Three year old boys treasure pirate memories: Gender and episodic memory in preschoolers

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Introduction

According to Tulving (2005), an important feature of the episodic memory system is mental time travel. This refers to the capacity for both deriving past personal experiences and imagining oneself in future situations. Tulving (2005) also hypothesized that this episodic memory system is not operational before the age of 4. Indeed, Scarf, Gross, Colombo and Hayne (2013) found that 3-year-olds performed at chance level on a task that involved using the memory of an earlier episode in order to prepare for a future act. Of the 4-year-olds, 75% succeeded. Furthermore, Scarf et al.’s (2013) results suggested that 3-year-olds form episodic memories, but do not retain them for longer than 15 minutes. The present study aimed at replicating these findings using Scarf et al.’s method.

Hypothesis

We predicted that more 4-year-olds than 3-year-olds would choose a key in order to open a locked pirate’s chest that they found during an earlier episode of treasure-hunting in a different location (i.e., sandbox).

Materials and methods

Participants

N = 23 three-year-olds (12 boys, 11 girls)
N = 23 four-year-olds (14 boys, 9 girls)

Procedure

Encoding (sandbox)

Delay (test room)

IQ assessment (40 – 60 min.)

Retrieval (test room)

1. Choice test
2. Questions

What is this?
What can we do with it?

Test of main hypothesis

- All children were familiar with the concept of “key”.
- Next to each of the percentages of 3- and 4-year-olds who selected the key immediately in the choice test (1), we looked at the percentages of children who made verbal reference to the pirate’s chest during the follow-up questions (2). In addition, children were allowed to reconsider their choice and we compared the percentages of children who selected the key at any point during the retrieval phase.

Results

Test of main hypothesis

- All children were familiar with the concept of “key”.
- Next to comparing the percentages of 3- and 4-year-olds who selected the key immediately in the choice test (1), we looked at the percentages of children who made verbal reference to the pirate’s chest during the follow-up questions (2). In addition, children were allowed to reconsider their choice and we compared the percentages of children who selected the key at any point during the retrieval phase.

Exploratory analyses

- Next, we explored the role of gender, IQ and knowledge about pirates.

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Conclusions

Contrary to predictions, in general 4-year-olds did not select the key more often than 3-year-olds. However, exploring gender differences revealed that 3-year-old boys outperformed 3-year-old girls. They even outperformed 4-year-old boys in that more 3-year-old boys picked the key at any time during the retrieval phase. These differences were not due in 3-year-old boys having more knowledge about pirates, but performing better on the intelligence test. If anything, the 3-year-old girls had higher total IQ scores.

The present results do not confirm Scarf et al.’s (2013) findings that 4-year-old preschools perform better in this particular episodic memory paradigm. It should be noted that the overall percentage of 4-year-olds selecting the key as their first choice (35%) was much lower than the 75% reported by Scarf et al. (2013). Disproportionate differences may account for this difference. For example, one of the distracter toys (the curly ball or toy spring) may have been particularly attractive, to the disadvantage of selecting the key. A pilot study suggested that the ball and spring were selected equally often (42%) and more frequently than the key (16%). Future studies may employ less attractive distractors to see whether the overall percentage of key-selectors increases.

As for gender differences, there is no obvious reason to assume that boys display better episodic memory than girls in general. The superior performance of the 3-year-old boys may be due to being more interested in pirates than girls. Although there were no differences in knowledge about pirates between 3-year-old girls and boys, it might be that boys simply find pirates more appealing. They may thus have encoded the sandbox episode more strongly or been benefited more from self-generated retrieval cues. If so, episodes that are more in tune with 3-year-old girls’ interests should boost their episodic memory performance. Future studies, by partly selecting larger groups of boys and girls, may shed further light on this.

All in all, the superior performance in the group of 3-year-old boys challenges Scarf et al.’s (2013) conclusion that in general, 3-year-olds more rapidly forget episodic information than 4-year-olds.

Further information

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References
