The effects of aging on verbal short-term memory and word production capacities

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INTRODUCTION

- The effects of aging on verbal short-term memory (STM) are still a matter of debate (e.g., Nilsson et al., 2003).
- Recent models of STM distinguish processes involved in the retention of item information (i.e., the identity of words) and order information (i.e., the order of presentation of items) (see Majerus, 2008, for a review).
- Finally, these models also incorporate relationships between STM and word production capacities, which are often impaired in aging (Burke et al., 1991).

AIMS

- To explore the effects of aging on both item and order STM capacities.
- To explore the effects of aging on naming capacities.
- To explore the relationships between STM and naming in aging.

PARTICIPANTS

3 groups of participants:
- (1) 56-64 years old (N=26) – (2) 65-74 years old (N=23) – (3) 75-84 years old (N=22)

✓ Matched for the Mill Hill and for socio-economic background
✓ Native French speakers
✓ Corrected or normal vision
✓ No dementia (Mattis Scale > 130/144)
✓ neurological, neuropsychological, psychiatric disorder
✓ medication use

TASKS

Item STM

Single nonword delayed repetition task
Auditory presentation of monosyllabic nonwords (example: “dum”)
Matched for phonetic frequency
Filled delay: backward counting, from 95, in steps of 3 (during 8 s)

Word recognition
Monosyllabic words and distractors (differ only by one phoneme)
Matched for imaginability and lexical frequency
Presented in lists with increasing length (2 to 5 items)

STM tasks = auditory presentation  participants’ hearing status was controlled

Order STM

Animal race task
Lists of animals names
Presented in lists with increasing length (3 to 7 items)

Picture naming task
134 black and white drawings (adapted from Bonin et al., 2003)

Word production

Nonword repetition
Word recognition
Order STM
Picture naming

RESULTS

Analyses of variance and covariance

<table>
<thead>
<tr>
<th>Task</th>
<th>ANOVAS</th>
<th>Post-hoc</th>
<th>ANCOVAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonword repetition</td>
<td>F(2,68) = 3.78, p &lt; .05</td>
<td>56-64 &gt; 65-74 &gt; 75-84</td>
<td></td>
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<tr>
<td>Word recognition</td>
<td>F(2,68) = 5.84, p &lt; .01</td>
<td>56-64 &gt; 65-74 &gt; 75-84</td>
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<tr>
<td>Order STM</td>
<td>F(2,68) = 5.33, p &lt; .05</td>
<td>56-64 &gt; 65-74 &gt; 75-84</td>
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<tr>
<td>Picture naming</td>
<td>F(2,68) = 15.25, p &lt; .001</td>
<td>56-64 &gt; 65-74 &gt; 75-84</td>
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Become non significant when the hearing status is controlled for.
Remains significant when the hearing status and the Mattis Scale are controlled for.

Partial correlations between the picture naming and the STM tasks

<table>
<thead>
<tr>
<th>Task</th>
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</tr>
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<tbody>
<tr>
<td>Picture naming</td>
<td>.07</td>
<td>.06</td>
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Non significant.

DISCUSSION

- This study confirms the presence of naming difficulties in participants above 65 years of age, as previously shown by Verhaegen and Poncelet (in press).
- By contrast, in STM, the differences become non significant when the hearing status is controlled for.
- However, the items are presented auditorily in all STM tasks. Therefore, in order to confirm the absence of age-related differences in STM, it would be of interest to assess the participants with visual STM tasks.

References

- Bonin et al., 2003)
- Xilème Colloque International sur le Vieillissement Cognitif - June 2012 - Tours
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