## Background

- **Modality effect:** Enhanced recency for auditory vs. visual items
- **Inverse-modality effect:** Enhanced primacy for visual vs. auditory items (Murdock & Walker, 1969; Craik, 1969; Grenfell-Essam, Ward, & Tan, 2017)
- Numerous potential explanations have been posited:
  - Greater capacity of auditory store (Murdock & Walker, 1969)
  - Auditory items more persistent in short-term store (Craik, 1969)
  - Temporal information better encoded for auditory items (Gardiner, 1983; Glenberg & Swanson, 1986)
  - Auditory items have higher-dimensional representations (Cowan, Saults, & Brown, 2004; Nairne, 1990; Nilsson, Wright, & Murdock, 1979)
- Stronger associations among auditory items (Macken et al., 2016) **Goal:** Lend support to one or more of these theories through a large-scale study of the modality effect in free recall.

## Methods

- Two online immediate free recall experiments using Amazon Mechanical Turk
- Manipulations:
  - Modality (M), List Length (LL), Presentation Rate (PR)
- Experiment 1: 1100 participants, 8 visual **and** 8 auditory lists
- Experiment 2: 2000 participants, 16 visual or 16 auditory lists
- LL and PR varied within subjects in both experiments



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## **Modality and Recency Effects in Free Recall**

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	Primacy Effect	Red
Μ	Visual > Auditory*** (E <sub>1,2</sub> )	Aud
LL	Short > Long*** (E <sub>1,2</sub> )	Sho
PR	Slow > Fast*** (E <sub>1,2</sub> )	Slov
M*LL	n.s.	n.s.
M*PR	Fast rate reduces M.E.** (E <sub>1</sub> )	Fast
LL*PR	n.s.	Lon
M*LL*PR	n.s.	n.s.





Probability of First R (Final List Item)		
Μ	n.s.	
LL	Short > Long* (E <sub>1</sub> )	
PR	Slow > Fast*** (E <sub>1</sub>	
No significant interaction e		



- Results instead support an output interference account.
- lists when they also received visual lists.

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\* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001

## Discussion

• Inconsistent with STS accounts of the modality effect, our PFR results suggest that auditory presentation did not increase the accessibility of recency words.

• Differences in PLI recency may result from weaker temporal context for visual items, causing temporally-driven errors in the form of recent words intruding; feature-rich auditory lists may produce more distant, semantically-driven PLIs. Reduced ability to rehearse during auditory presentation may account for the

inverse-modality effect. This would explain the more pronounced effect in Experiment 1, if participants were more likely to attempt to rehearse auditory

## References