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Peer reviewed version

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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. Learning collaboratively with a familiar partner may improve older adults’ learning performance.
• 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 ordered by the Directors for 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).

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 ($\beta = -0.82, \ SE = 0.11, t = -7.25$), trial ($\beta = 0.63, \ SE = 0.03, t = 19.34$), and a trial by age interaction, with trial having a greater effect on older than younger participants particularly in later trials ($\beta = 0.14, \ SE = 0.04, t = 2.99$ (Figure 3)).

• 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 ($\beta = -0.53, \ SE = 0.19, t = -3.04$), Matchers ($\beta = -0.81, \ SE = 0.25, t = -3.28$)), and Trial (Directors ($\beta = 0.69, \ SE = 0.05, t = -13.32$), Matchers ($\beta = -0.95, \ SE = 0.07, t = -12.88$)) (Figure 4)

Figure 4: 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.


• 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 ($R (1,46) = 7.59, p < 0.01, R^2 = 0.14$ (Figure 6)) partners.

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.

References


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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