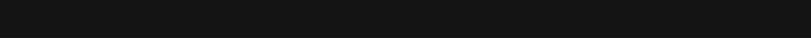


# Schema representations in distinct brain networks support narrative memory during encoding and retrieval

Rolando Masis-Obando, Kenneth A. Norman & Christopher Baldassano, 2021

A Review by: Vivianna DeNittis & Raymond Villareal

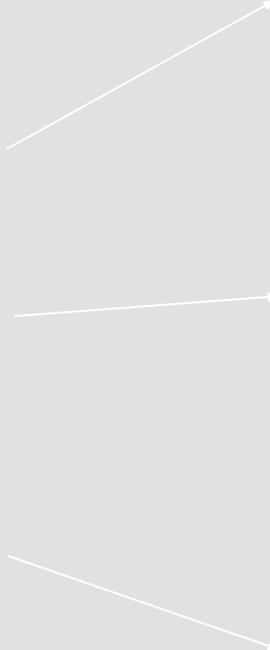




# Event Schemas



Our knowledge of how events generally unfold to support memory for specific details from those events (Masis-Obando et. al., 2021).



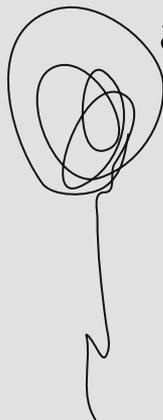


# What about other experiences during these events?



# Questions

- How do we use encoding and recall to support memory for recently encoded naturalistic stories
- To understand the neural mechanisms of how event schemas support memory for real-world, temporally-extended events, both at encoding and at retrieval



(Masis-Obando et. al., 2021)

# How do these scripts help?

Encoding:

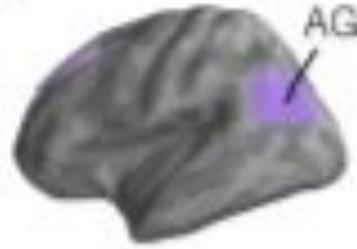
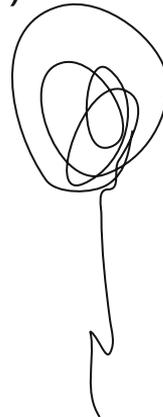
- Scaffold where we attach specific event details (Tomparry and Thompson-Shill, 2021)

Retrieval

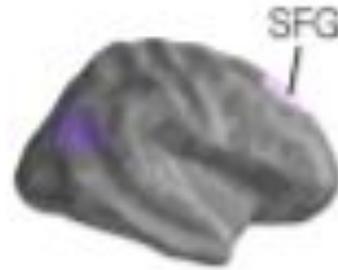
- Certain steps can act as a cue (Schank and Abelson, 1975)

# Regions of interest

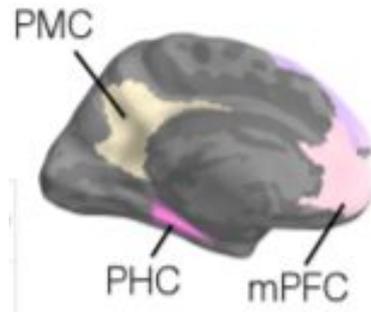
(Masis-Obando et. al., 2021)



Right Angular Gyrus



Superior Frontal Gyrus

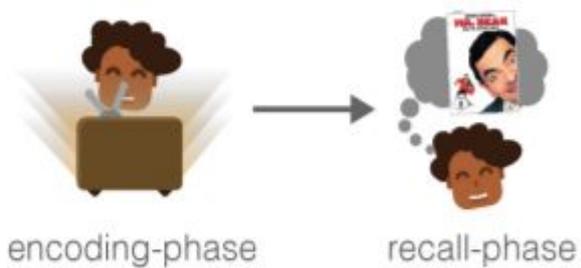


Medial Prefrontal Cortex  
Parahippocampal Cortex  
Posterior Medial Cortex

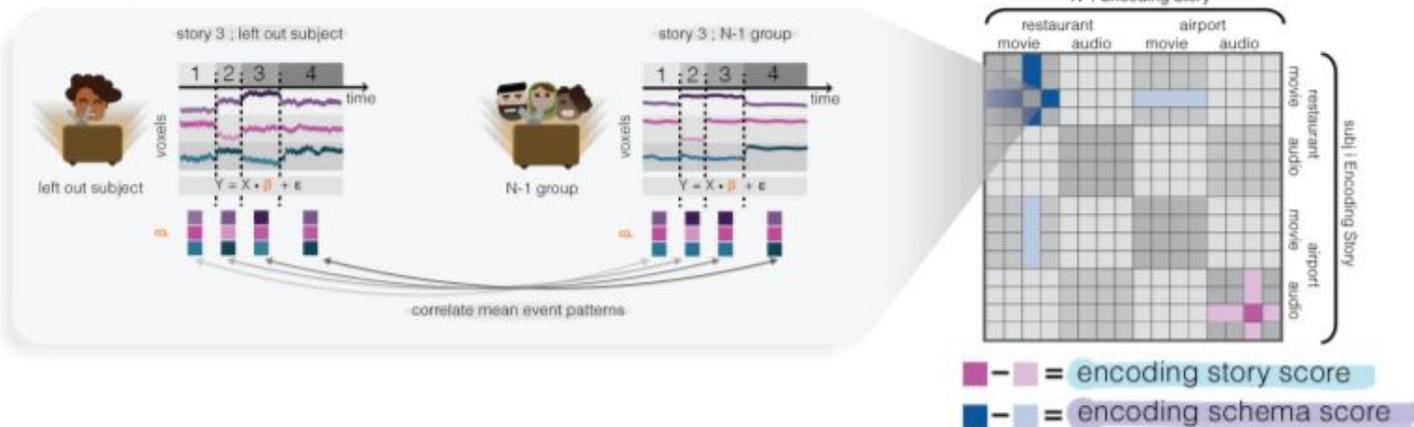
A.



B.



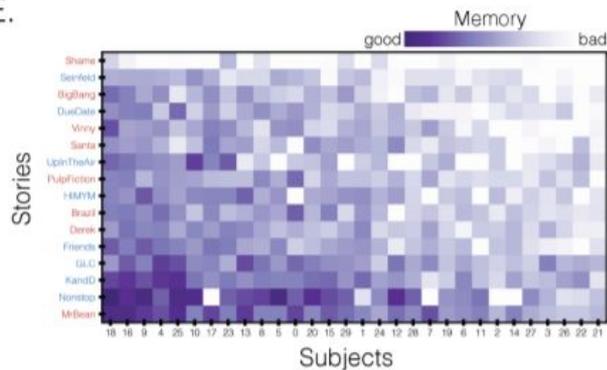
C. encoding-phase



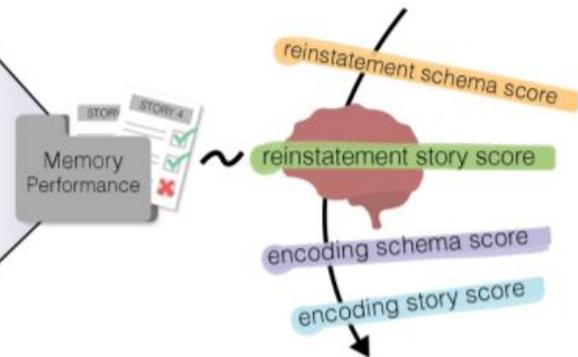
## D. recall-phase



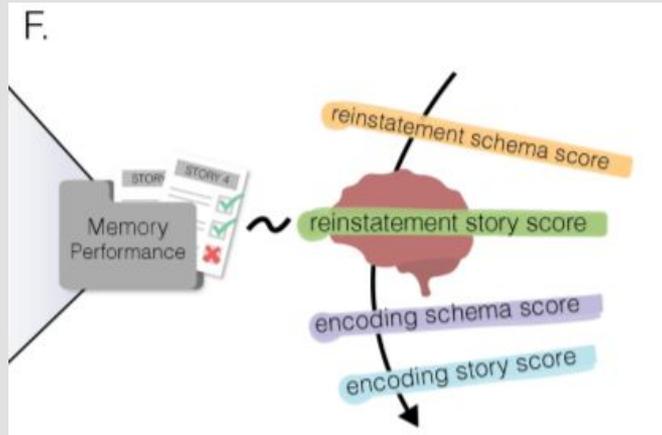
E.



F.



## Defining measures



### *Story score:*

Activations from a single story compared to the same story across all participants

### *Schema score:*

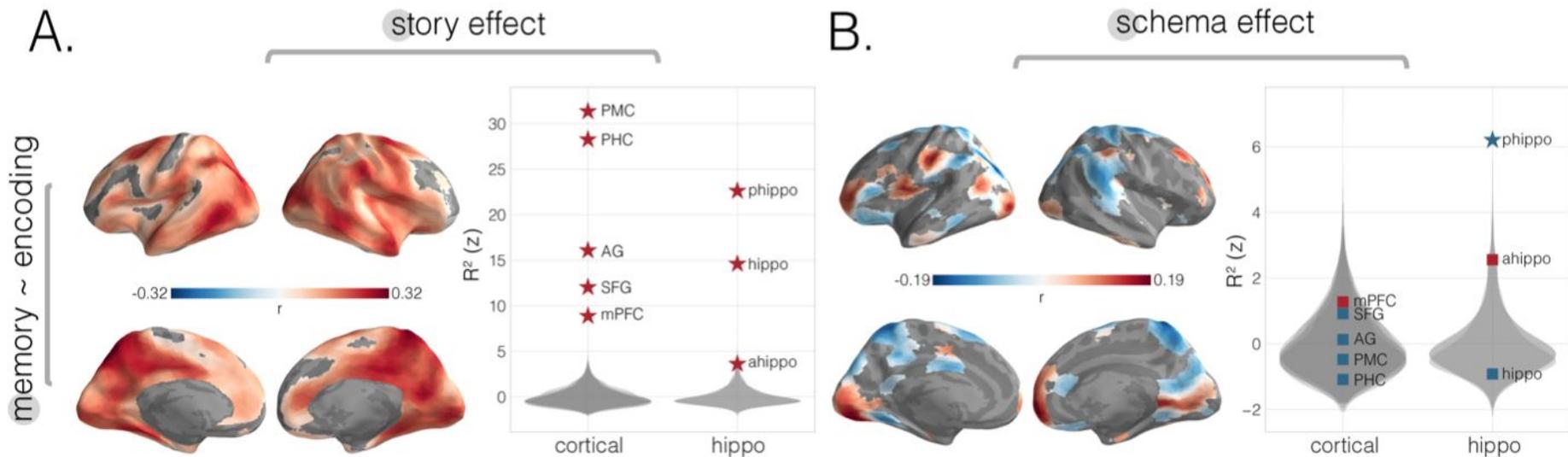
Activations from stories within same schema across all participants

### *Memory performance:*

Scores calculated from number of details described during recall

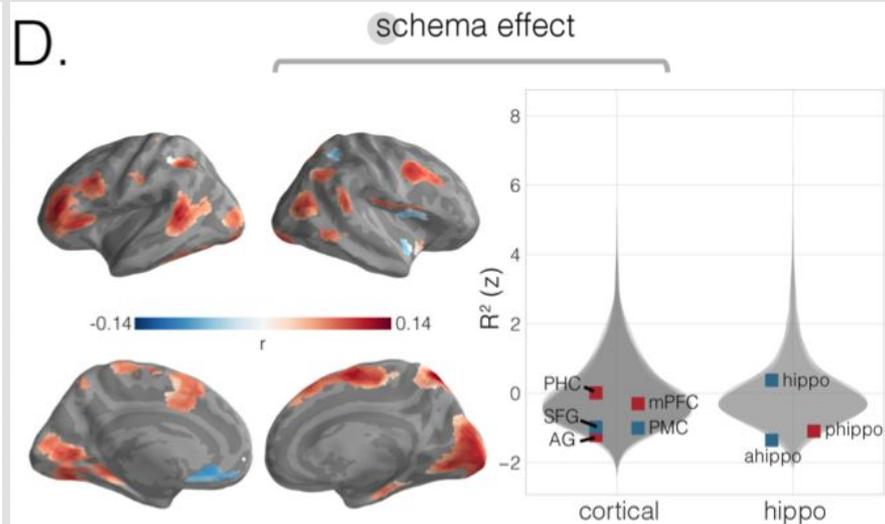
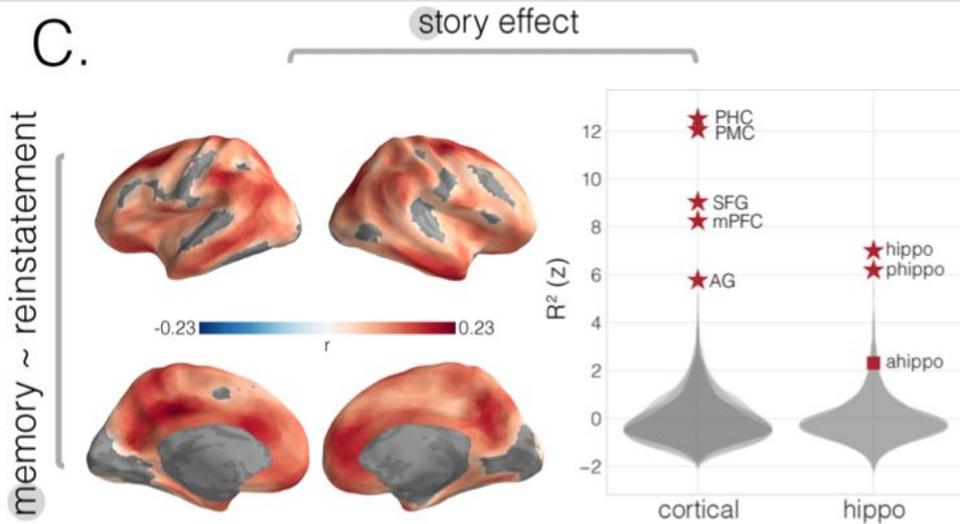
# Results

Predicting behavioral memory from neural *encoding* scores



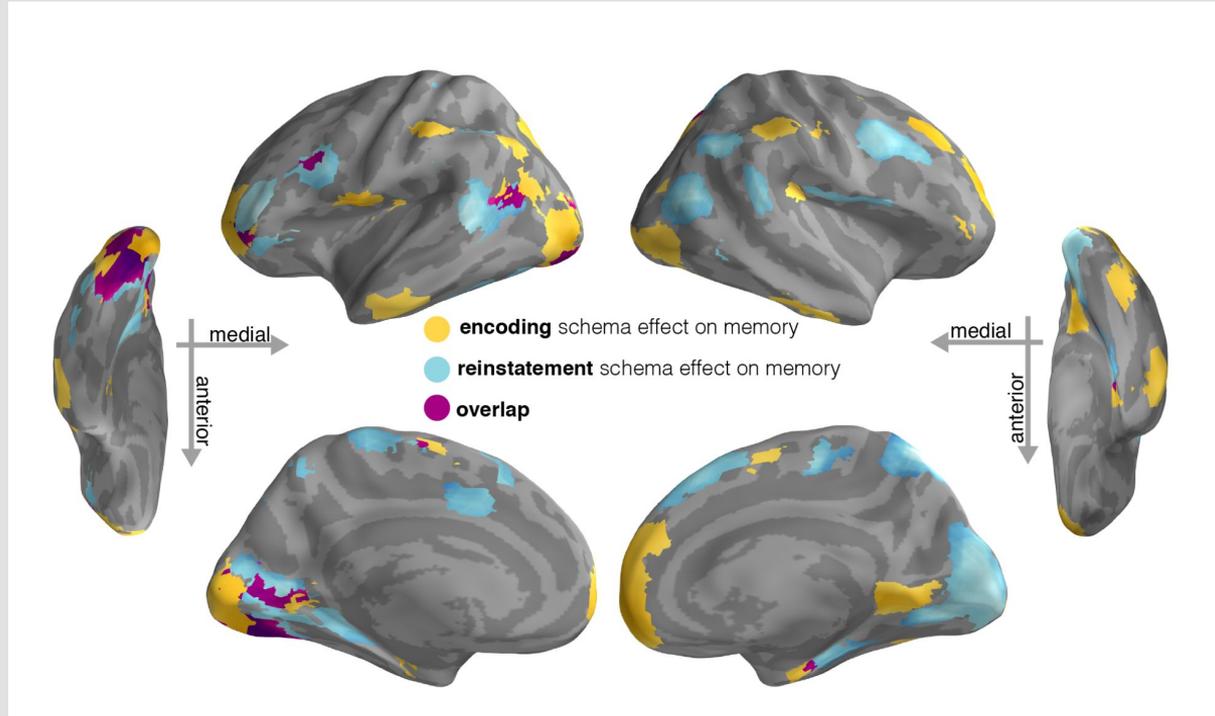
# Results

Predicting behavioral memory from neural *reinstatement* scores



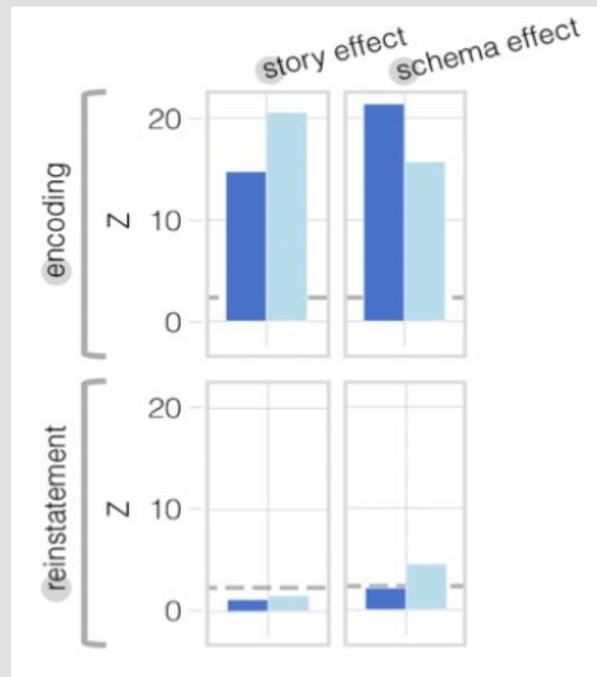
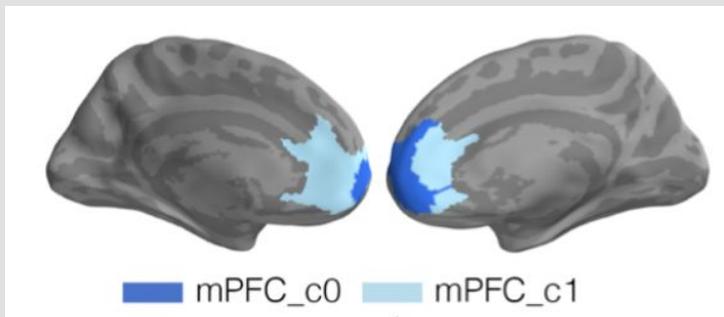
# Results

Schema scores associated with memory performance



# Results

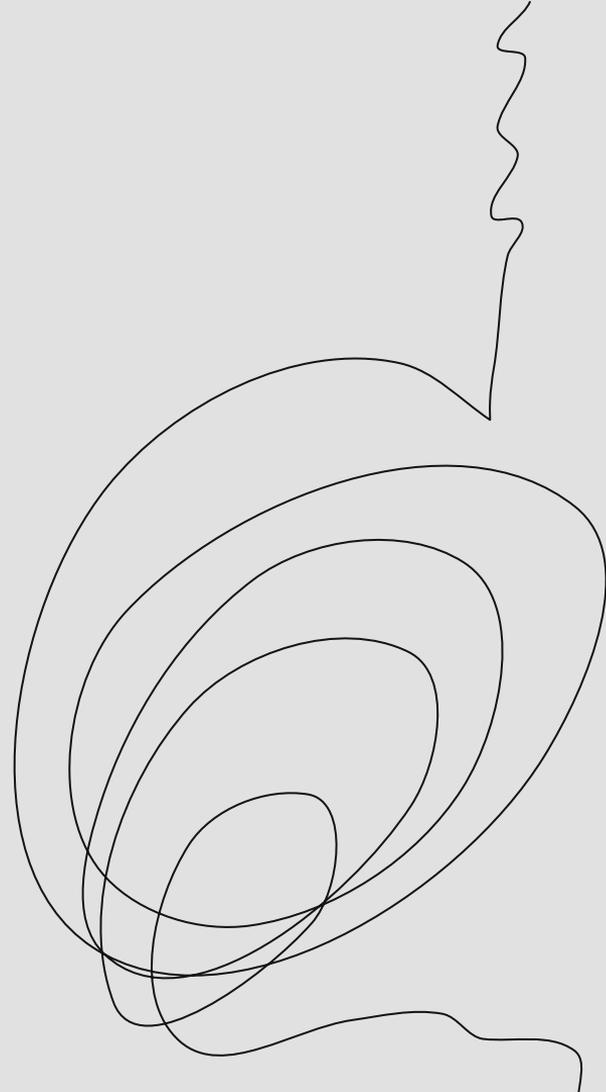
mPFC functionally splits during encoding



# Conclusions

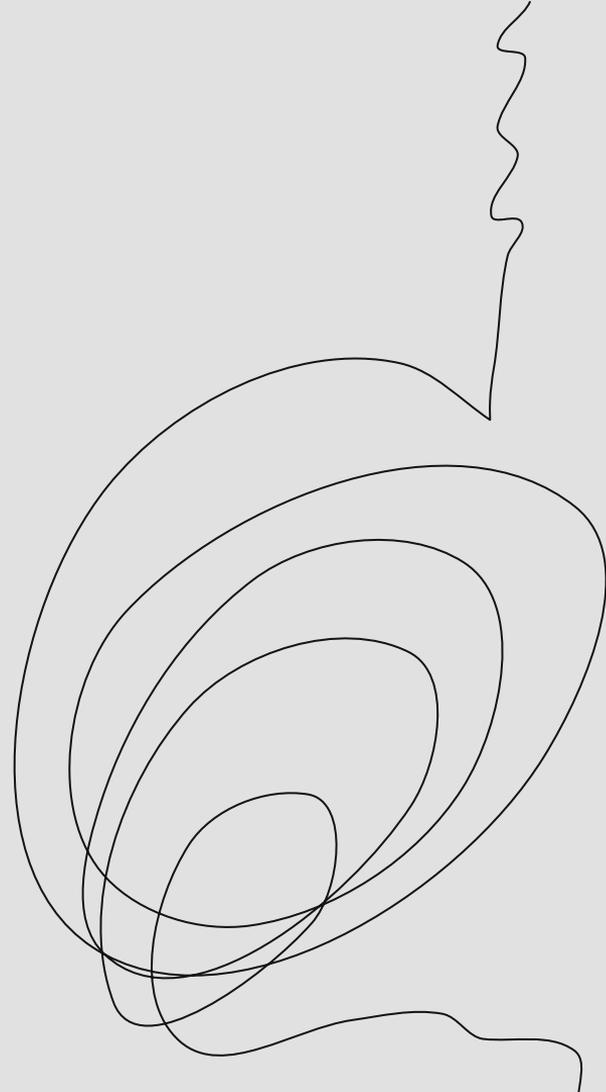
Schema encoding reliably predicts memory performance

- Two forms of information; two neural networks
- Brains “frontload” use of schematic information
- Neural schematic representations are distinct during encoding and reinstatement



# Notably:

- Complex measures
- Modalities
- Visual cortex??
- Time point of data retrieval
- Age range: 18-34



# Acknowledgements

BraiNY Bunch Journal Club, importantly noting Jocelyn Brenton & Camila Demaestri

Dr. Nuttida Rungratsameetaweemana

Rolando Masis-Obando, Kenneth A. Norman, & Christopher Baldassano. 2021. Schema representations in distinct brain networks support narrative memory during encoding and retrieval. *BioRxiv*.

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