



Is a Picture Really Worth a 1000 Words: Age and Format Effects in Recall



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INTRODUCTION

Quite a lot of research has demonstrated the superiority of pictures over printed words for recall from both working memory (e.g., Goolkasian & Foos, 2002) and long-term memory (e.g., Paivio, 1975). Other work has focused on the advantage of spoken words over printed words, a finding referred to as the modality effect (e.g., Greene, 1985). We have recently proposed that both of these sets of findings are due to an attenuation of attention for printed words (Foos & Goolkasian, 2005). Experienced readers pay a bit less attention to printed words than they do to pictures and spoken words and this attenuation results in lower performance for printed words. The present study tests this hypothesis with older adults by using standard and alternating case printed words (e.g., house and HoUsE, respectively) in an attempt to draw attention to printed words and reduce their disadvantage.

It is also well documented that older adults have difficulty in focus switching but not in task switching (e.g., Verhaeghen & Basak, 2005) in addition to an overall reduction in processing resources (e.g., Barrouillet, Bernardin, & Camos, 2004). If this is so, then older adults should perform as well, or nearly as well, as younger adults in our task switching study. With, however, fewer processing resources, any increase in attention to alternating case words should be less for older than for younger adults. The expected improvement in performance with such words should be less for older than for younger adults.

METHOD

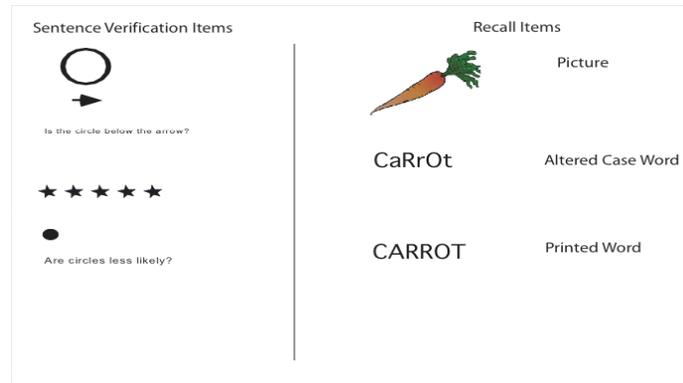
- 26 younger adults (M = 19.76) and 19 older adults (M = 72.71) participated. All reported being in good to excellent health.

- The same common concrete nouns used in prior studies were presented as stimulus items to participants, on a lap top computer, and occurred equally often as pictures, spoken words, printed words, or alternating case printed words.

- After 5 practice trials, on each experimental trial, participants received a stimulus item followed by a verification items followed by another stimulus items, followed by another verification item, until 3 or 6 stimulus items had been presented. Examples of stimulus and verification items are shown in the accompanying figure. After the last stimulus item on a trial, a row of question marks appeared on the screen and the participant attempted to recall all presented stimulus items.

- Each of the 4 item types (pictures, spoken words, printed words, and alternating case words), occurred 3 times at each length (3 and 6 items).

- The computer gathered data on response time and accuracy for the verification task.



RESULTS

Table 1 shows mean performance on pictures, spoken words, printed words, and altered case words for older and younger adults. As expected, the disadvantage of printed words was reduced when such words were printed in alternating case, $F(3, 129) = 54.01, p < .001, \eta^2 = .56$. There was no overall difference between old and young adults, $F(1, 43) = 1.54$. Performance with only 3 items to remember was significantly better than with 6 items, $F(1, 43) = 114.42, p < .001, \eta^2 = .73$. This difference interacted with age, $F(1, 43) = 6.91, p = .01, \eta^2 = .14$. Older and younger adults performed equally well with 3 items but young adults performed better with 6. The interaction between stimulus type and age was significant, $F(3, 129) = 7.08, p < .001, \eta^2 = .14$. For younger adults the gap between pictures and spoken words on the one hand and printed words on the other was .24; this was reduced to .14 when printed words appeared in alternating case. For older adults, the initial gap was .16 and reduced to .10 with alternating case words. As predicted, the reduction was larger for younger adults. Younger adults responded significantly quicker on the verification task, $F(1, 43) = 59.06, p < .001, \eta^2 = .58$.

TABLE 1

Mean performance on Pictures/Spoken Words, Printed Words, and Alternating Case Words for Older and Younger Adults

Age Group	Stimulus Type			
	Pic/Spkn	Words	Alt. Case	Overall
Older	.57	.40	.47	.50
Younger	.64	.41	.50	.55
	.60	.40	.48	

CONCLUSIONS

These results offer strong support for the attenuation of attention model (Foos & Goolkasian, 2005) by showing that when attention is attracted to printed words by alternating case, performance improves and the gap between pictures and spoken words and words appearing in print is greatly reduced.

As predicted by Verhaeghen and Basak (2005) no overall age difference in task switching was found but older adults, with fewer available processing resources benefited less from alternating case stimuli than did younger adults.

REFERENCES

- Barrouillet, P., Bernardin, S., & Camos, V. (2004). Time constraints and resource sharing in adults' working memory spans. *Journal of Experimental Psychology: General, 133*, 83-100.
- Foos, P. W., & Goolkasian, P. (2005). Presentation format effects in working memory: The role of attention. *Memory & Cognition, 33*, 499-513.
- Goolkasian, P., & Foos, P. W. (2002). Presentation format and its effects on working memory. *Memory & Cognition, 30*, 1096-1105.
- Greene, R. L. (1985). Constraints on the long term modality effect. *Journal of Memory & Language, 24*, 526-541.
- Paivio, A. (1975). Perceptual comparisons through the mind's eye. *Memory & Cognition, 3*, 635-647.
- Verhaeghen, P., & Basak, C. (2005). Ageing and switching of the focus of attention in working memory: Results from a modified N-back task. *The Quarterly Journal of Experimental Psychology, 58A*, 134-154.