Is there a reduction in serial order working memory abilities in healthy aging?

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The preservation of the ability to maintain information over the short-term in healthy aging remains a controversial question. Here we focused on one of the most challenging aspects of verbal working memory, the ability to not only maintain verbal events (like words and nonwords) but to also maintain their serial order of occurrence.

METHOD

IMMEDIATE SERIAL RECALL TASK

<table>
<thead>
<tr>
<th>Lenght 1</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>words</td>
<td>cave</td>
<td>four</td>
<td>bac</td>
<td>rire</td>
</tr>
<tr>
<td>nonwords</td>
<td>nail</td>
<td>dour</td>
<td>bammee</td>
<td>rize</td>
</tr>
<tr>
<td>Lenght 2</td>
<td>words</td>
<td>rêve</td>
<td>rouge</td>
<td>date</td>
</tr>
<tr>
<td>nonwords</td>
<td>zit</td>
<td>vonne</td>
<td>ruck</td>
<td>dabe</td>
</tr>
</tbody>
</table>

ITEM score = percentage of items recalled independently of serial position

ORDER score = percentage of items recalled in correct serial position divided by the total amount of items recalled

RESULTS

![Graph showing item and order scores for young and older adults]

Absence of group effect

$BF_{01} = 3.25$ for words; $BF_{01} = 1.26$ for nonwords

Anecdotal evidence in favor of a group effect

$BF_{10} = 2.9$ for words; $BF_{10} = 0.5$ for nonwords

CONCLUSIONS

- If there is a reduction of verbal WM abilities in healthy aging, it is very small and limited to the maintenance of serial order information.
- These results may explain the previous inconsistent reports regarding the preservation of verbal WM in healthy aging (Collette et al., 2007): difficulties in WM tasks may be dependent on the requirements for serial order storage of the specific WM tasks administered.
- Our findings are also in line with other studies suggesting an age-related reduction in the precision of serial order coding in verbal WM (Maylor et al., 1999)

PARTICIPANTS

- 30 Young adults: ≈ 25.63 years old
- 30 Older adults: ≈ 69.43 years old

Matching variables:

<table>
<thead>
<tr>
<th></th>
<th>Education</th>
<th>Vocabulary (Mill-Hill)</th>
<th>Anxiety (HADS)</th>
<th>Depression (HADS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young</td>
<td>13.83</td>
<td>23.57</td>
<td>6.37</td>
<td>3.5</td>
</tr>
<tr>
<td>Older</td>
<td>12.83</td>
<td>26.47</td>
<td>5.26</td>
<td>4.63</td>
</tr>
<tr>
<td>Bayesian t-test; $BF_{10}$</td>
<td>1.92</td>
<td>0.57</td>
<td>1.6</td>
<td>1.12</td>
</tr>
</tbody>
</table>

REFERENCES


