Effect of Speech Recognition Testing on Self-Reported State Anxiety
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Introduction

- Dichotic speech recognition is known to induce increases in state anxiety for young adults with normal hearing. Young adults with normal hearing, however, do not constitute a clinical population.
- Middle-age and older adults with hearing loss are known to have deficits in speech recognition, especially in competitive listening environments (e.g., background noise, dichotic listening, etc.).
- The impact of increased levels of state anxiety due to clinical speech recognition testing on individual comfort level and recognition performance have not been considered in a clinical audiologic population.
- The purpose of the present study was to assess individual anxiety as a function of speech recognition testing using three clinical measures of speech in noise and one clinical measure of dichotic speech recognition.

Methods

SUBJECTS
- Three groups participated:
  - Young adults (18-39 years; n = 24)
  - Middle-age adults (40-59 years; n = 10)
  - Older adults (60-89 years; n = 14)
- Inclusion criteria included:
  - 1) Normal otoscopy and tympanometry; 2) right-handedness; 3) native speakers of English; and 4) normal cognitive function for the older adults.

MATERIALS
- Clinical Measures of Speech Recognition
  - Quick Speech in Noise test (QSIN)
  - Speech Perception in Noise test (SPIN)
  - Words-in-Noise test (WIN)
  - VA Dichotic Digits test (DDT)
- State anxiety was measured by the State-Trait Anxiety Inventory (STAI)

PROCEDURES
- State anxiety was measured pre- and post-speech recognition testing for a total of five measurements;
- The order of testing was counterbalanced across subjects;
- Presentation level via insert earphones: 50 dB HL for young adults and 30 dB HL re. 2000 Hz threshold for middle-age and older adults.

Results

Figure 1. STAI scores presented as boxplots for young adults (grey left panel), middle-age adults (red middle panel), and older adults (green right panel) across response conditions. Each boxplot includes the median (thin black line), mean (thick black line), 25th and 75th percentiles (lower and upper box), 10th and 90th percentiles (whiskers), and outliers (dots).

Table 1. Percentage of subjects answering yes or no to the question “Does anxiety cause you to avoid social situations with background noise, or difficult listening situations?”

<table>
<thead>
<tr>
<th>Condition</th>
<th>Young Adults</th>
<th>Middle-Age Adults</th>
<th>Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>96%</td>
<td>80%</td>
<td>86%</td>
</tr>
<tr>
<td>Post-QSIN</td>
<td>96%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Post-SPIN</td>
<td>96%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Post-WIN</td>
<td>96%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Post-DDT</td>
<td>96%</td>
<td>20%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Conclusions

- Significant increases in anxiety from baseline were found for the middle-age and older adult groups.
- Results suggest that difficult speech recognition tasks impact the state of the patient, often raising anxiety level.
- Awareness of the patient’s state anxiety may be beneficial for patient comfort and counseling purposes before and after diagnostic testing.