Symbols and Output Modes for Augmented Conversation in Moderate Dementia

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Funded by U. S. Department of Education, NIDRR #H133G04176
• Outcome measures from 21 randomly ordered, augmented conversations with Lena, an 86-year-old woman with mod-severe Alzheimer’s disease are reported.
• Conversations were held with communication boards containing 5 different symbol sets +/- digitized voice output.
• Symbol sets for 20 food items that Lena enjoyed eating or preparing were created using print alone; 2-D photos alone; 2-D photos+print; 3-D tangible symbols alone; and 3-D tangible symbols+ print.
• Percent nonproductive utterances and total number of utterances are presented for +/-print and +/-voice output.
• Print affected number of utterances produced; the presence of voice output was related to a reduction in verbal conversation.
Subject

Lena
Dx: moderate/severe Alzheimer’s Disease
MMSE: 4
CDR: 3
FLCI: 50
Residence: Locked SNF
Primary care giver: Daughter
Method

1. Determine participants’ preferred topics and select associated vocabulary (Interview caregiver);
2. Randomly assign participant to an AAC device condition;
3. Develop AAC device for each participant;
4. Conduct conversations with participants with and without AAC devices;
5. Analyze 5 minutes/videotaped conversation.
Flexiboard with 2-D symbols
Flexiboard with 3-D symbols
Lena using a communication board (2-D+print condition)
Data Analysis

**Independent variables for analysis:**
- +/- voice output
  (N utterances = 661 with voice; 1268 without voice)
- +/- print
  (N utterances=1290 with print; 637 without print)

**Dependent variables:**
- Number of utterances;
- Nonproductive utterances:
  Unintelligible + Perseveration + Fragments
- Number of productive utterances:
  Total utterances – nonproductive utterances
Conversation conditions
(2 conversations/condition for N=22)

Control (No board)
- 2-D photograph
  - 2 + digitized voice output
  - 2 - voice output
- 2-D photograph + print
  - 2 + digitized voice output
  - 2 - voice output

3-D tangible symbol
- 2 + digitized voice output
- 2 – voice output

3-D tangible symbol + print
- 2 + digitized voice output
- 2 – digitized voice output

Print
- 2 + digitized voice output
- 2 – voice output
Number of utterances/condition

- Print
  - +print: 1400
  - -print: 400

- Voice
  - +voice: 800
  - -voice: 600

Legend:
- Red: Presence
- Yellow: Absence
<table>
<thead>
<tr>
<th></th>
<th>Total number of utterances</th>
<th>Percent nonproductive utterances</th>
<th>Percent productive utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print conditions</td>
<td>1374</td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td>No print conditions</td>
<td>707</td>
<td>22%</td>
<td>78%</td>
</tr>
<tr>
<td>Voice output conditions</td>
<td>770</td>
<td>6%</td>
<td>94%</td>
</tr>
<tr>
<td>No voice output conditions</td>
<td>1311</td>
<td>26%</td>
<td>74%</td>
</tr>
</tbody>
</table>
Conclusions

• For this single subject, voice output is serves as a distracter and is related to a reduction in expressive language.

• Print did produce more utterances than non-print conditions.

• The importance of collecting data from *multiple* conversations is stressed due to significant variations in attention, alertness, and motivation.