Remembering the 2016

Election Campaign:

Temporal Proximity Predicts Free Recall Order

Mitchell G Uitvlugt and M Karl Healey

CBCC LAB

MICHIGAN STATE UNIVERSITY

Temporal Contiguity in Episodic Memory

What is Temporal Contiguity?

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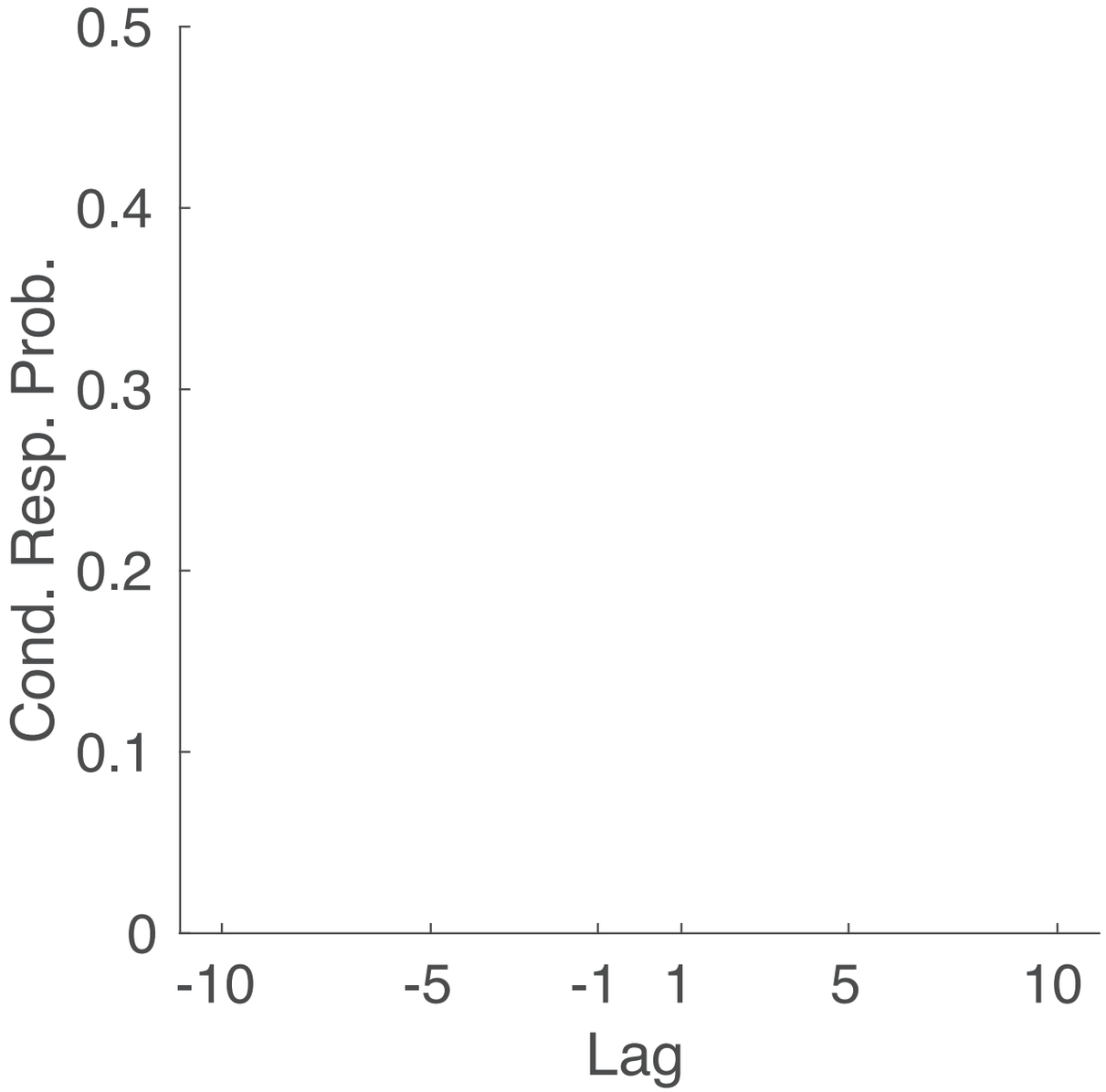
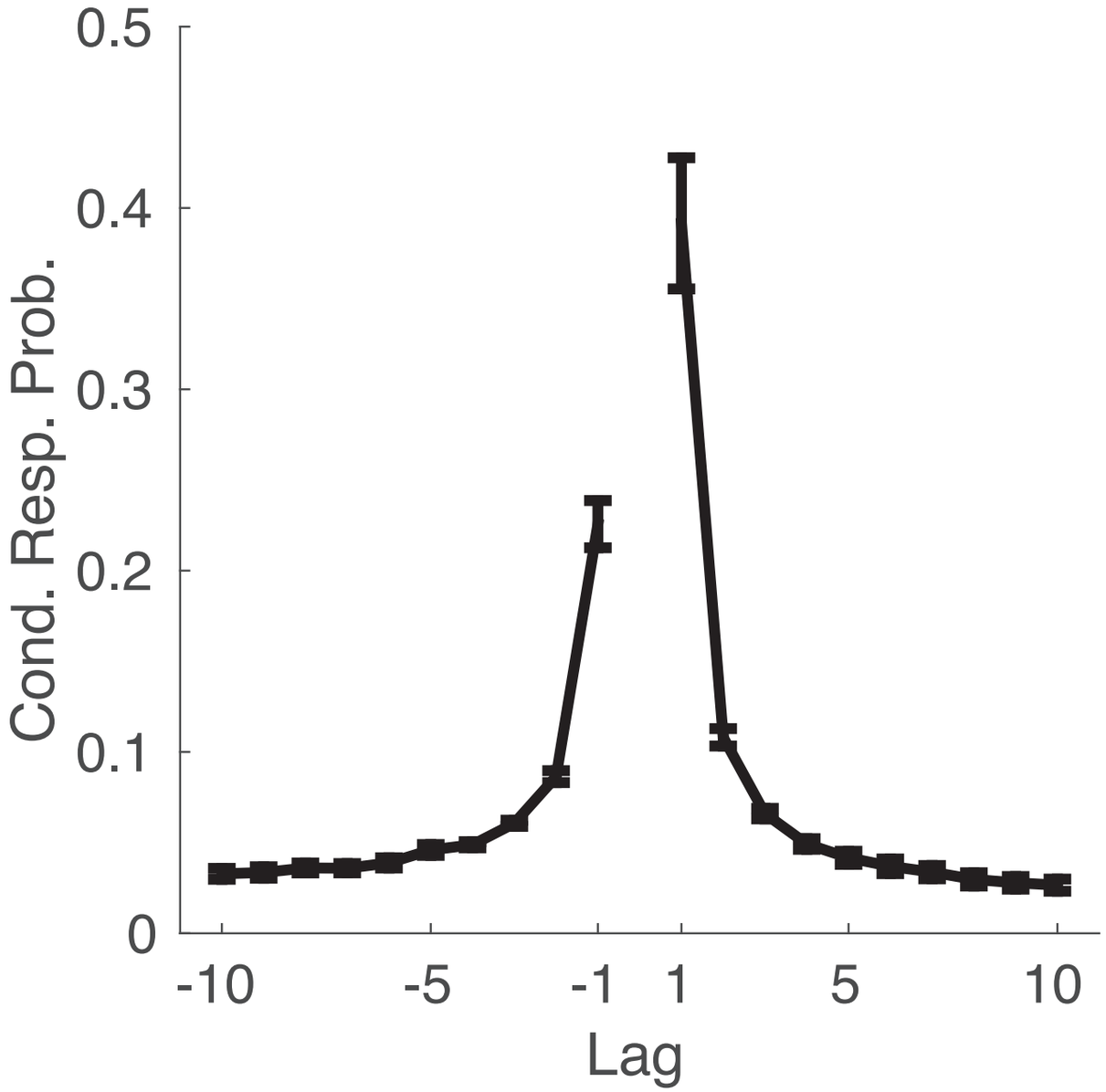
- Recalling one event, *i*, tends to trigger recall of an another event that occurred near in time to *i*

Temporal Contiguity



Kahana (1996)
Healey & Kahana (submitted)

Temporal Contiguity



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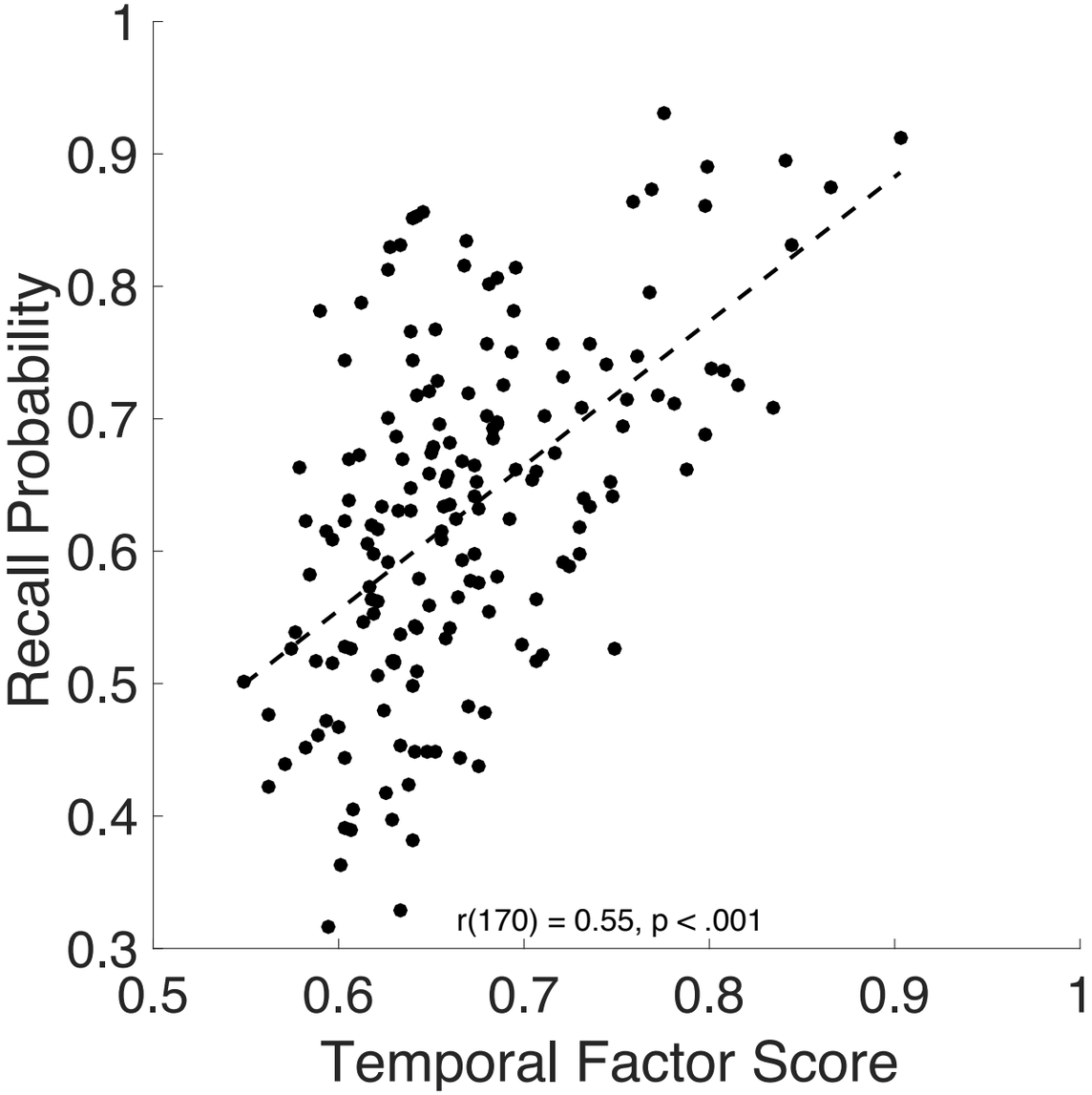
It is important: Related to Memory Ability and IQ



Unsworth 2009
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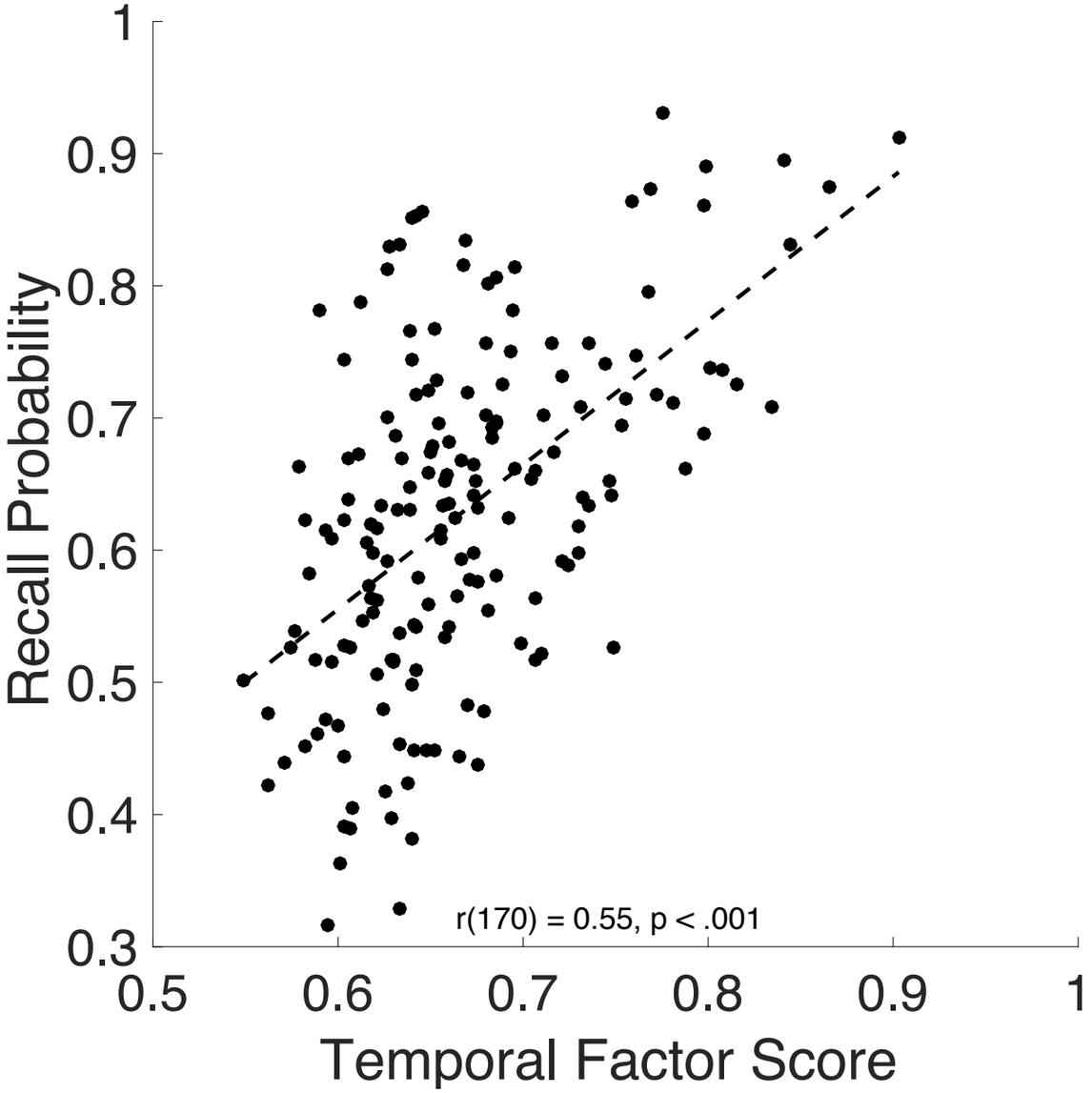

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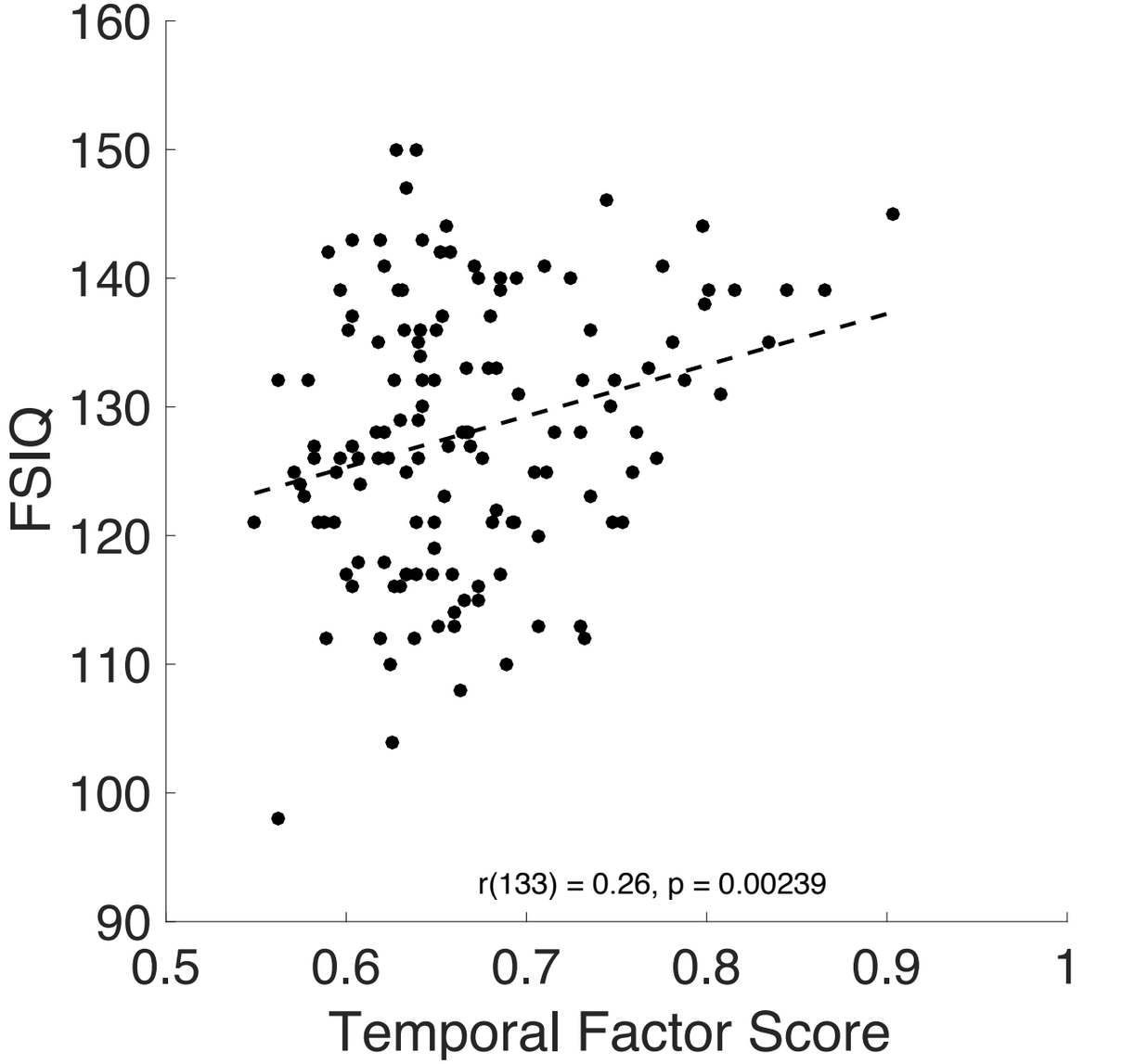

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- Memory system naturally encodes information about temporal distance (TCM, SIMPLE)

- It is a trick of the peculiarities of free recall (task-specific strategies)

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1. Does the effect depend on the peculiarities of free recall?

Does it depend on ability?

Healey & Kahana (submitted)

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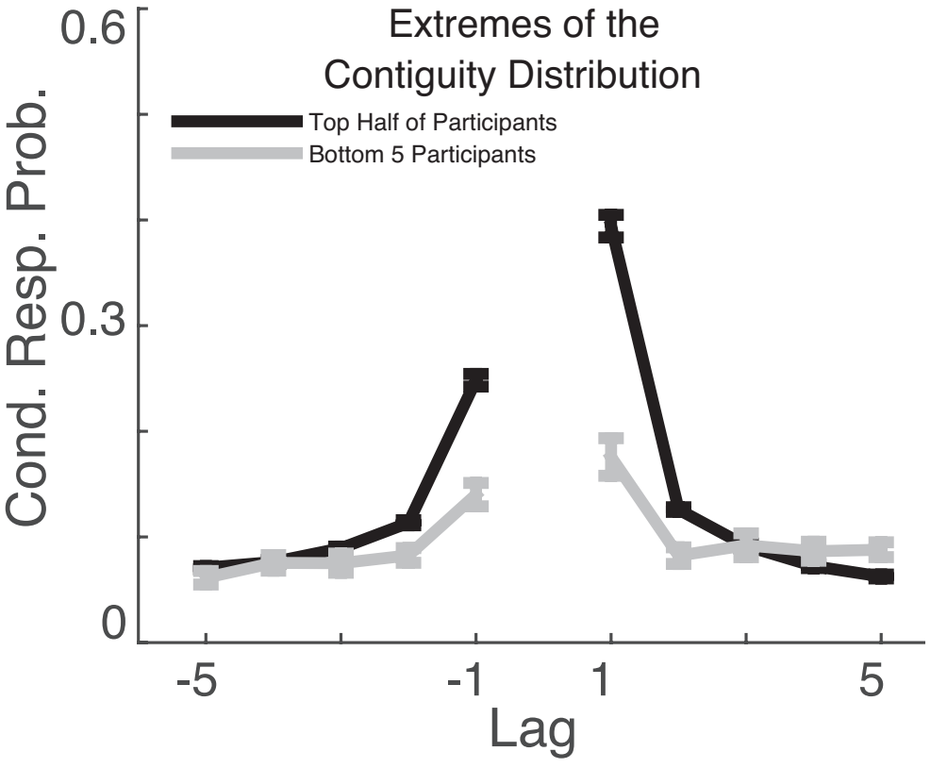

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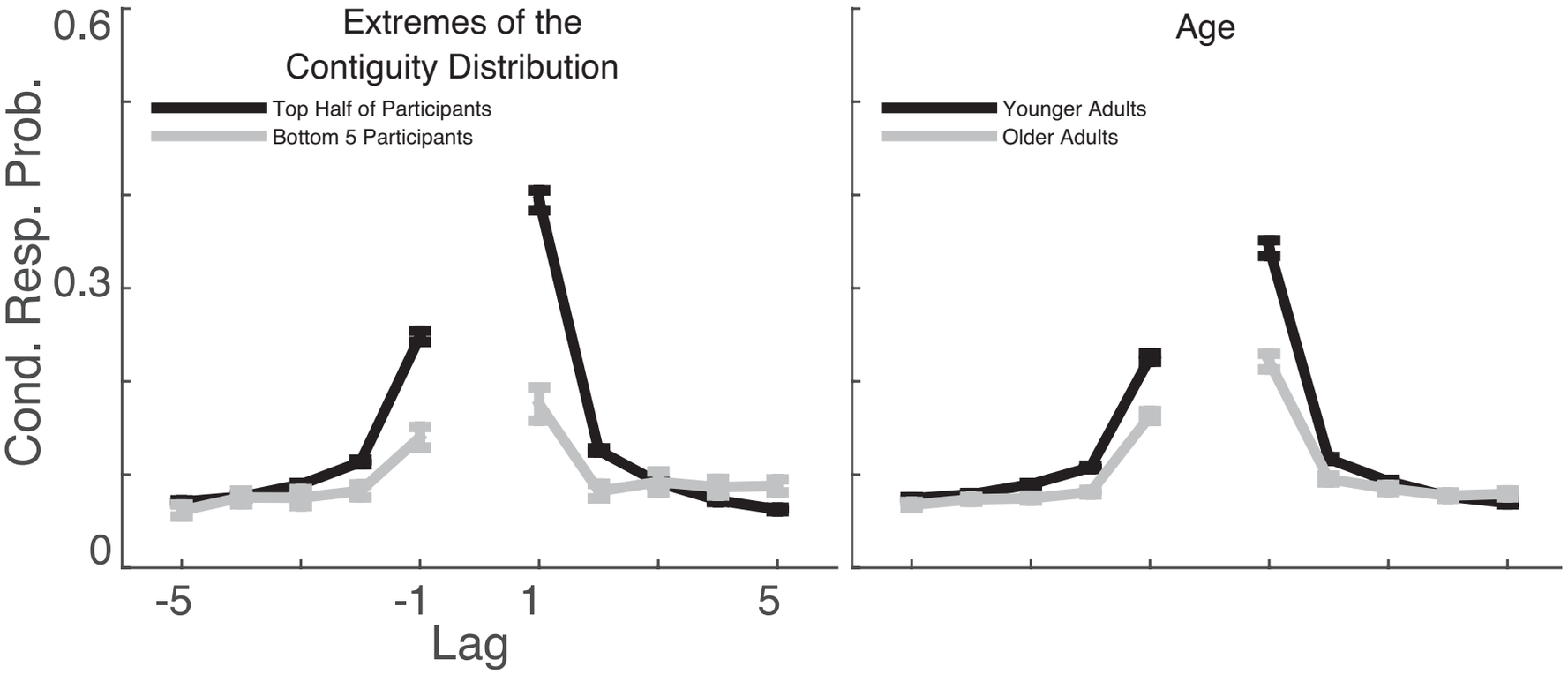

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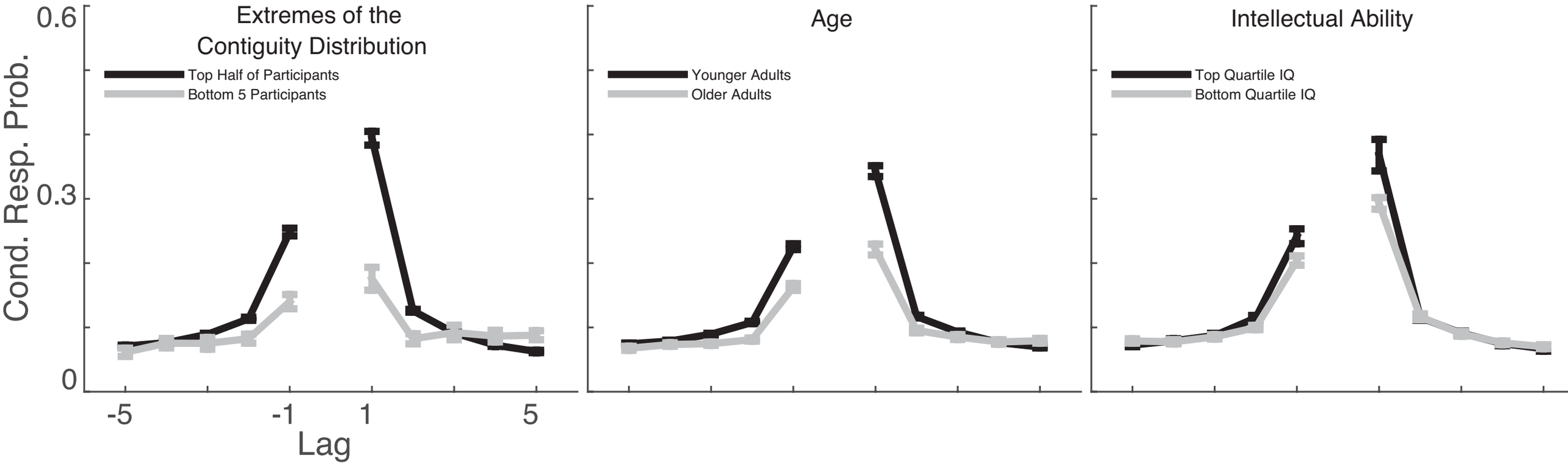

Healey & Kahana (submitted)

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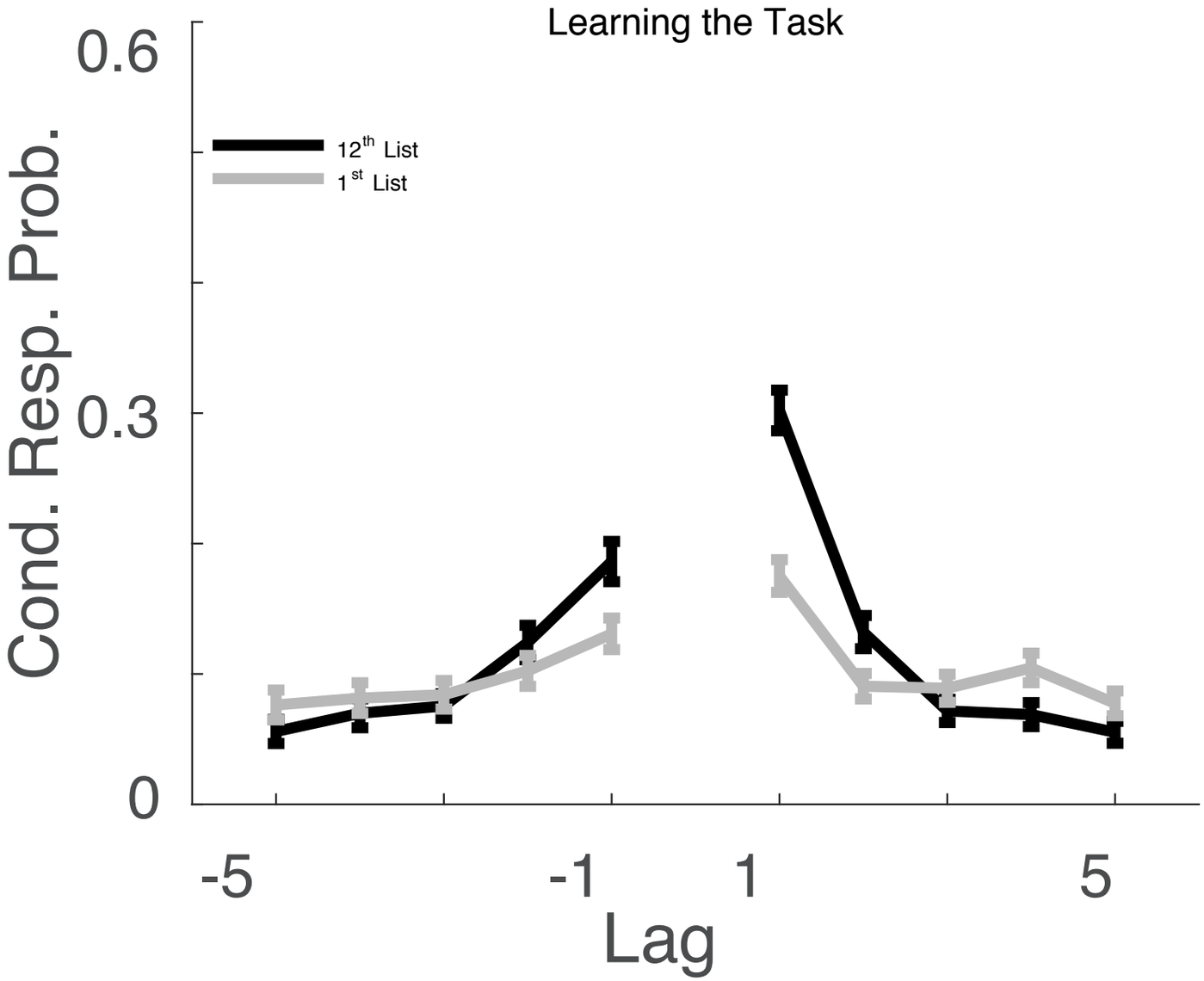

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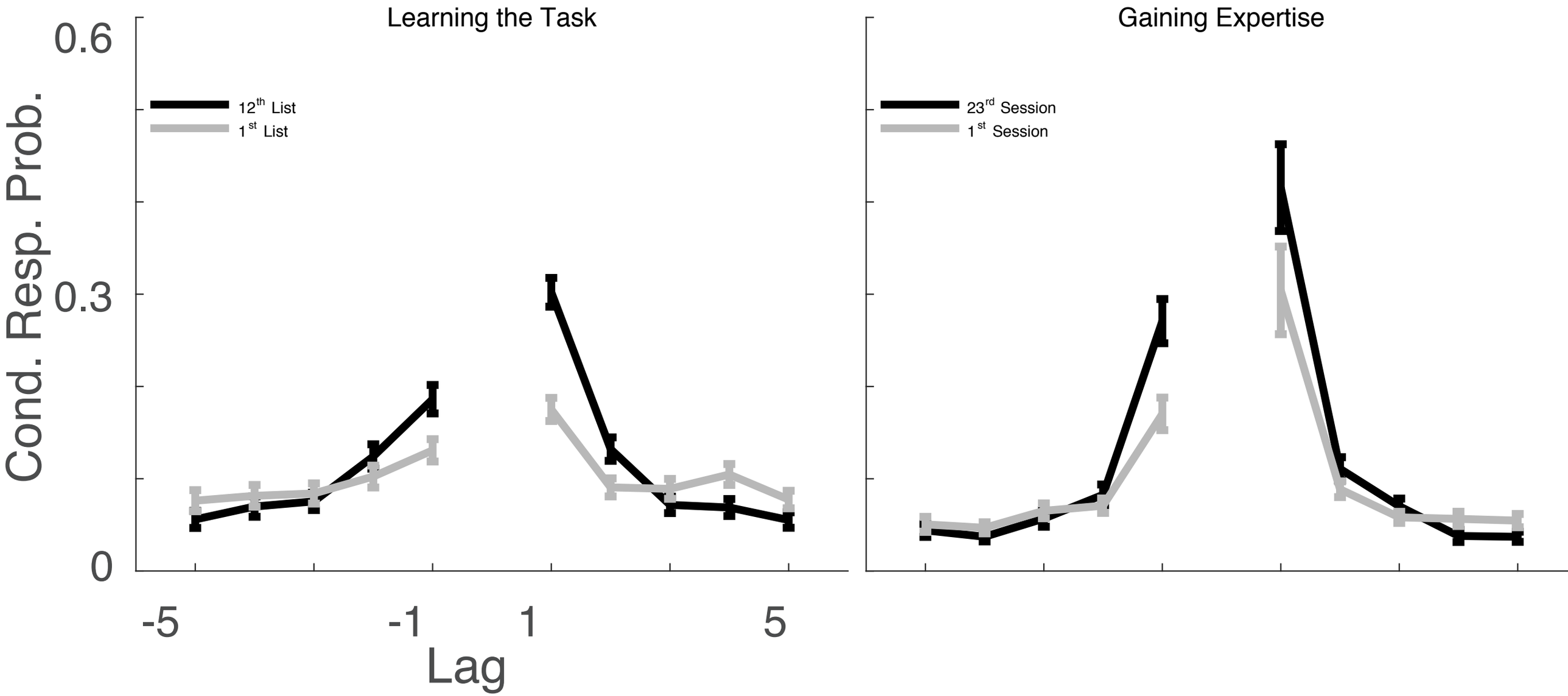

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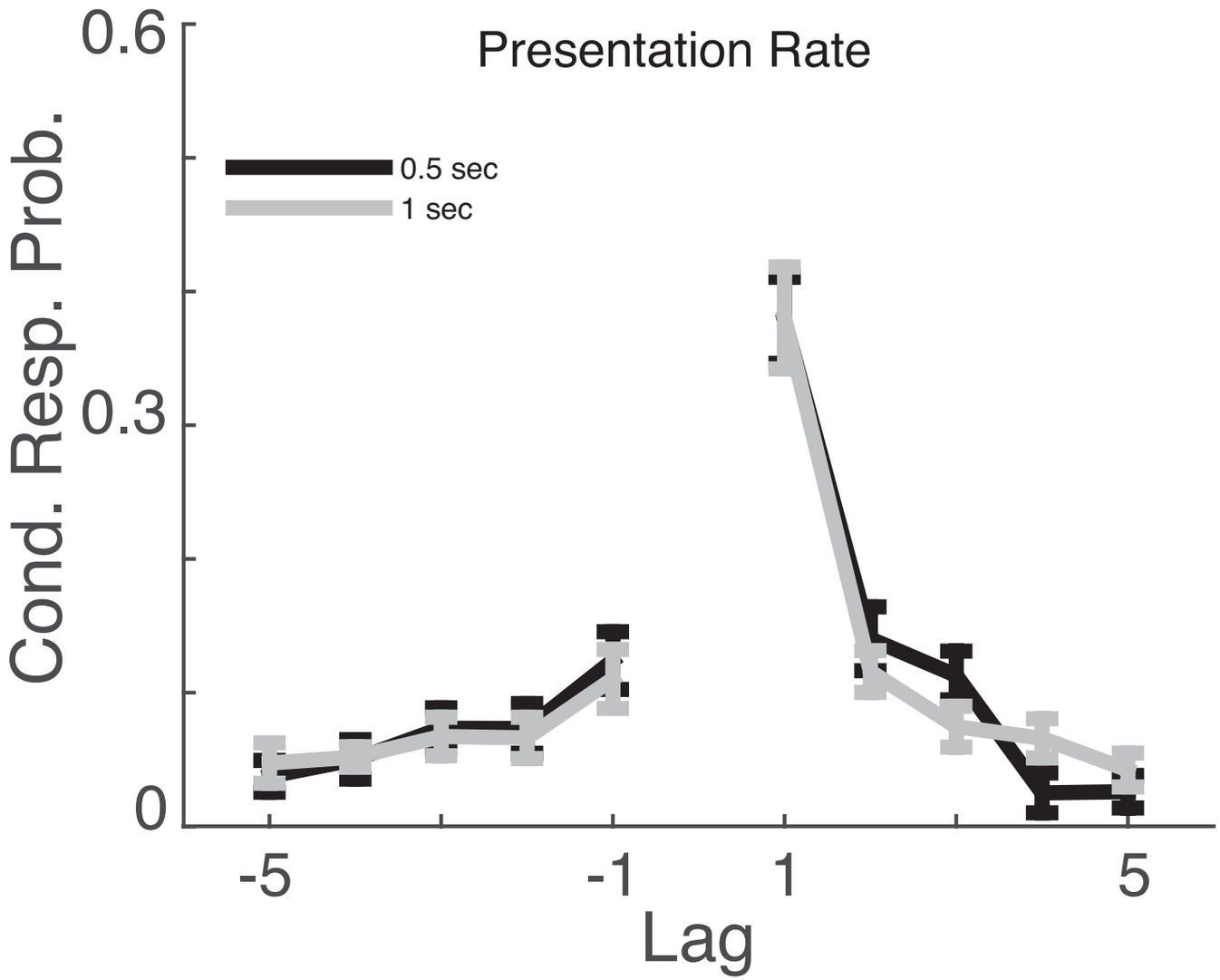

Healey & Kahana (submitted)

Presentation rate?

- Robust to very fast presentation rates (Howard,2016)
- Robust to very slow presentation rates (Nguyen & McDaniel, 2015)

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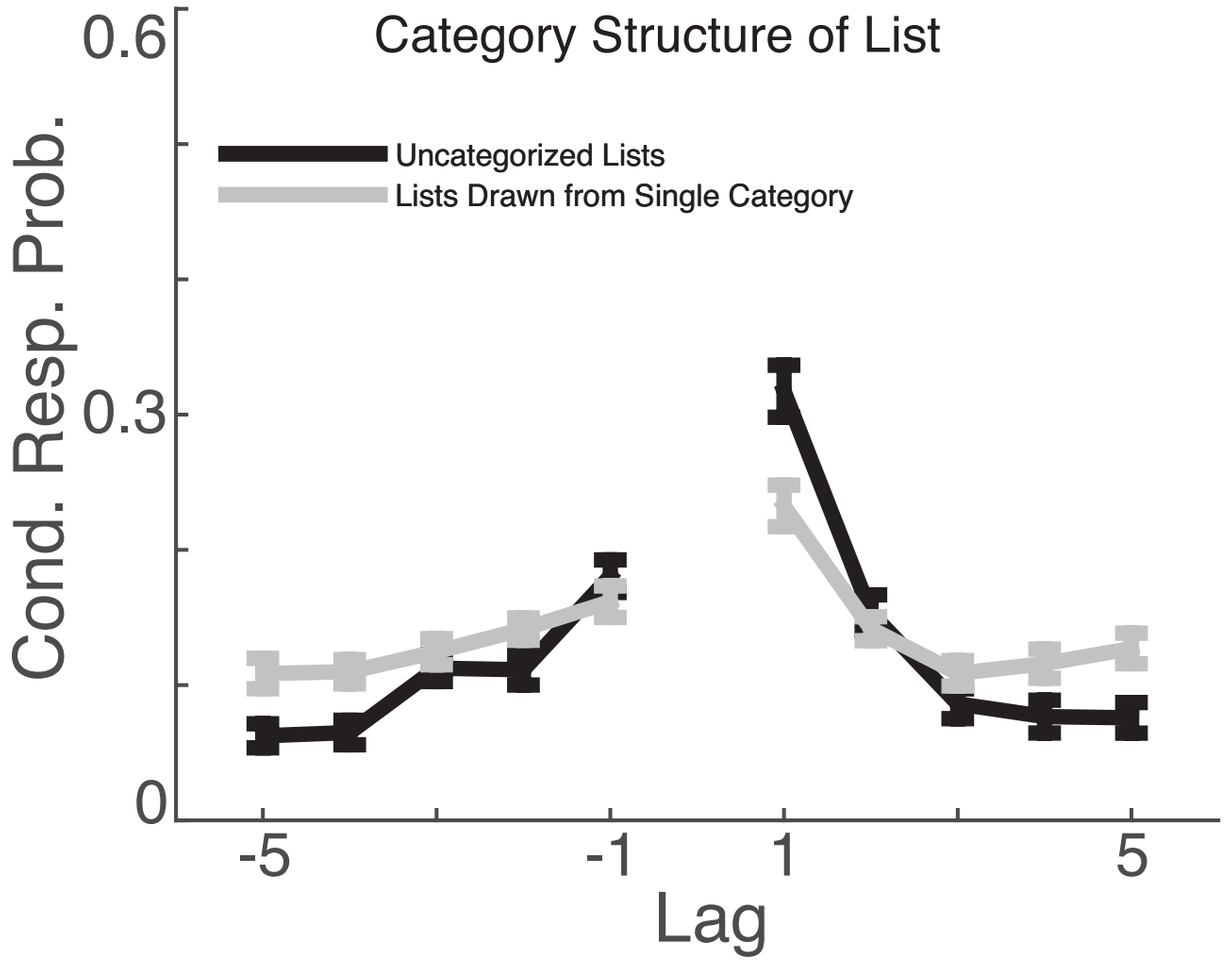

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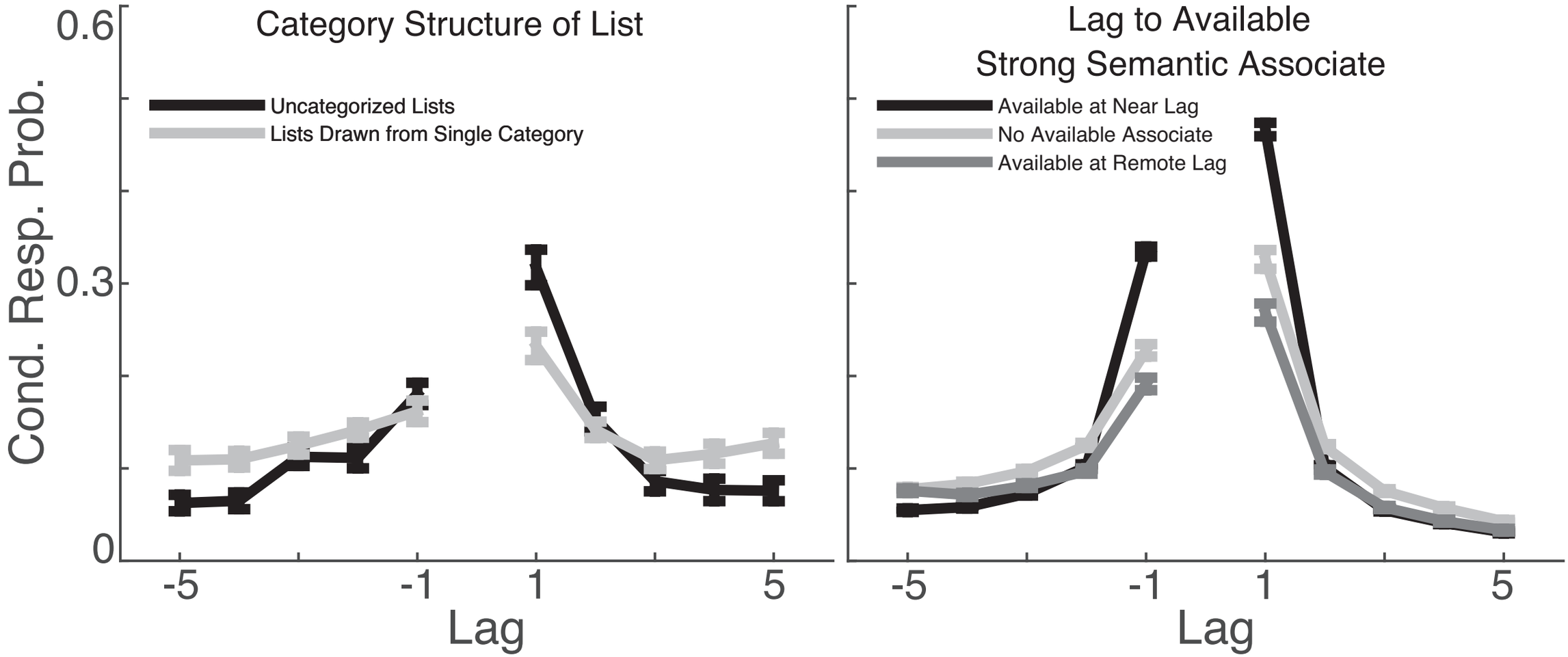

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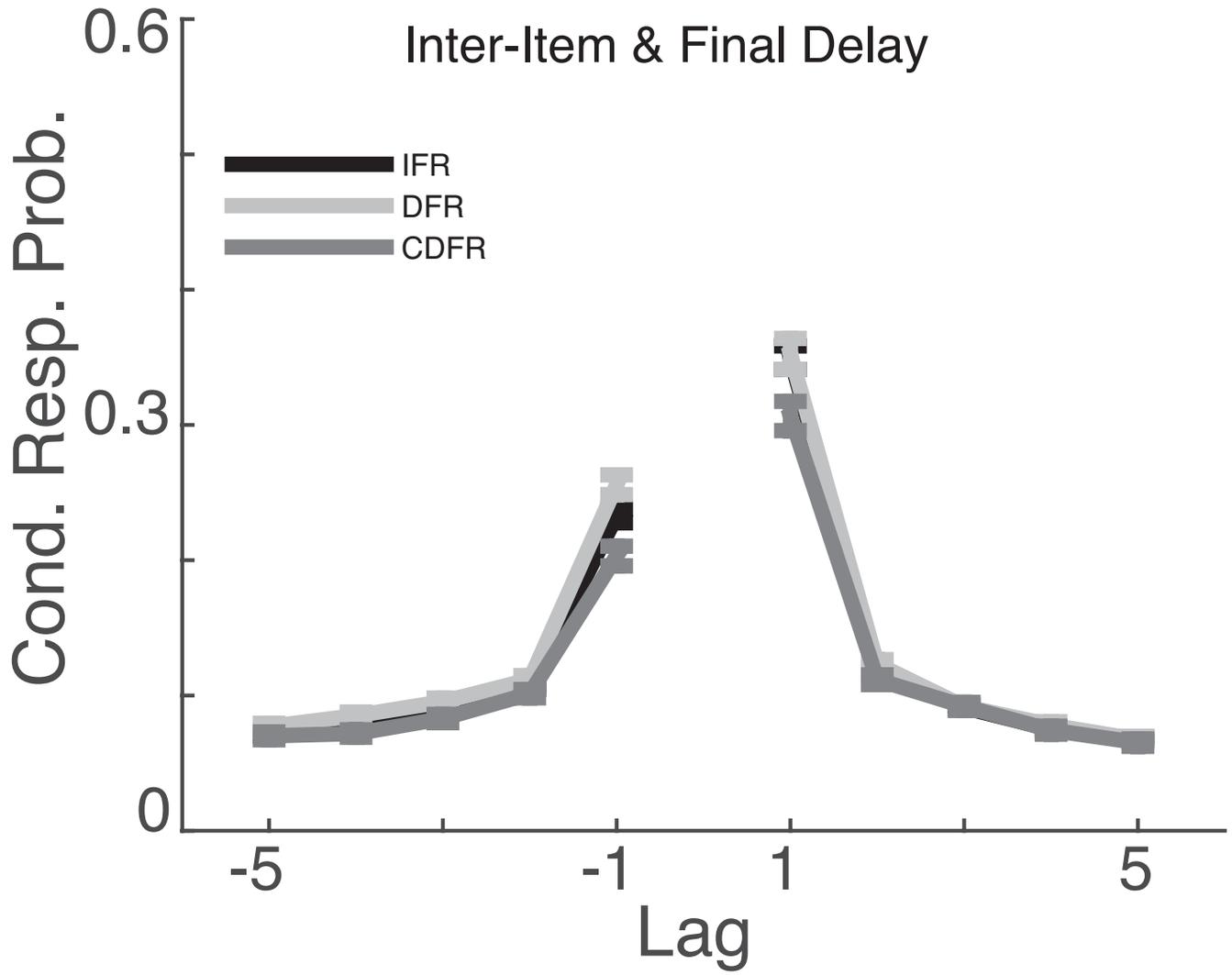

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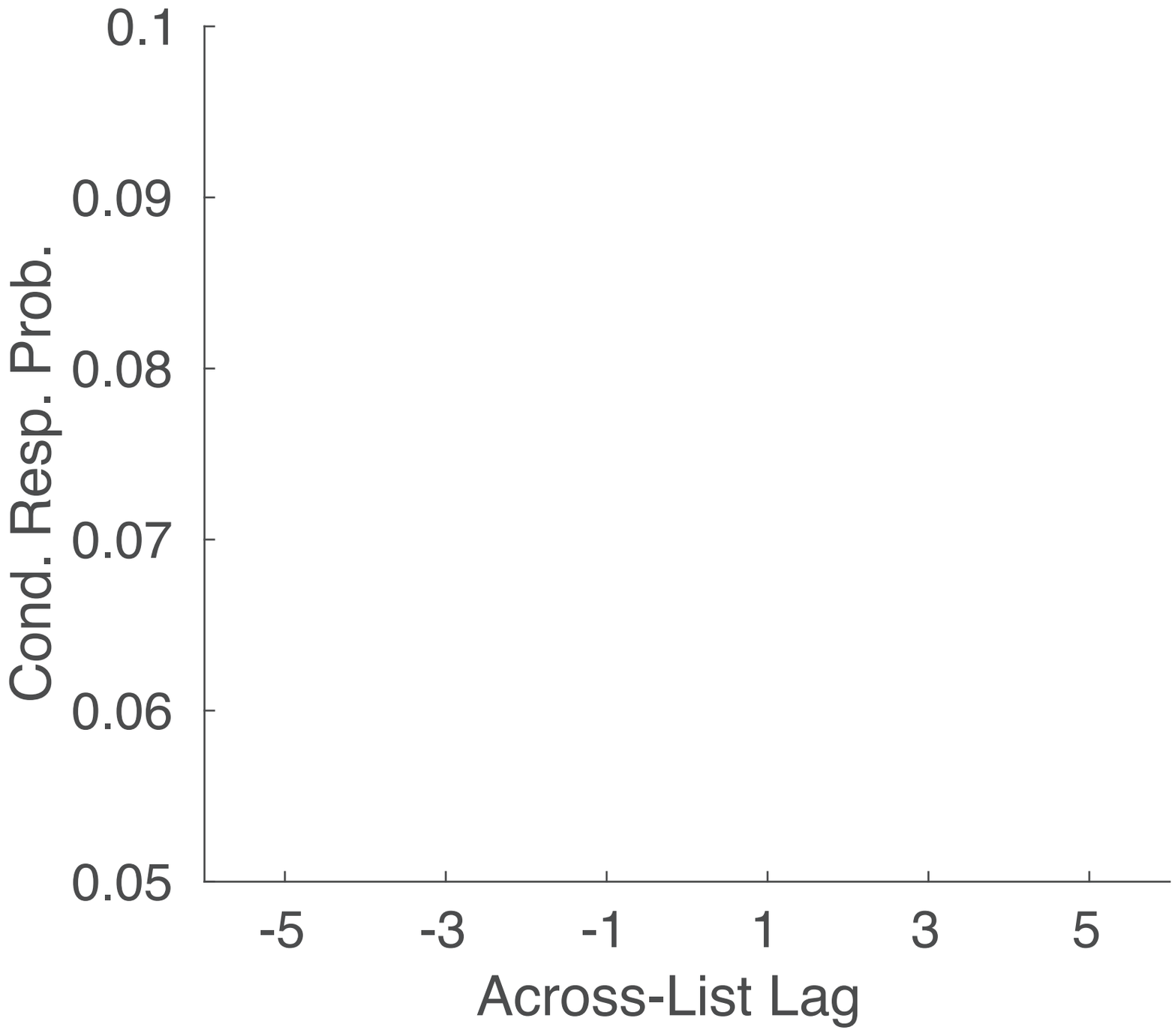

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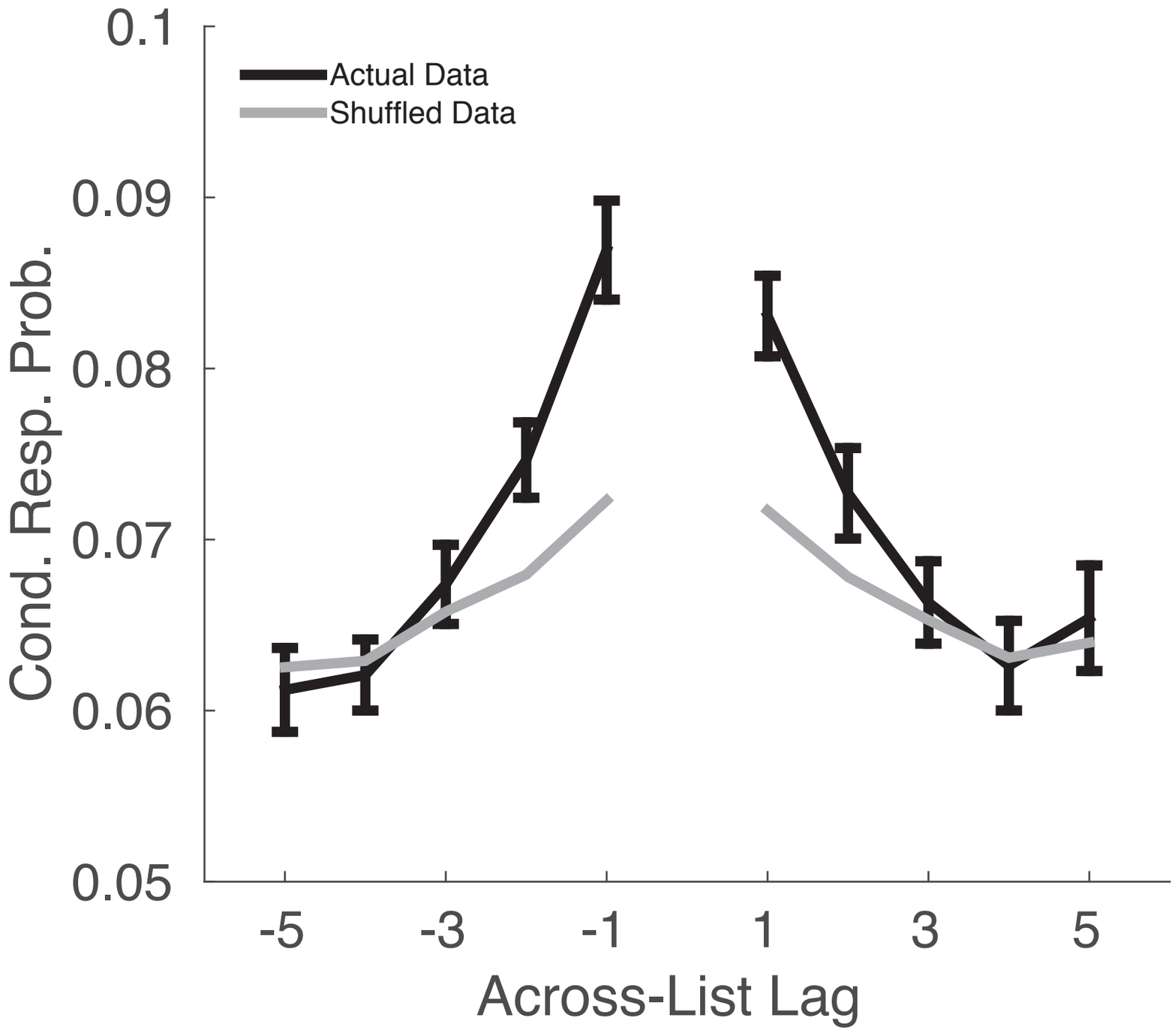

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- Recall of autobiographical events (Moreton & Ward, 2010)

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Healey & Kahana (submitted)

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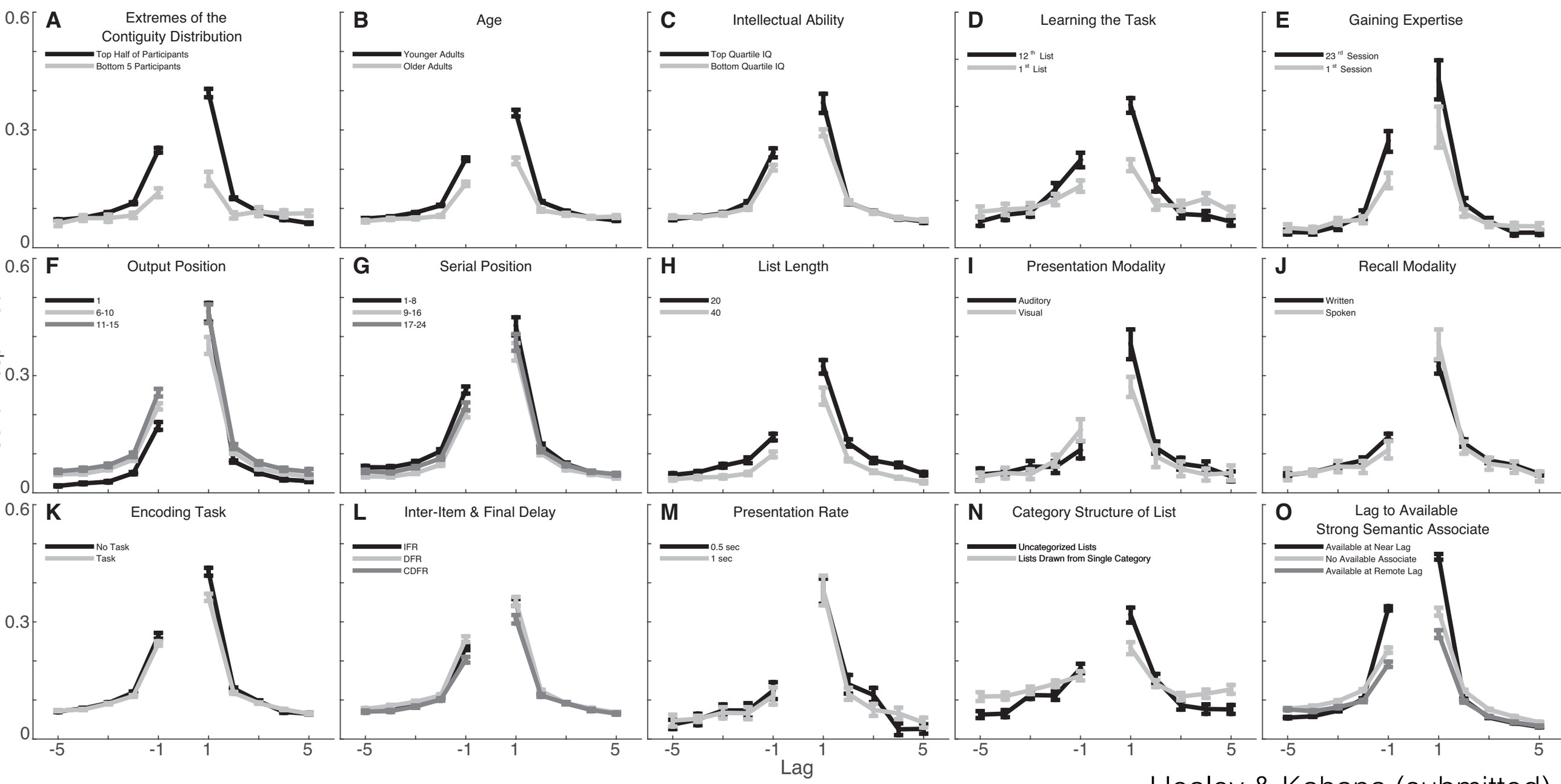

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  - Absent when subjects do not intend to encode (Nairne et al., 2017)

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- Places claims of universality on shaky ground
(Hintzman, 2016)

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- **Experiment 1:** looking for contiguity when there is no intent to **learn** (Nairne et al., 2017)

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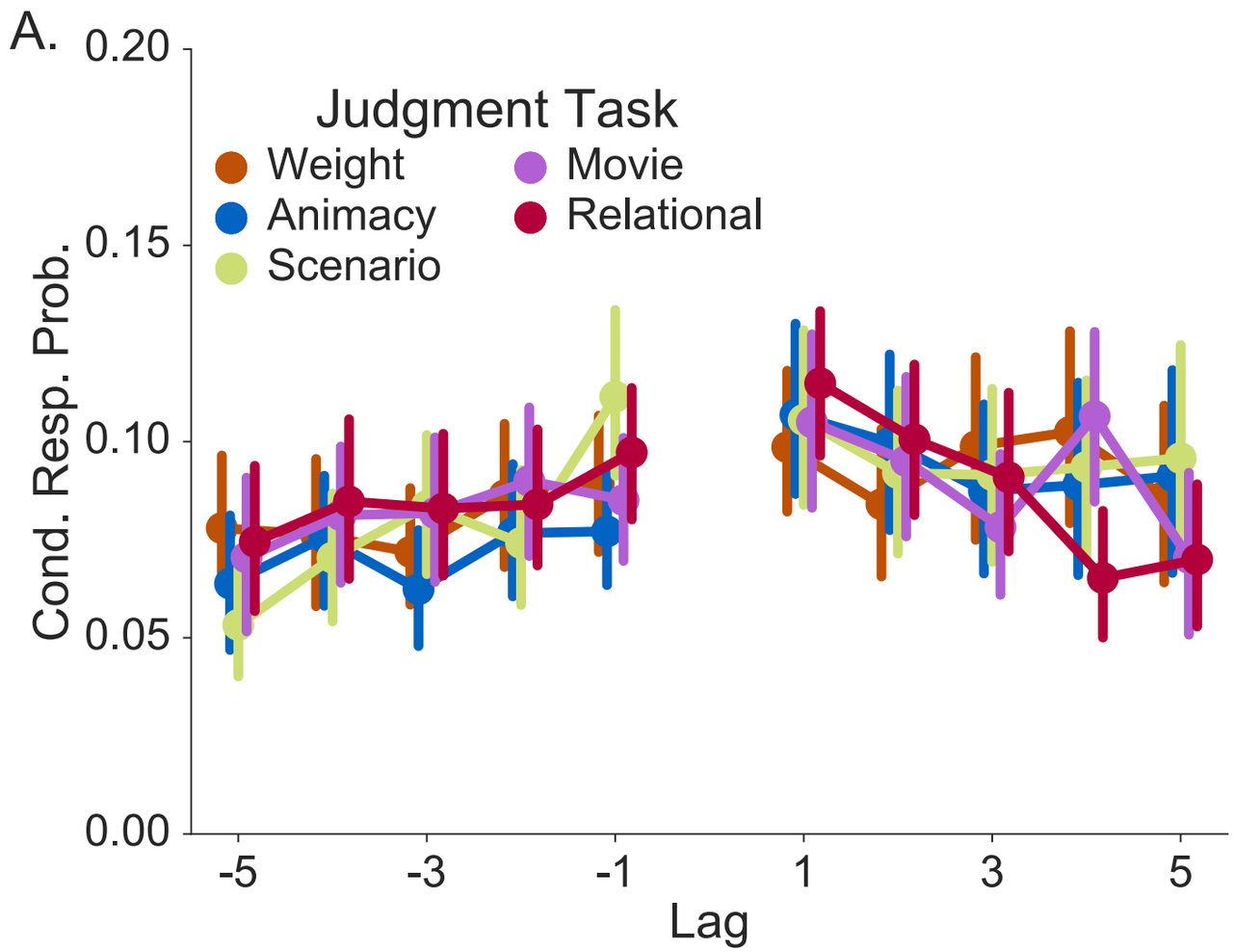
    5. Make a mental movie that incorporates each new item (Deep Relational)

Removing intent to encode **does not** eliminate contiguity



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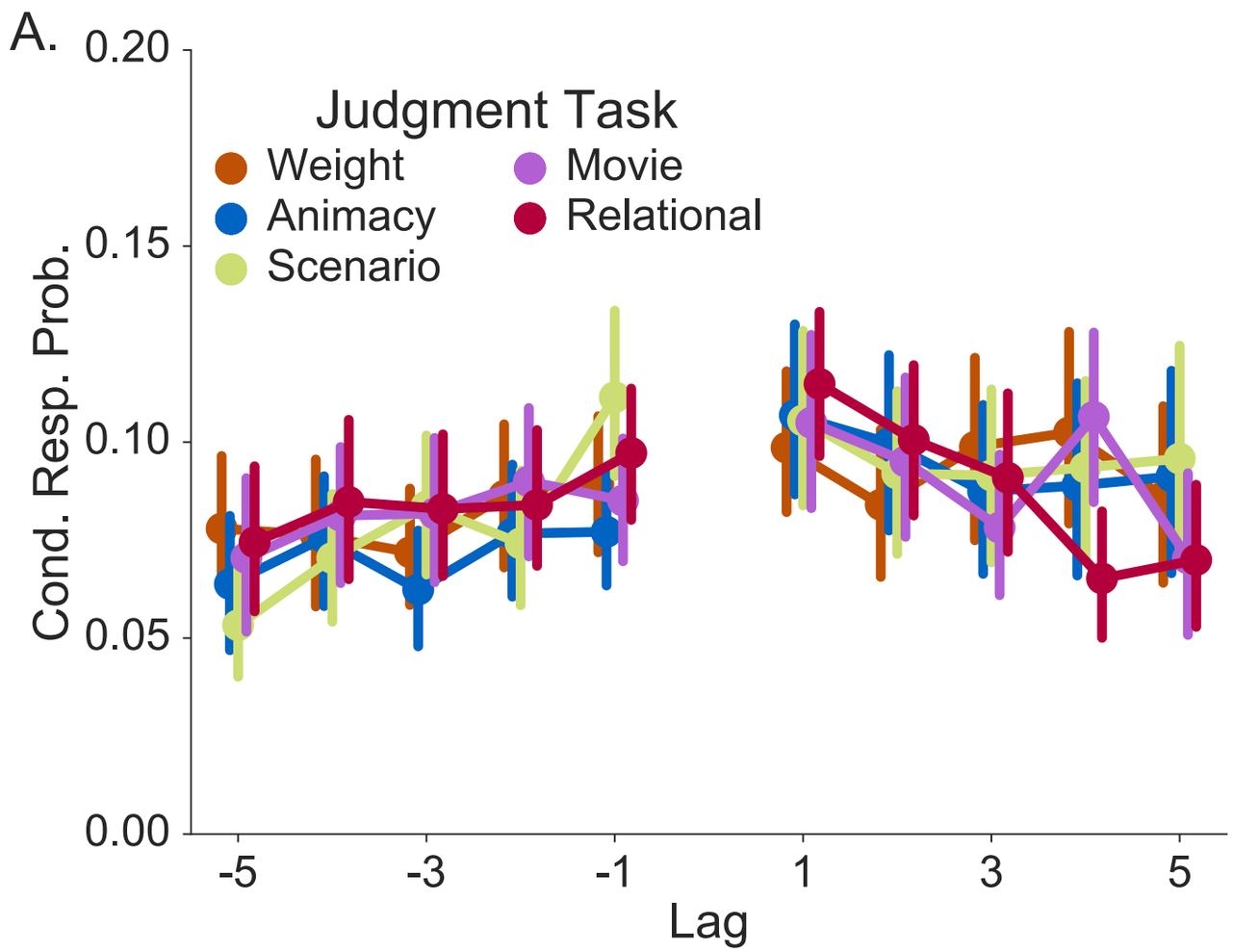

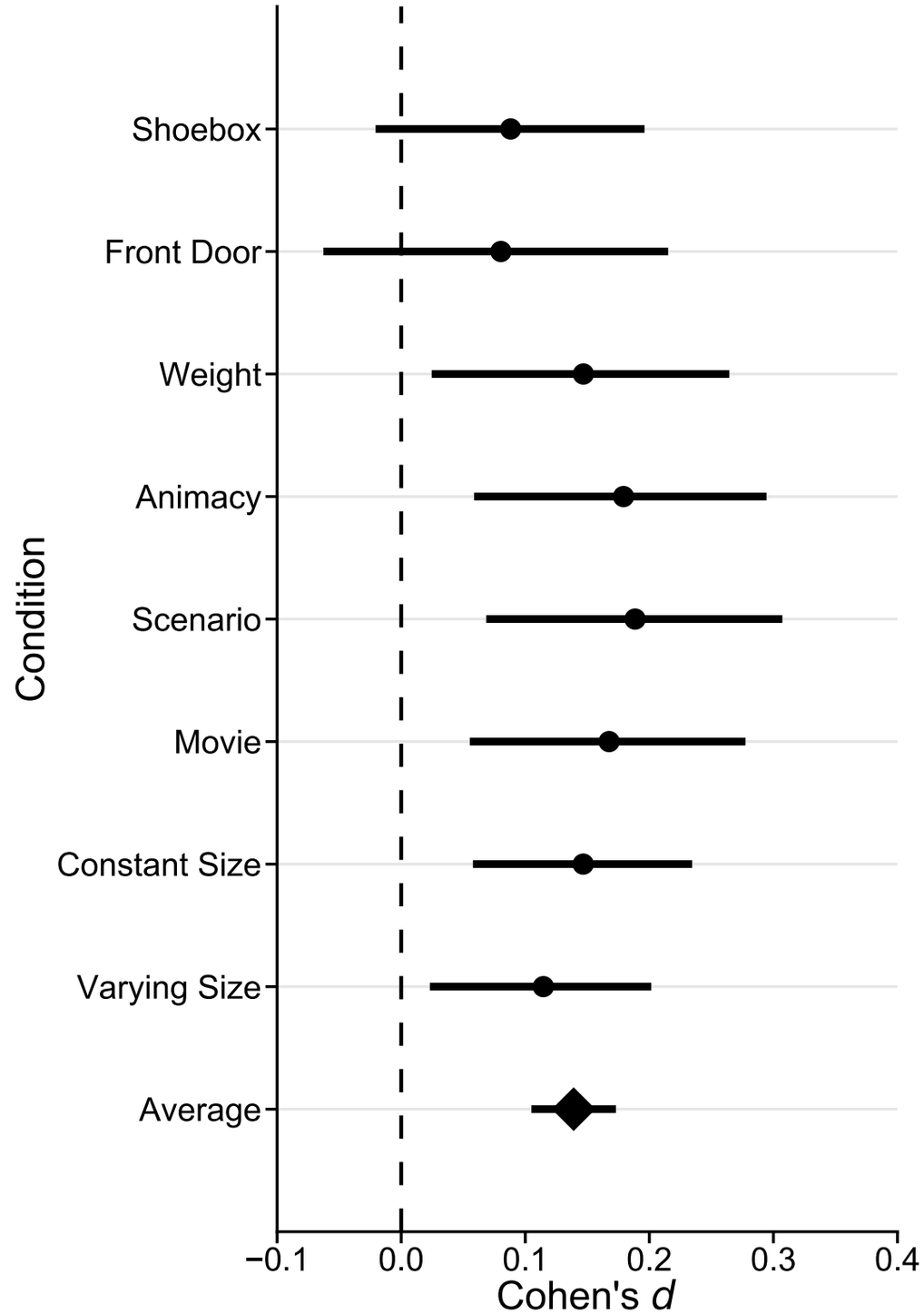

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- **Experiment 2:** looking for contiguity **outside the lab**

Looking for Temporal Contiguity Outside the Lab

- In the weeks following the 2016 presidential election we looked for temporal contiguity when people recalled details of the election campaign.

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  - Except not studied one after another in a chain.
  - Instead, interwoven with other events separated by irregularly spaced intervals of days to months.

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- 5,776 transitions (*M* = 5.50, *SD* = 4.36)

Calculating Transition Lags

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"Trump's Access
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- October 7, 2016

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- October 28, 2016

Calculating Transition Lags

"Trump's Access Hollywood hot mic"

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Lag = 599 - 578 = +21

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“Trump won’t accept the
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Calculating Transition Lags

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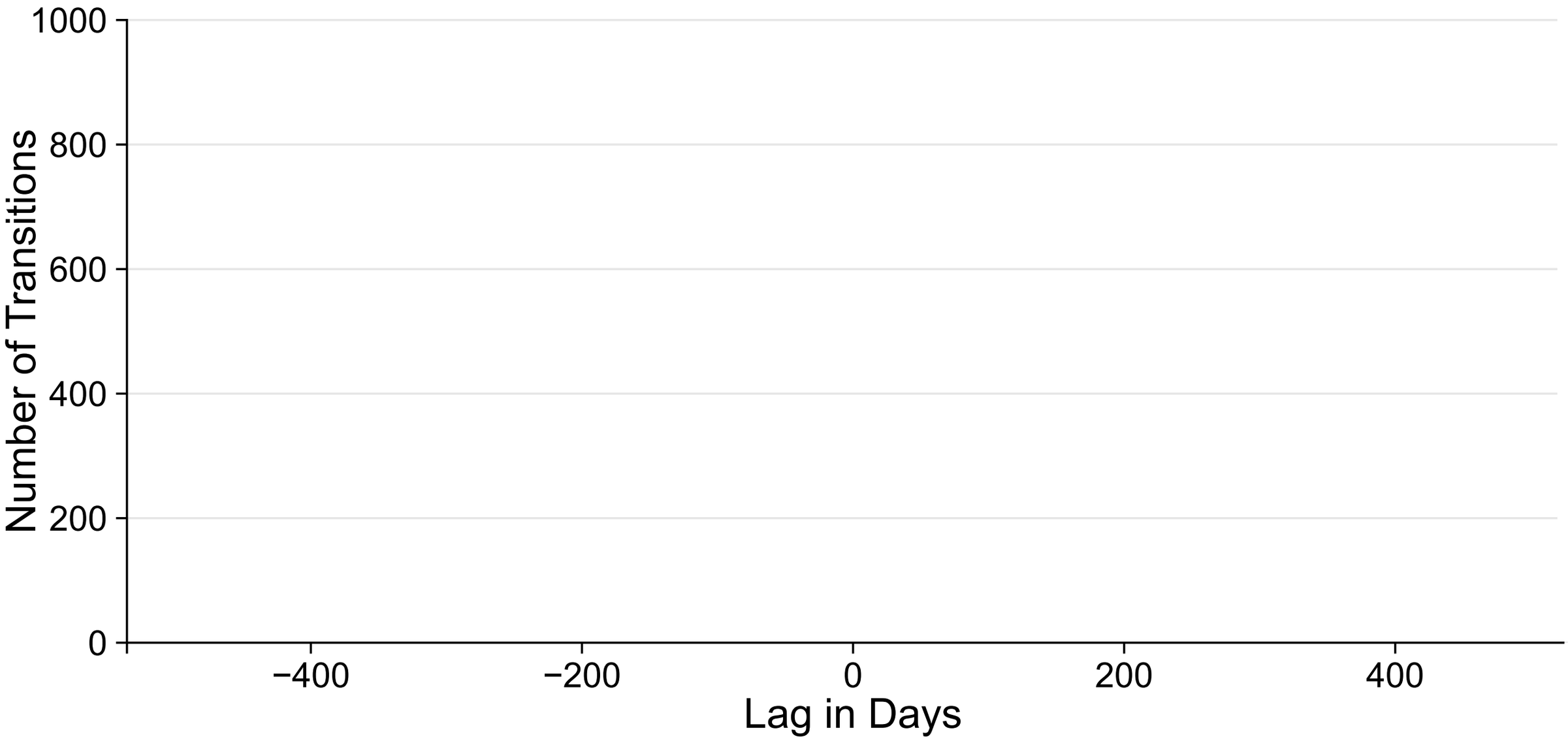
Lag = 0

Transition lags peak at zero days



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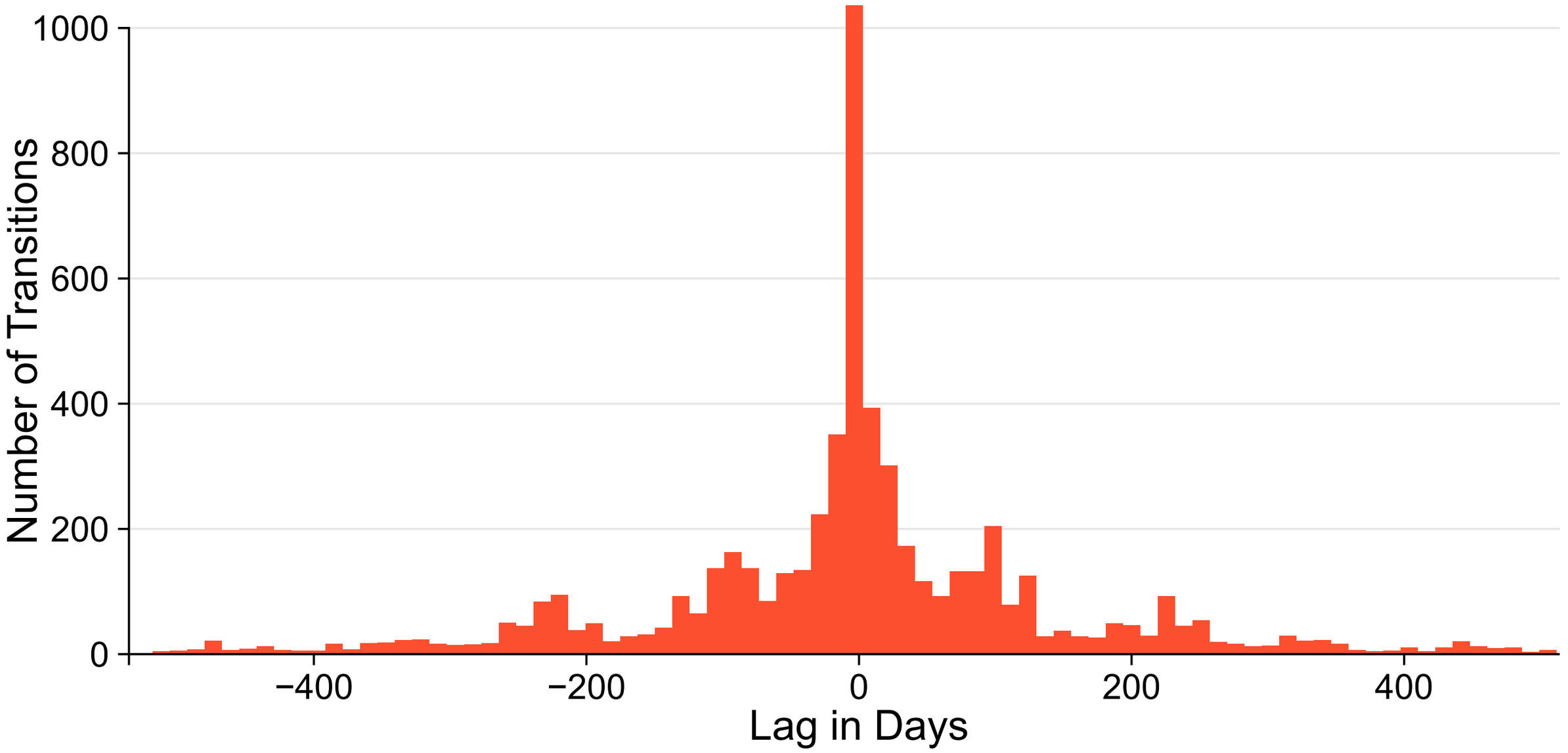

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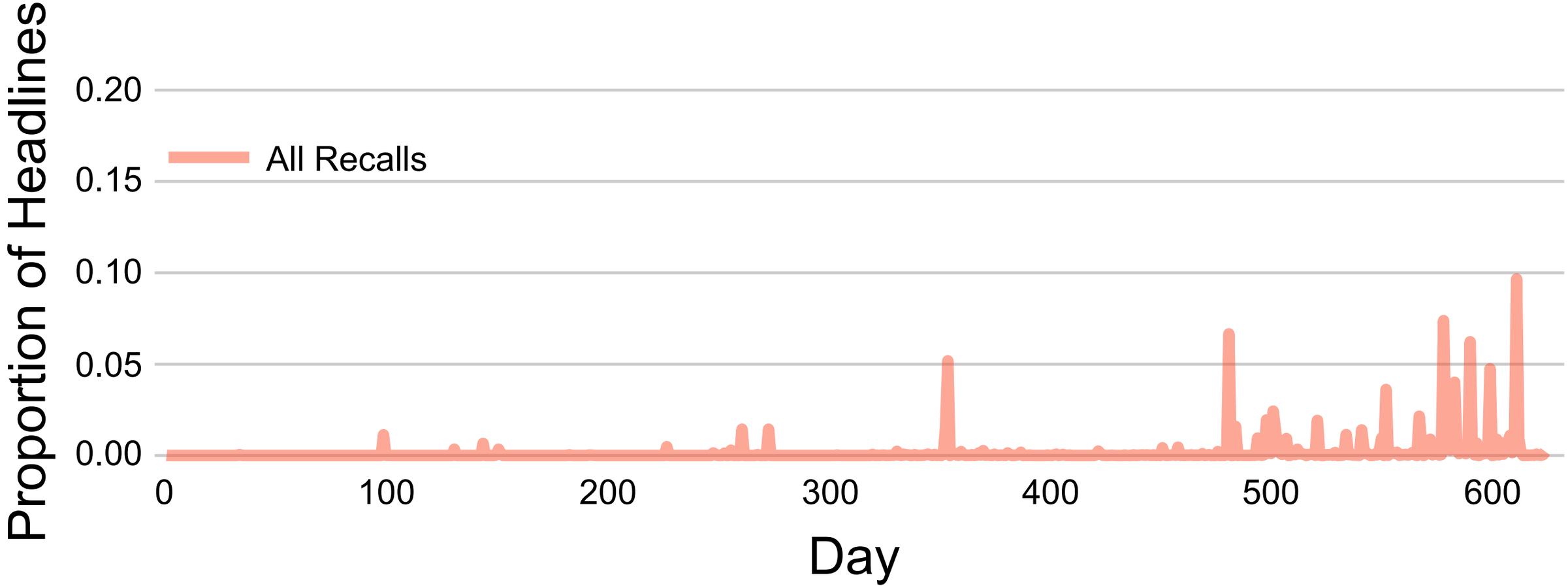
- We'd expect an artificial contiguity effect

Distribution of recalled headlines across days



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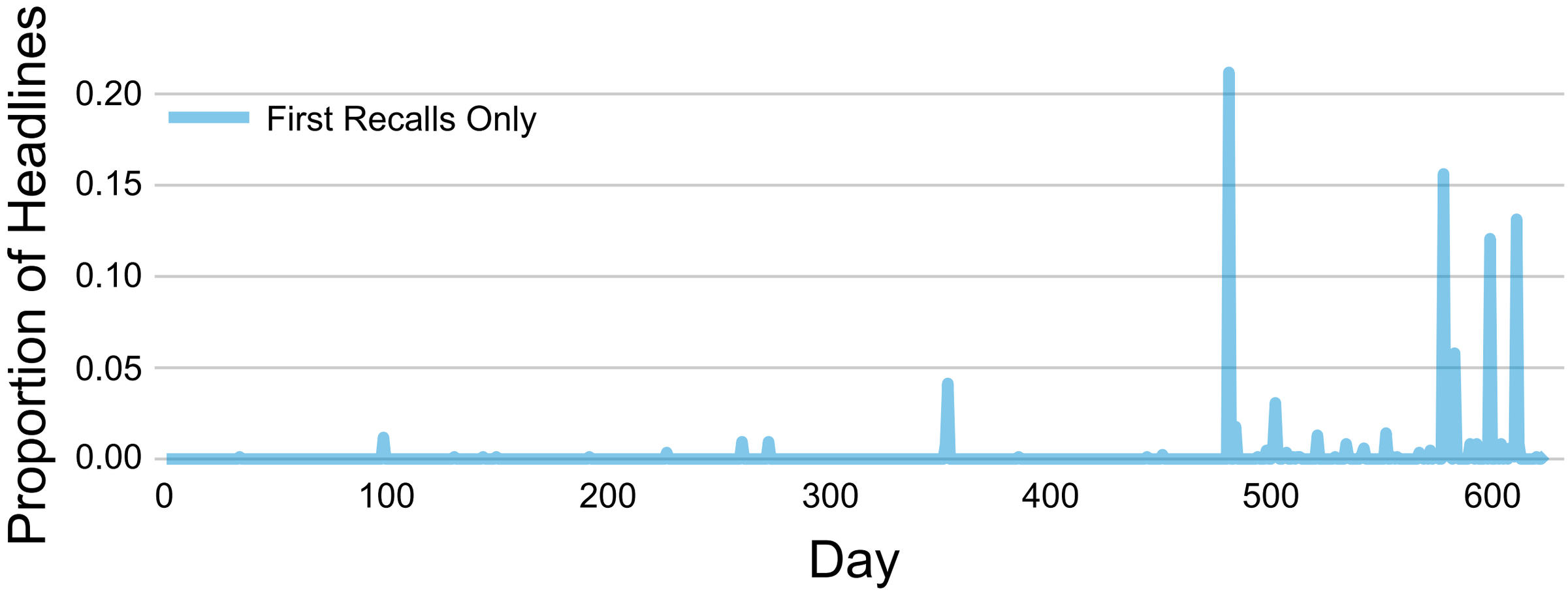

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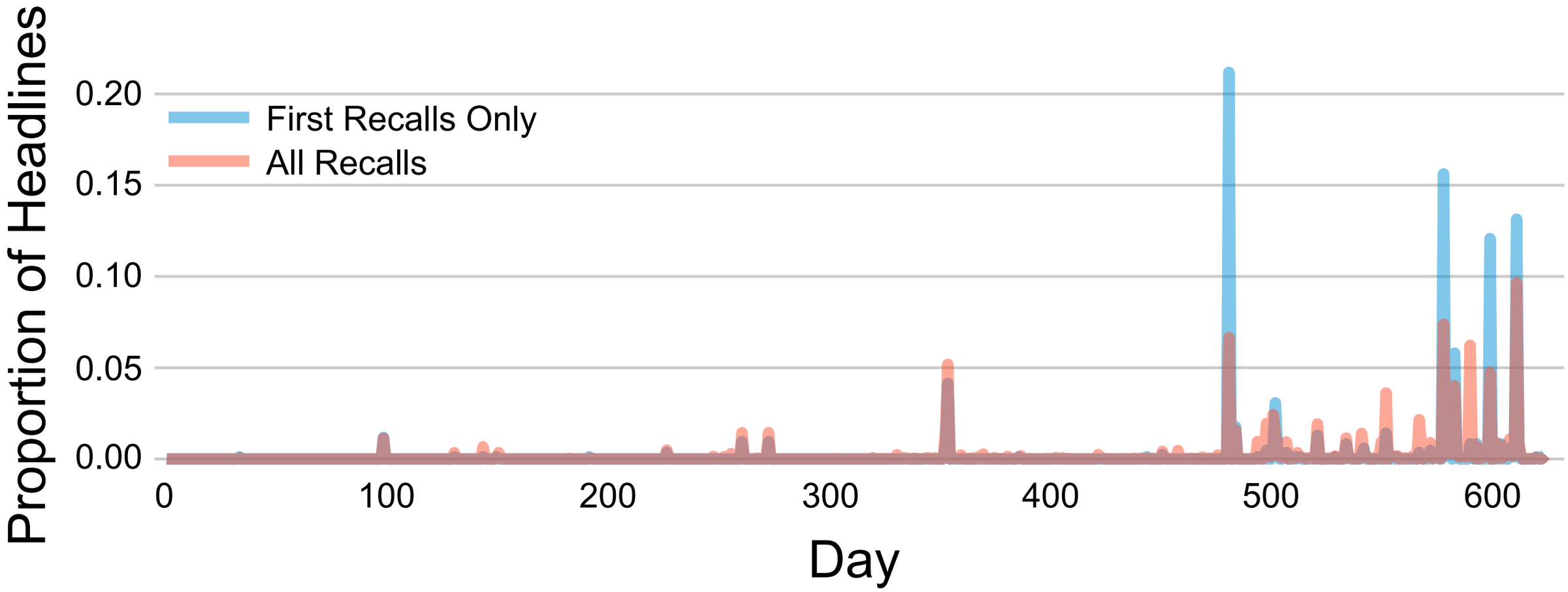

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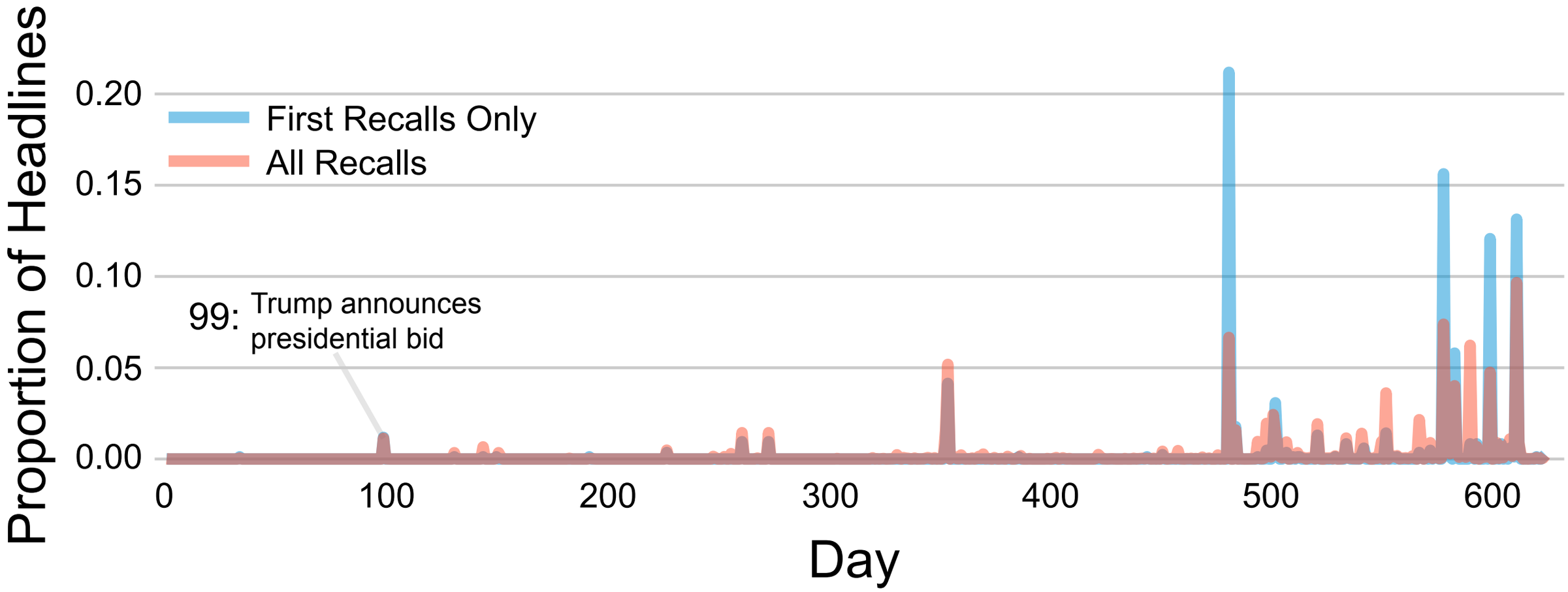

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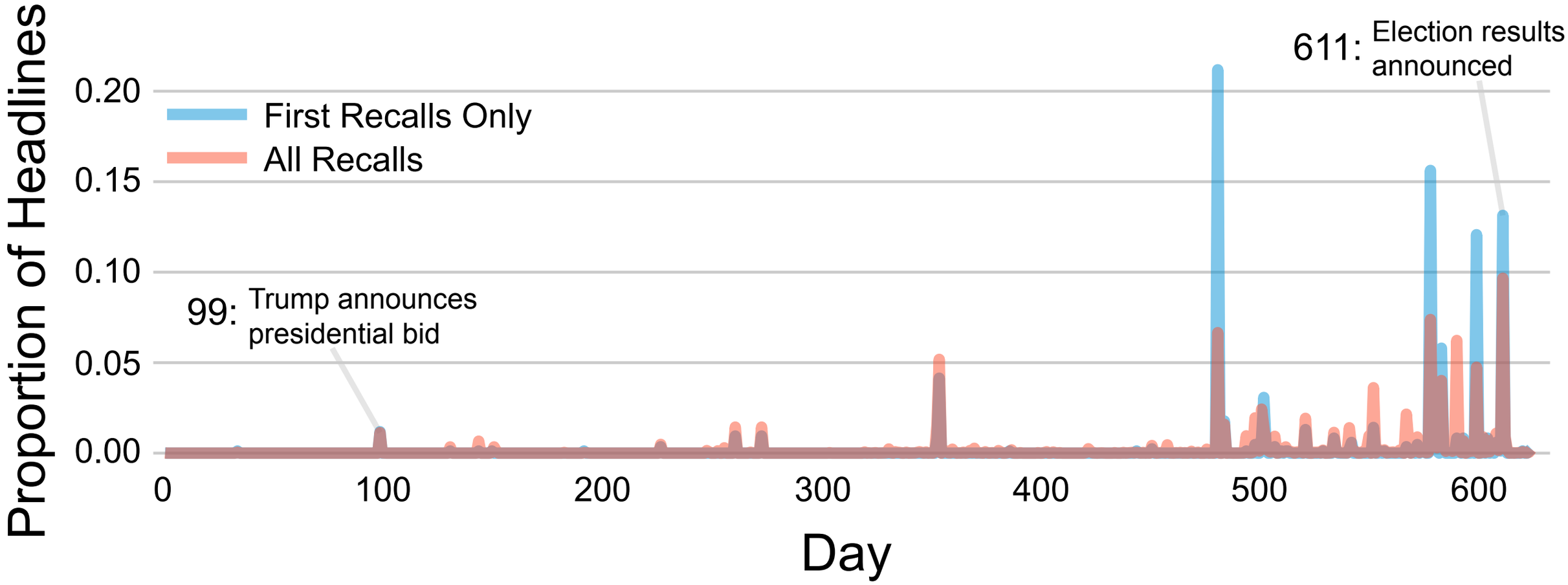

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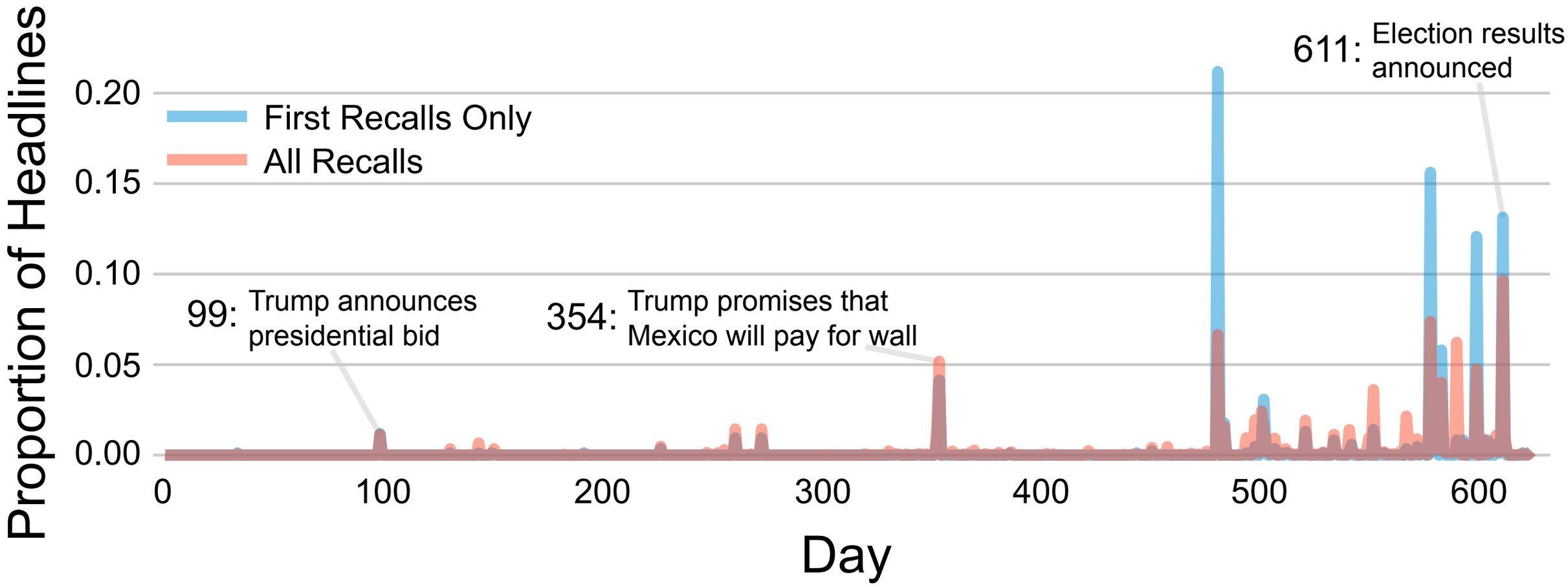

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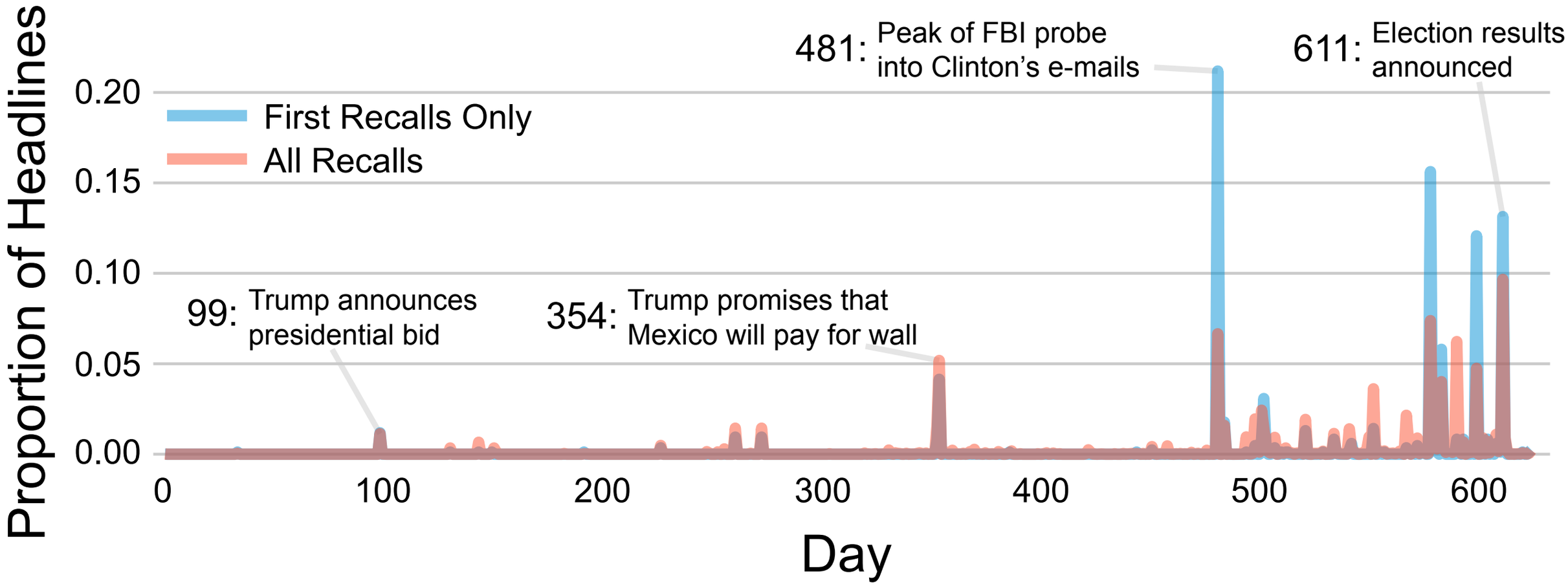

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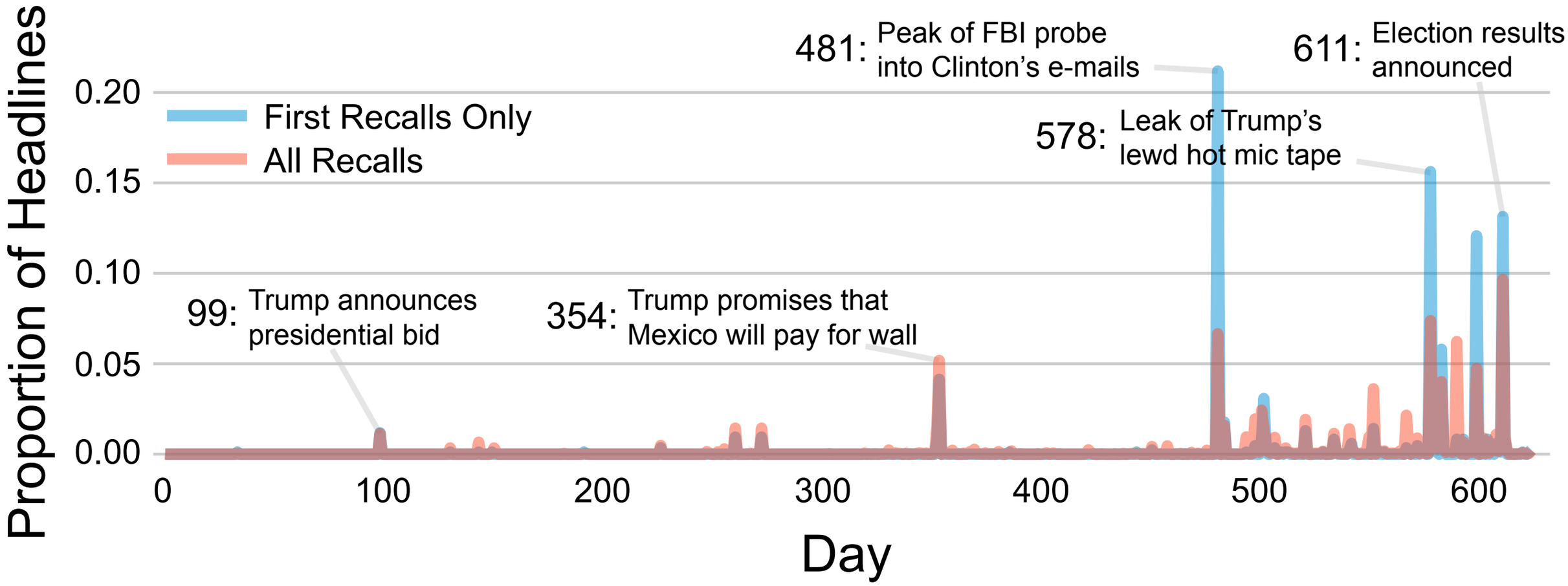

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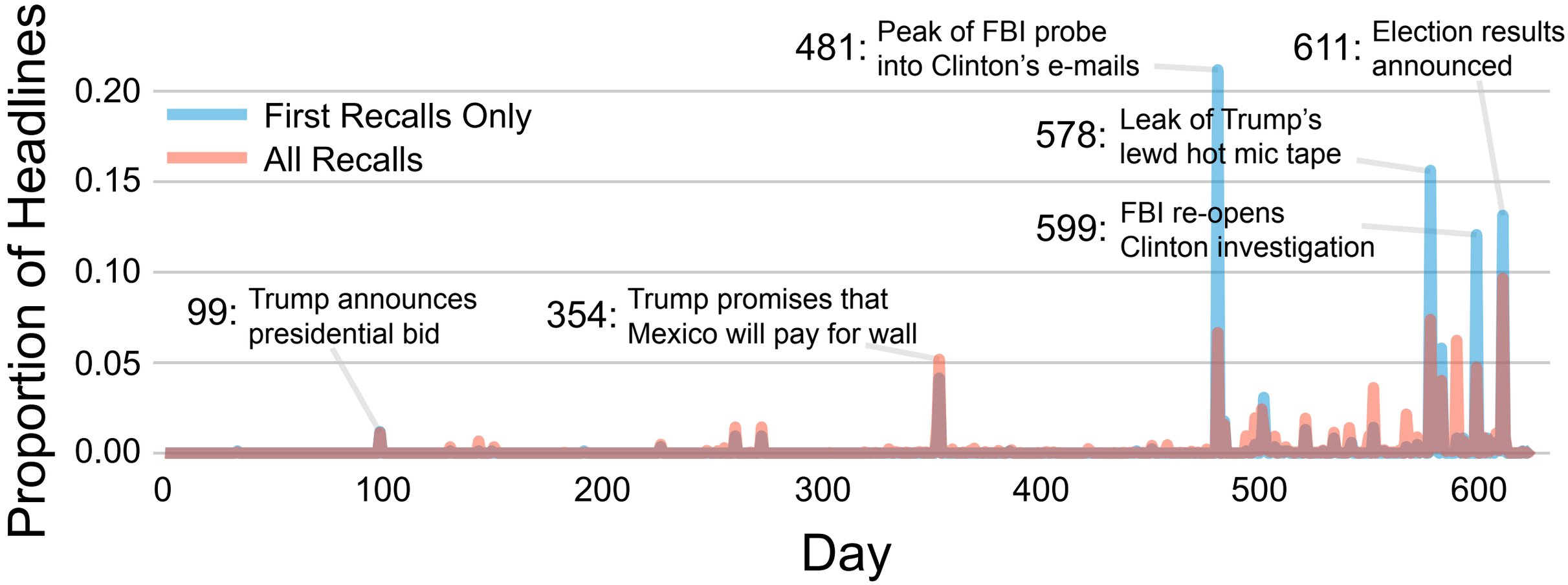

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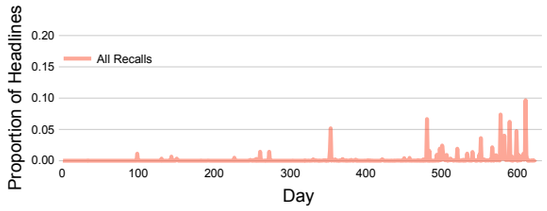

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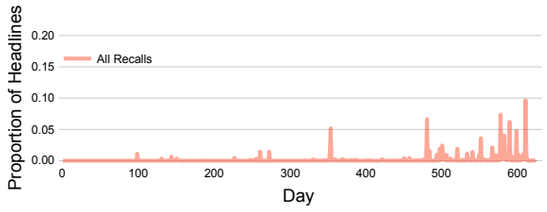
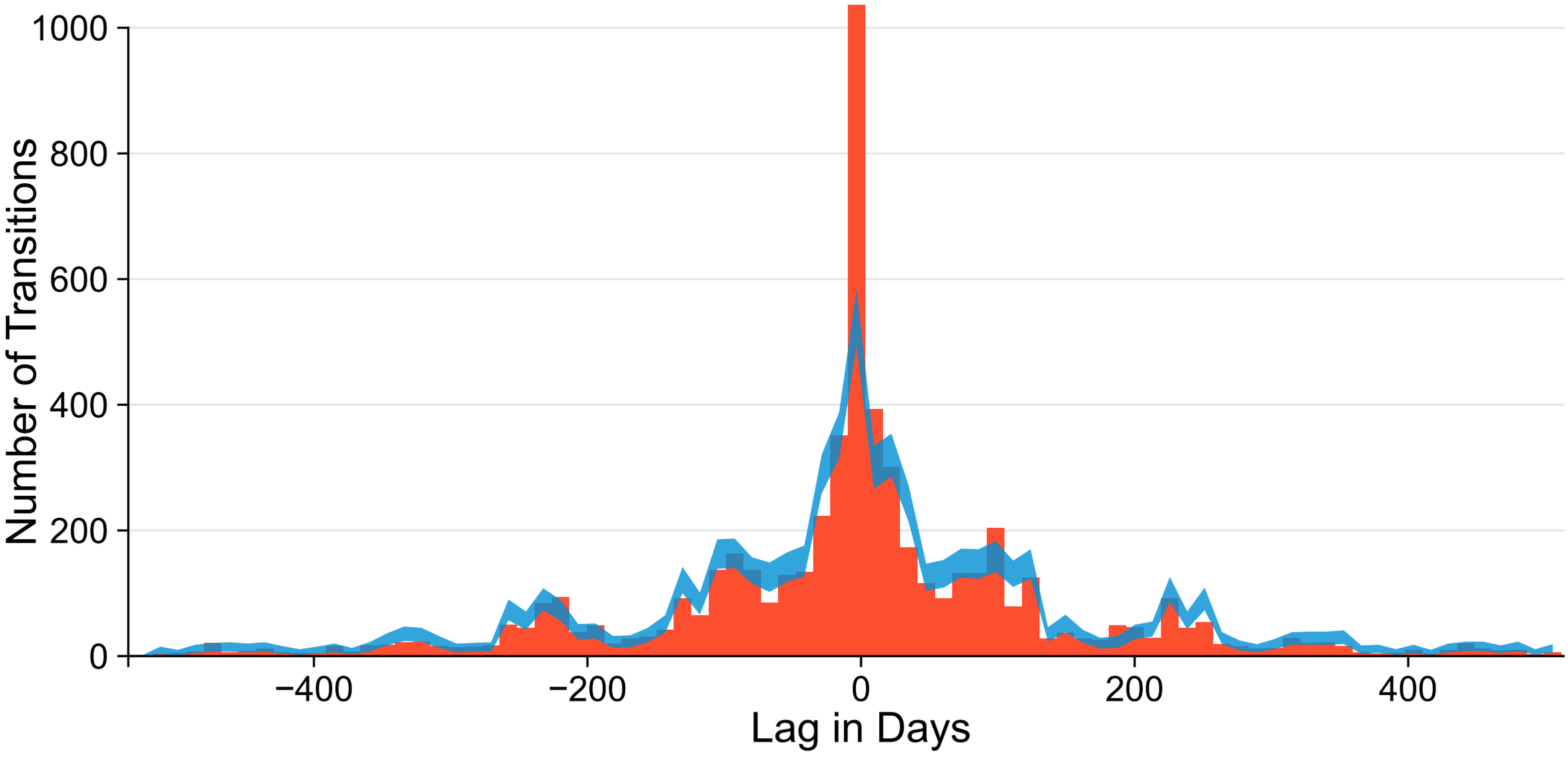


- Because each draw from the distribution is independent, all links between successive recalls are broken and transition lags depend only on headline-clustering

Near-Lag Transitions More Frequent than Chance



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$$Temporal\ bias\ score = actual\ count - expected\ count$$

Lets zoom in on short-lags

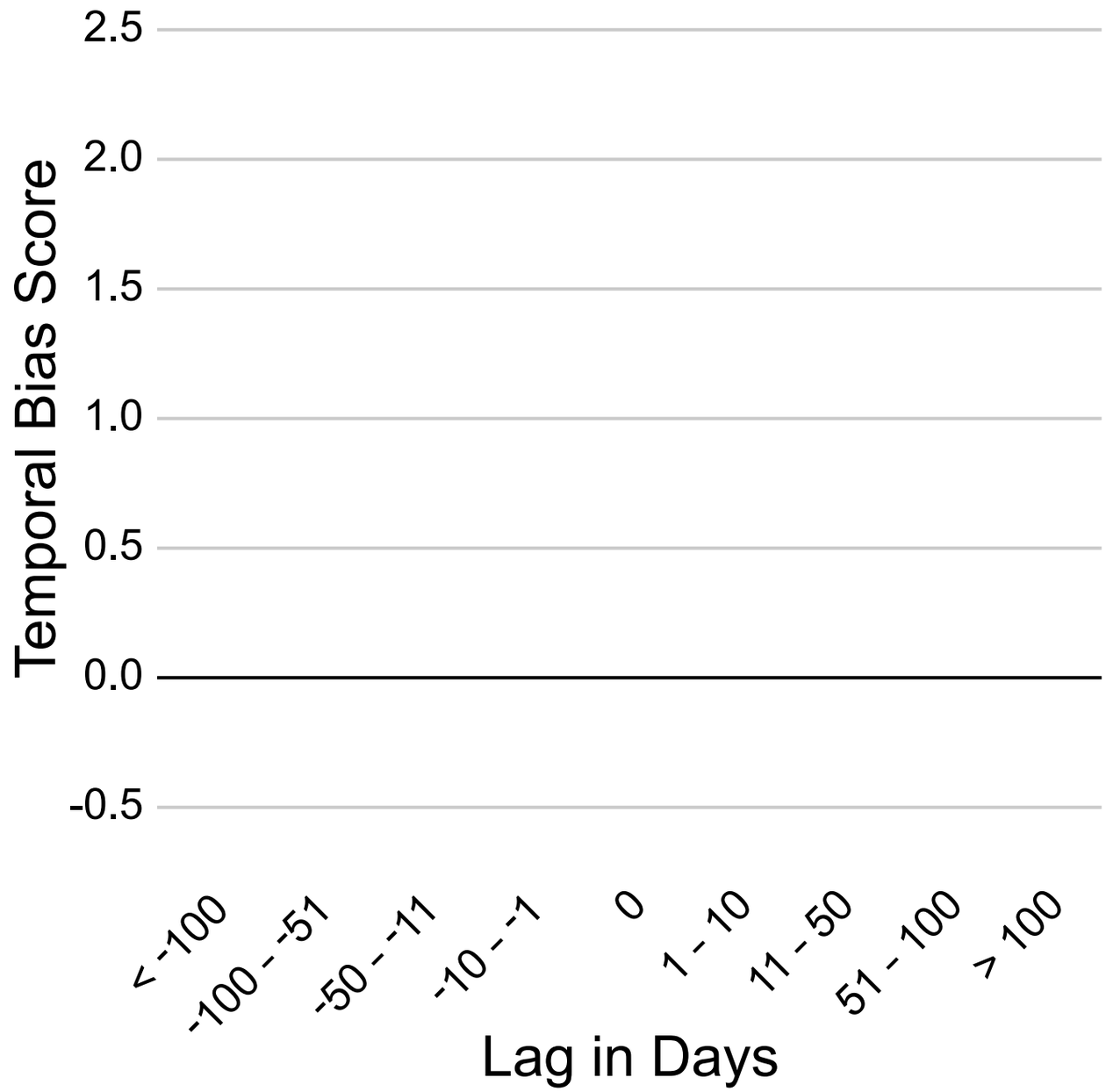
- The difference between the actual and null distributions is largest at short lags.

- Zoomed in on these short lags by grouping lags into bins, using wider bins for longer lags

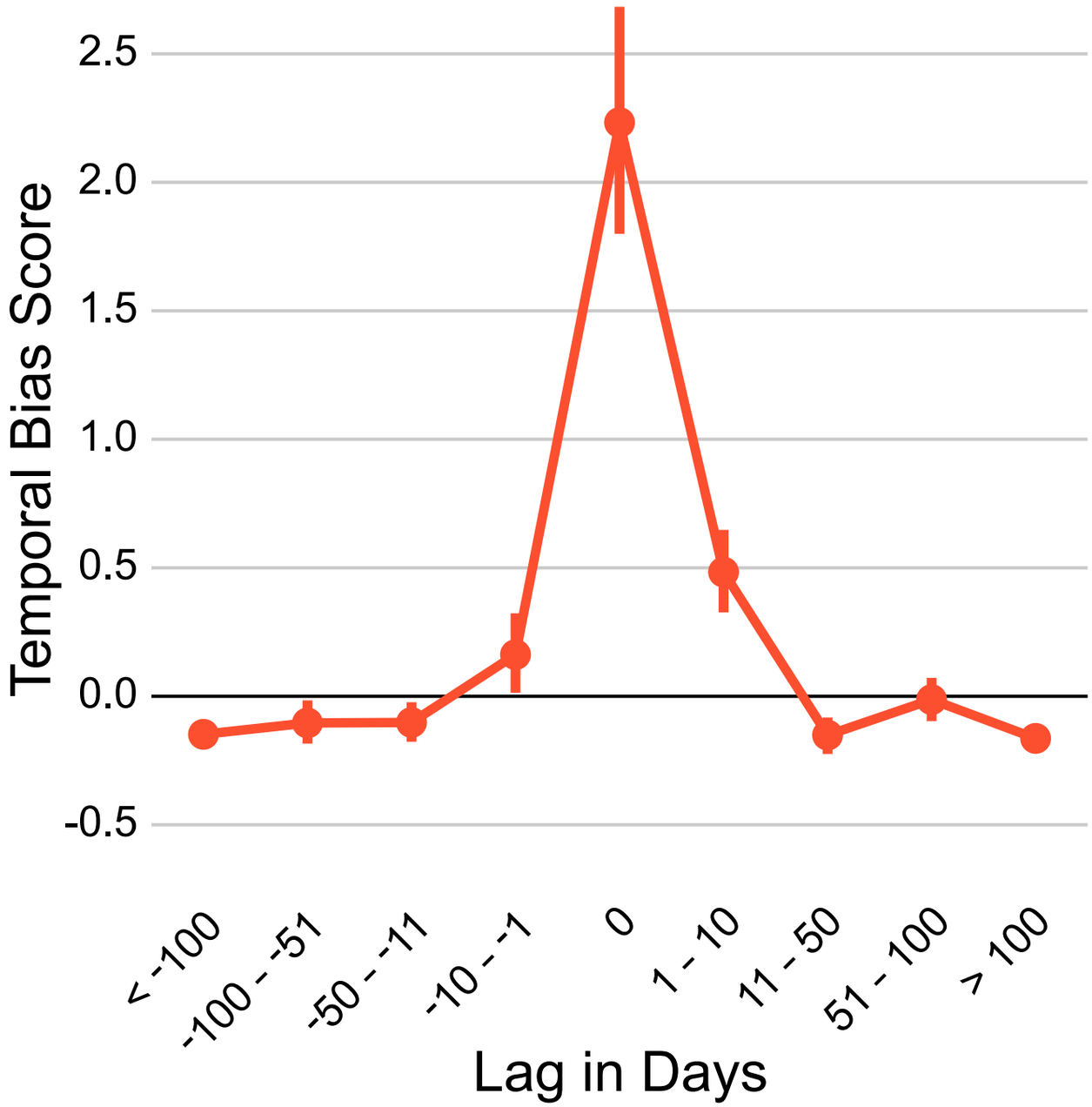
- For each bin, used the actual and null distributions to calculate a *temporal bias score:*

$$Temporal\ bias\ score = \frac{actual\ count - expected\ count}{expected\ count}$$

A Bias Toward Near-Lags



A Bias Toward Near-Lags



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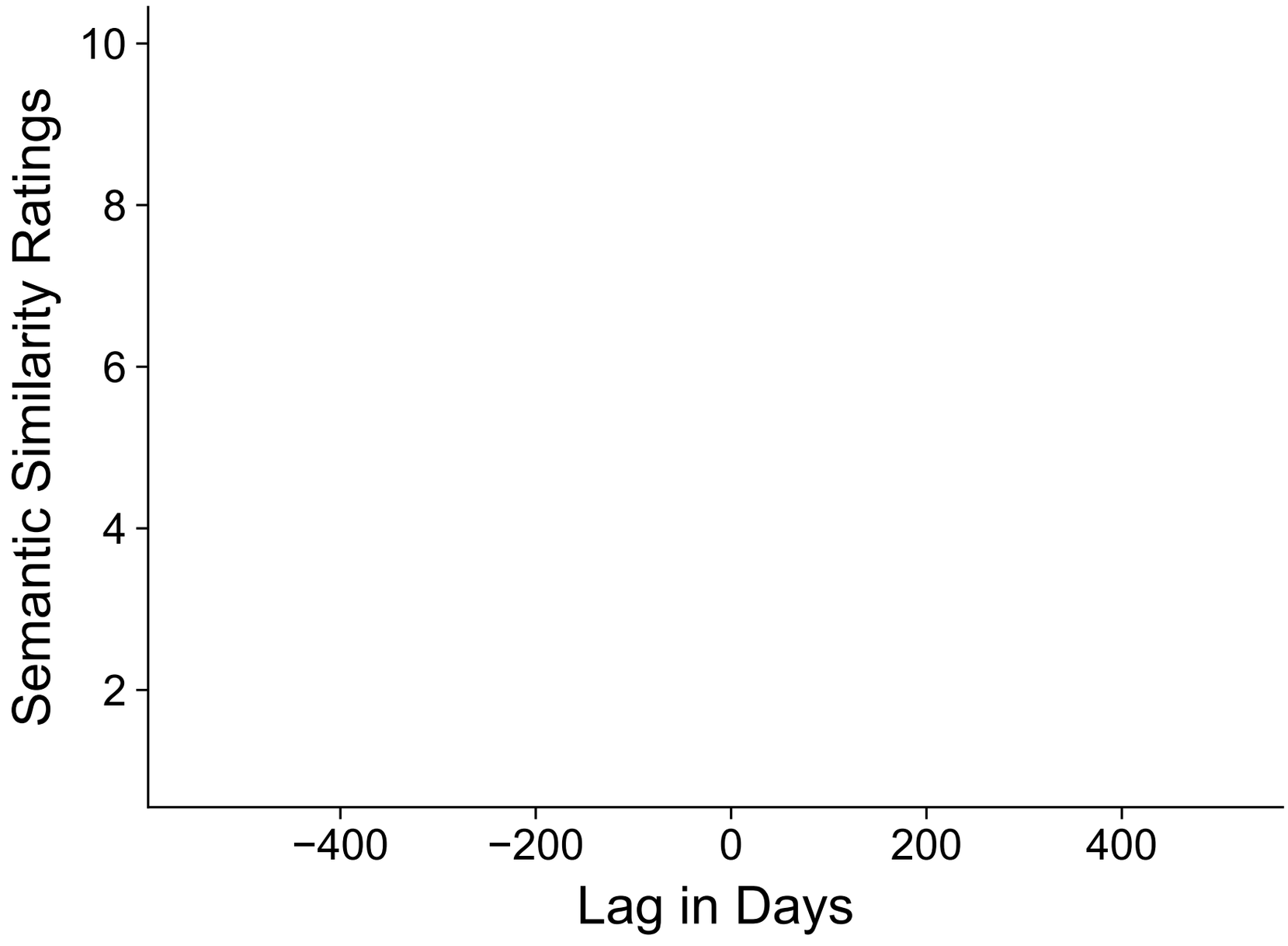
- 4+ raters judged the semantic similarity between the headlines in each of the 5,776 transitions.

Lag and semantic similarity are related



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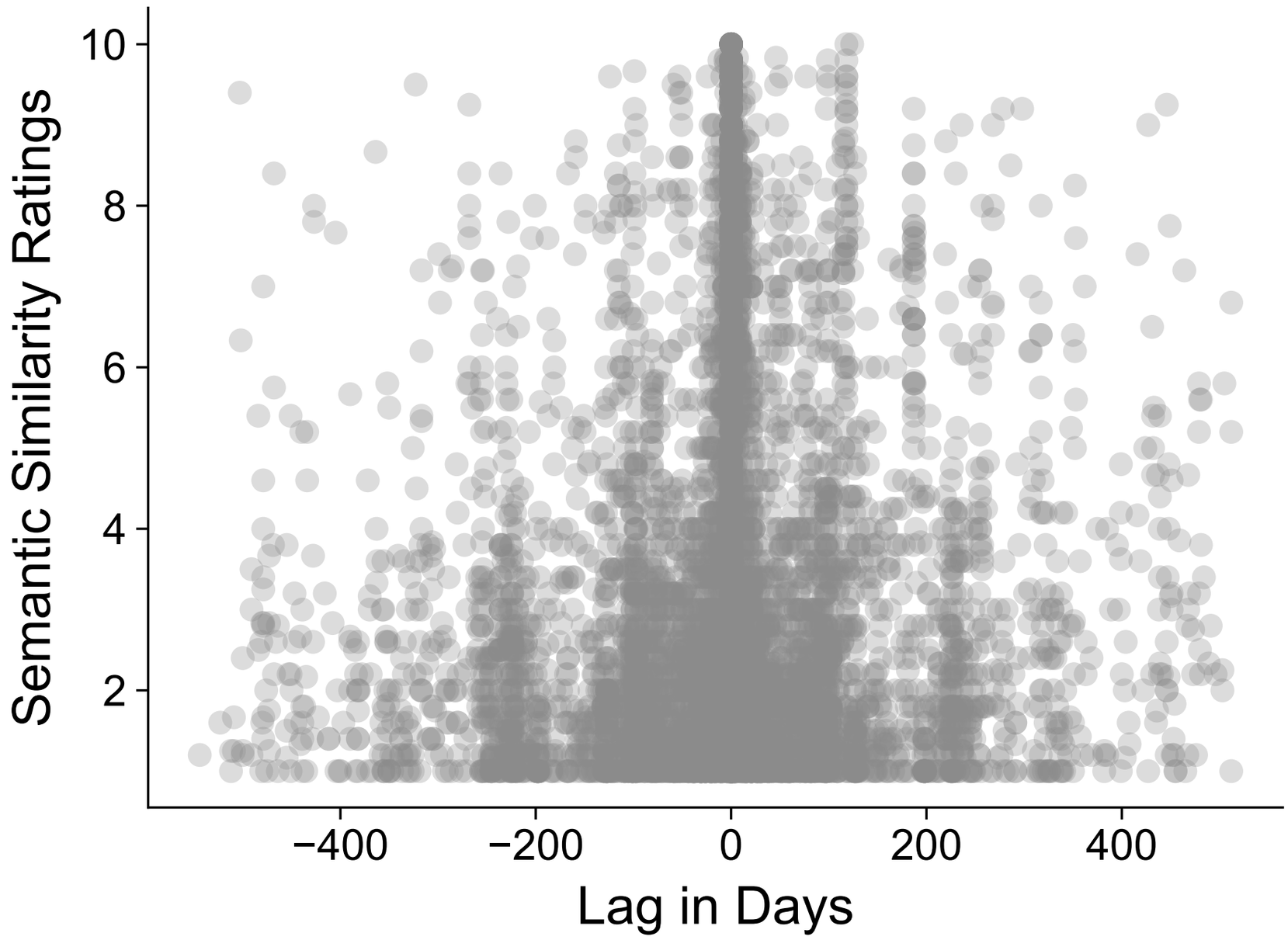

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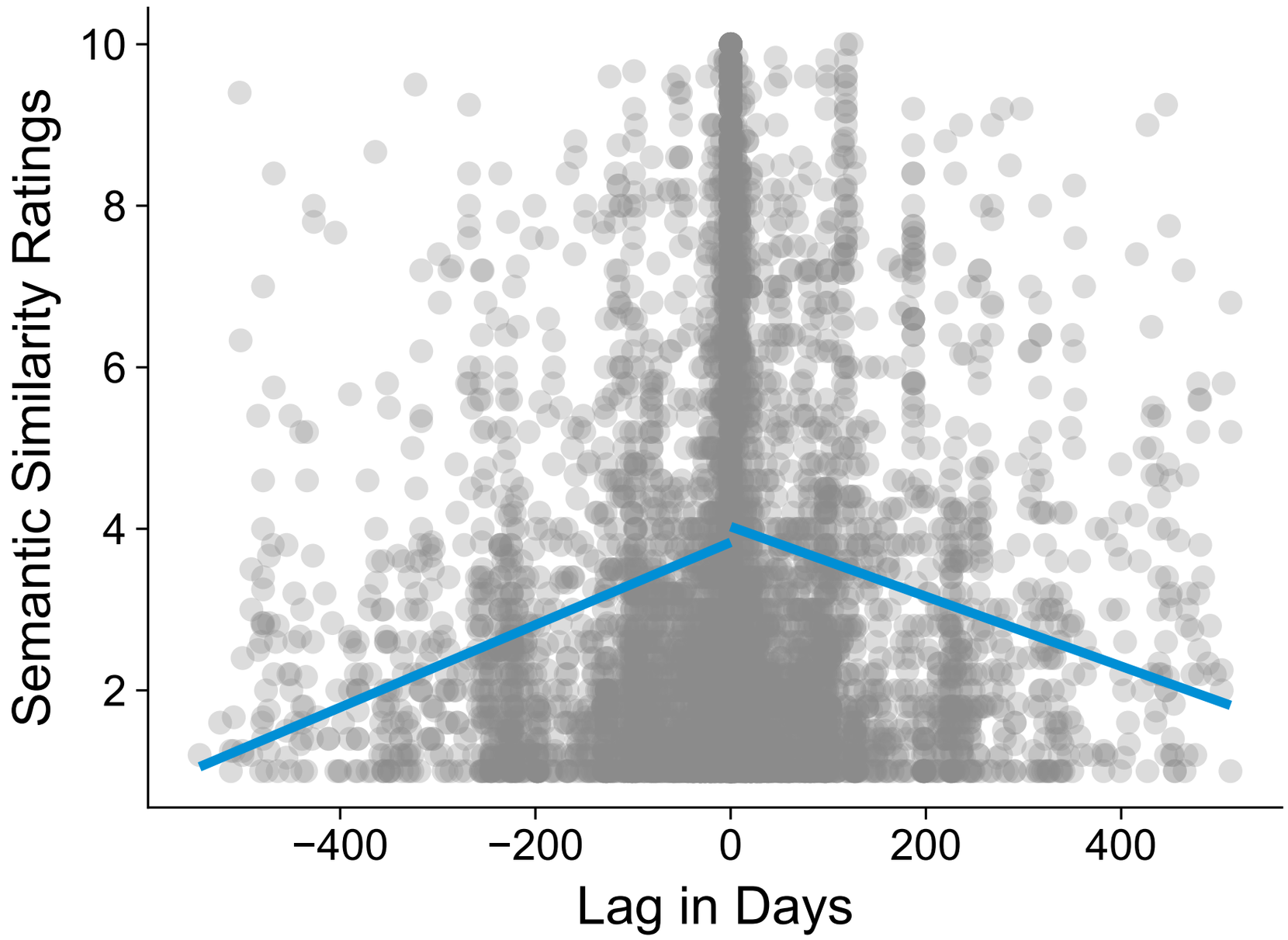

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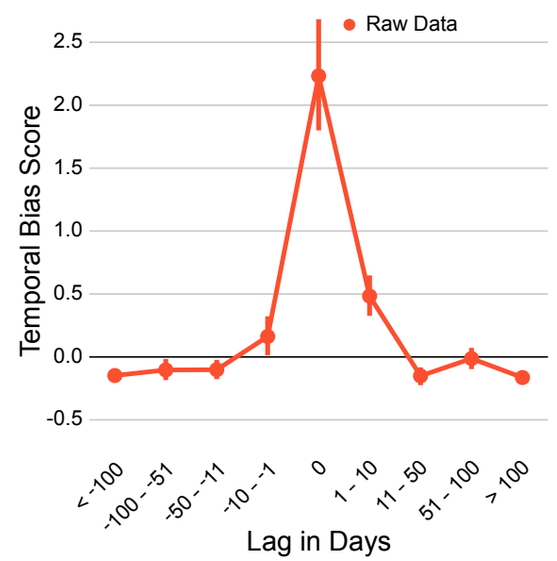

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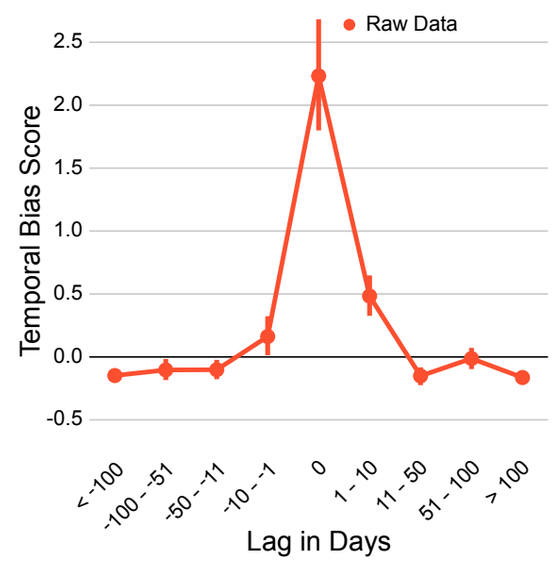

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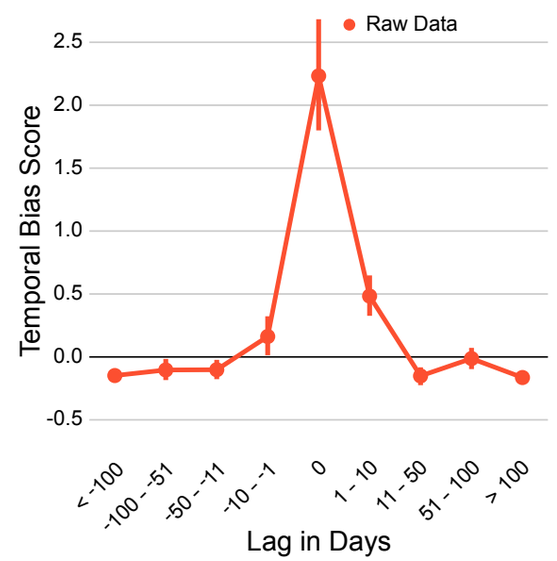

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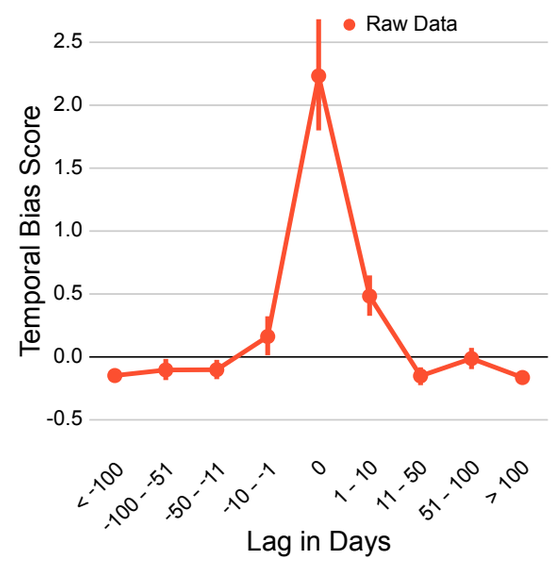
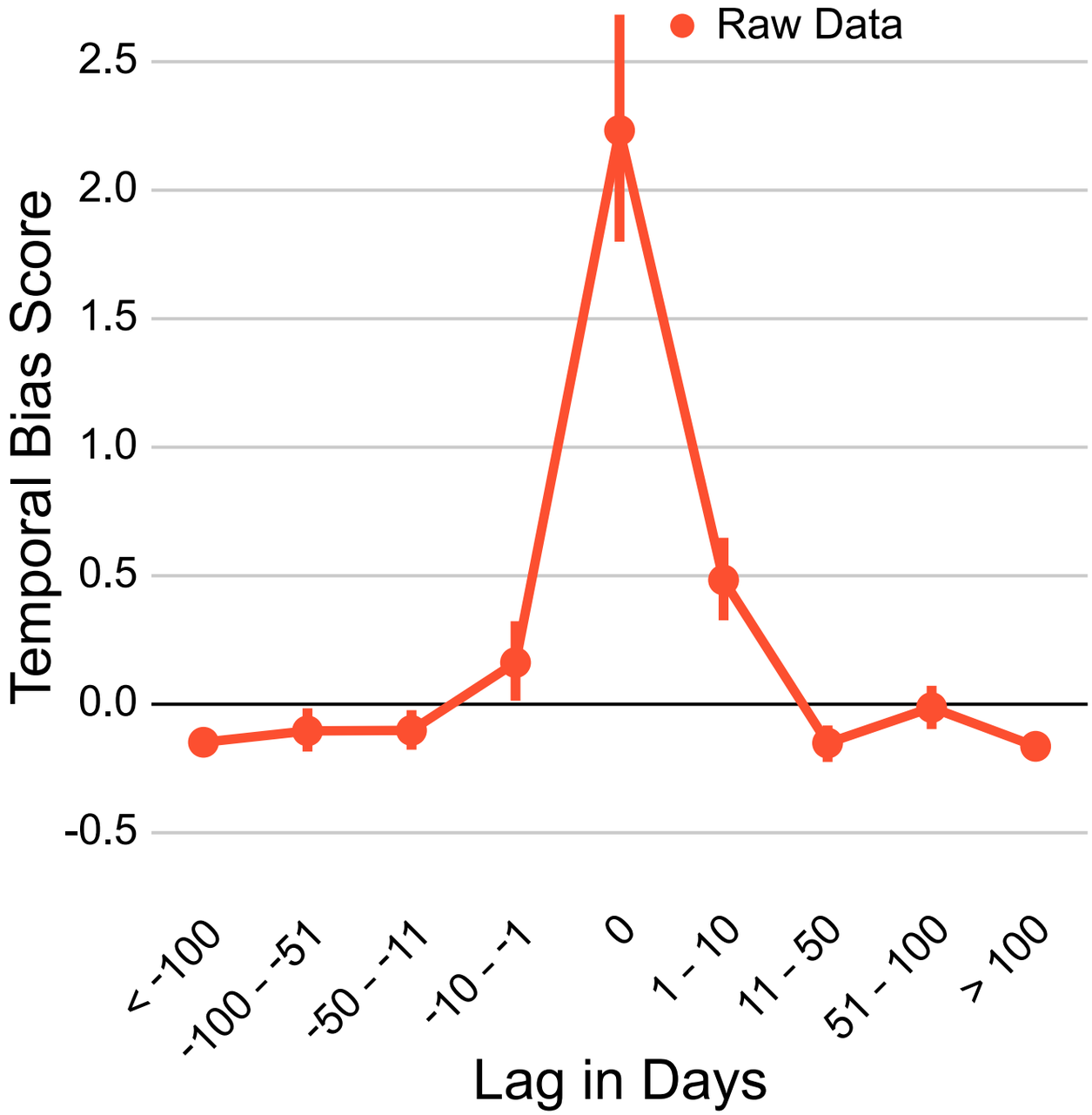
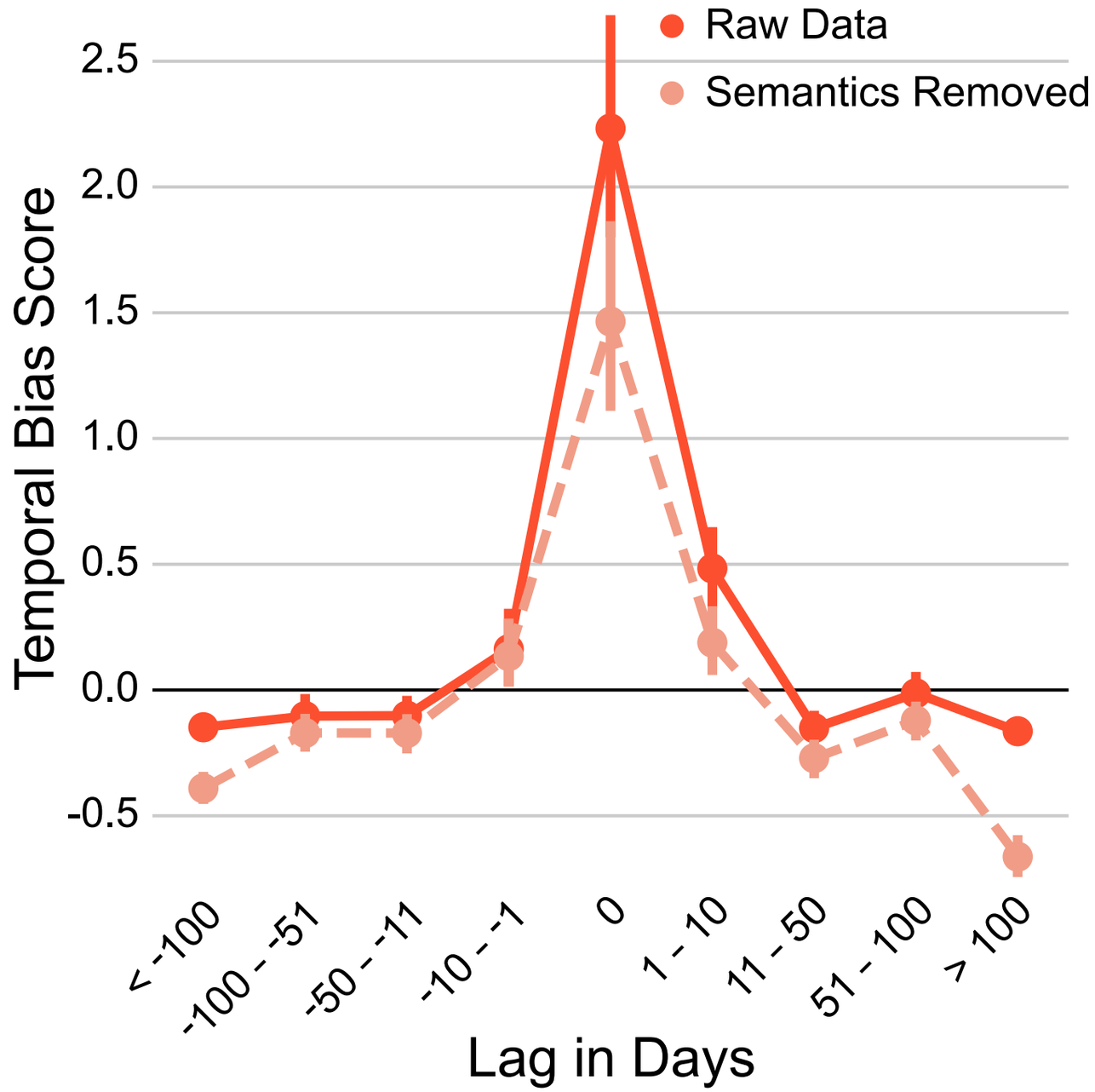


- The residuals give the portion of the temporal bias scores that **cannot** be predicted by semantic similarity.

A Bias Toward Near-Lags



Even After Removing The Influence of Semantics



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  - After controlling for semantic associations

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Thanks!

CBCC LAB

MICHIGAN STATE UNIVERSITY

Zero lag transitions

- Different headlines refer to exact same event:
    - “Hillary Clinton Loses the Election”
    - “Donald Trump is New President Elect”

- Different headlines stemming from one event:
    - E.g., 3rd Presidential Debate
    - “Trump won’t accept the results of election”
    - “Trump invites Obama’s half-brother to third debate”

- Seemingly unrelated:
    - E.g., October 7, 2016
    - “WikiLeaks posts John Podesta’s e-mails”
    - “Trump’s Access Hollywood video surfaces”

Lag calculations

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“Trump gets the White House”

“Hillary Clinton loses in a surprise upset”

Lag calculations

"Trump gets the White House"

- November 8, 2017

"Hillary Clinton loses in a surprise upset"

- November 8, 2017

Lag calculations

"Trump gets the White House"

- November 8, 2017
- Day 611

"Hillary Clinton loses in a surprise upset"

- November 8, 2017
- Day 611

Lag calculations

"Trump gets the White House"

- November 8, 2017
- Day 611

"Hillary Clinton loses in a surprise upset"

- November 8, 2017
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Lag = 611 - 611 = 0

Lag calculations

Lag calculations

“Trump’s Access Hollywood hot mic”

“FBI re-opens Clinton’s e-mail investigation”

Lag calculations

"Trump's Access Hollywood hot mic"

- October 7, 2016

"FBI re-opens Clinton's e-mail investigation"

- October 28, 2016

Lag calculations

"Trump's Access Hollywood hot mic"

- October 7, 2016
- Day 578

"FBI re-opens Clinton's e-mail investigation"

- October 28, 2016
- Day 599

Lag calculations

"Trump's Access Hollywood hot mic"

- October 7, 2016
- Day 578

"FBI re-opens Clinton's e-mail investigation"

- October 28, 2016
- Day 599

Lag = 599 - 578 = +21