The Development Of Item-location Binding In 4-8 Year Old Children

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Introduction

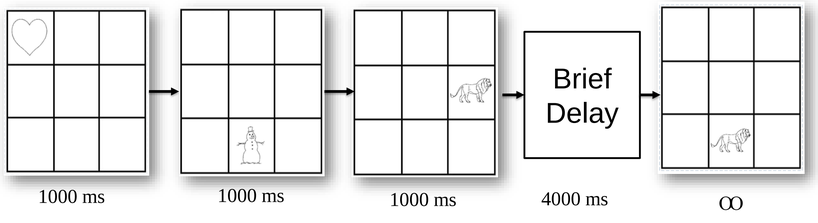
- Memory for events are contextual in nature (e.g., Eichenbaum et al., 2007).
- Studies have shown that the capacity to encode these contextual factors develops with age (e.g., Lorsbach & Reimer 2005; Lee et al., 2016).
- Many tasks that assess these featuring binding skills utilize a measure of signal detection theory called d`.
- The literature indicates that subunits of d` might be driving effects in younger children differently than in older children (Lloyd & Newcombe, 2009). The purpose of this study is to investigate the development of item location binding in children four to eight years old.
- **Purpose One:** The purpose of this study is to investigate the development of item location binding in children four to eight years old.
- **Purpose Two:** To explore age related differences in hit rates and false alarm rates.

Methods

Participants

- Two hundred children, ages 4-8 (M age=6.27 years, SD=1.49) participated in a memory and brain development study. 182 provided data for this report. All participants completed an assessment for Item location binding.

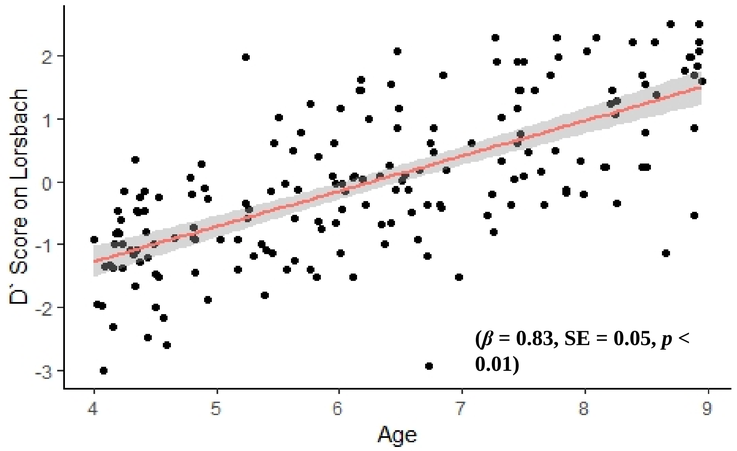
Item-Location Binding Task



- During one trial of the task, participants were asked to remember the location of three black-and-white line drawings in a 3 x 3 square grid with the center cell blacked out.
- After a four second interval the participants were shown another image in one of the cells.
- The participants then indicated if that image had been present in that cell during the previous trial (Lorsbach & Reimer 2005)
- Signal detection theory was applied to derive d` scores.

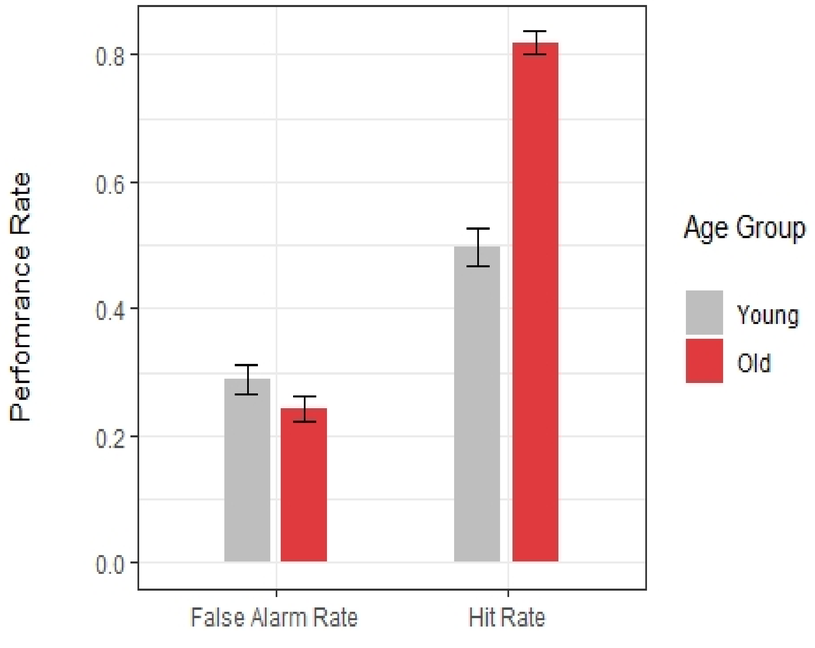
Results: Age-Performance

Performance on the item-location binding task was predicted by age when controlling gender.



Results: D-prime Components & Age

There were age-related differences in hit rates $F_{(1,180)} = 89.98$, $p < 0.01$ but not false alarm rates rates.



Discussion

- Results indicate that children improve on an item-location binding tasks with age.
- This effect appears to be driven by hit rates and not the false alarm rates.
- This was contrary to Lloyd & Newcombe's research, which suggested false alarm rates drive performance differences on an item-location binding task in early childhood.
  - These differences may be due to differences in memory tasks.
- Future work should identify the cause for this discrepancy.
- It should also investigate subunits of d` in other contextual binding tasks.

Take-Home Message

Results suggest item location binding improve with age in early childhood & that these effects are driven by hit rates and not false alarm rates.

References

- Eichenbaum et al., (2007).
- Lee et al., (2016).
- Lloyd & Newcombe (2009). *The development of memory in infancy and childhood*
- Lorsbach & Reimer (2005). *The Journal of Genetic Psychology.*

Acknowledgements

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