Incongruent visual animations make unrelated narratives more memorable by driving stronger brain responses

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Introduction

- How does visual context affect the memory of an auditory narrative?
- Does the neural reliability of electroencephalography (EEG) predict memory accuracy?

Rationale

- How do people select what to encode into memory?
- Do multisensory cues aid in this process?
- Goal: Investigate incidental learning in the context of naturalistic stimuli
- Measure a neural signal of encoding

Methods

Information presented within continuous “life-like” scenario: 10 animated stories (StoryCorps, NYT Modern Love)

3 conditions:
- Auditory Only (A-Only) n = 17
- Auditory + Visuals (AV) n = 22
- Auditory + Visuals, scrambled (AVsc) n = 18

3 weeks later:

Question: What would Rocco do with the narrator when they went for walks?

Neural reliability and memory accuracy are correlated across narratives, subjects, and questions

Results

Multisensory presentations enhance incidental episodic memory

Memory performance for different stimulus modalities (A) and different narratives (B) (Broken Heart Doctor (BHD), Don’t Let It Snow (SLS), Falling in Love at 71 (FILSO), Lost and Found (LF), and “The Matchmaker” (TM) and 5 from StoryCorps’ animated shorts: Eyes on the Stars (EOTS), John and Jair (JU), Meeting the Distance (MDT), Sunskate at Roccos’ (SAR), and “F.R.P. Talks about Love” (FRPTAL)). No Show indicates the chance level of performance on the memory questions given no information (n = 16). Note that exposure to just the visual stimuli (V Only, n = 14) yields performance no better than chance. Error bars indicate standard error of the mean. *P < 0.05, **P < 0.01, ***P < 0.001.

Multisensory presentations increase reliability of neural responses & Spatial distribution of reliable neural response are preserved across modalities

Conclusions

Visuals aid in recognition regardless of congruency

ISC correlates with recognition accuracy

Location of components appears consistent across modalities

References


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