



PSYCHONOMIC SOCIETY  
**62<sup>ND</sup> ANNUAL MEETING**

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# Levels of Processing and Temporal Contiguity in Free Recall

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# Background

- Levels of Processing Effect: deep processing tends to result in better memory than shallow processing ( Craik & Tulving, 1975)
- Temporal Contiguity Effect (TCE): recall of one event triggers recall of other events originally experienced nearby in time (Healey, Long & Kahana, 2019)
- Theory-based predictions
  - Retrieved Context Models — a **deep processing task** may increase the rate of context drift during encoding, **increasing the TCE** relative to shallow processing (Healey & Kahana, 2016)
  - Item-Order Account — a **deep processing task** may enhance item information at the expense of order information, **reducing the TCE** relative to shallow processing (McDaniel & Bugg, 2008)
  - Accounts based on control processes — **any assigned task** may interfere with participants' own temporally-based strategies, **reducing the TCE**



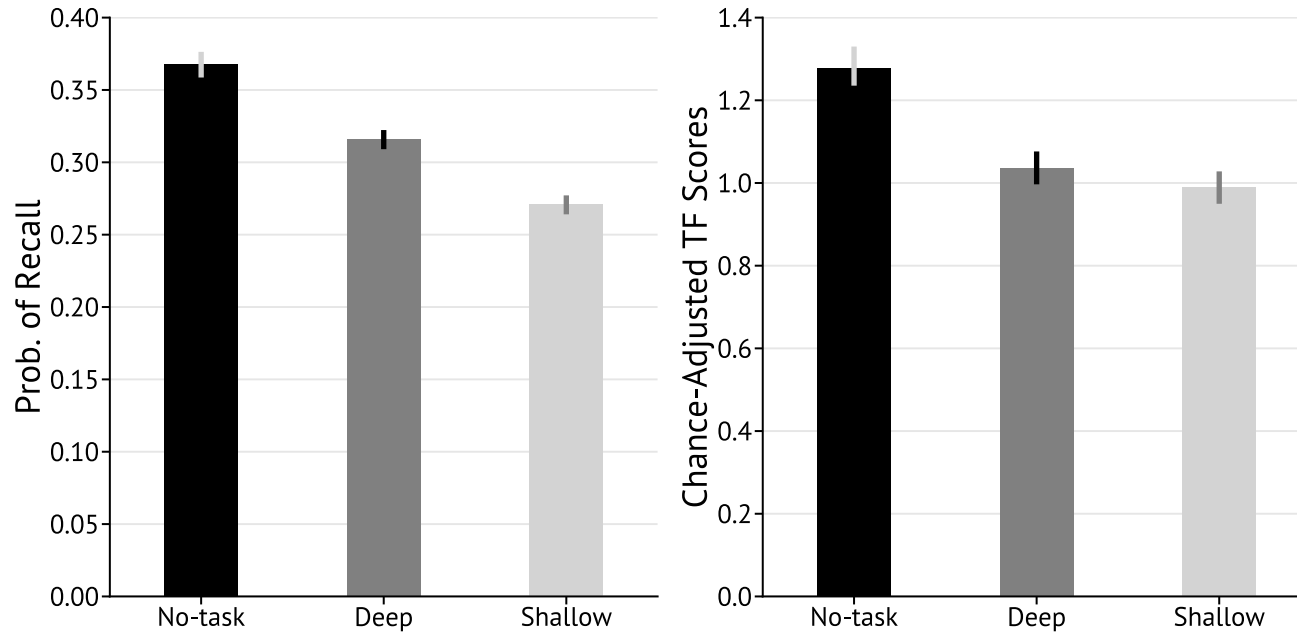
# Design

*How does a deep processing task affect temporal contiguity?*

- $N = 680$
- Immediate free recall of 16-item lists
  - 30 lists; 10 lists each for deep, shallow, and no-task instructions
  - Deep: Does this word refer to a living thing?
  - Shallow: Does this word contain the letter T?
  - No-task: Study words with no response required



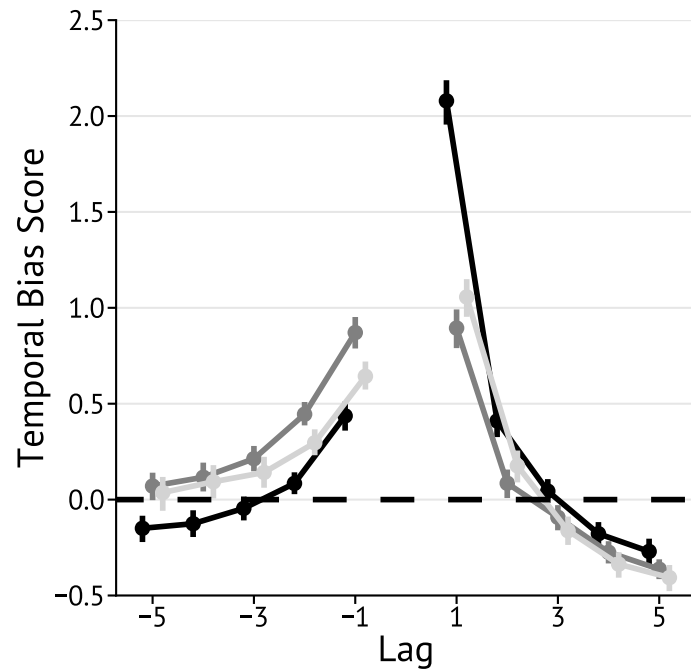
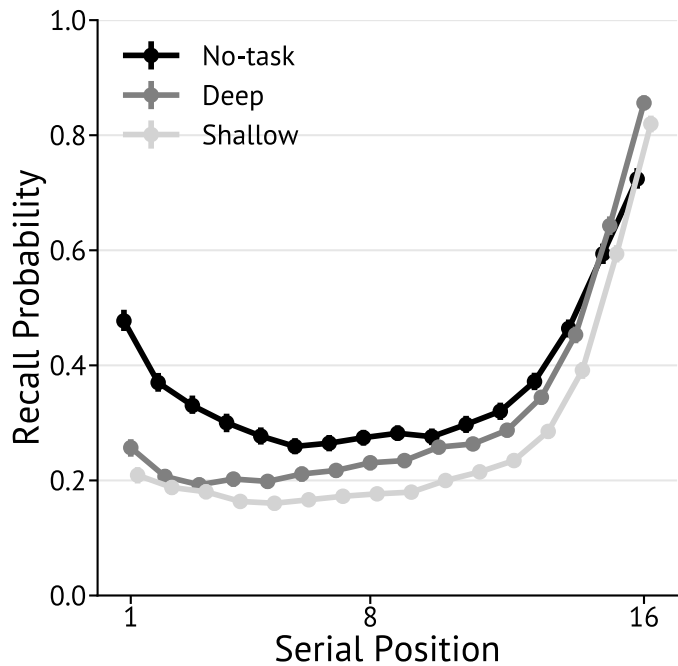
Error bars represent bootstrapped 95% CI



- Recall highest in no-task; higher for deep than shallow processing ( $d=0.937$ )
- TCE highest in no-task; higher for deep than shallow processing ( $d=0.110$ )



Error bars represent bootstrapped 95% CI



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# Conclusions

- Results support both **retrieved context models** and **accounts based on control processes**
  - Both perspectives should be considered in future theory development
- **Any** assigned task reduced recall & the TCE
  - Participants may have engaged in adaptive control processes
- **Deep processing** improved both recall & the TCE relative to shallow processing
  - Bias for near backward transitions higher in deep processing
- Temporal contiguity may be a piece of the levels of processing puzzle



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