AGE DIFFERENCES IN TRACKING CHARACTERS DURING NARRATIVE COMPREHENSION
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RATIONAL

Narrative comprehension involves building a mental model of the situation suggested by the discourse (called a situation model; Zwaan & Rapp, 2006). Important to understanding the narrative situation are the multiple characters that enter and exit dynamically as the plot unfolds, so that tracking these characters during reading is critical (Gernsbacher et al., 2004). While there is little evidence for age-related decline in situation model processing of discourse (Radvansky & Dijkstra, 2007; Stine-Morrow et al., 2002), little research has explored age differences in the ability to manage multiple characters. Recent work in our lab (Noh & Stine-Morrow, 2007) has shown that older adults are similar to younger adults in their accuracy to track characters in narratives, but that they show greater attentional cost in accessing earlier characters once a new character has been introduced. In this study, we investigated this issue by examining age differences in encoding and maintaining activation for a new character as a function of whether a character has been introduced earlier in the story (i.e., effects of proactive interference in learning new characters).

METHODS

Participants

<table>
<thead>
<tr>
<th></th>
<th>Young</th>
<th>Old</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>Age Range</td>
<td>18-32</td>
<td>60-80</td>
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</table>

Age and WM Span

<table>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>21.37</td>
<td>21.37</td>
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<tr>
<td>WM Span</td>
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</table>

WAIS-R Vocabulary

<table>
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<tbody>
<tr>
<td></td>
<td>47.84</td>
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</tr>
<tr>
<td>Education (yrs)</td>
<td>14.37</td>
<td>14.37</td>
</tr>
</tbody>
</table>

Notes:
* Means reported w/ standard errors in parentheses
† Significant group difference, p<.05

Design and Procedure

Participants read a set of short narratives that mentioned a target character (e.g., ‘Grant’) in a target sentence that was preceded by a paragraph presented in one of three conditions: 1) the target character was described (Same), 2) a character different from the target was introduced (Different), or 3) no character was explicitly mentioned (Neither—a baseline condition) (see Table 1).

Target sentence reading time was measured. The accessibility of the target character was probed by presenting the target character’s name immediately after a filler paragraph that followed the introduction of the target character.

Table 1. Example of Stimulus Material Used

<table>
<thead>
<tr>
<th>Paragraph 1 (Character manipulation)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Same condition</strong> Grant checked the control panels of the spacecraft...</td>
</tr>
<tr>
<td><strong>Different condition</strong> Alexas checked the control panels of the spacecraft...</td>
</tr>
<tr>
<td><strong>Neither condition (baseline)</strong> It is necessary to check the control panels of the spacecraft...</td>
</tr>
</tbody>
</table>

Target Sentence

Grant remained calm while searching the database for information.

POST

He prepared the computer system to initiate communication with the foreign beings. The first message was an effort to express friendly greeting... Test probe: GRANT

RESULTS

The data for the target sentence reading time and probe recognition were analyzed in a 2 (Age: young vs. old) x 3 (Character Condition: Same, Different, Neither) repeated-measures ANOVA, with Age as a between-subject variable and Character Condition as a within-subject variable.

Target Sentence Reading Time (RT)

Target sentence RT (msec/syllable) was used to assess the influence of a prior character on the encoding of a new target character.

A marginally significant Age x Character interaction, F(2, 142)=2.84, p<.07, suggested that while both younger and older adults experienced a similar degree of updating cost in encoding the target character when another character had been previously introduced (Different-Neither), t(69)=2.26, p<.05.

Probe Recognition Latency

The probe recognition latency for correct responses showed a significant Age x Character interaction, F(2, 130)=4.39, p<.02.

Compared to baseline, both age groups showed reduced activation of the target character in the Different condition, but older adults showed a disproportionate effect, t(65)=2.70, p<.01.

Probe Recognition Errors

Older adults tended to have higher error rates than younger adults, but the main effect of Age did not reach significance, F(1, 68)=2.56, p=.11.

The main effect of Character was reliable, F(2, 136)=13.74, p<.001, indicating that readers showed increased error rates in the Different condition, t(69)=2.78, p<.01, but decreased error rates in the Same condition, t(69)=2.53, p<.05, relative to baseline.

Although older adults appeared to make disproportionately more errors in the Different condition relative to baseline, the Age x Character interaction was not significant, F(2, 136)=1.78, p=.18.

CONCLUSIONS

Collectively, these data suggest that both younger and older readers experience an attentional cost in integrating a new character into discourse once another is already in focus.

Contrary to other results in aging and situation model processing, our findings suggest that older readers may have difficulty managing multiple characters, both in accessing an old character when a new character is introduced (Noh & Stine-Morrow, 2007), and as shown in the current study, in maintaining activation of a new character while other characters inhabit the discourse world.

REFERENCES


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