Measuring Lexical Retrieval in Older Adults’ Discourse

Lorraine Obler1,2,3,4, JungMoon Hyun1, Avanthi Paplikar1, Eve Higby1,2,3, Mira Goral1,5, and Dalia Cahana-Amity2,3
1. The Graduate Center of the City University of New York, 2. Boston University School of Medicine, 3. VA Boston Healthcare System, 4. Hadassah College, Jerusalem, 5. Lehman College, CUNY

BACKGROUND

- **Confrontation naming**: Commonly used to measure language abilities in aging, but scores on standard tests do not necessarily reflect age-related word-finding problems in natural speech.
- **Word retrieval in discourse**
  - Measuring the quality of retrieval in discourse is not easy; it is often unclear what the target words should be.
  - Lower frequency lexical selection in discourse of older adults (Kavé, Samuel-Enoch, & Adiv, 2009).
  - Less-relevant word choice (Kavé & Nussbaum, 2012).
- **Comparison of the two tasks**: Mixed findings
  - Discourse lexical retrieval is better when not balancing tasks for lexical characteristics (Pashek & Tompkins, 2002).
  - Confrontation naming is better when lexical characteristics are balanced for (Law et al., submitted).

RESEARCH QUESTIONS

- Does performance on confrontation naming tasks predict lexical retrieval in discourse?
- Does lexical retrieval performance differ for nouns and verbs when items are matched for word frequency across the two tasks?

METHODS

- **Participants**
  - 135 Narrators, and 30 age- and education-matched Raters
  - Community-dwelling
  - Narrators: Age: 72.55 years (range 55-84)
    Education: 14.9 years (range 9-17+)
  - BNT & ANT (Boston Naming Test, Kaplan, Goodglass, & Weintraub, 1983; Action Naming Test, Obler & Albert, 1985)
    - Participants were asked to narrate the story and include 31 circled target objects and 15 target actions.
    - Raters rated the appropriateness of the narrators’ responses for each target item on a 7-point Likert scale.
  - To directly compare performance across the two tasks, we selected a subset of 19 nouns and 13 verbs with comparable word frequencies (CELEX).
  - Discourse item appropriateness (conversion to percentage) = Rating of a response for a target item / Highest rating for a target item × 100
  - Analyses: Multiple regression & repeated-measures ANOVA

RESULTS

- **All item analysis**
  After age, education and gender were controlled for, BNT and ANT accuracy predicted appropriateness of lexical responses in discourse ($p < .001$ for nouns, $p < .01$ for verbs).
- **Matched-subset item analysis**
  - After education and gender were controlled for, age predicted noun but not verb retrieval on both tasks.
    - BNT, $p = .005$; nouns-in-discourse, $p = .009$
    - ANT, $p = .071$; verbs-in-discourse, $p = .300$
  - A significant main effect was found for both Task and Word Class as well as a Task x Word Class interaction.
  - Lexical retrieval was poorer in discourse than in confrontation naming, with verbs showing lower accuracy than nouns only in discourse ($p < .001$).

Discourse Appropriateness and Confrontation Naming Accuracy (all items) – Discourse (0-6 points)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse Nouns</td>
<td>135</td>
<td>3.74 – 4.94</td>
<td>4.51</td>
<td>.21</td>
</tr>
<tr>
<td>Discourse Verbs</td>
<td>135</td>
<td>2.96 – 4.41</td>
<td>3.91</td>
<td>.27</td>
</tr>
<tr>
<td>BNT (%)</td>
<td>134</td>
<td>45 - 100</td>
<td>84.41</td>
<td>10.11</td>
</tr>
<tr>
<td>ANT (%)</td>
<td>132</td>
<td>65 - 100</td>
<td>88.17</td>
<td>6.61</td>
</tr>
</tbody>
</table>

Repeated Measures ANOVA (32 subset items)

<table>
<thead>
<tr>
<th></th>
<th>F value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>253.54</td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td>Word Class</td>
<td>91.51</td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td>Task x Word Class</td>
<td>99.27</td>
<td>$p &lt; .001$</td>
</tr>
</tbody>
</table>

Discourse and Confrontation Naming Performance (32 items)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td></td>
</tr>
<tr>
<td>Verbs</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

- **Word-finding in confrontation naming predicts lexical retrieval in discourse.**
- **When word-frequency is controlled for, lexical choice in discourse is less precise than on confrontation naming tasks** (consistent with Law et al., submitted).
- **Discourse permits great variability in lexical selection, leading to less precise word-choice in older adults.**

This project was supported in part by the Clinical Science Research and Development Service, US Department of Veterans Affairs, and by National Institute on Aging Grant SRO1AG014345-12 (Pis: Martin Albert & Loraine K. Obler). We thank our participants and volunteer research assistants, especially Katherine Howitt for the subset item analysis. For further information about Language in the Aging Brain projects, contact loraine.obler@gmail.com or our laboratory website at www.bu.edu/lab.