Have a break: Aging effects on sentence production and structuring in French
Angélina Bourbon, Anne Hermes

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BACKGROUND
• Physiological changes due to aging
• With increasing age:
  o Ribcage cannot expand and contract as well and diaphragm becomes weakened [1];
  o Larger lung volume to initiate speech, longer sentences split into smaller units [2, 3]

MOTIVATION
• Effects of aging on prosodic structuring are relatively sparse and limited to English;
• Cover repair mechanisms and adaptations to the speech system

How does aging affect prosodic structuring in French?

METHOD
Subjects: 27 native French speakers (18 women/9 men)
• 14 ‘Younger’ speakers (23-44y) and 13 ‘Older’ speakers (68-88y)

Material: Read speech of 12 different French sentences (designed on the basis of [4]), differing in length (short vs long) and syntactic complexity (simple vs complex)
→ 12 sentences x 3 repetitions x 27 speakers = 972 tokens

Measurements:
(A) Pause duration in seconds
(B) Articulation rate (syllables/second)
(C) Sentence duration (total utterance time including pauses)

Annotation:
• Manually segmented as visual and audible breaks
• Including inspiratory and physiological phenomena

REFERENCES

RESULTS

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mélanie Dupont a réservé ses vacances. (Mélanie Dupont booked her holidays.)</td>
<td>short-simple</td>
</tr>
<tr>
<td>Mélanie Dupont, qui adore le soleil, a réservé ses vacances. (Mélanie Dupont, who loves the sun, booked her holidays.)</td>
<td>short-complex</td>
</tr>
<tr>
<td>Mélanie Dupont a réservé lors d’un froid jour d’hiver ses vacances en Andalousie. (Mélanie Dupont booked her holidays in Andalusia on a cold winter’s day.)</td>
<td>long-simple</td>
</tr>
<tr>
<td>Mélanie Dupont a dit à sa mère, qui l’a appelée dans la matinée, qu’elle attend avec impatience ses vacances. (Mélanie Dupont told her mother, who called her in the morning, she’s looking forward to her vacation.)</td>
<td>long-complex</td>
</tr>
</tbody>
</table>

(A) Pause duration

(B) Articulation rate

(C) Sentence duration

• Longest pause durations in both groups for long-complex
• Longer pause durations in all conditions for older than younger speakers
• Speakers with the slowest articulation rate produced the longest pauses:
  • Slower articulation rate for older than younger speakers
• The longer and complex a sentence, the longer its duration
• Age-effect even more visible

DISCUSSION AND CONCLUSION
Both length and complexity affect durational patterns in younger and older speakers
Age entailed an additional increase in duration (of e.g. whole sentences, and even pauses)
• Possible explanations:
  1. (a) a mechanism to make sure to reach the targets properly [5]
  2. A slower speech rate for e.g. long-complex sentences can be explained by increased cognitive demands [6]
• Link to breathing will be of main interest in future studies

This study shows that:
1. All age groups produce phrasal breaks at expected syntactic boundaries
2. Older speakers produced much longer pause breaks, slower articulation rates and longer sentence duration than the younger ones

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