

Introduction

- During early childhood, children undergo drastic changes to their sleep habits as they make the shift from biphasic to monophasic sleep.
- Research has shown negative relations between weekday napping and attention span in preschool-aged children (Lam et al., 2012).
- During this developmental period, children also show age-related improvements in many aspects of memory development, from short-term and working memory (Gathercole, 1999; Ahmed et al., 2022) to precision memory, the ability to distinguish similar items from memory (e.g., Ngo et al., 2018)
- However, the influence of nap habits on memory development in early childhood remains unclear
- This study seeks to address these gaps by investigating the potential moderating role of nap status on the relation between STM/WM and precision memory

Methods

- 68 children between 3 and 5 years completed an MST task over Zoom spanning a two-week period
- 34 participants were designated as nappers (nap ≥ 5 days/week) and 34 as non-nappers (nap ≤ 2 days/week).
- 36 of the 68 participants completed the Short-Term Memory task (21 Nappers) and 34 completed the Working Memory task (15 Nappers)

Mnemonic Similarity Task

Figure 1. Study Visit Overview

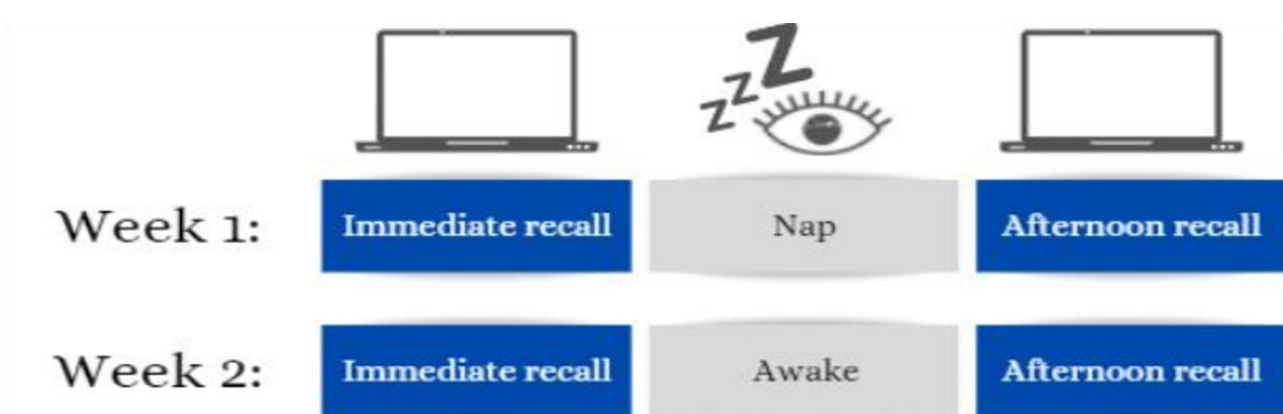
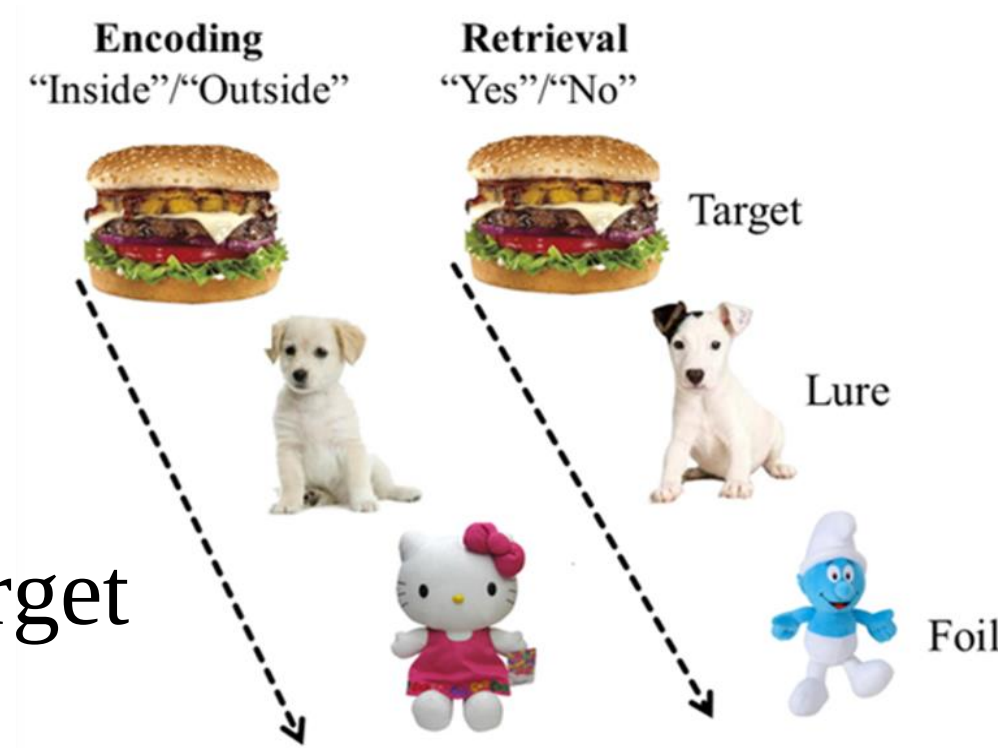


Figure 2. Task Design

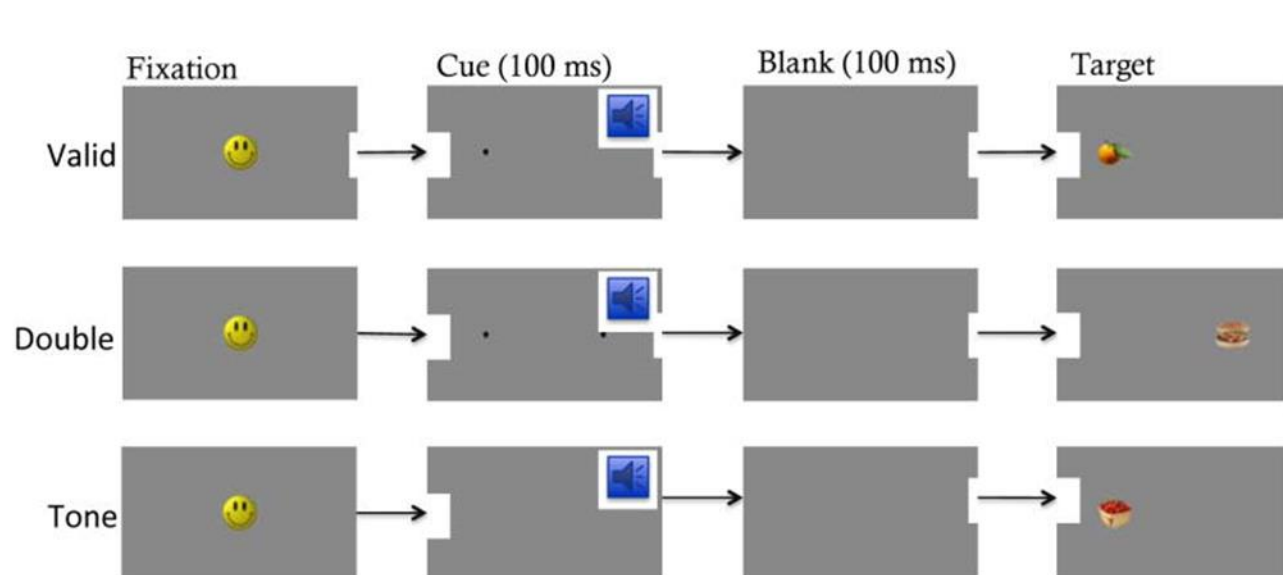


Lure Discrimination Index (LDI) = Target Hits – Lure False Alarms

- “Yes” Response to Targets – “Yes” Responses to Lures

Short-Term Memory Task

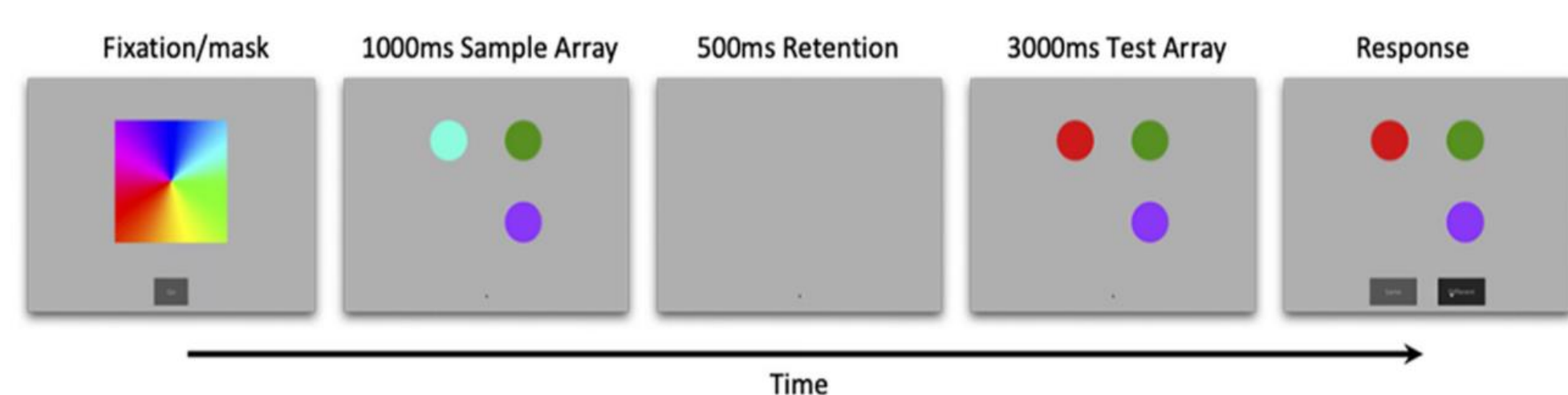
Figure 3. Attention Cueing Task Design



Cue Competition = (doubleRT – validRT)/toneRT

Working Memory Task

Figure 4. Working Memory Task Design

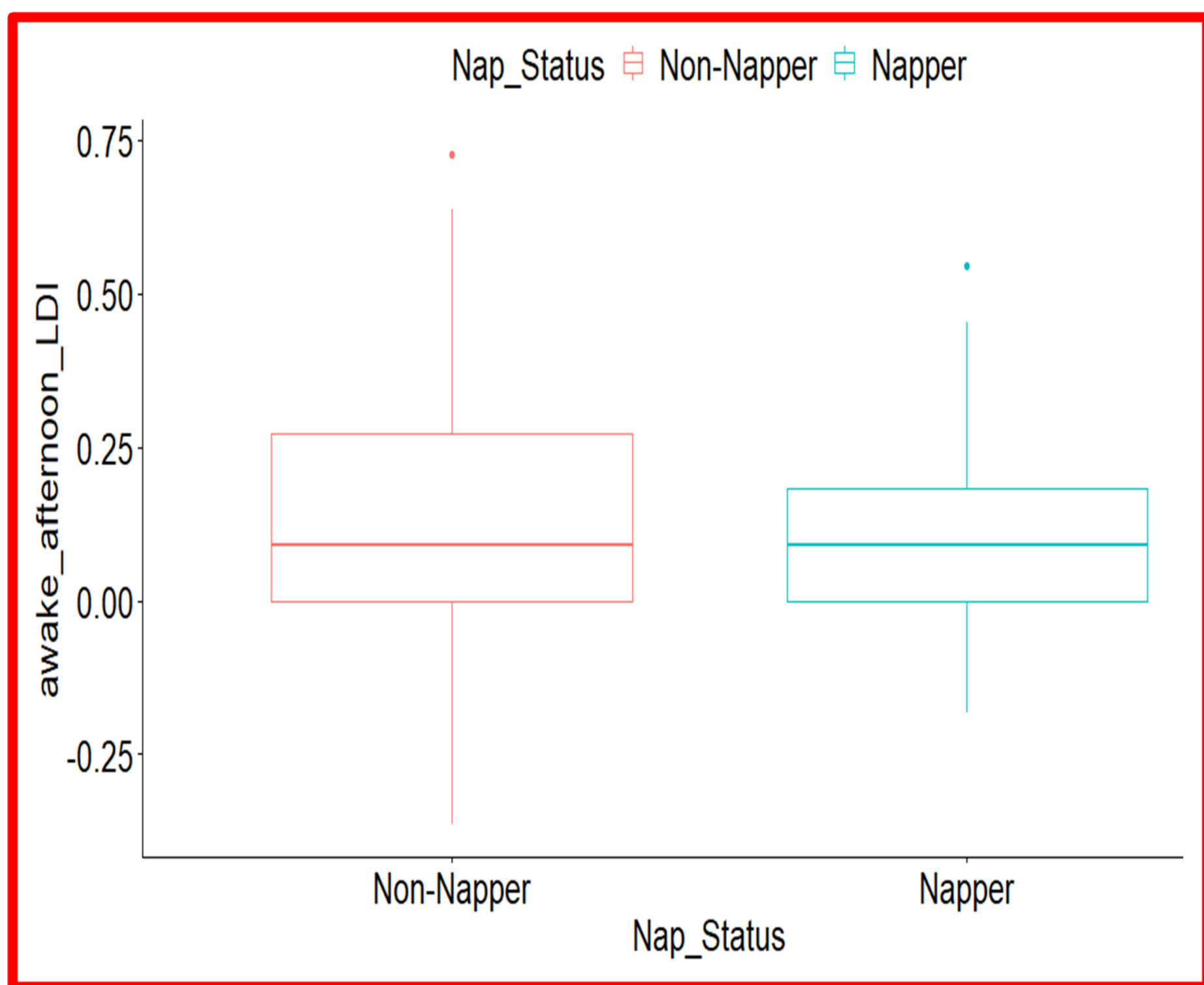
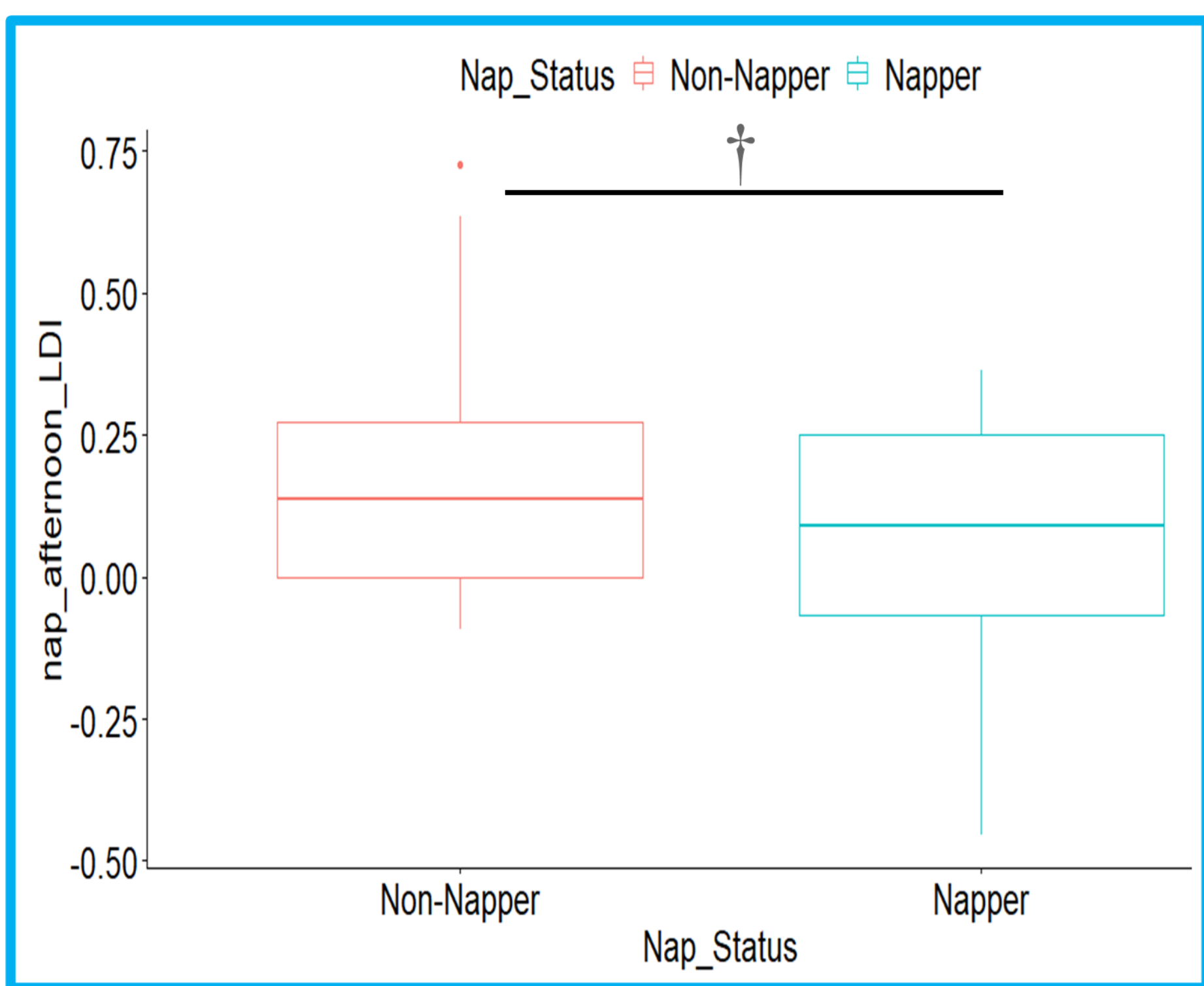


Capacity for array size 4 = $4 \times (H-FA)/(1-FA)$

- H = Hit Rate
- FA = False Alarm Rate

Results

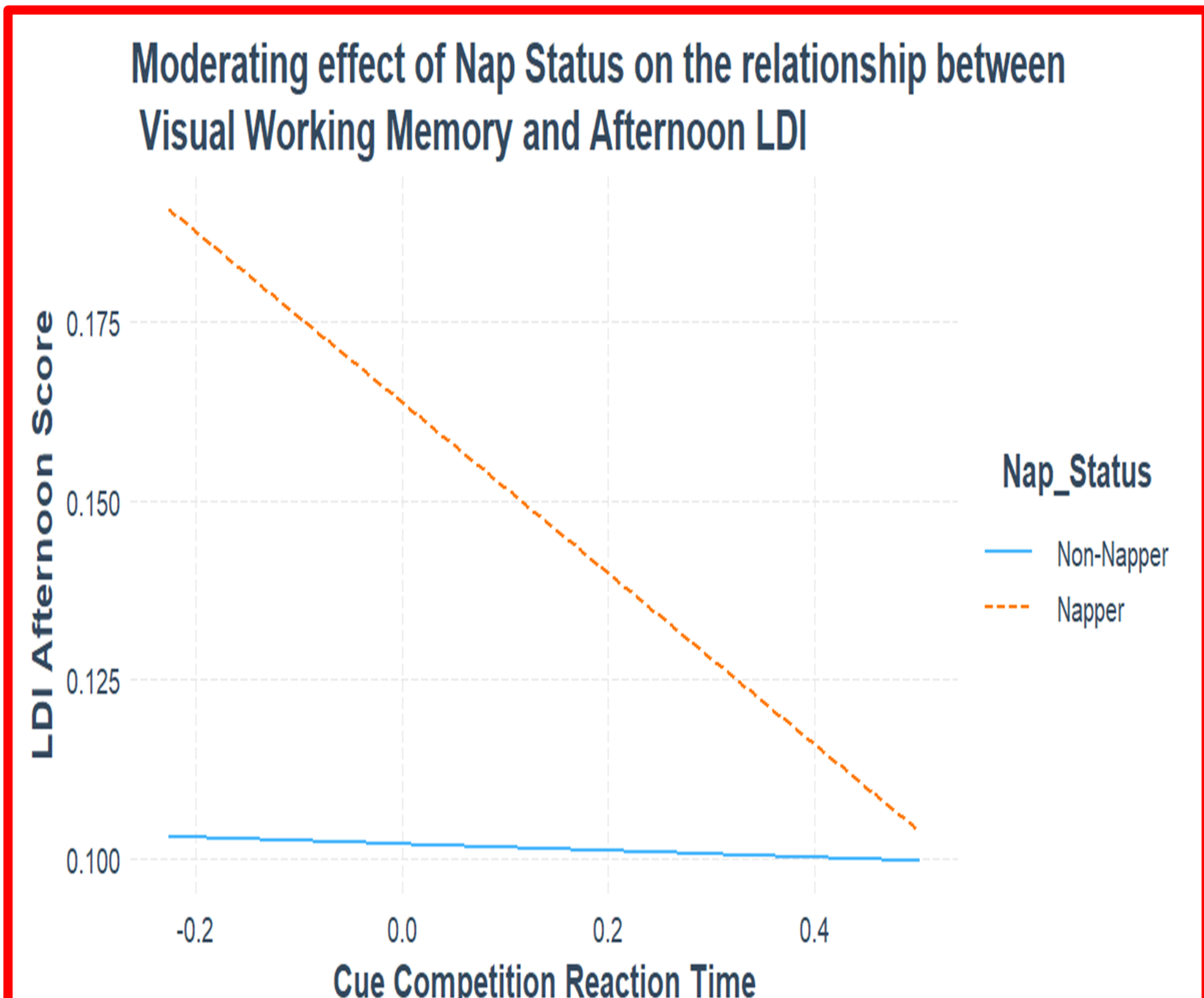
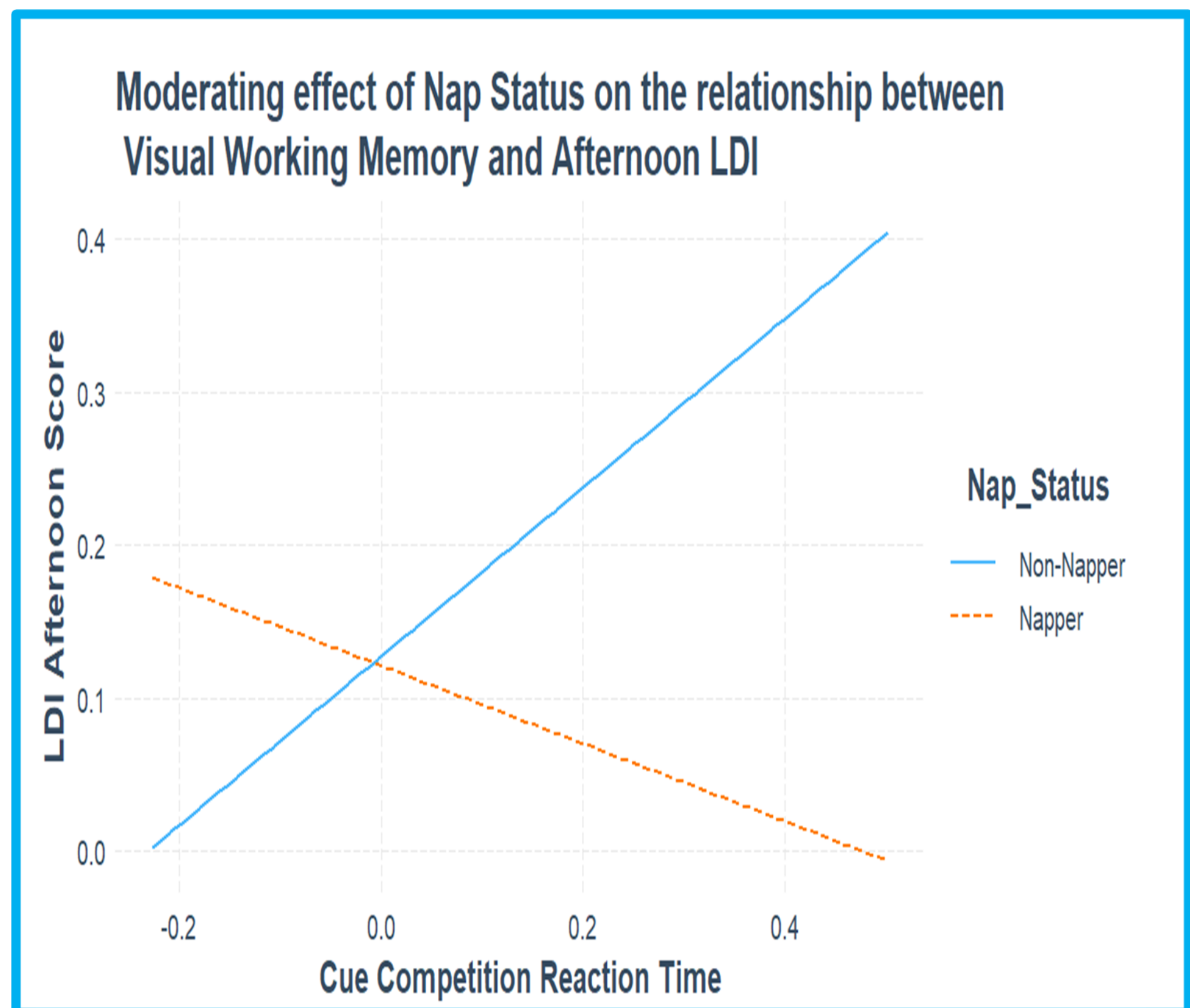
Do Nappers and Non-Nappers Differ on LDI, Working Memory, and Short-Term Memory Measures?



- T-tests revealed a marginal difference between Nappers and Non-Nappers for the afternoon LDI during the **Nap** session. There were no significant differences between Nappers and Non-Nappers on the afternoon LDI during the **Awake** session, Cue Competition or Capacity (array size 4) Score

Does Nap Status Moderate the Relation Between Visual Working Memory and Lure Discrimination?

- Moderation analyses controlling for age revealed a marginal interaction between Nap Status and Cue Competition RT in predicting LDI ($B = -0.81$, $t = -2.00$, $p = .0541$) for the **Nap** Session but no significant interaction for the **Awake** session



- Non-Nappers trended towards a positive relation between the Cue Completion Score and LDI afternoon score, whereas nappers trended towards a negative/non-significant relation
- Nap Status and Capacity Score did not significantly interact to predict LDI for either the Nap or Awake Session ($ps > .05$)

Conclusion

- Virtual testing of precision memory and self-administration of STM and WM was a success!
- Nappers showed worse precision memory than Non-Nappers following a Nap
- STM and LDI may still be related but this warrants further investigation

Future Directions

- Complete the study again in-person and run a comparative analysis with the online version.
- Explore the nap transition by investigating semi-nappers (nap 2-5 days/wk) in addition to nappers and non-nappers
- Run follow-up analyses with nap status as a continuous variable (number of days/week the child naps)

References

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Acknowledgments

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