Introduction

Grapheme – colour Synaesthesia

Fact 1: Grapheme – colour Synaesthesia improves visual associative memory and visual memory in general.

Fact 2: Elderly participants have impaired memory for visual associations, but memory for individual items is preserved relative to control young control subjects.

Predictions

1. Performance accuracy on pair – associative memory is expected to yield a significant group effect:
   Synaesthetes > Controls > Elderly.

2. Performance accuracy on single item memory will show the same pattern as for pair – associates, but is not expected to be significant.

Explanatory question

1. Do Synaesthetes show a memory advantage during learning or retrieval of pair – associates, or both?

Method

Participants
7 young Synaesthetes [M=22 (3.56)]; 7 Elderly [M=67 (7.41)]; 7 young Controls [M=23 (3.4)]

Learning Phase
→ Pair – associative learning
Participants learned 8 pair – associates to 87% criterion

Memory load manipulation

- 5 visually dissimilar pairs
- 3 visually similar pairs

→ Singleton learning
Participants learned 8 single fractal images to 87% criterion

Pair – associative retrieval

Results, Pair - learning

No effect of group (F[2,60] = 5.36, p = .068)
Sign. effect of group (F[2,102] = 13.81, p < .001)

Results, Pair - vs Singleton learning

→ No effect of Learning Type
F[1,102] = 0.1, p = .921
→ Main effect of group
F[2,102] = 9.91, p < .001
→ Sign. interaction
F[2,102] = 9.03, p < .001
Syms > Control, p = .058
Control > Elderly, p = .013
Syms > Elderly, p < .001

Results, Pair-associative retrieval

→ No effect of Learning Type
F[1,102] = 0.1, p = .921
→ Main effect of group
F[2,102] = 9.91, p < .001
→ Sign. interaction
F[2,102] = 9.03, p < .001
Syms > Control, p = .058
Control > Elderly, p = .013
Syms > Elderly, p < .001

Conclusions

Visual associative learning
→ Synaesthesia leads to a significant advantage in associative learning of visually unrelated (dissimilar) information, but shows no advantage on associating visually similar items or single items.

→ By contrast, Age significantly impairs the ability to associate visually unrelated information, but spares associative learning for visually similar items and single items.

Visual associative memory
→ Synaesthetes showed no persistent associative memory advantage at retrieval, an effect that appeared to be influenced by poorer discrimination ability between true and false associations.

References


Acknowledgements
This work was jointly supported by the Medical Research Council and the Brighton and Sussex Medical School.