



# Narratives Protect against Retrieval Induced-Forgetting of Naturalistic Information



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## Introduction

**Retrieval-induced forgetting** has been studied previously using word lists, in which participants are given word pair associations to remember (Fruit – Orange, Fruit – Banana, Tree – Birch). In these paradigms, participants are asked to encode these word pairs, then practice a subset of these word pairs by completing a word stem (Fruit – Or\_\_\_). After a short delay, participants will complete a final test for all word pairs.

- **RP+** trials are practiced after encoding
- **RP-** trials are related to RP+ but unpracticed
- **NRP** trials are unrelated and unpracticed

Past research indicates that after retrieving RP+ trials, there is a decreased recall of RP-. This indicates that competition of RP+ and RP- drives inhibition, and inhibition drives forgetting, thus resulting in RP- trials being forgotten.<sup>1</sup> **Retrieval-Induced Facilitation (RIFA)** is when related but unpracticed items (RP- trials) are strengthened after retrieving the related trials (RP+ trials).<sup>2</sup> Moreover, narratives have been shown to drive integration across multiple, episodic memories.<sup>3</sup>

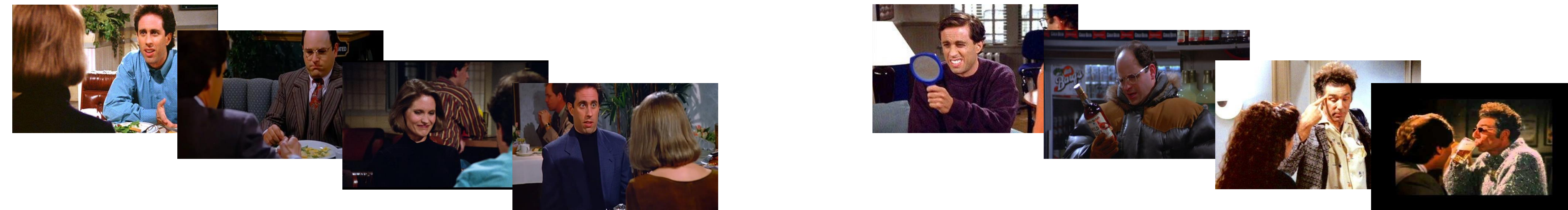
### Research Questions

1. Can we find evidence for either RIFO or RIFA when using complex, naturalistic stimuli as memoranda?
- Prediction 1:** Narratives will result in retrieval-induced forgetting due to integration at encoding.
2. Is narrative a critical factor that determines whether we obtain RIFO or RIFA in controlled experimental contexts?
- Prediction 2:** Those in the No-narrative condition will experience retrieval-induced forgetting due to competition at retrieval practice.

## Methods

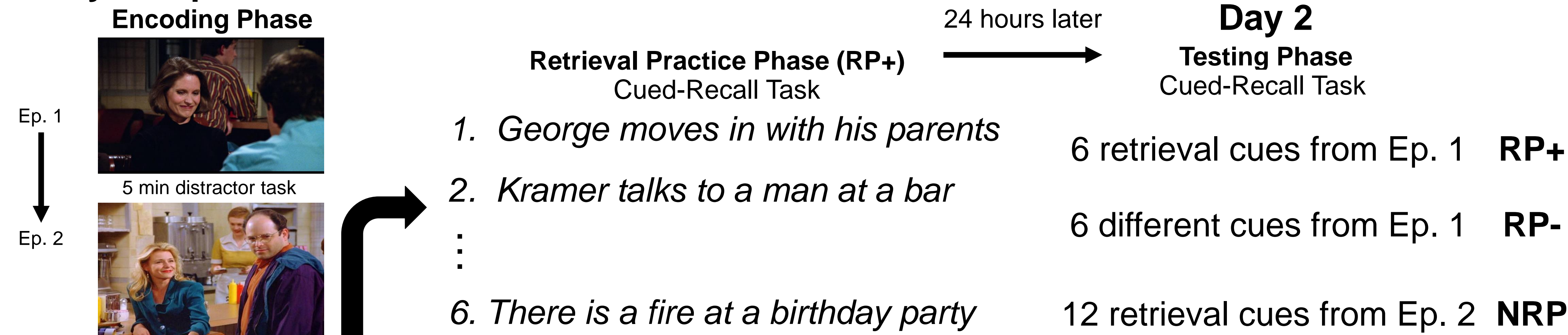
### Experiments 1 & 2 Conditions

**Narrative** = Normal Episode of Seinfeld      **No-Narrative** = Spliced together scenes from various episodes



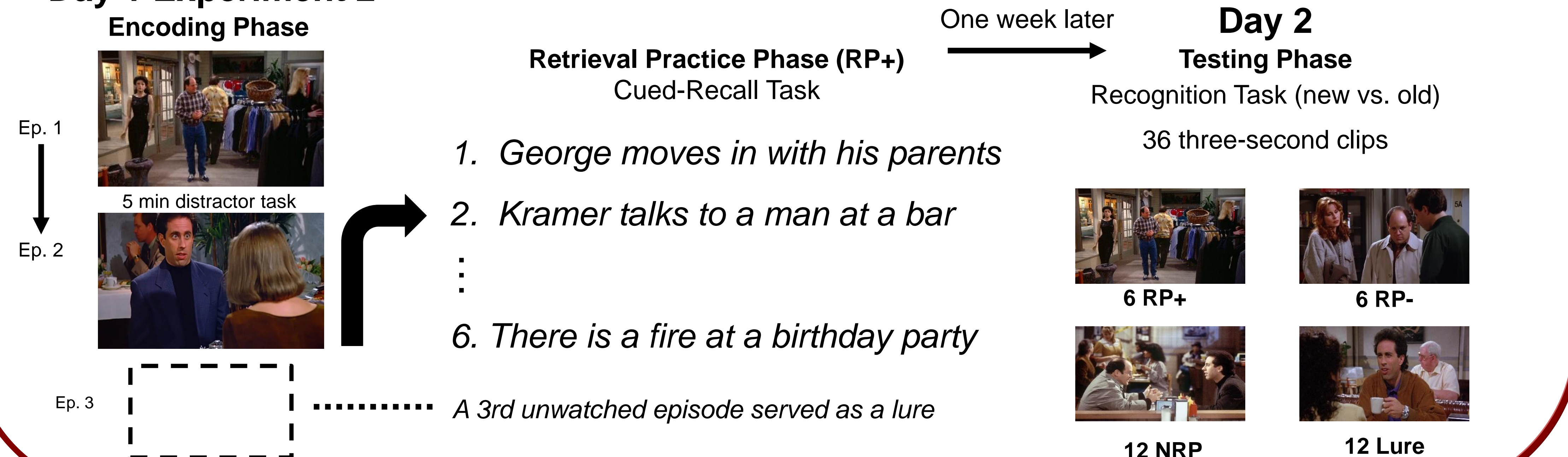
### Day 1 Experiment 1

Trial Types: RP+ = Ep. 1 (practiced), RP- = Ep. 1 (practiced, related), NRP = Ep. 2, (practiced, unrelated)



### Day 1 Experiment 2

Trial Types: RP+ = Ep. 1 (practiced), RP- = Ep. 1 (practiced, related), NRP = Ep. 2, (practiced, unrelated)

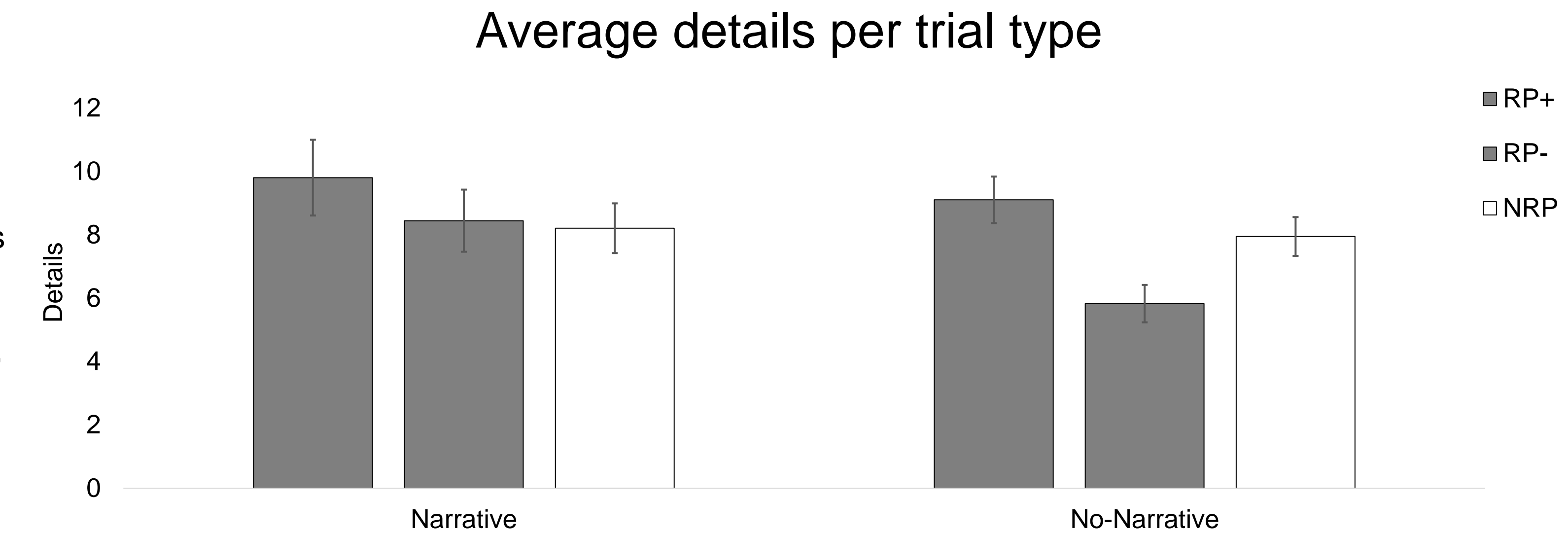


## Narratives Protect Against Retrieval-induced Forgetting

**Main effect of trial type**(F(1.83, 127.96) = 27.38, p < .001

**Significant testing effect** in both conditions (RP+ vs. RP- and RP+ vs. NRP. Narrative condition t(35) = 2.53, p = .008, t(35) = 2.95, p < .001; No-Narrative condition, t(35) = 7.75, p < .001, t(35) = 2.94, p < .001

**Significant trial x condition interaction** (F(1.83, 127.96) = 7.91, p = .001



After encoding naturalistic information, narratives protected against forgetting. In the absence of a narrative, a retrieval-induced forgetting effect was found (RP- vs. NRP), t(35) = -5.67, p < .001.

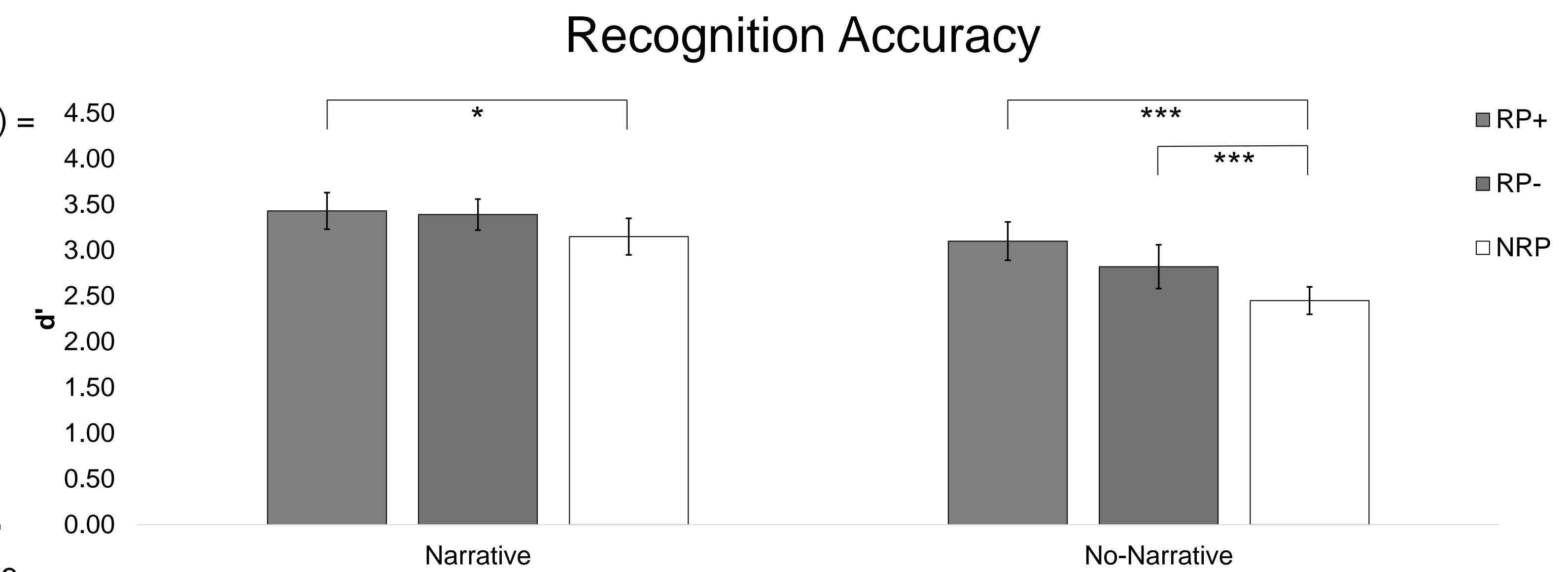
## Recognition Task Eliminates Retrieval-Induced Forgetting

**Main effect of trial type** (F(2, 140) = 8.401, p < .001); **Main effect of condition** (F(1, 70) = 7.488, p < .001

**Significant testing effect** (RP+ vs. NRP) in both conditions. Narrative, t(35) = 2.02, p = .026;

No-Narrative, t(35) = 4.15, p < .001

**Retrieval-induced facilitation effect in the No-Narrative condition** (RP- vs. NRP trials, Narrative, t(35) = 1.58, p = .062; No-Narrative, t(35) = 2.33, p = .013



After switching to a recognition task, narratives continued to protect against forgetting. In the absence of a narrative, a retrieval-induced facilitation was found (RP- vs. NRP, t(35) = 2.33, p = .013).

## Conclusion

In Experiment 1, we demonstrated that when using a cued recall task, and **in the absence of a narrative, a retrieval-induced forgetting effect was found**. However, the presence of narrative resulted in protection from retrieval-induced forgetting.

In Experiment 2, we demonstrated that when using a recognition task, and **in the absence of a narrative, a retrieval-induced facilitation effect was shown**. However, the presence of narrative resulted in protection from retrieval-induced forgetting.

These experiments showed that after encoding naturalistic information, information structured with a narrative can mitigate retrieval-induced forgetting perhaps by driving integration at encoding. Moreover, whether retrieval practice produces forgetting or facilitation of unpracticed stimuli in the absence of a narrative may depend on the type of retrieval task.

## References

- <sup>1</sup>Anderson, M. C., Bjork, R. A., & Bjork, E. L. (1994). Remembering can cause forgetting: Retrieval dynamics in long-term memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20(5), 1063–1087.
- <sup>2</sup>Chan, J. C. K., McDermott, K. B., & Roediger, H. L. III. (2006). Retrieval-induced facilitation: Initially non-tested material can benefit from prior testing of related material. *Journal of experimental psychology: General*, 135(4), 553–571.
- <sup>3</sup>Cohn-Sheehy, B. I., Delarazan, A. I., Reagh, Z. M., Crivelli-Decker, J. E., Kim, K., Barnett, A. J., Zacks, J. M., & Ranganath, C. (2021). The hippocampus constructs narrative memories across distant events. *Current biology: CB*, 31(22), 4935–4945.e7.