Collaborative learning in healthy ageing with familiar and unfamiliar partners.

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Collaborative learning in healthy ageing with familiar and unfamiliar partners.

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Introduction

- Learning and memory abilities decline in healthy ageing[1]. Learning collaboratively with a familiar partner may improve older adults' learning performance. [2]
- We tested familiar and unfamiliar pairs to see if familiarity affects performance, or if collaboration alone improves older adults' performance.
- Investigated whether better social abilities underlie better learning outcomes.

Method

- Younger (18-30) and Older (60+) participants (n=48) completed the task with a familiar partner and a stranger.
- Each pair had a Director and Matcher, sitting opposite each other separated by a short barrier, each with 12 abstract tangram shapes.

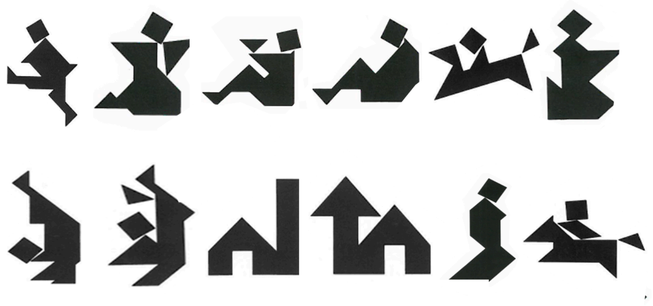


Figure 1 : A selection of tangram shapes described by the Directors to the Matchers.

- The Directors' card order was communicated to the Matcher. Pairs create and learn referential labels for shapes, making interaction more efficient over time.
- Performance measured over 9 trials (3x3 bins).

Figure 2: Two unfamiliar participants complete the task. Figure shows the barrier and tangram boards.

- Also completed Memory, Executive and Social Cognition measures.

Results

- Analysis using linear mixed effect models showed learning effects in younger and older adults.
- Older initially took longer to complete than younger. There was a main effect of age (β = -0.82. SE = 0.11, t = -7.25), trial (β = - 0.63, SE = 0.03, t = 19.34), and a trial by age interaction, with trial having a greater effect on older than younger participants particularly in later trials (β = 0.14, SE = 0.04, t = 2.99 (Figure 3))

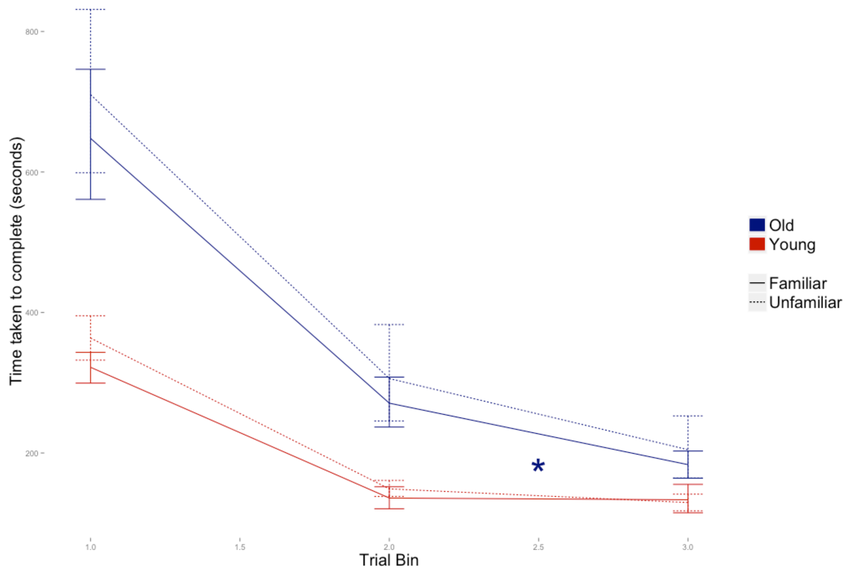


Figure 3: Mean and standard error for number of words and used by Old and Young participants in Director and Matcher Roles with Familiar and Unfamiliar Partners. * indicates significant interaction.

- Over trials, participants used fewer words as they learned their co-created referential labels for each shape, which enabled more efficient communication. There was a main effect of age (Directors (β=- 0.53, SE = 0.19, t = -3.04), Matchers (β=- 0.81, SE = 0.25, t = -3.26)), and Trial (Directors (β= 0.69, SE = 0.05, t = -13.32), Matchers (β=-0.95, SE = 0.07, t =-12.88) (Figure 4))

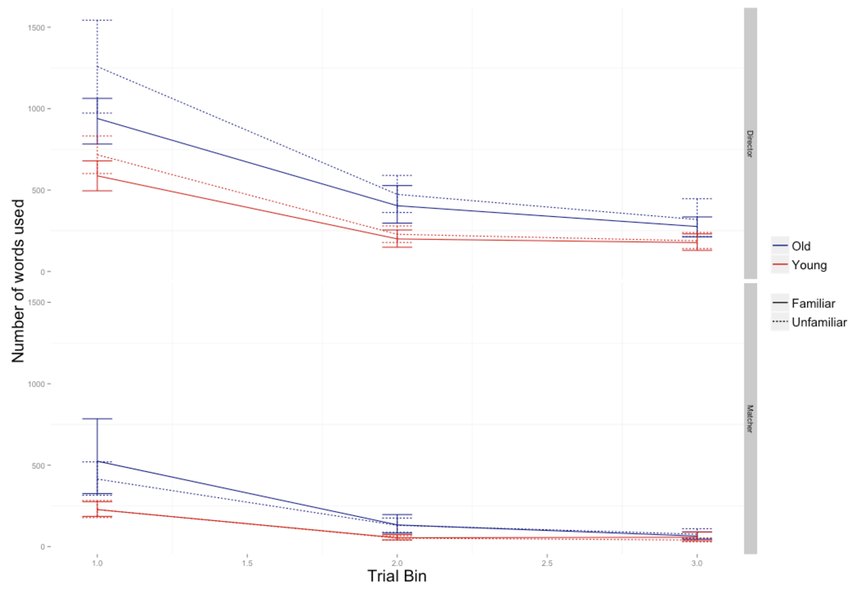
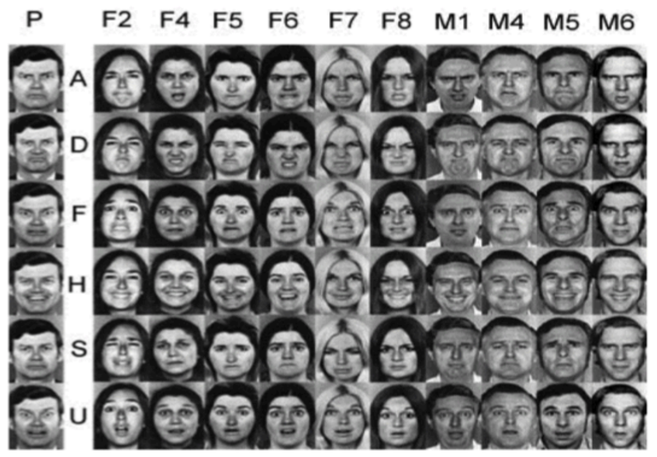


Figure 4 Mean and standard error for number of words used by Old and Young participants in Director and Matcher Roles with Familiar and Unfamiliar Partners

- Social cognition measured using Ekman Faces [3], Reading the Mind in the Eyes [4], Judgment of Preference [5], and Visual Perspective Taking [6].



- Social ability predicted efficient task performance on early trials with unfamiliar (F (1,46) =12.36, p < 0.001, R^2 = 0.21 (Figure 5)) and familiar (F(1,46) = 7.59, p < 0.01, R^2 = 0.14 (Figure 6)) partners.

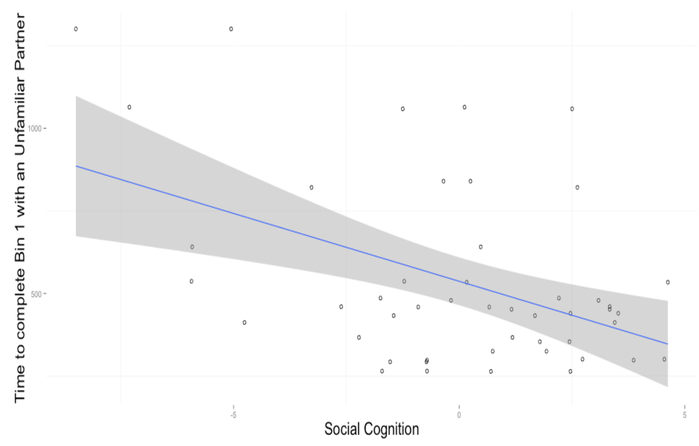


Figure 5: Regression of Bin 1 time to complete with an unfamiliar partner and Social Cognition, with 95% confidence region

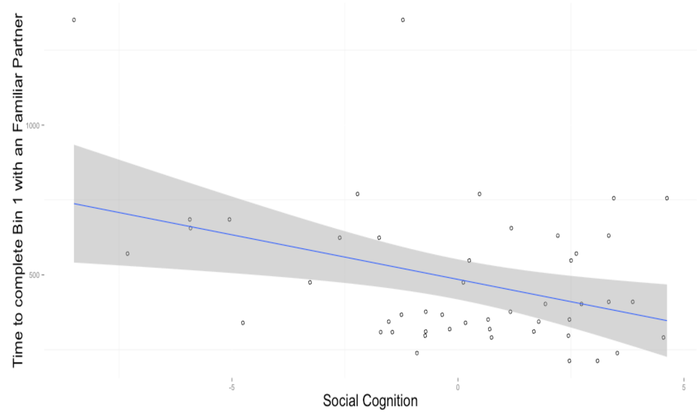


Figure 6: Regression of Bin 1 time to complete with a familiar partner and Social Cognition with 95% confidence region.

Conclusions

- Older adults achieve the same level of performance as younger adults, but only over multiple trials.
- Collaborating with a familiar partner does not improve performance compared with an unfamiliar partner.
- Performance on Social Cognition measures predicts collaborative learning efficiency in early trials.

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Further information

We are now using a computerised version of this paradigm to compare younger and older adults' performance and interaction style with natural and synthetic speech systems.

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