

Introduction

- Age-related changes can affect multiple aspects of cognitive performance including episodic memory and practice accumulation.

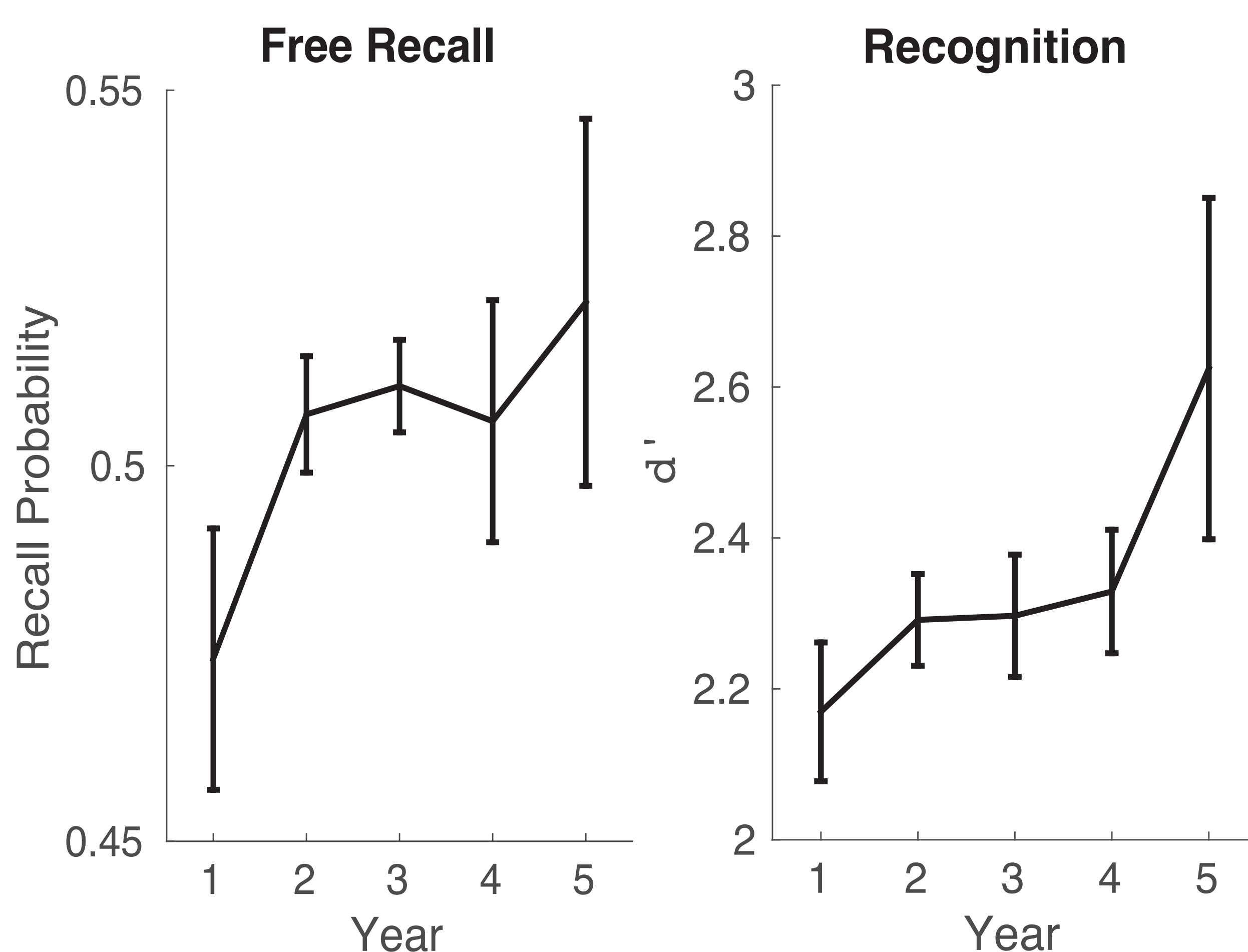
Two Questions

1. Can we effectively model these components?
2. Can we reliably detect age-related changes in these components?

Experiment

- 8 older adults (age 62-74 years)
- Free recall & recognition; 7 sessions; 16 lists/session; 16 words/list
- Completed 4-5 waves of annual follow-ups

Initial Findings



- When practice is ignored, an increase in annual performance is observed.
- Practice may be affecting annual performance and obscuring age-related changes.

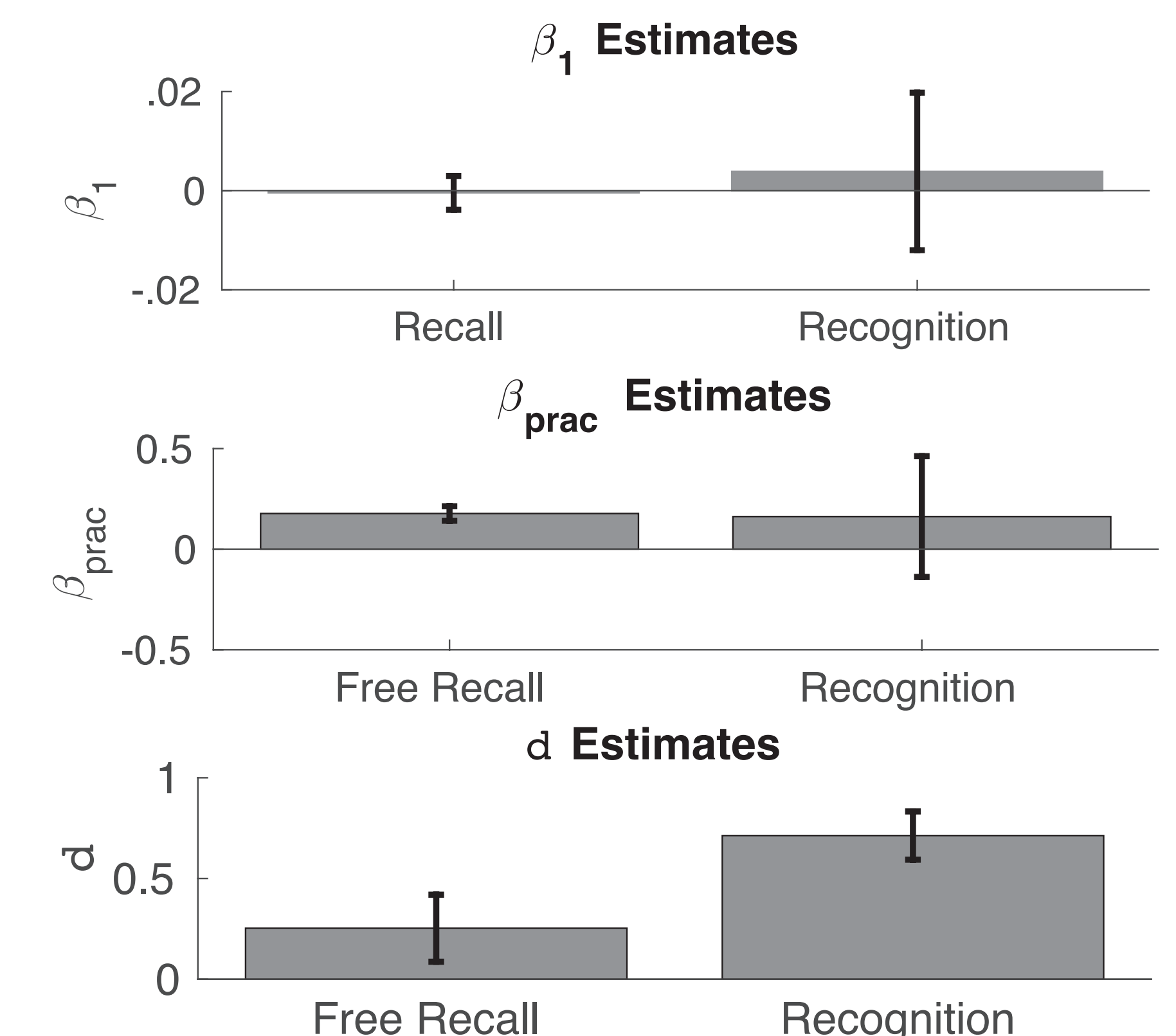
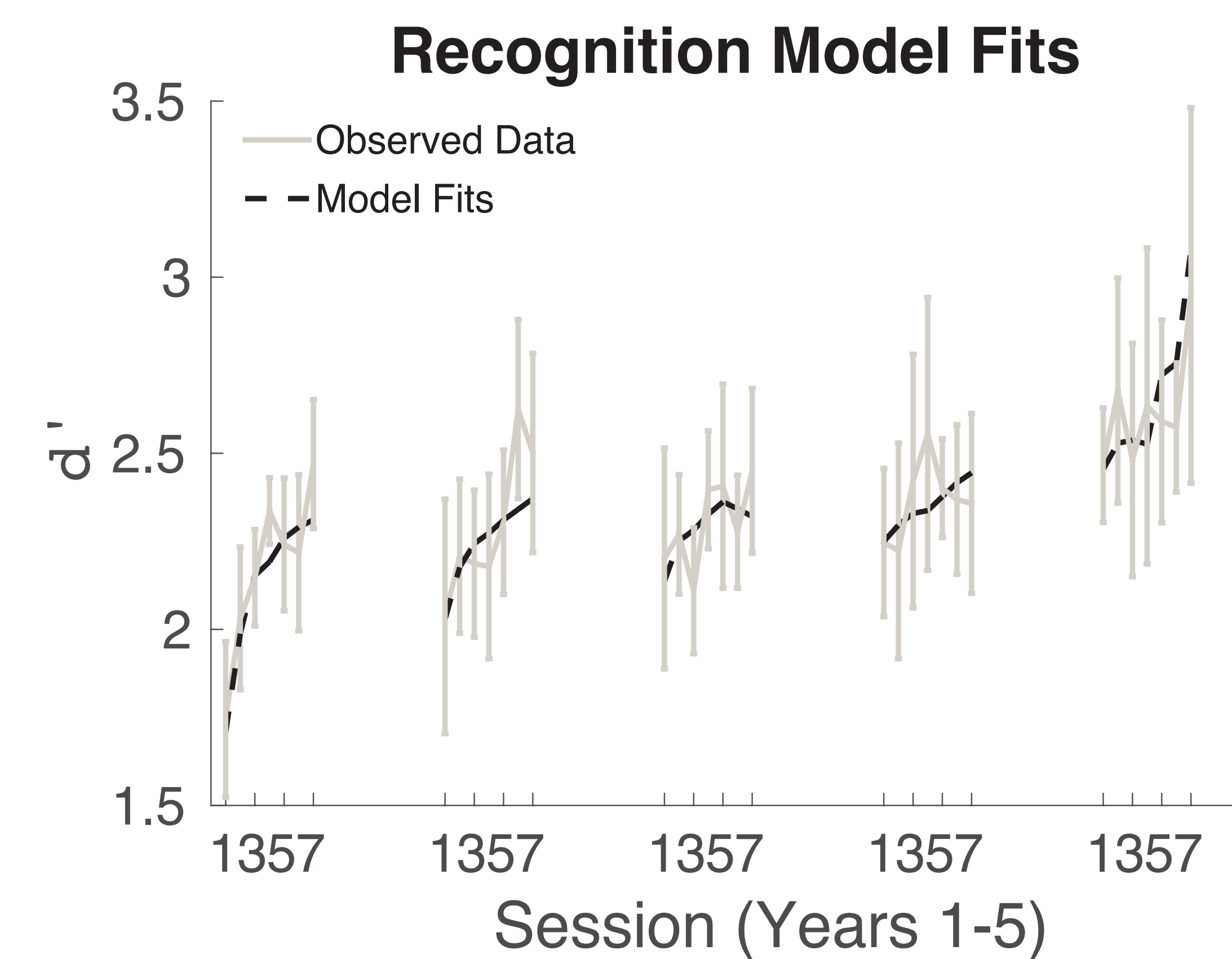
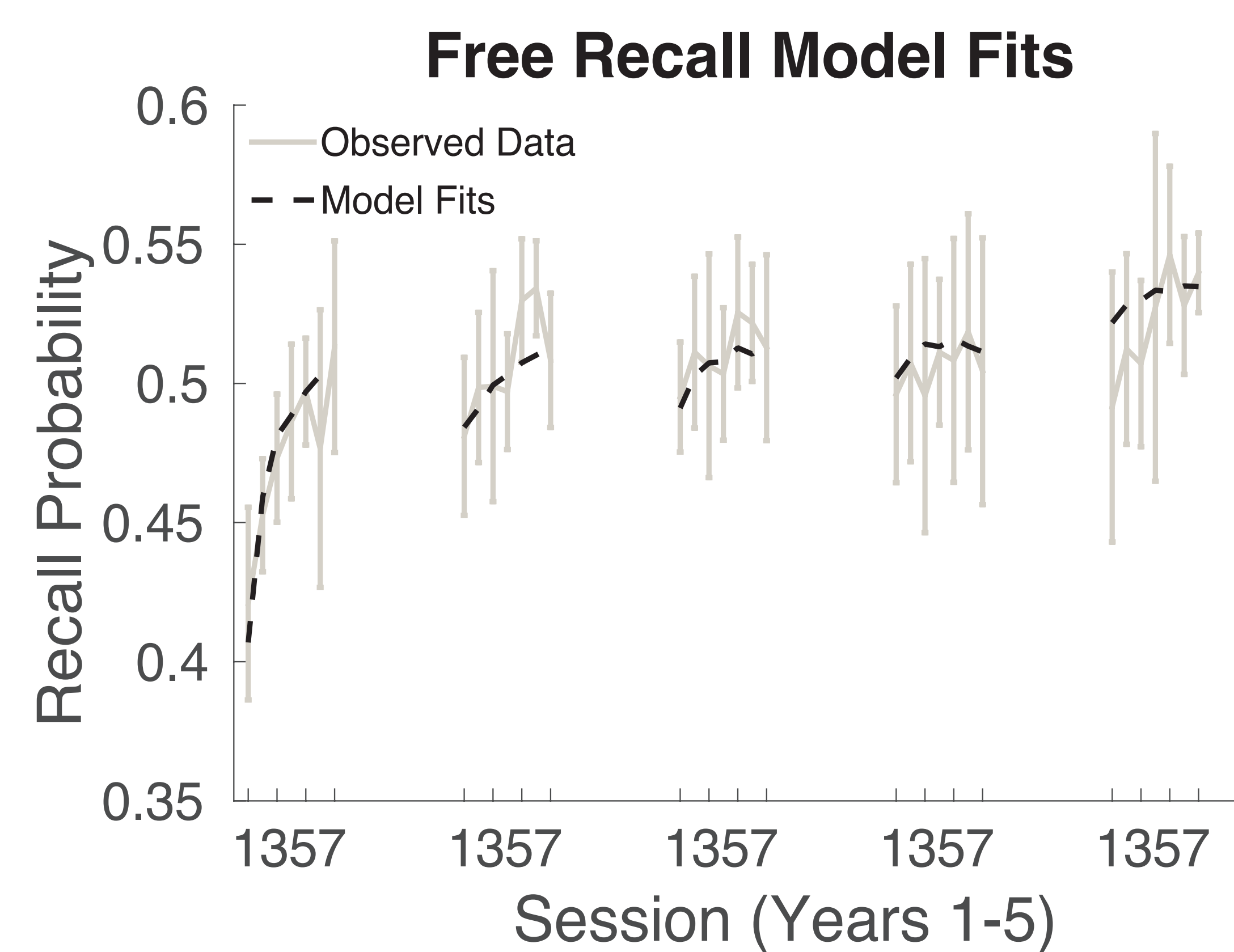
Works Cited

1. Anderson, J. R., Fincham, J. M., & Scott, D. (1999). Practice and Retention: A unifying analysis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 25(5), 1120-1136.
 2. Sliwinski, M. J., Munoz, E., Hofer, S., & Scott, S. B. (2015). Global Perceived Stress Predicts Cognitive Change Among Older Adults. *Psychology and Aging*, 30(3), 487-499.
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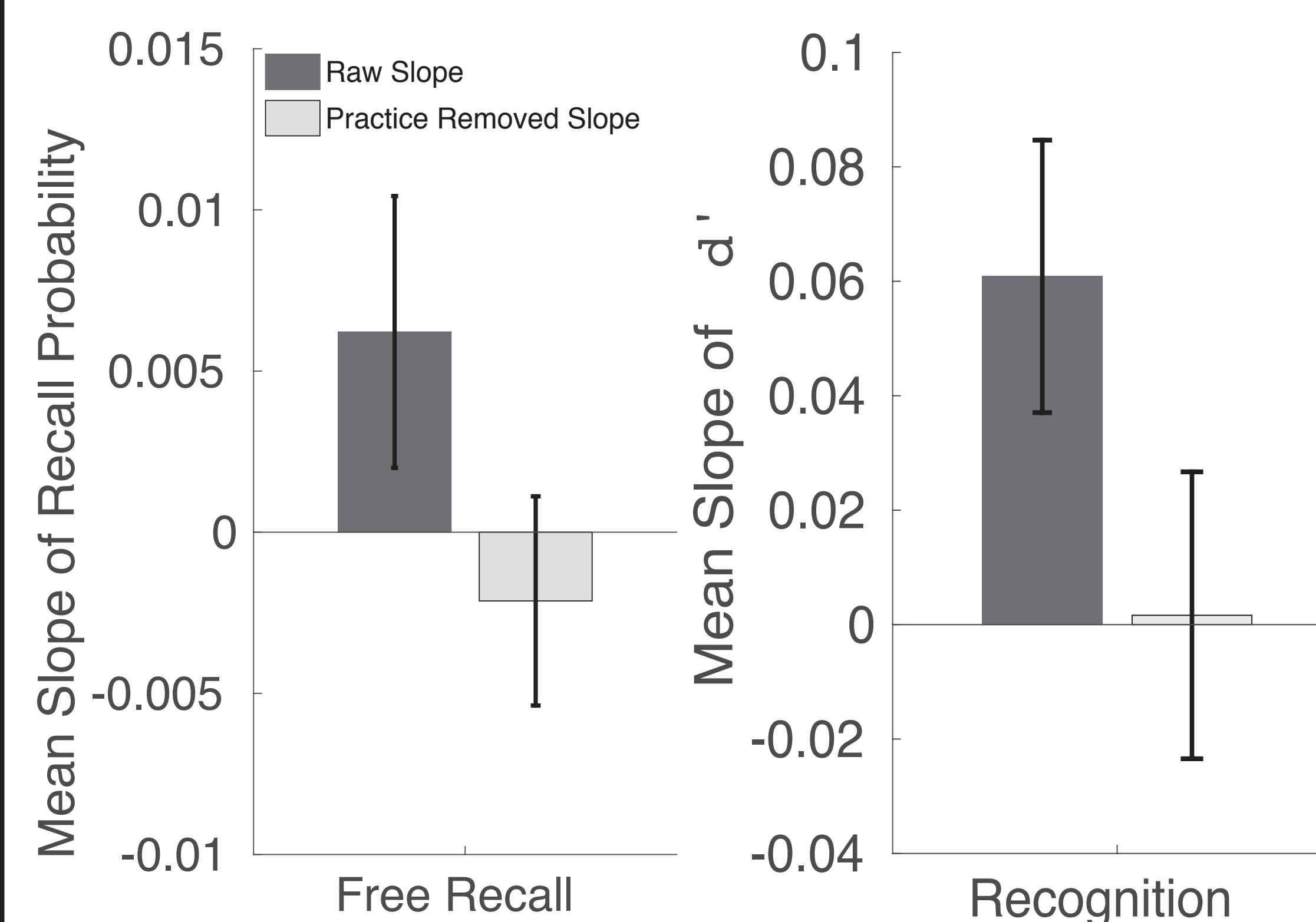
Simultaneously Modeling Memory and Practice:

• Adapted from the Strength Accumulation Equation (Anderson et. al., 1999)

$$Performance = \beta_0 + \beta_1 Age + \left(\beta_{prac} - \frac{\beta_{prac}}{\sum_{i=1}^n t_i^{-d}} \right) \quad t_i = Date(n) - Date(i) + 1$$

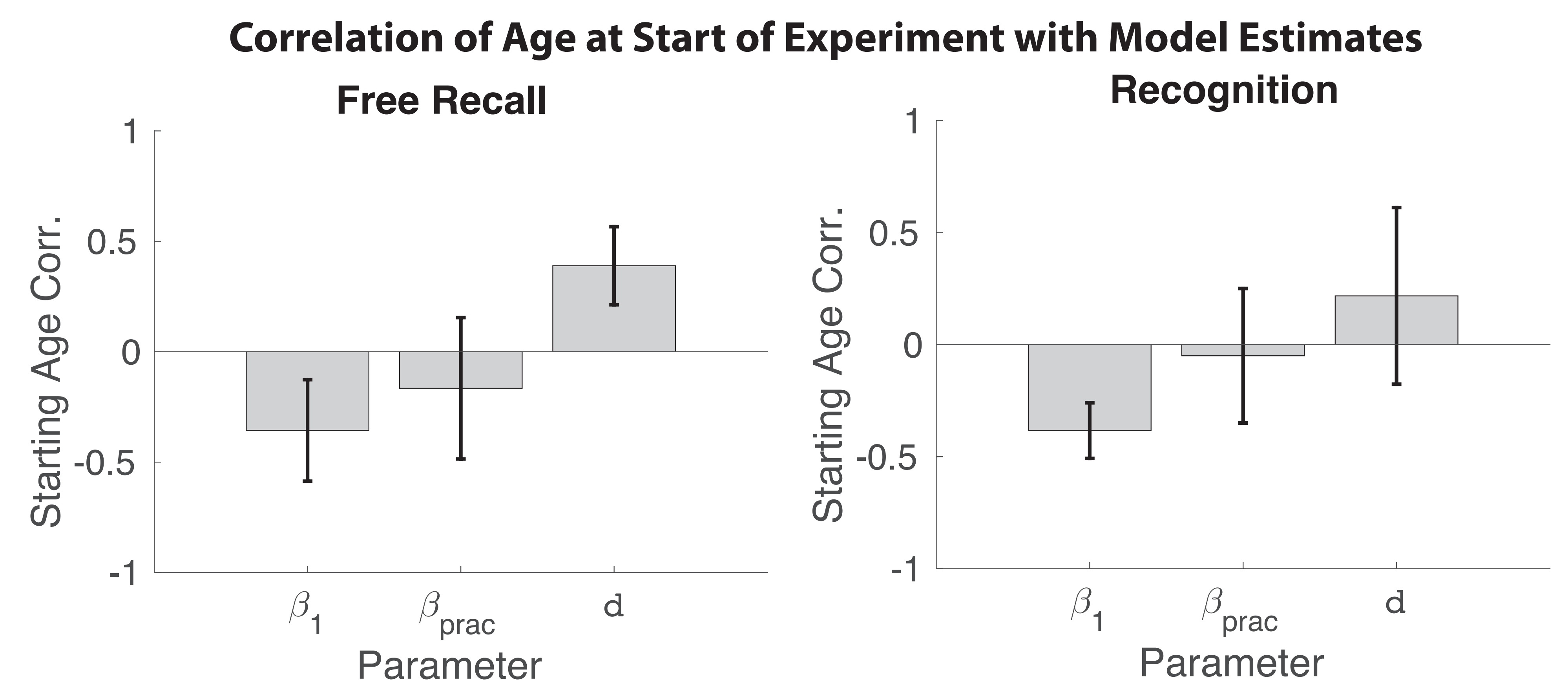


No Age-Related Decline When Practice Removed



- Slope of annual performance is significantly lower when estimated practice effects are removed

Parameter Estimates Correlate With Starting Age



- β_1 : Age-related performance change
- β_{prac} : Maximum possible performance gain due to practice
- d : Rate of practice accumulation during testing and forgetting in between sessions

Summary

- The application of our model reveals that with practice removed, annual memory performance does not change significantly in our population.
- Older participants are estimated to have more negative age-related changes and a higher rate of forgetting in between testing waves.