AGE DIFFERENCES IN TRACKING CHARACTERS DURING NARRATIVE COMPREHENSION

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RATIONALE

☙ 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

	Young		Old	
N	36		37	
Age Range	18-32		60-80	
Age †*	21.37	(0.70)	67.53	(1.39)
Verbal WM Span †*	5.56	(0.29)	4.54	(0.27)
WAIS-R Vocabulary †	47.84	(1.81)	51.11	(1.33)
Education (yrs) †*	14.37	(0.41)	15.89	(0.56)

† 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

Paragraph 1 (Character manipulation)

Same condition

Grant checked the control panels of the spacecraft…Grant, in his red and white shiny suit…was equally ready for this next mission of discovery…Suddenly, the red light of a danger warning started to flash on the control panel…This created panic and uncertainty about what would happen.

Different condition

Alexa checked the control panels of the spacecraft…Alexa, in her red and white shiny suit…was equally ready for this next mission of discovery…Suddenly, the red light of a danger warning started to flash on the control panel… This created panic and uncertainty about what would happen.

Neither condition (baseline)

It is necessary to check the control panels of the spacecraft…The team members wore red and white shiny suit…were equally ready for this next mission of discovery…Suddenly, the red light of a danger warning started to flash on the control panel…This created panic and uncertainty about what would happen.

Paragraph 2

Target Sentence

Grant remained calm while searching the database for information.

Filler

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 previously been introduced (Different-Neither), $t<1$, older adults showed greater facilitation when the character had been foregrounded in the Same condition by being rementioned (Same-Neither), $t(71)=2.26$, $p<.05$.
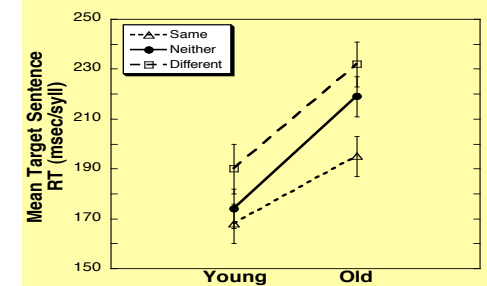
Probe Recognition Latency

☙ The probe recognition latency for correct responses showed a significant Age x Character interaction, $F(2,130)=4.59$, $p<.02$.

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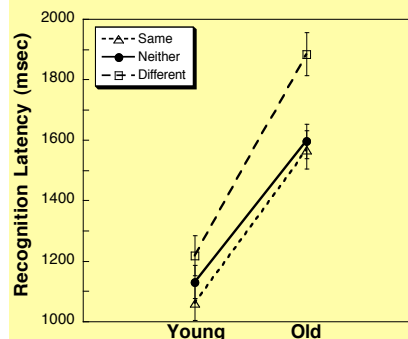

Probe Recognition Errors

☙ 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 disproportionably more errors in the Different condition relative to baseline, the Age by Character interaction was not significant, $F(2,136)=1.78$, $p=.18$.
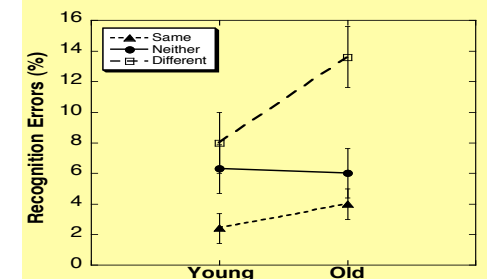
CONCLUSIONS

☙ 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.

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