

LEARNING FROM RETEST

EPISODIC MEMORY PRACTICE EFFECTS AND LONGITUDINAL COGNITIVE CHANGE

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KEY FINDING: Greater episodic memory practice effects were associated with higher global cognition and more favorable estimated trajectories, especially for memory-sensitive outcomes.

BACKGROUND

Practice effects in repeated cognitive testing are often treated as measurement bias¹. However, individual differences in retest gains may reflect learning responsiveness and early cognitive vulnerability². Distinguishing generic retest gains from meaningful interindividual differences is essential for interpreting longitudinal cognitive trajectories.

OBJECTIVE

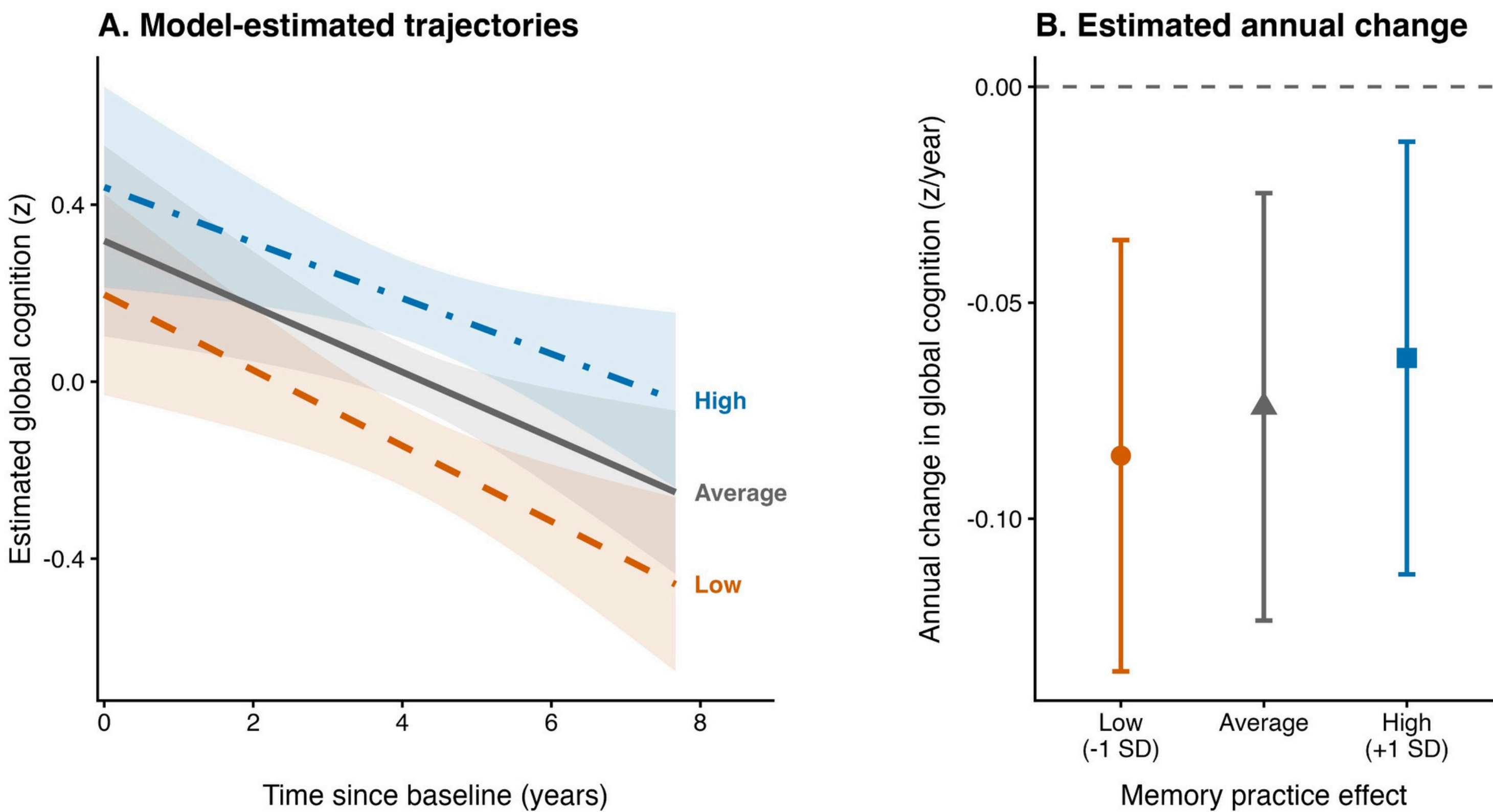
Examine whether baseline-adjusted episodic memory practice effects are associated with cognitive level and longitudinal cognitive change beyond generic retest-related gains in cognitively healthy adults.

METHODOLOGY

- **Sample:** 395 cognitively healthy BBHI adults
- **Measurements:** Holistic in-person neuropsychological test-battery in 2018, 2020, and 2025
- **Cognition:** CFA-derived domain scores and global cognition factor
- **Practice effect:** Baseline-adjusted Wave 2–Wave 1 episodic memory gain
- **Models:** Linear mixed-effects models adjusted for age, education, sex, and retest-related effects

MAIN RESULTS FIGURE

FIG. 1. GLOBAL COGNITION TRAJECTORIES BY MEMORY PRACTICE EFFECT



DOMAIN SPECIFIC ASSOCIATIONS

Outcome	Cognitive Level	Longitudinal Change
Global Cognition	Present	Present
Episodic Memory	Present	Present
Processing Speed	Present	Present
Reasoning	Present	None
Attention/Working Memory	None	None
Cognitive Flexibility	None	None

FIG. 2. SIGNIFICANT ASSOCIATIONS OF MEMORY PRACTICE EFFECT WITH COGNITIVE LEVEL AND LONGITUDINAL CHANGE ACROSS DOMAINS.

RESULTS

- Retest-related gains were evident at both follow-up waves, highlighting the need to model practice effects explicitly.
- Greater baseline-adjusted episodic memory practice effect was associated with higher global cognitive performance across waves.
- Higher memory practice effect was also associated with more favorable estimated longitudinal change in global cognition.
- Domain-specific associations were strongest for global cognition and episodic memory, weaker for processing speed/reasoning, and absent for attention/working memory and cognitive flexibility.

CONCLUSION

- Episodic memory practice effects may capture meaningful interindividual differences beyond generic retest-related gains.
- Informative value was strongest for global cognition and memory-sensitive outcomes.
- Explicitly modeling retest effects may improve interpretation of longitudinal cognitive trajectories.

REFERENCES

¹ Salthouse TA, Tucker-Drob EM. Implications of short-term retest effects for the interpretation of longitudinal change. *Neuropsychology*. 2008 Nov;22(6):800–11. doi: 10.1037/a0013091. PMID: 18999354; PMCID: PMC2593909.

² Jutten RJ, Grandoit E, Foldi NS, et al. Lower practice effects as a marker of cognitive performance and dementia risk: A literature review. *Alzheimer's Dement*. 2020; 12:e12055. <https://doi.org/10.1002/dad2.12055>

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