The processing of individual words is facilitated by sentence context, yet little is known about how such contextual facilitation varies differentially through the adult lifespan as a function of literacy skill. We examined comprehension and contextual facilitation among adults varying in age and literacy skill, who read sample sentences, in which semantic constraint was manipulated, as their eye movements were monitored. Comprehension was generally better for older readers and for high-skill readers. Low-skill readers had differentially poor comprehension as constraint decreased. Reading time (RT) was generally faster with increasing literacy skill, but this depended on age for measures of early lexical processes. First fixation durations became faster with age among those with intact literacy skills, while those with underdeveloped literacy skill showed the reverse pattern. Older readers, regardless of literacy skill, were differentially facilitated by increased semantic constraints in measures of later reading processes (e.g., regression path duration). Collectively, these results suggest that while the negative effects of undeveloped literacy become exacerbated with age, the ability to utilize semantic constraints increases with age and is not moderated by literacy skill.

**Method**

**Participants**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Low Literacy</th>
<th>High Literacy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>M = 26.96, SD = 7.58, N = 80</td>
<td>M = 20.15, SD = 6.90, N = 80</td>
<td>M = 20.15, SD = 6.90, N = 80</td>
</tr>
<tr>
<td>Education Level</td>
<td>M = 11.56, SD = 11.26, N = 80</td>
<td>M = 11.52, SD = 12.41, N = 80</td>
<td>M = 11.52, SD = 12.41, N = 80</td>
</tr>
<tr>
<td>Speed*</td>
<td>M = 0.03, SD = 0.97, N = 80</td>
<td>M = 0.48, SD = 0.88, N = 80</td>
<td>M = 0.48, SD = 0.88, N = 80</td>
</tr>
<tr>
<td>Fluid Ability (Ge)*</td>
<td>M = -0.04, SD = 0.74, N = 80</td>
<td>M = 0.43, SD = 0.84, N = 80</td>
<td>M = 0.43, SD = 0.84, N = 80</td>
</tr>
<tr>
<td>Reading Grade Level</td>
<td>M = 6.97, SD = 1.98, N = 80</td>
<td>M = 11.79, SD = 1.72, N = 80</td>
<td>M = 11.79, SD = 1.72, N = 80</td>
</tr>
</tbody>
</table>

* Estimated as standardized composite measures.

**Materials and Procedure**

Texts were 60 sentences (mean FK grade level = 2.1) in which contextual constraint (i.e., the cloze probability for a sentence-final word) and expectancy of the sentence-final target (based on that context) were manipulated. Target words were controlled for length and word frequency; sentences were controlled for length and grade level. Participants read these sentences in order to answer comprehension questions as their eye movements were monitored.

**Figures**

- **Fig 1.** Comprehension accuracy as a function of cloze probability for varying levels of literacy skill.
- **Fig 2.** The effects of constraint and expectancy on the untransformed indices for the sample as a whole. Reading time measures (in milliseconds) are on the left y-axis, and probabilities are represented on right y-axis. Error bars represent one standard error of the mean. FFD, first fixation duration; GD, gaze duration; RPD, regression path duration; PRO, probability of regressing out; Skip, probability of skipping.
- **Fig 3.** FFD, log transformed, as a function of age for varying levels of literacy skill.
- **Fig 4.** RPD, log transformed, as a function of cloze probability and age.

**Conclusions**

- Literacy may have a selective benefit in counteracting the effects of age-related slowing on the efficiency of early lexical processing, at least in midlife.
- Both younger and older readers, regardless of literacy skill, showed strong sensitivity to contextual constraints, as measured in all indices of processing. This effect increased with age specifically for regression path duration, suggesting that older adults differentially rely on semantic constraint to support text integration processes.
- Collectively, these results suggest that while literacy experience over the lifespan may differentially facilitate word recognition processes, the increased reliance on contextual constraints with age may be linked to aspects of cognitive development unrelated to engagement with print.

**REFERENCES**


