = 1.9 \text{ years})\)
- Mean duration of CI use: 10.7 years \((SD = 2.2 \text{ years})\)
- Oral communication
- 11.7% unilateral CI, 11.7% bimodal, 76.6% bilateral CI

24 adolescents with TH
- Mean chronologic age: 13.7 years \((SD = 2.5 \text{ years})\)
## Apparatus

### SMI RED250 mobile eye tracker

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration</td>
<td>5-point</td>
</tr>
<tr>
<td>Sampling rate</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Gaze position accuracy</td>
<td>0.4”</td>
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<tr>
<td>Spatial resolution (rms)</td>
<td>0.03”</td>
</tr>
<tr>
<td>Latency</td>
<td>8 msec</td>
</tr>
</tbody>
</table>
Fixations on areas of interest during gated emotion recognition task (video)

60% of the video
80% of the video
100% of the video

Fixations on areas of interest during gated emotion recognition task (video)

Compared to hearing peers, children and adolescents with CI:

- Recognize emotion in static images with similar accuracy and rate
- Recognize emotion in videos with similar accuracy
- Fixate longer on the mouth versus eyes
  - Significantly different with early cues of angry emotion

For more information, please email warnerczyz@utdallas.edu.