The Effects of Read-aloud Assistance on Second Language Oral Fluency in Text Summary Speech

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Why Text Summary Speech?

• Text summary speaking task
  – Very common in academic contexts where learning is largely driven by reading (e.g., book chapters, articles)
  – Text comprehension phase + Retelling speech phase

• The importance of fluency
  – To maintain listeners’ attention, a certain level of fluency is necessary in the real-world communication (Lennon, 2000)
  – A crucial role in the comprehensibility of speech (cf. Suzuki & Kormos, 2019)

• Enhancing fluency in text summary speech may support L2 English learners’ content learning.
**L2 Speech Production Mechanism**

**L2 Speech Production Model**

(Kormos, 2006; Segalowitz, 2010)

- **Self-monitoring**
  - Conceptualizing the message
  - Formulating its linguistic form
  - Articulation

**Key Theories**

- Efficiency of processing is reflected in L2 utterance fluency.
- L2 learners rely on both controlled and automatic processing.
- L2 learners’ attentional resources are, by nature, limited.
- Activation of linguistic knowledge can lead to save their attentional resources.

(cf. Skehan, 2014)
How we can enhance fluency?
To Elicit Fluent Speech

**Multiword Sequences (MWS)**

- “recurring sequence patterns comprised of multiple words” including idioms, collocations and lexical bundles, (Yi et al., 2017, p.521)
- Processing advantages for oral fluency (Boers et al., 2006; Wood, 2010)

**Read-aloud assistance (RAA) for Text Summary Speech**

- RAA during text comprehension phase further activates the phonological representations of linguistic items in the text
  - Intonational information helps students to segment speech into a larger unit of meaning/forms (= MWS)
  - RAA tends to facilitate text comprehension due to the dual-modal input (Košak-Babuder et al., 2019)
Research Goal & Context

• Goal: *How activation of phonological representations can enhance utterance fluency?*

• Task: Text summary speaking task

• Condition: without vs. with *read-aloud assistance* (RAA)

• Participants: Japanese learners of English (N = 24)
  – Recruited at a private university in Japan
  – Prof. level: B1-to-C1
Text Summary Speaking Task

Materials

• Text comprehension = Source texts + Audio recordings for RAA
• Source texts from Dreamreader.net (http://dreamreader.net/)
  – Text modification for vocabulary by JACET8000 wordlist
  – Comparability in terms of vocabulary, text length and readability

<table>
<thead>
<tr>
<th></th>
<th>Text A</th>
<th>Text B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>US flag</td>
<td>Red Cross</td>
</tr>
<tr>
<td>Flesh-Kincaid value</td>
<td>71.21</td>
<td>64.79</td>
</tr>
<tr>
<td>TextEvaluator score</td>
<td>380</td>
<td>660</td>
</tr>
<tr>
<td>Length in words</td>
<td>324</td>
<td>303</td>
</tr>
<tr>
<td>Speed of Delivery (wpm)</td>
<td>116.4</td>
<td>119.6</td>
</tr>
</tbody>
</table>

• Audio-recordings for RAA
  – by a L1 Canadian English speaker with 15-year teaching experience in university in Japan
Procedure & Design

**Procedure**

- Text comprehension (3min) → Planning (3min) → Speaking
- Note-taking
- Looking at the text while speaking

**Within-subjects design**

- All the participants experienced two conditions:
- Counterbalance: (a) Order of conditions and (b) texts
MWS and UF Measures

Multiword Sequences

- Lexical overlap indices: Single-word and Bi-, Tri- and Quad-grams
  - The ratio of single-/multi-word *keywords* from the source texts (Text A/B) in relation to COCA
  - Keywords: relatively more frequent in the source texts (vs. COCA)
  - Computed by TAACO (*Crossley et al.*, 2019)

Utterance fluency *(Pause > 250ms)*

- *Articulation rate*—Mean no. of words per minute (excl. pauses)
- *Mid-clause pause ratio*—Mean no. of pauses within clauses
- *Final-clause pause ratio*—Mean no. of pauses between clauses
- *Dysfluency ratio*—Mean no. of dysfluency words

*N.B.* The latter three were standardized by the total no. of words

(cf. *Suzuki & Kormos, 2019*)
Analysis

**Focus: The effects of RAA on MWS**
- A set of Wilcoxon signed-rank tests for lexical overlap indices across conditions

**Focus: The effects of RAA on oral fluency**
- A set of Wilcoxon signed-rank tests for utterance fluency indices across conditions

**Focus: The effects of RAA on the MWS–fluency relationship**
- A set of Spearman’s rank-order correlations between lexical overlap and fluency indices for each condition
Results
Effects of RAA on Lexical Overlaps

**Wilcoxon signed-rank tests**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Single-words</td>
<td>0.115</td>
<td>0.025</td>
<td>0.133</td>
<td>0.041</td>
<td><strong>2.251 0.024 0.355</strong>*</td>
</tr>
<tr>
<td>Bigrams</td>
<td>0.095</td>
<td>0.057</td>
<td>0.091</td>
<td>0.062</td>
<td>0.200 0.841 0.046</td>
</tr>
<tr>
<td>Trigrams</td>
<td>0.034</td>
<td>0.030</td>
<td>0.029</td>
<td>0.033</td>
<td>0.469 0.639 0.097</td>
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<tr>
<td>Quadgrams</td>
<td>0.018</td>
<td>0.021</td>
<td>0.013</td>
<td>0.022</td>
<td>0.719 0.472 0.147</td>
</tr>
</tbody>
</table>

**Findings**

- RAA during text comprehension enhanced lexical overlaps only at the single-word level.
- No influence on the multiword levels
Effects of RAA on Utterance Fluency

Wilcoxon signed-rank tests

<table>
<thead>
<tr>
<th>UF measure</th>
<th>[ - RAA]</th>
<th>[ + RAA]</th>
<th>Wilcoxon-signed rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulation rate</td>
<td>104.95</td>
<td>109.49</td>
<td>1.743</td>
</tr>
<tr>
<td>Final-clause pause ratio</td>
<td>0.108</td>
<td>0.114</td>
<td>0.829</td>
</tr>
<tr>
<td>Mid-clause pause ratio</td>
<td>0.404</td>
<td>0.423</td>
<td>1.057</td>
</tr>
<tr>
<td>Dysfluency ratio</td>
<td>0.193</td>
<td>0.166</td>
<td>1.714</td>
</tr>
</tbody>
</table>

Findings

- Under [+ RAA] condition, L2 speakers tend to produce faster speech with fewer dysfluency phenomena
Relationship between MWS and Fluency

Spearman’s rank-order correlations

<table>
<thead>
<tr>
<th>UF measure</th>
<th>Single-words</th>
<th>Bigrams</th>
<th>Trigrams</th>
<th>Quadgrams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulation rate</td>
<td>[ - RAA] 0.119</td>
<td>-0.301</td>
<td>0.079</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>[ + RAA]</td>
<td></td>
<td></td>
<td>0.250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.438*</td>
<td>0.309</td>
<td>0.599**</td>
</tr>
<tr>
<td>Final-clause pause ratio</td>
<td>-0.206</td>
<td>-0.020</td>
<td>-0.345†</td>
<td>-0.543**</td>
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<tr>
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<td>-0.626**</td>
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<td></td>
<td></td>
<td>-0.412*</td>
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<td></td>
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<td></td>
<td>-0.535**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.599**</td>
</tr>
<tr>
<td>Mid-clause pause ratio</td>
<td>0.098</td>
<td>0.176</td>
<td>-0.065</td>
<td>-0.267</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>-0.143</td>
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<td>-0.587**</td>
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<td>-0.163</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.567**</td>
</tr>
<tr>
<td>Dysfluency ratio</td>
<td>0.048</td>
<td>-0.180</td>
<td>0.150</td>
<td>-0.253</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>-0.174</td>
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<tr>
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<td></td>
<td>-0.603**</td>
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<td></td>
<td>-0.299</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.373†</td>
</tr>
</tbody>
</table>

Findings—Trigrams & Quadgrams

- Under [–RAA] condition, only FCPR was significantly correlated in a supportive direction.
- Under [+RAA] condition, all UF measures were significantly correlated in a supportive direction except for FCPR vs. Quadgram.
Discussion
Effects of RAA on Lexical Overlaps

*Increase in single-word lexical overlaps*
- The activation of phonological representations can facilitate the use of single words presented in the source texts.
- L2 speakers could be more successful in retelling the content of the texts under [+RAA] than [−RAA].

Why not n-grams?

*Source text (Text A):*
  “...the woman who designed the first flag of the United States.”

*Speaker’s text (ID: 1008):*
  “...she is a designer of the first American flag.”
Effects of RAA on Utterance Fluency

• Marginally significant gains in Articulation rate and Dysfluency ratio under the [+RAA] condition

• Speed: Activated phonological representations might have led to efficient phonological/phonetic encoding and faster articulatory gestures

• Dysfluency: Activated relevant linguistic items for text retelling reduced dysfluency phenomena such as self-repetitions, false starts, reformulations, etc.
Interrelationship between MWS and Fluency

- Under [+RAA] condition, most UF measures were *supportively* related to tri- and quad-gram keyword overlaps.

- RAA may facilitate *chunking* during text comprehension (*Ellis, 2003*)
  - The RAA’s *intonational information* can help L2 learners to segment texts into larger units of meaning.
  - They could have established the connections among lexical items within the intonation units (i.e., *chunking*).
  - As a result, they might have stored such multiword sequences as chunks, and they used these chunks.
Conclusions

In text summary speaking, the read-aloud assistance (RAA) during text comprehension can...

• directly facilitate the use of **single-word keywords**; and

• indirectly enhance **speed** and reduce **dysfluency features** in the subsequent speech.

With RAA, the more L2 learners engage with **chunking**, the more fluent their speech is.

**Limitations**

• Relatively small sample size \( (N = 24) \)

• No investigation into the interaction effects between texts and conditions.
Thank you for your attention!

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References


