

Study of early metacognition and its influence on the use of the memorability heuristic

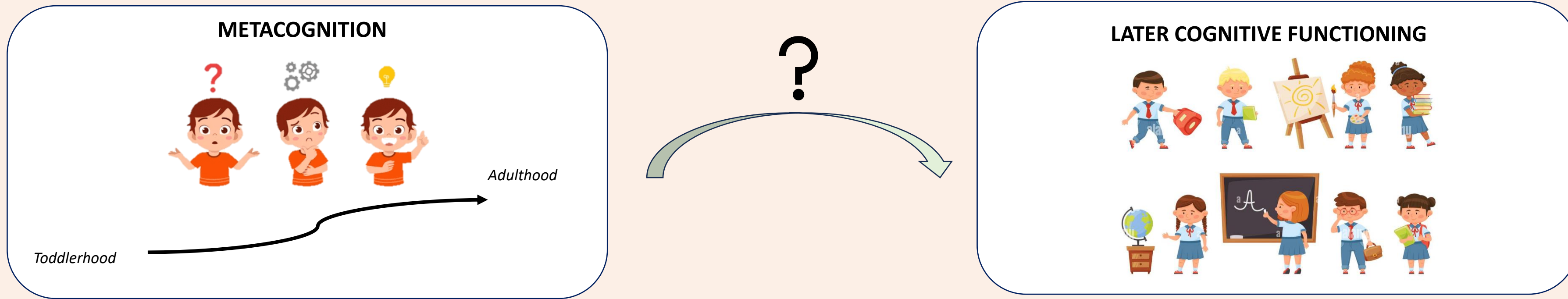
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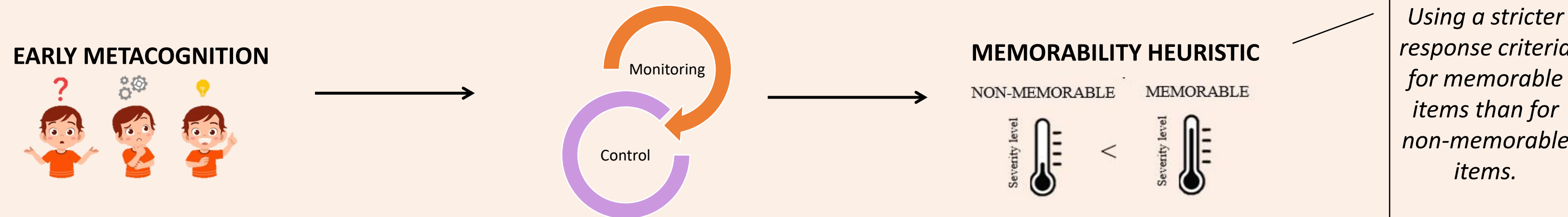
Introduction

Long considered a late-onset skill, **metacognition** has recently been shown to **emerge early** during child development, how these early processes **impact later cognitive functioning** remains, however, **unexplored**.



In school-aged children, being able to correctly assess and regulate one's internal states can exert a **positive influence on participant's performance**, usually through the implementation of **adapted strategies** (Fandakova et al., 2018; Koriat et al., 2009).

BUT how is early metacognition related to these strategic regulatory behaviours?



Authors (Geurten & Willems, 2016) postulate that metacognitive heuristic results from the **automatization of a previously learned association between monitoring and control processes**. That implies that early metacognition is important for the emergence of later strategic behaviours.

Aim

To examine whether and when children's early metacognitive skills start to predict 4.5-year-old children's use of the memorability heuristic.

Participants

69 preschool French-speaking children. Six children dropped out for personal reasons between T0 and T2.

Table 1. Descriptive Analysis of participants

	T0 (n=69)		T1 (n=67)		T2 (n=63)	
	F	M	F	M	F	M
N	32	37	31	36	27	36
Age Mean (months)	32.3	32.3	43.58	43.56	55.63	55.72
S.D.	1.51	1.7	1.69	1.8	1.71	1.6
Min.	29	29	39	39	51	52
Max.	35	35	46	46	58	58

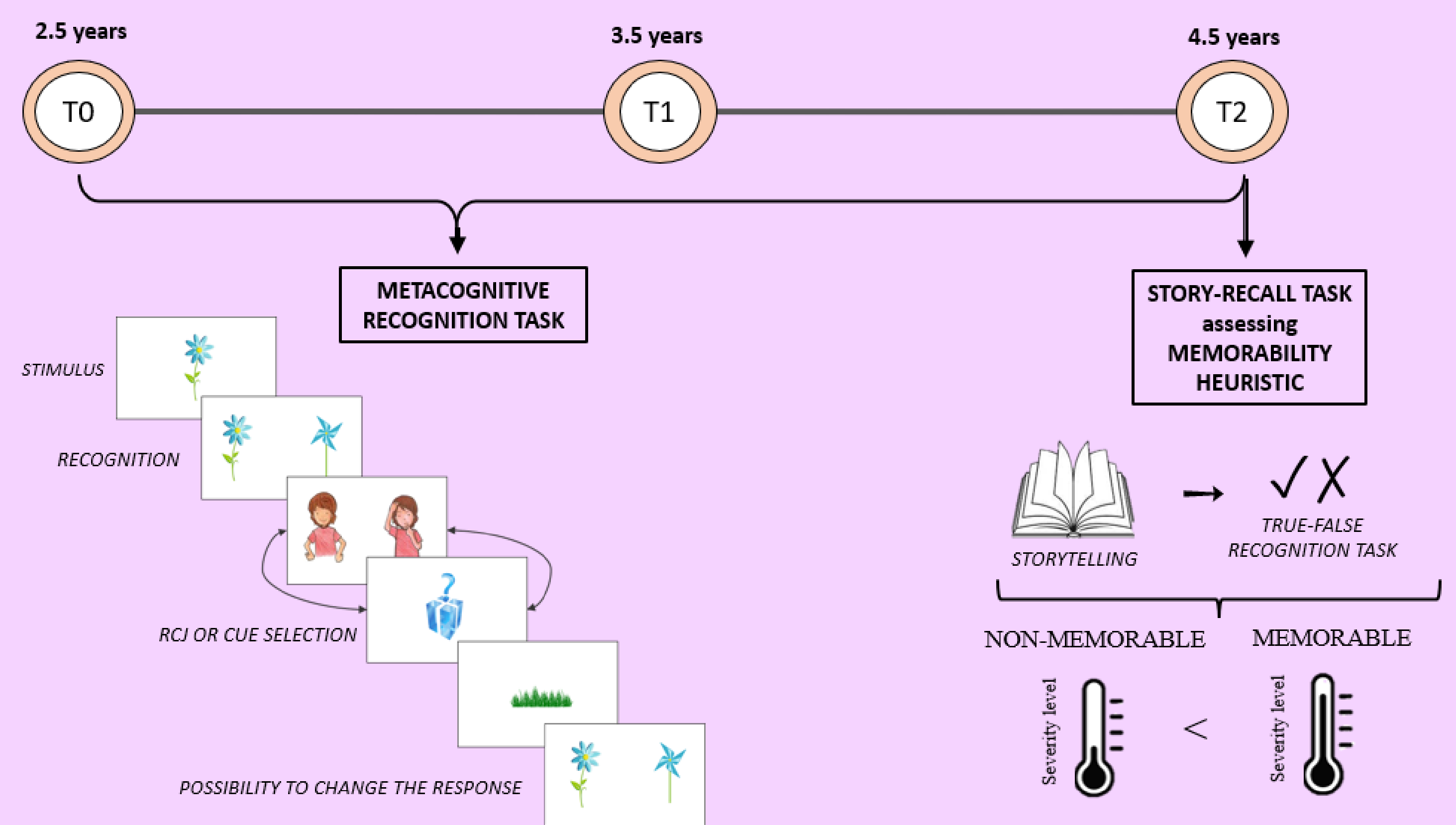
Methodology

Basic metacognition was evaluated at **three time points** (12 months interval) (Geurten & Bastin, 2019):

- **Metacognitive monitoring** : assessed using item-by-item retrospective confidence judgement
- **Metacognitive control processes** : assessed using a cue selection paradigm

At the **last assessment point** (Leonard et al., 2023): a story-recall task including **memorable and non-memorable events** followed by a true-false recognition test was administered to measure children's use of the **memorability heuristic**.

Memorability heuristic = a strategic post-retrieval decision-making process based on the metacognitive expectation that memorable information is likely to be remembered in more detailed than less memorable information.



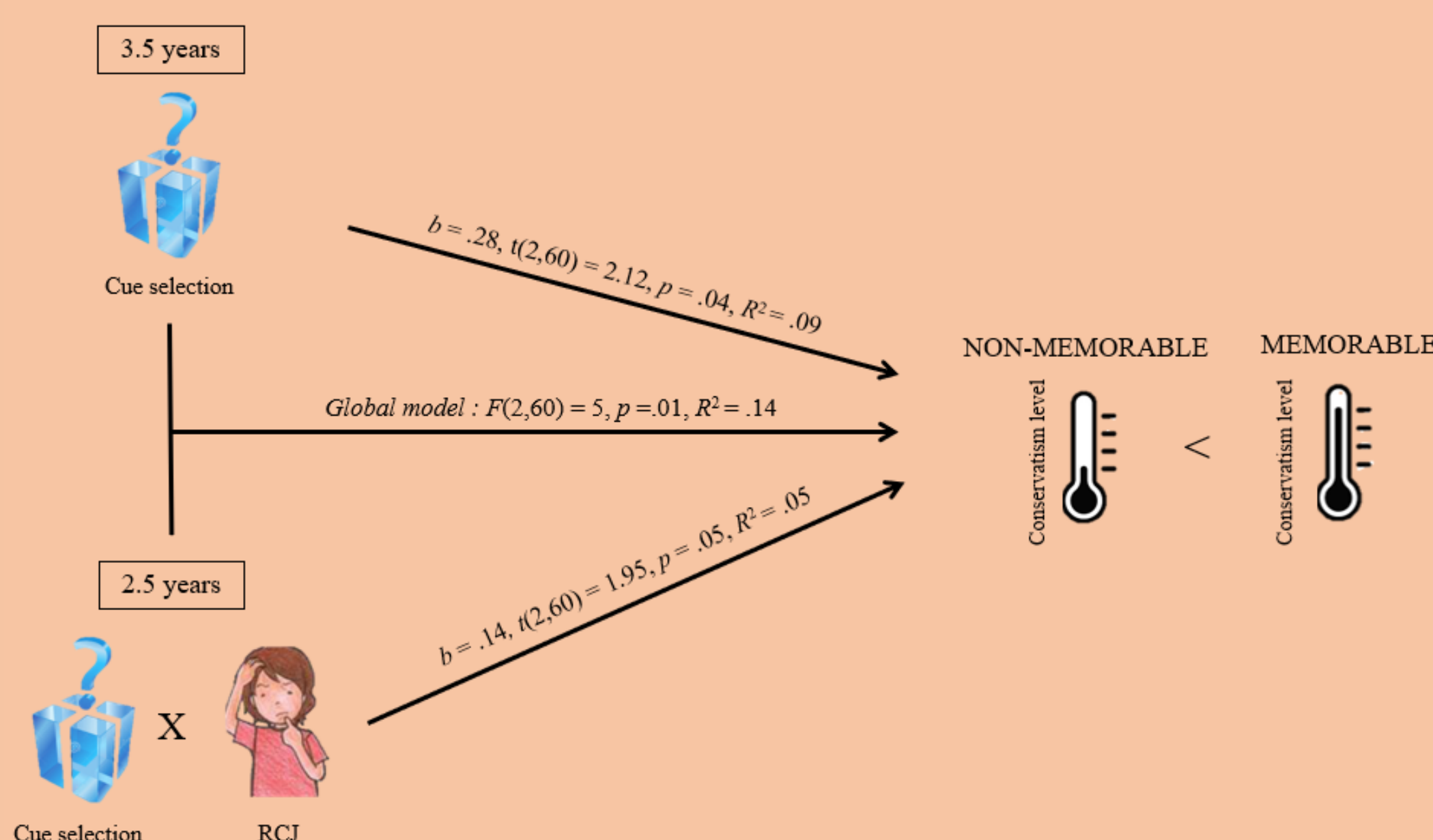
Results



Wilcoxon paired-sample t-test comparing memorable and non-memorable events revealed that children were significantly more conservative for highly memorable events ($M=0.85$) compared to less memorable ones ($M=0.69$).

Best fitting model (AIC=79.4) in all possible regression models revealed:

- the accuracy of children's metacognitive **control processes at age 3.5** to predict the use of the memorability heuristic one year later.
- a small (albeit at threshold) effect of the **interaction between monitoring and control at 2.5**, suggesting that higher monitoring and control scores at age 2.5 could possibly favor children's use the memorability heuristic two years later.



Discussion

Replicating previously reported data (Geurten, Meulemans, & Willems, 2015; Geurten et al., 2018; Leonard et al., 2023), our results revealed a **pattern consistent with the use of the memorability rule**.

By showing that the use of the memorability heuristic is predicted by prior, but not current, metacognitive skills, **our findings support the postulate according to which metacognitive heuristics require the involvement of earlier metacognitive skills**.

Future directions

- Replication with more sensitive paradigms to early metacognitive skills (e.g., Eye-Tracker or post-decision time measures).
- Examine whether early metacognition skills could not only support the emergence but also the maturation of the memorability heuristic.
- Evaluation of other strategic behaviours, more resource consuming strategy (e.g., categorization, mental imagery).

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References

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- 3) Geurten and Willems (2016). *Child Development Perspectives*, 10, 263–268.
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- 5) Leonard et al. (2023). *Journal of Applied Research in Memory and Cognition*.
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- 7) Geurten et al. (2018). *Journal of Experimental Child Psychology*, 172, 130–148.