EXPERIMENT 1

Rationale
The goals of this experiment were:
1) To assess whether proactive interference (PI) affects encoding processes while reading text, and
2) To determine whether this effect varied with age.

Methods
Using the Wickens et al. (1967) paradigm, younger (N=24) and older adults (N=24) (see Table 1) read 6 blocks of sentences (3 topically related and 1 topic shift) (cf. Dempster, 1985; see Table 2).

Results
Recall Performance
The proportion of propositions recalled (inter-rater agreement = 0.89) was analyzed in a 2 (Age) x 4 (Trials) ANOVA.

- Younger adults recalled a higher proportion of propositions than the older adults, F (1, 34) = 8.00, p<.008 at all four trials.
- A 2 (Age) x 3 (Trials) ANOVA indicated that recall decreased across the first three trials, F (2, 20) = 11.14, p<.001. Recall increased with a change in topic on the fourth trial, t(35) = 11.60, p<.001.
- The effect of trial did not vary with age, F=1.

Reading Times
Regression analysis was used to isolate the allocation of reading time to conceptual integration at sentence boundaries (cf. Stine-Morrow, 2001). This variable was analyzed in a 2 (Age) x 3 (Trials) ANOVA to isolate interference effects.

- Time allocation to conceptual integration decreased reliably from Trial 1 to Trial 3, F (3, 44) = 6.67, p<.001 for both younger and older adults.
- The Trial x Age interaction, F (3,44) = 4.98, p = .005 indicated unsystematic differences in this trial effect between younger and older adults.
- The 2 (Age) x 2 (Trial: 3 vs. 4) showed a reliable release from PI, F (1, 46) = 8.46, p = .006. This effect did not vary as a function of Age, F=1.

Conclusion
Both older and younger adults demonstrated similar patterns of PI build-up in text recall. Both older and younger adults also demonstrated a reduction in the time allocated to conceptual integration, a factor that has been related to decreased recall in earlier research (e.g., Stine-Morrow et al., 2001), suggesting that text encoding processes are diluted by proactive interference.

This implies that under conditions of PI, it would take relatively longer to study text for effective recall. This was explicitly tested in Experiment 2. This study also addressed whether the effects of PI on encoding efficiency could be reduced by the coherence created by a mental model.

EXPERIMENT 2

Methods
Younger (N=18) and older adults (N=17) (see Table 3) read 15 12-sentence passages in three conditions (mental model (MM), proactive interference (PI), and proactive interference-shift (PIS)) word-by-word using the moving window method (see Table 4).

Results
Encoding Time
To measure the effects of interference, data from the PI and MM conditions were averaged within each of the first three trials. Encoding time (indexed as time per concept recalled) was analyzed in a 2 (Age) x 2 (Condition; PI/MM, MM) x 3 (Trial) ANOVA.

- Older adults required more time per concept for effective encoding than younger adults, F(1, 33) = 11.95, p<.002.
- Encoding time increased across the first three trials, F(2, 66) = 17.38, p<.001. This increase was similar across age and condition; for interactions involving the trial effect, F(2, 66) < 1.78. From Trial 3 to 4, encoding time showed no change in the PI condition, t(34) = .001, whereas encoding time reliably decreased in the PIS condition, t(33) = 2.025, p<.051.
- A Condition x Age interaction, F(1, 33) = 6.53, p = .015 showed that older adults required relatively less encoding time in the mental model condition than in the interference conditions.

Conclusions
Across two experiments, PI reduced the effectiveness of reading time allocation. There was no evidence that age moderated this effect.

Encoding effectiveness among older readers was differentially enhanced by the availability of the mental model.

References