2aSC3: Effects of talker experience on perceived clarity and acoustic features of clear versus conversational speech

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Methods (cont’d)

Listeners were 17 young adults (13 male) aged 18 to 31 years. All were native speakers of American English and passed a hearing screening.

Acoustic analyses

Speaking rate was measured and is reported here.

• The original recording file containing all 14 sentences was edited to remove all pauses. The duration of the file was then measured and speaking rate was calculated in words per minute.

Final consonant release was measured but is omitted here for space reasons.

• In each list of 14 sentences, 15 word-final stops were identified. Stops were classified as either strong or weak based on perceptual impressions and examination of the waveform/spectrogram.

Sound insertions were also counted.

• Across the 8 talkers for the 14 sentences in each style, only 3 insertions occurred in clear speech; 2 insertions occurred in conversational speech.

Results and Discussion:

Perceptual testing procedures

Sentences were arranged in two test blocks of 112 items, each containing both clear and conversational sentences produced by 2 male and 2 female talkers.

To avoid effects of sentence intelligibility or familiarity, listeners studied the list of 28 sentences for 5 minutes prior to testing. Clear and conversational items were intermixed on the study list.

Sentences were presented monaurally at 70 dB SPL in quiet via TDT System 3. Listeners rated the clarity of sentences by selecting from these categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Label</th>
<th>Number of talkers</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>No prior experience</td>
<td>14</td>
</tr>
<tr>
<td>Little</td>
<td>Only occasional experience</td>
<td>8</td>
</tr>
<tr>
<td>Some</td>
<td>A relative or friend with hearing loss, but less than one interaction per week</td>
<td>9</td>
</tr>
<tr>
<td>Lots</td>
<td>At least weekly contact with one or more people with hearing loss</td>
<td>10</td>
</tr>
</tbody>
</table>

In experiments assessing the intelligibility of clear and conversational vowels, experience communicating with listeners with hearing loss has been found to have no bearing on the magnitude of the clear speech effect (Ferguson, 2004; under review).

The present study explored whether talker experience effects might emerge with more meaningful speech materials. Perceptual analysis consisted of subjective ratings of speech clarity, which Ferguson and Kerr (2009) found to provide useful, valid perceptual data. Acoustic analyses were also performed.

Materials were CID Everyday Sentences from the Ferguson Clear Speech Database (a different set of 14 sentences in each speaking style). All were scaled to the same average RMS amplitude.

Eight talkers were selected: Four with ‘lots’ of experience and four reporting ‘none’. Each set of four contained 2 males and 2 females. Each also contained two talkers who had produced a large clear speech vowel intelligibility benefit for young normal listeners in Ferguson (2004) and two who had produced no clear speech benefit for vowels. None were included in Ferguson and Kerr (2009).

In a multilevel regression analysis with talkers and listeners as random factors (talkers nested within listeners):

• Significantly higher clarity ratings in clear speech than conversational speech.

• Significantly higher clarity ratings for talkers with “No” experience communicating with listeners with hearing loss than those with “Lots” of experience. This group effect is likely driven by the high conversational scores for talkers F19 and M17.

• The group X style interaction was not significant, suggesting that experience communicating with listeners with hearing loss is unrelated to talkers’ ability to produce clear speech that is noticeably clearer than their conversational speech.

References


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