Elevated depressive symptoms associate with an emotion-general deficit in speech perception at a cocktail party
Zilong Xie1, W. Todd Maddox2, Bharath Chandrasekaran1

1Department of Communication Sciences & Disorders, 2Department of Psychology, The University of Texas at Austin

BACKGROUND

Information conveyed by speech
- Linguistic information, e.g., lexical and semantic information
- Social and personal information, e.g., the speaker’s emotion status

The perception of speech information in noise

Speech perception deficit in IM & Individuals with elevated depressive symptoms

Goals
- To determine whether the listening-condition specific (i.e. IM) deficit in the perception of neutral speech (linguistic information) observed in HD individuals extends to emotional speech.
- We tested the perception of sentences that represent four basic emotions: anger, fear, sadness, happiness, plus a neutral comparison condition.

Hypotheses
- Deficit for anger, fear, happiness, as well as neutral sentences.
- Deficit may be alleviated (or disappear) for sentences that convey sadness.

METHODS

Participants

TABLE 1: LOW TALKER BABBLE SPECTRAL-Temporal Overlap at the Auditory Periphery, Leading to Degraded Neutral Representation of the Target

<table>
<thead>
<tr>
<th>HD group</th>
<th>LD group</th>
<th>N</th>
<th>Age (mean)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>LD</td>
<td>19</td>
<td>19.53 (1.87)</td>
<td>17.08</td>
<td>21.96</td>
<td>1.89</td>
</tr>
<tr>
<td>Anger</td>
<td>Fear</td>
<td>19</td>
<td>13.79 (0.92)</td>
<td>12.47</td>
<td>15.12</td>
<td>1.37</td>
</tr>
<tr>
<td>HD- M: 18.23</td>
<td>19.23</td>
<td>0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D: mean (SD)</td>
<td>28.05 (7.24)</td>
<td>24.76 (7.98)</td>
<td>10.88 (4.77)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D: range</td>
<td>16-40</td>
<td>16-44</td>
<td>0-21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI- SF: mean (SD)</td>
<td>12.26 (3.98)</td>
<td>8.84 (4.68)</td>
<td>2.16 (1.89)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI- SF: range</td>
<td>7-19</td>
<td>7-21</td>
<td>0-21</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RESULTS

FIGURE 1: LOW TALKER BABBLE SPECTRAL-Temporal Overlap at the Auditory Periphery, Leading to Degraded Neutral Representation of the Target

FIGURE 2: EMOTIONAL MASKING PROFILES FOR DIFFERENT SPEECH PERCEPTION TASKS

DISCUSSION

- The selective deficit in speech perception during IM observed in individuals with elevated depressive symptoms extended from neutral speech to speech spoken that conveys emotive states (anger, fear, happiness, and sadness).
- Inconsistent with our hypothesis, we did not find that this selective deficit alleviated (or disappear) for sentences that convey sadness.
- These results indicate that cognitive biases toward sad information that characterize depression may not confer advantage in tasks that require the resolution of competition between speech targets portraying sadness and background speech.
- The impairments in executive function observed in individuals with depression possibly undermine their selective speech perception deficit during IM situations.
- Our findings showed that emotion in speech modulates speech perception in noise, in which anger sentences were recognized the best.
- Typical social conversations often include emotional speech and transpire in IM environments, hence, this selective deficit could lead to (or exacerbate) social and communicative difficulties in individuals with depression.

REFERENCES

Chandrasekaran, B. et al., 2002; Kessler & Walters, 1998)