Recap

- Immediate vs. delayed vs. continual distractor free recall
- Probability of first recall
- Clustering:
  - Temporal clustering (contiguity effect)
  - Semantic clustering

How do people organize their memories?

- Time
- Meaning
- Location on screen
- Starting letter
- Visual appearance (of referent)
- Sound, smell, touch, taste, etc.
- Utility of referent
- Font properties (color, shape, size)
- Anything else you can measure…

Quantifying how people organize memories by {time, meaning, …}

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- Take all the words you haven’t recalled yet, and order them by similarity to the previously recalled word

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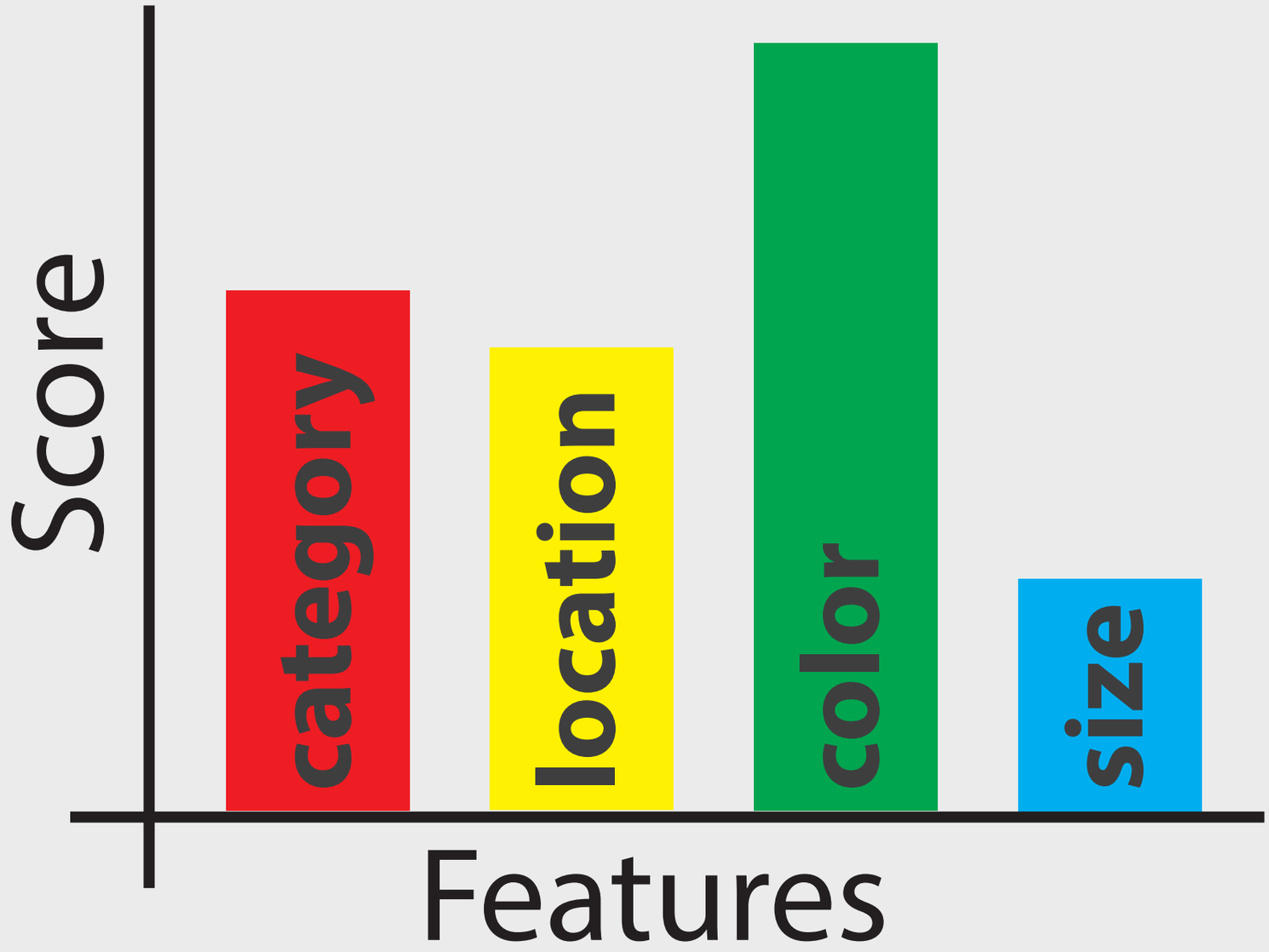
Quantifying how people organize memories by {time, meaning, …}

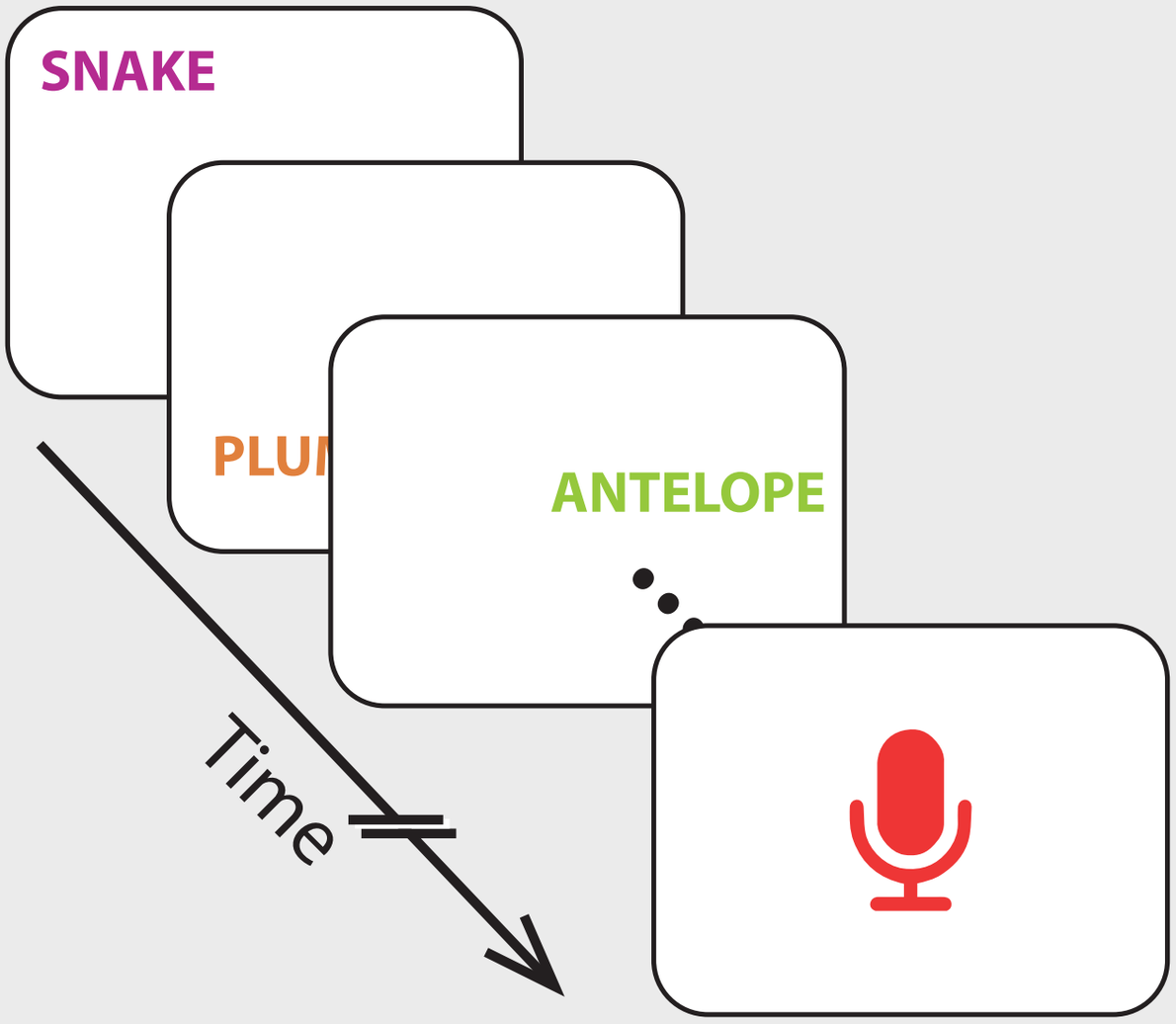
- Take all the words you haven't recalled yet, and order them by similarity to the previously recalled word
- Now compute the percentile rank of the word you actually recalled next
- **Clustering score:** average percentile rank across all recalls

Memory fingerprint



Ongoing work in my lab...

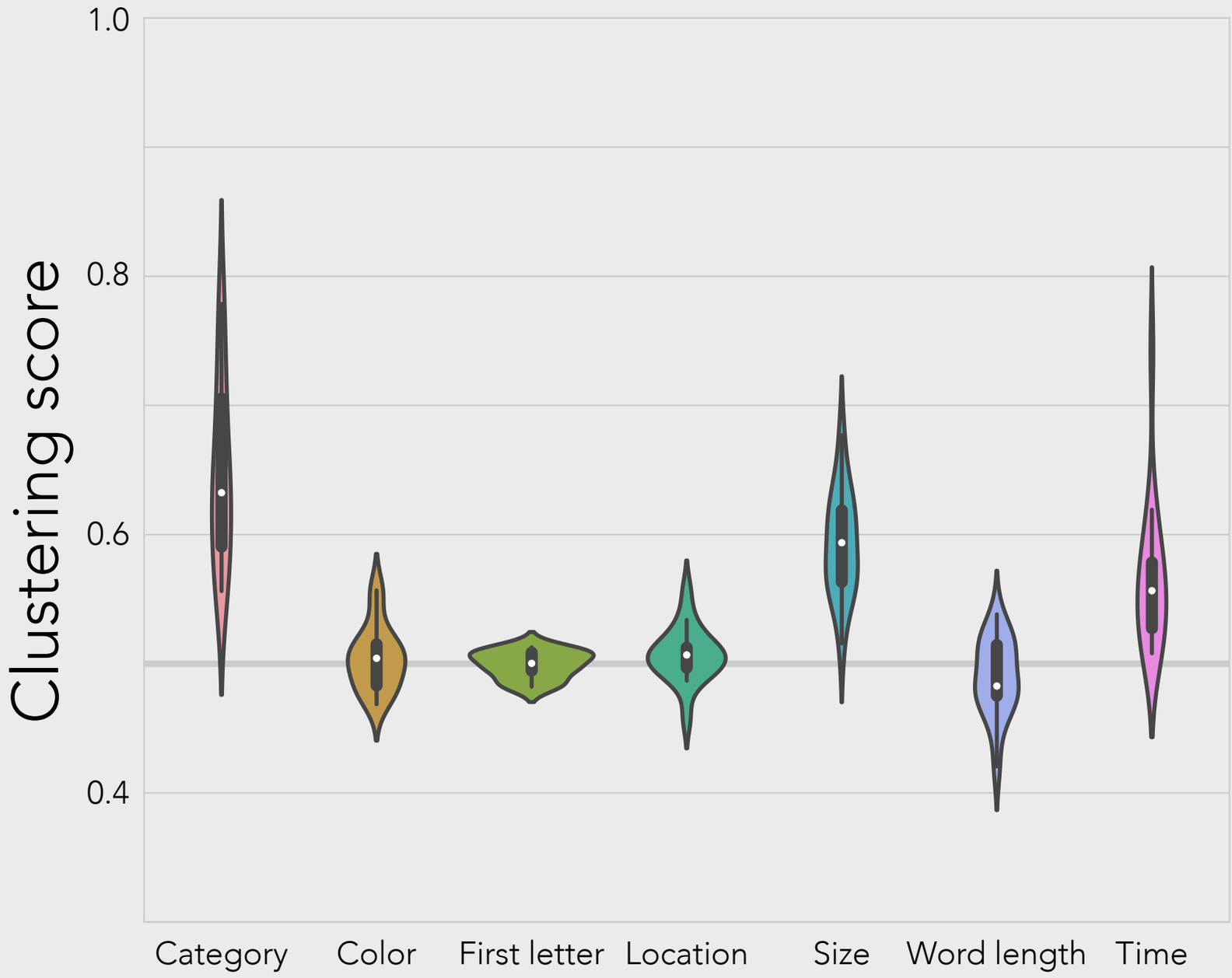
Feature-rich free recall



16 words
16 lists

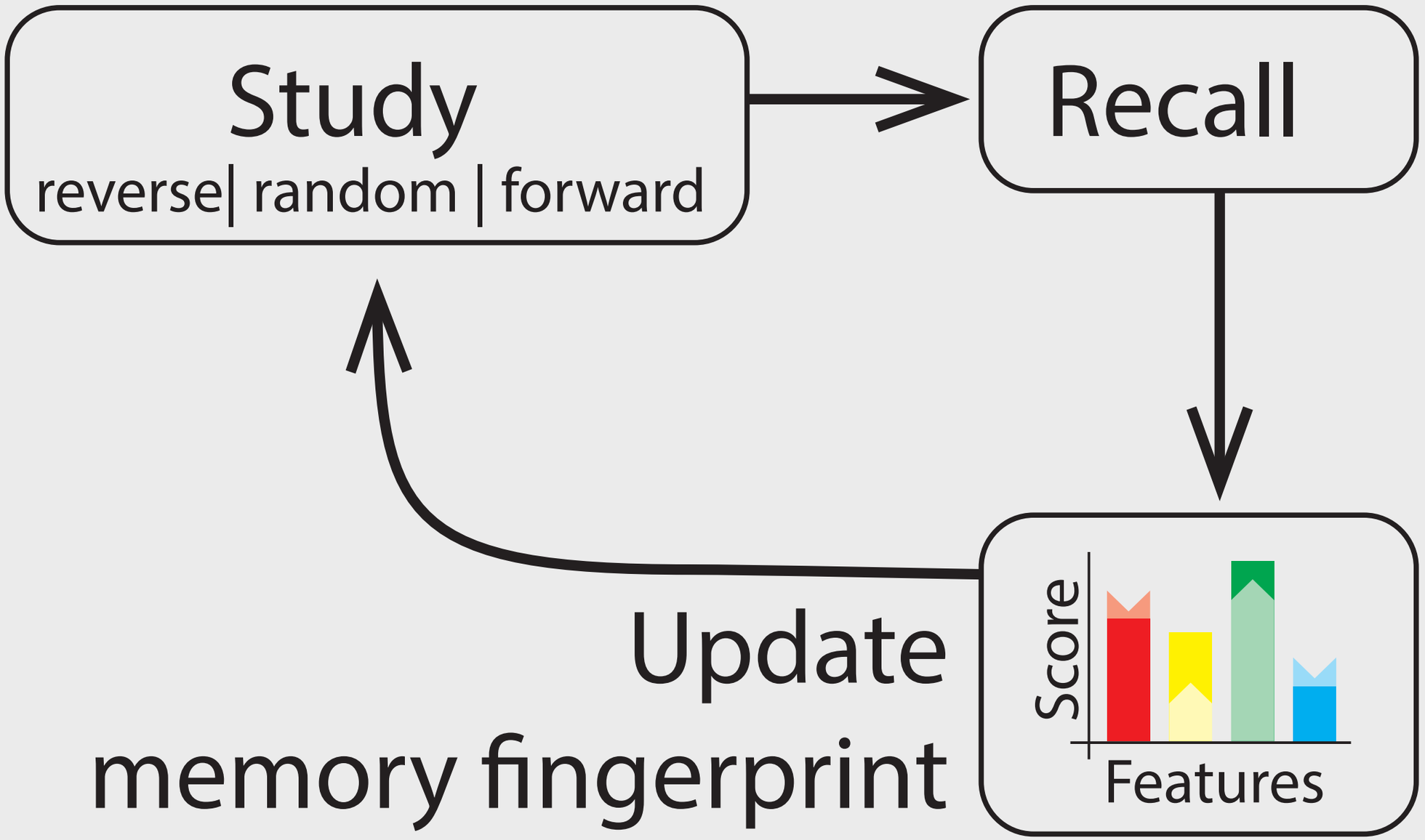
Ongoing work in my lab...

Feature-rich free recall



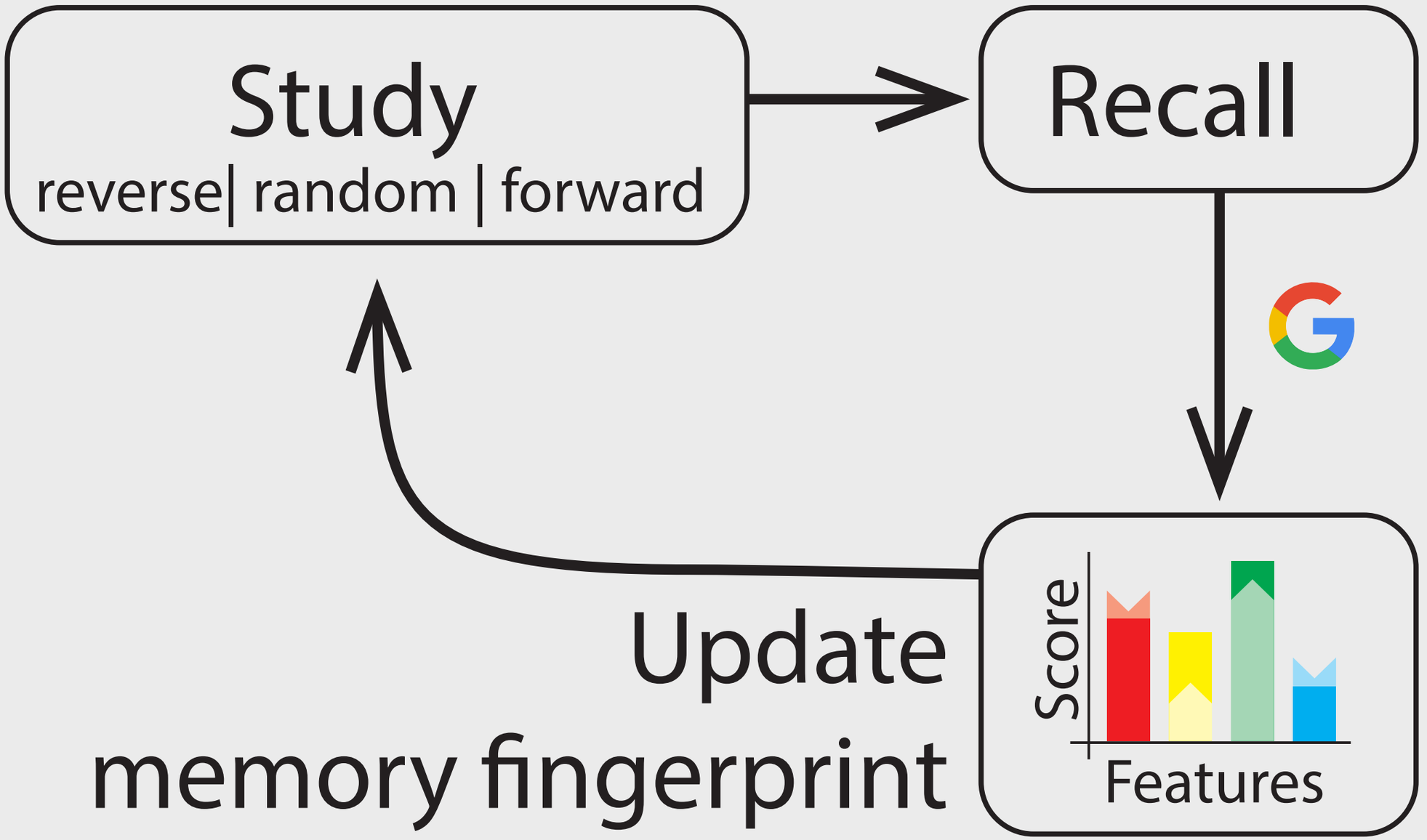
Ongoing work in my lab...

Adaptive free recall



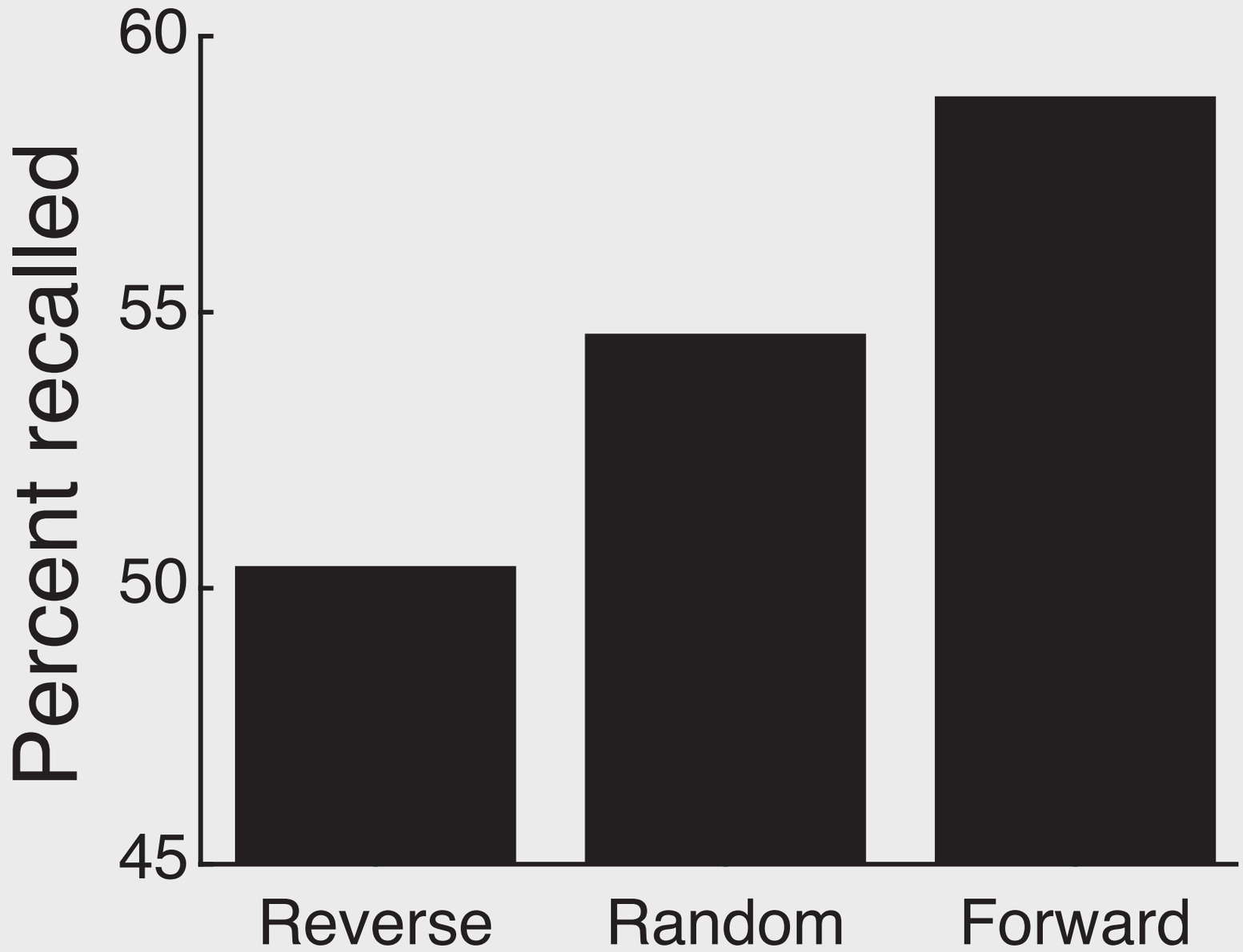
Ongoing work in my lab…

Adaptive free recall



Ongoing work in my lab…

Adaptive free recall



Ongoing work in my lab...

testing room

hungry

itchy

exams

weather

NOTEBOOK

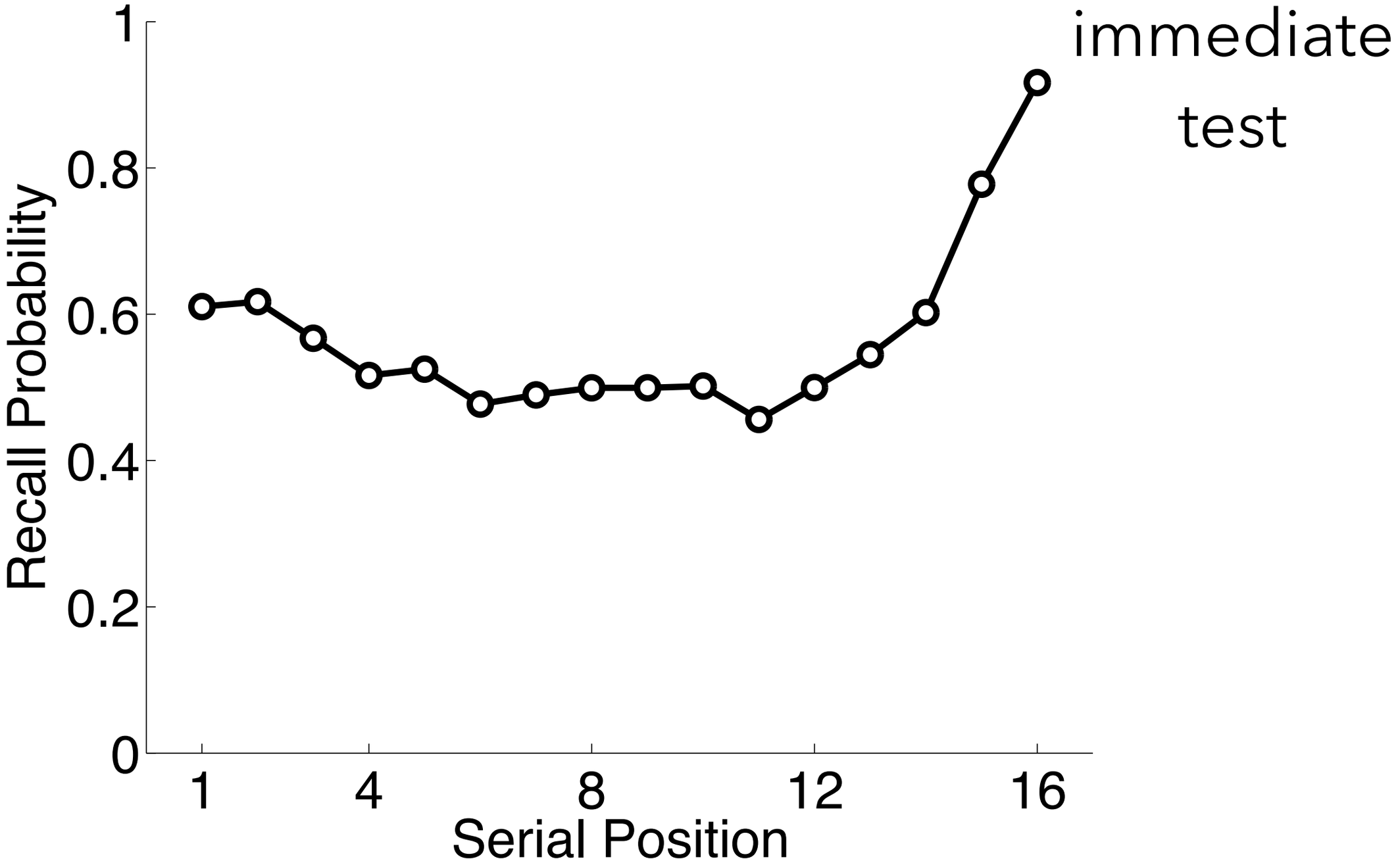
SKULL

LEAF

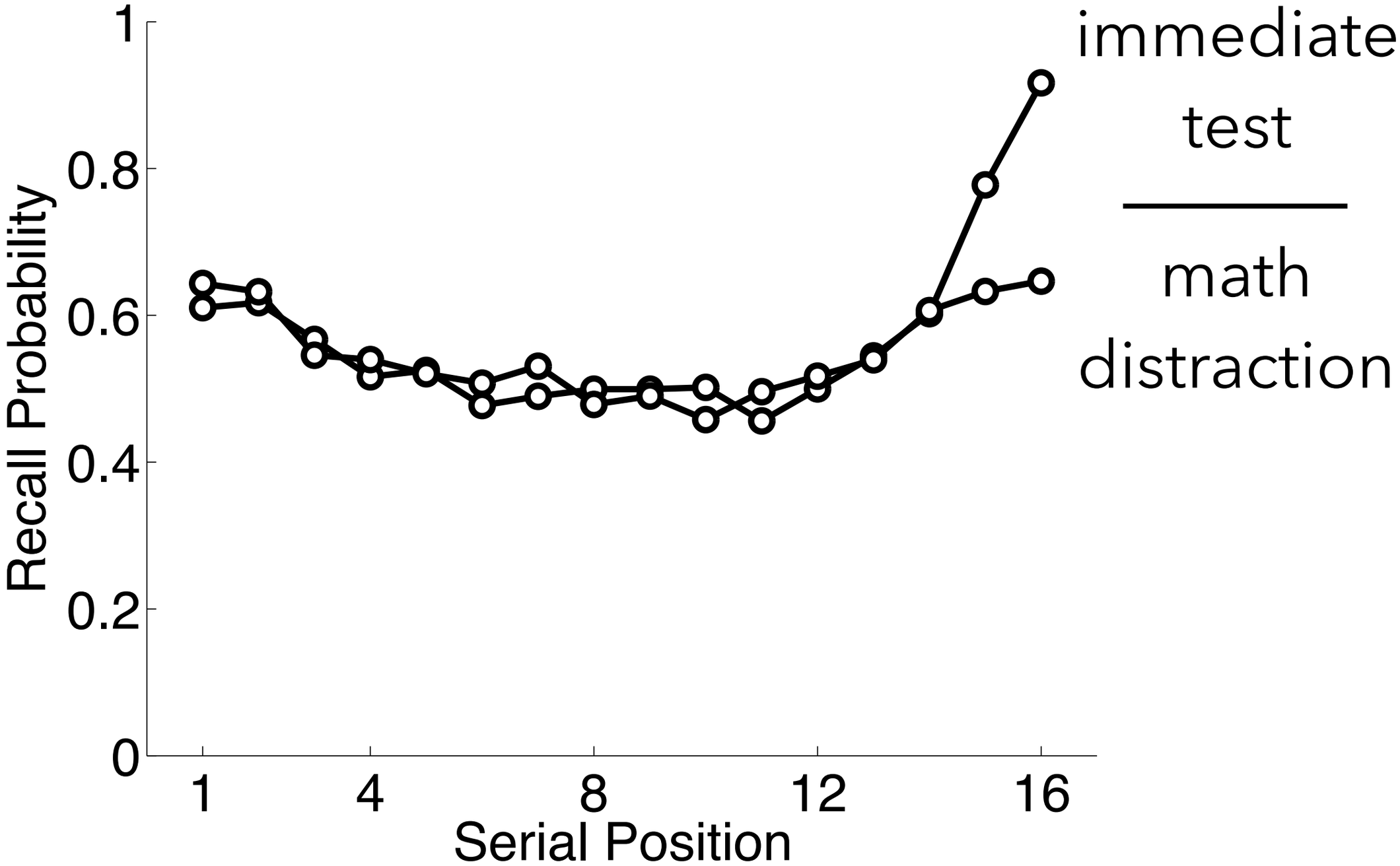
BANANA

SHARK

Overall recall probability



Overall recall probability



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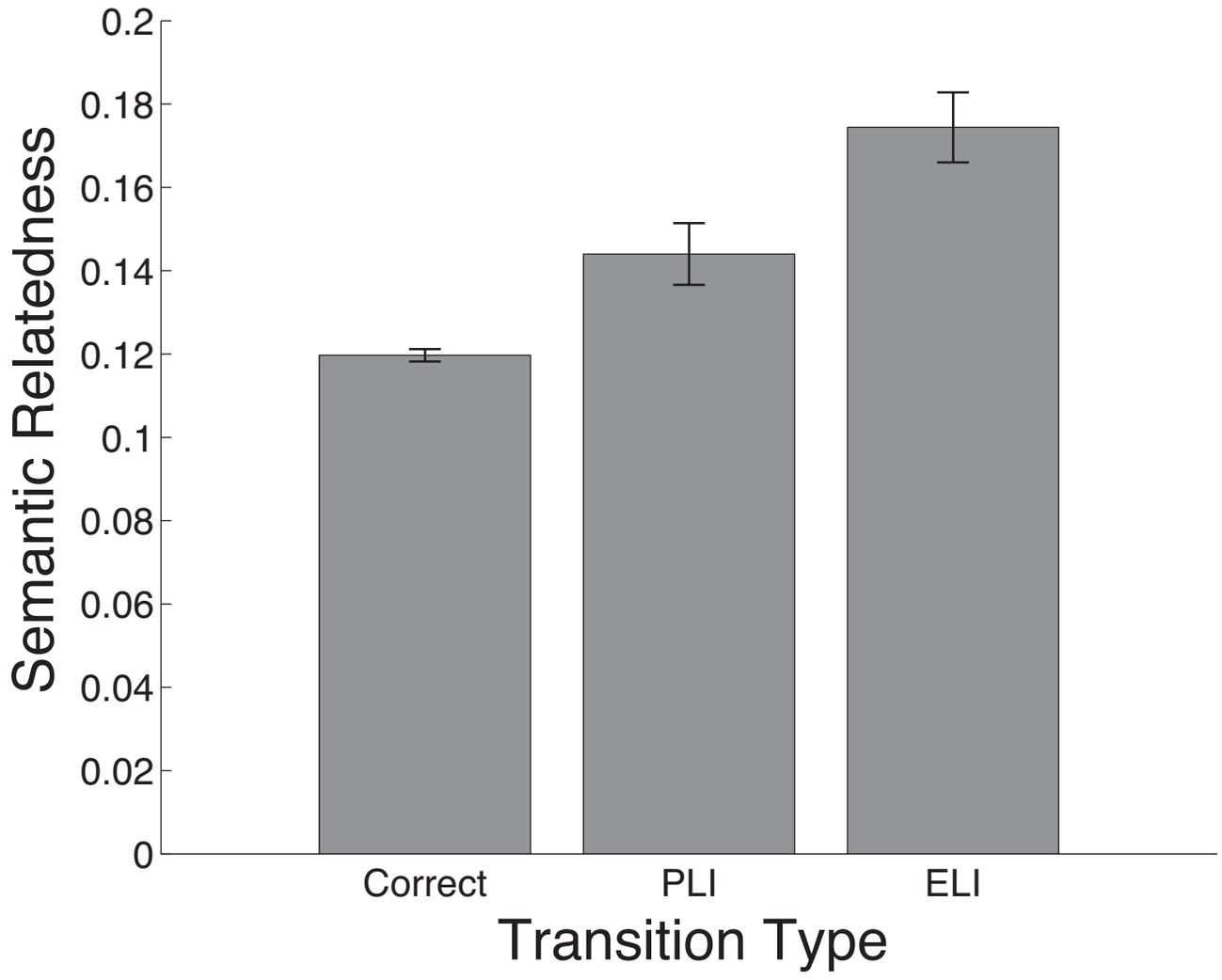
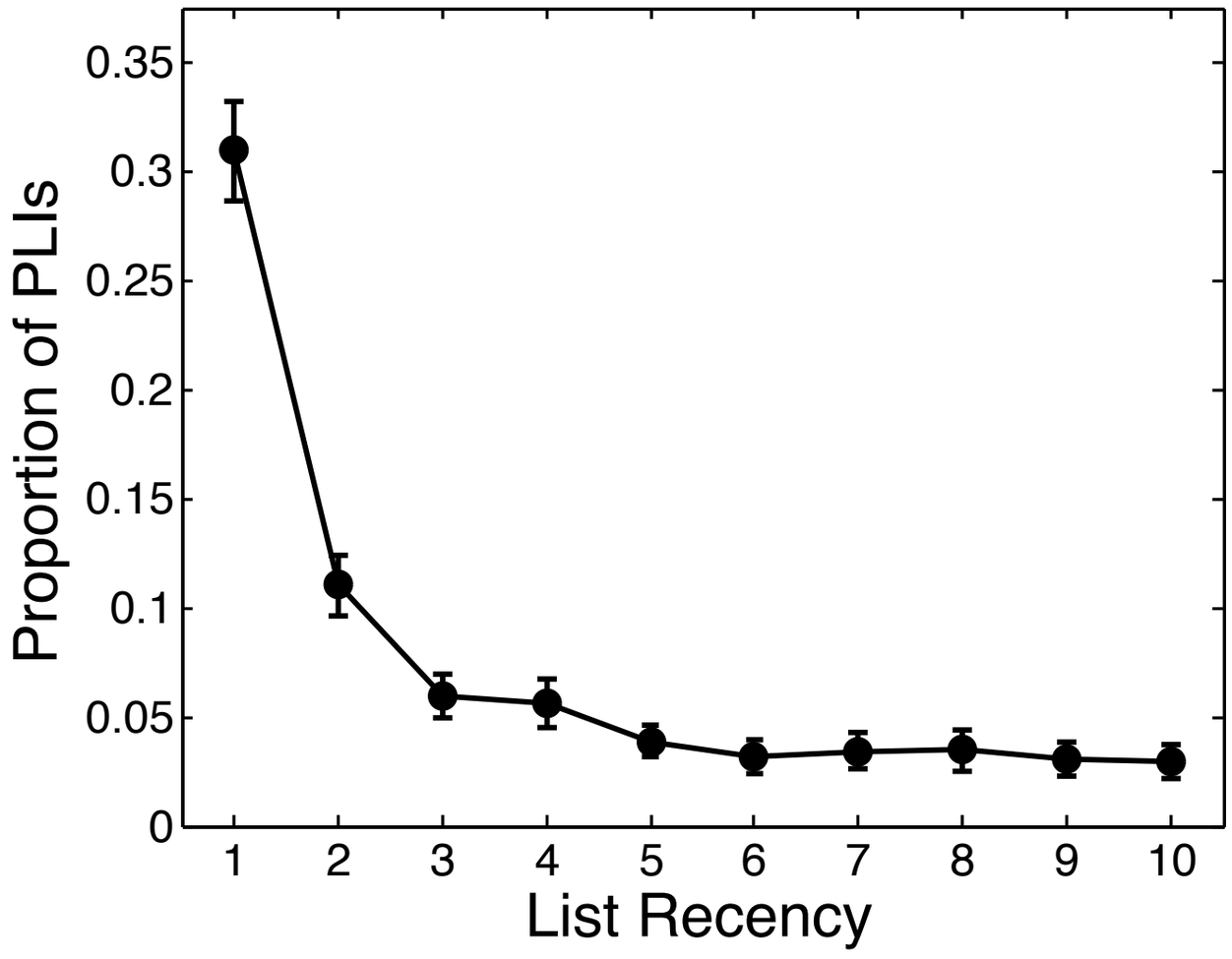
Errors

- Forgetting: fail to recall a studied word
- Prior list intrusions: recall a word from a previous list
- Extra list intrusions: recall a word that wasn’t studied (on any list)

Errors


0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Semantic Relatedness
Correct
PLI
ELI
Transition Type

Prior list intrusions



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weather

NOTEBOOK

SKULL

LEAF

BANANA

SHARK

begin demo

+

IRON

LAWYER

HOTEL

PUPIL

RADIO

begin real demo

+

MOTOR

FEVER

POST

ARTIST

WITCH

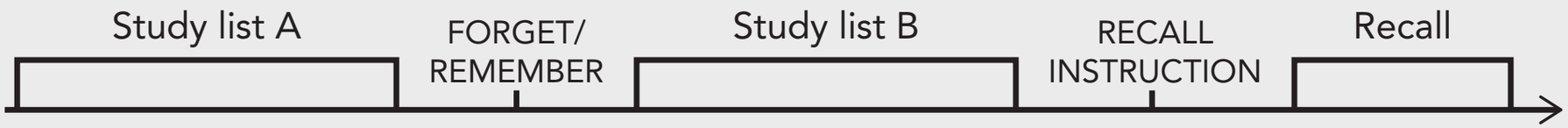
+

Recall the practice list!

FIRST LIST	SECOND LIST
1. IRON	1. MOTOR
2. LAWYER	2. FEVER
3. HOTEL	3. POST
4. PUPIL	4. ARTIST
5. RADIO	5. WITCH

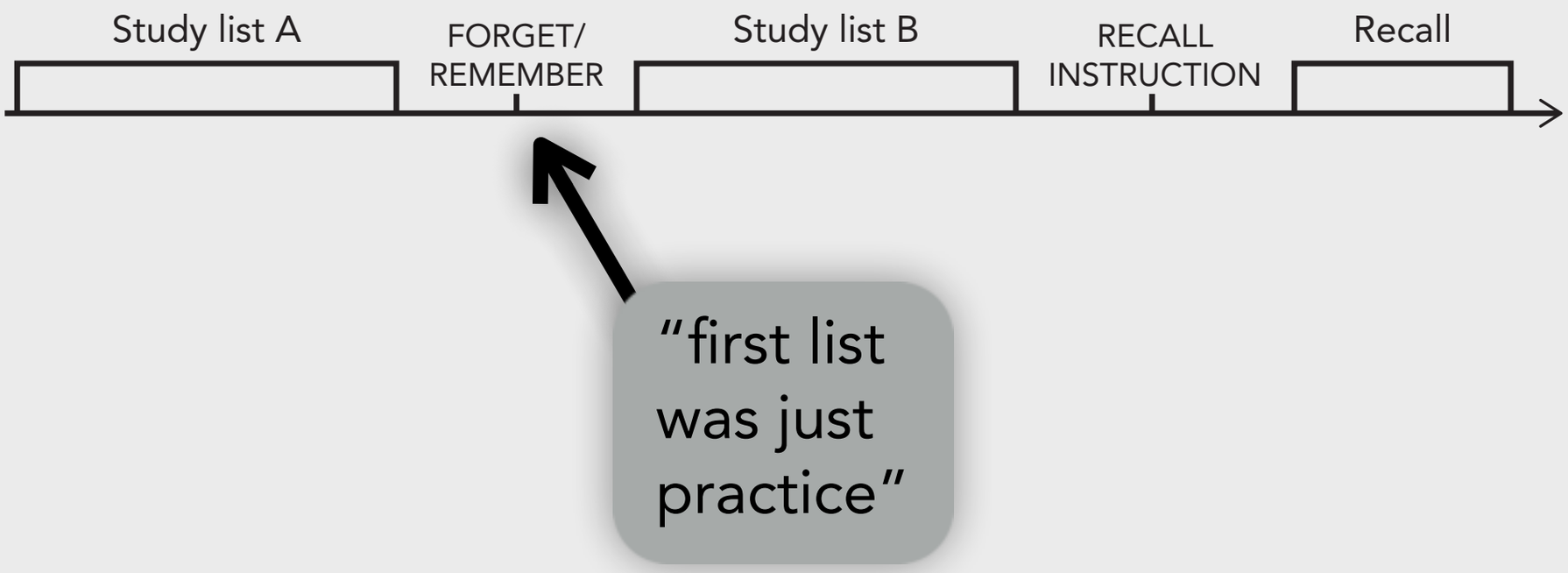
FIRST LIST	SECOND LIST
1. IRON	1. MOTOR
2. LAWYER	2. FEVER
3. HOTEL	3. POST
4. PUPIL	4. ARTIST
5. RADIO	5. WITCH

List method directed forgetting



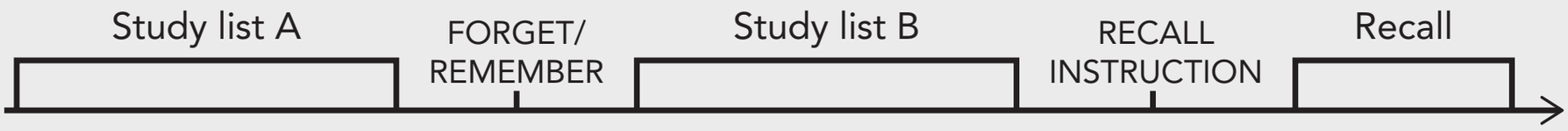
Manning et al. 2016

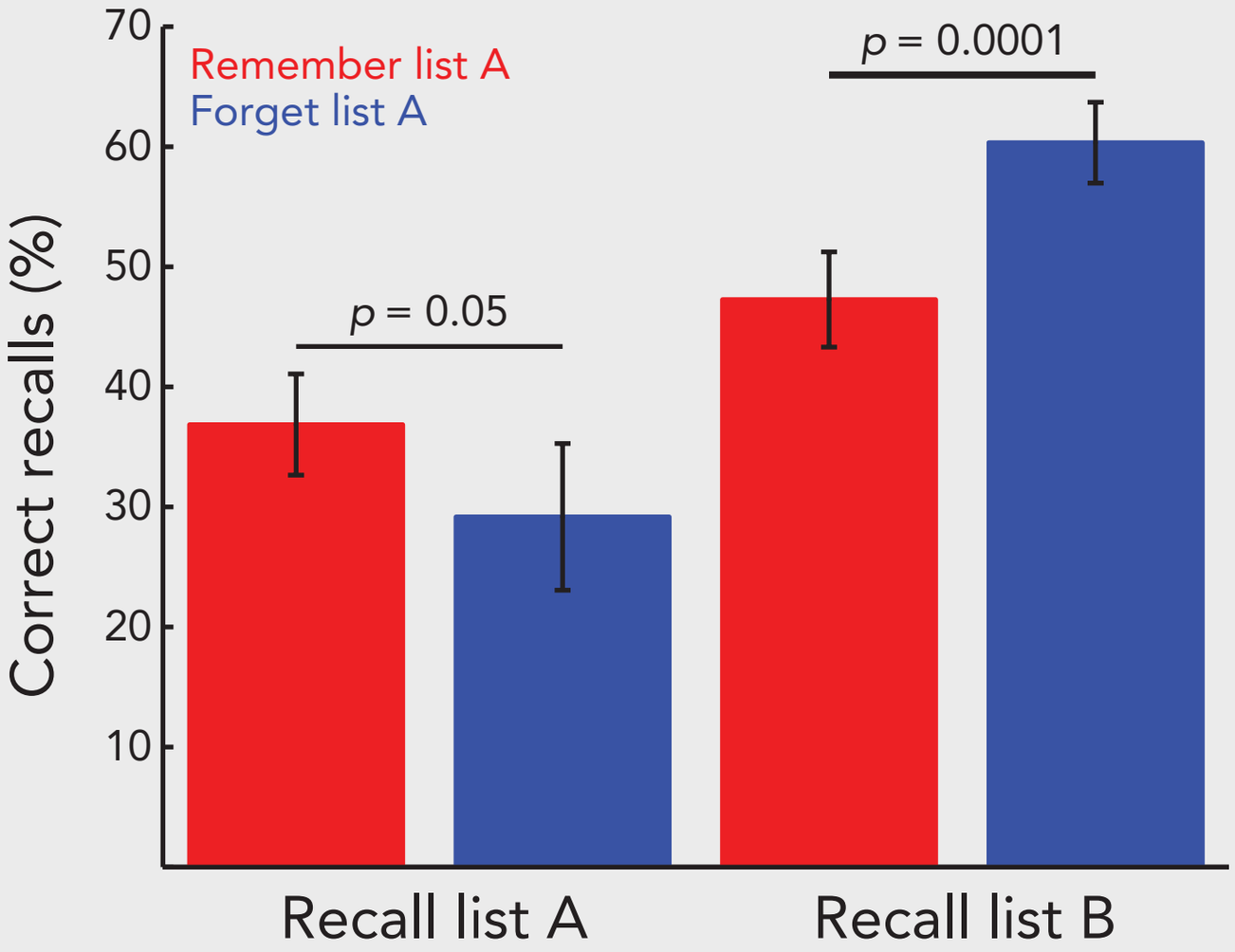
List method directed forgetting



Manning et al. 2016

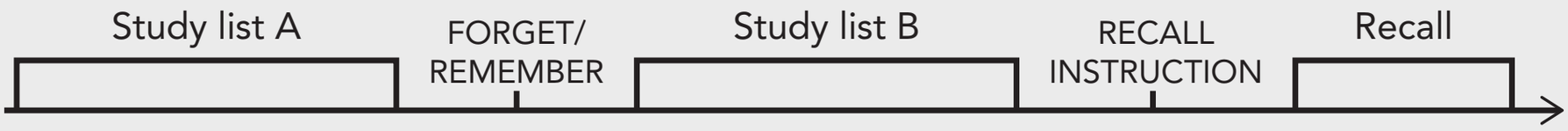
List method directed forgetting

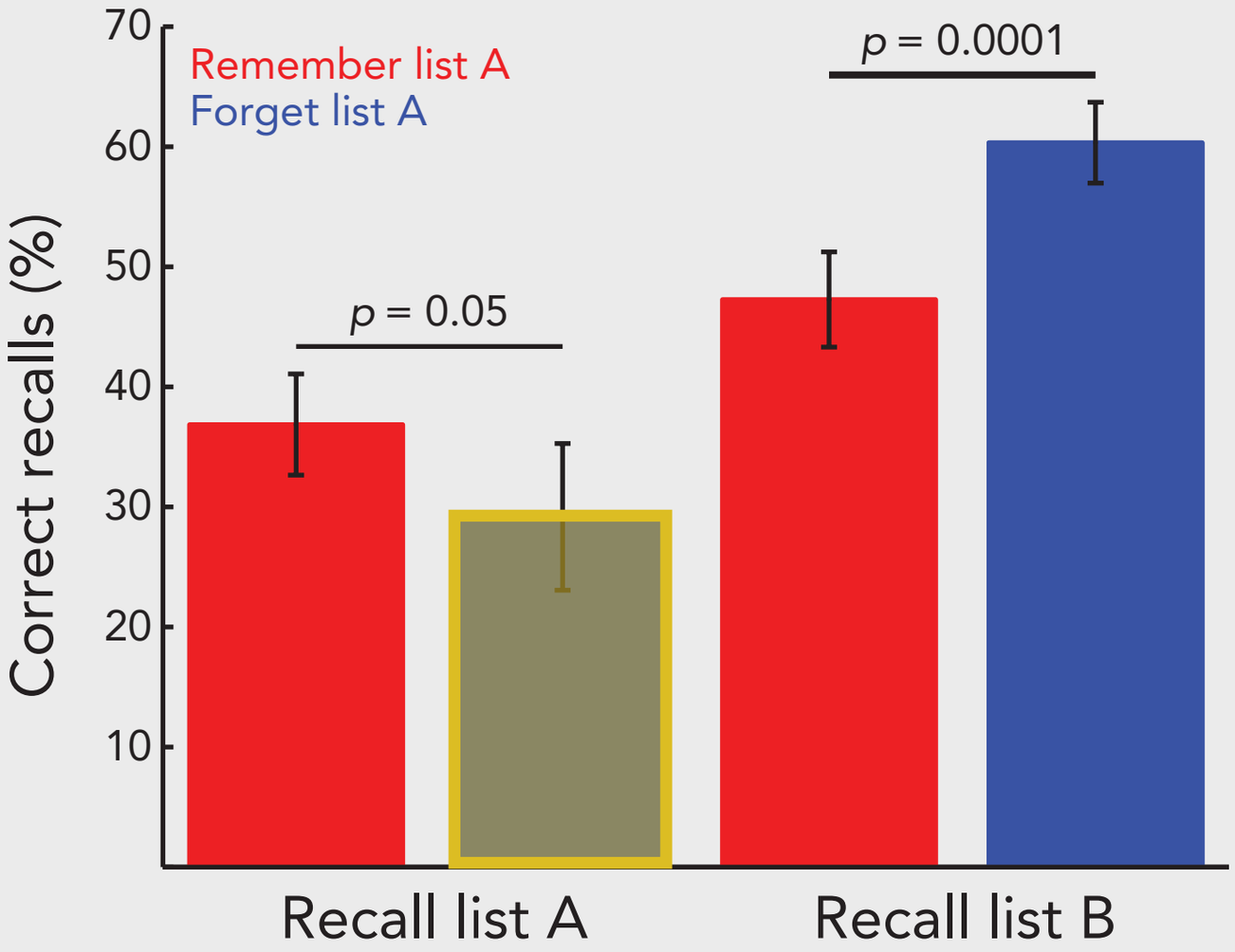




Manning et al. 2016

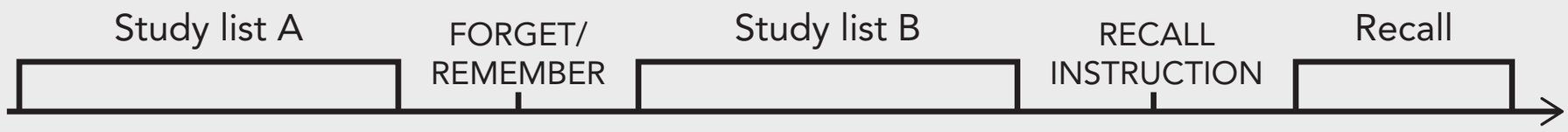
List method directed forgetting

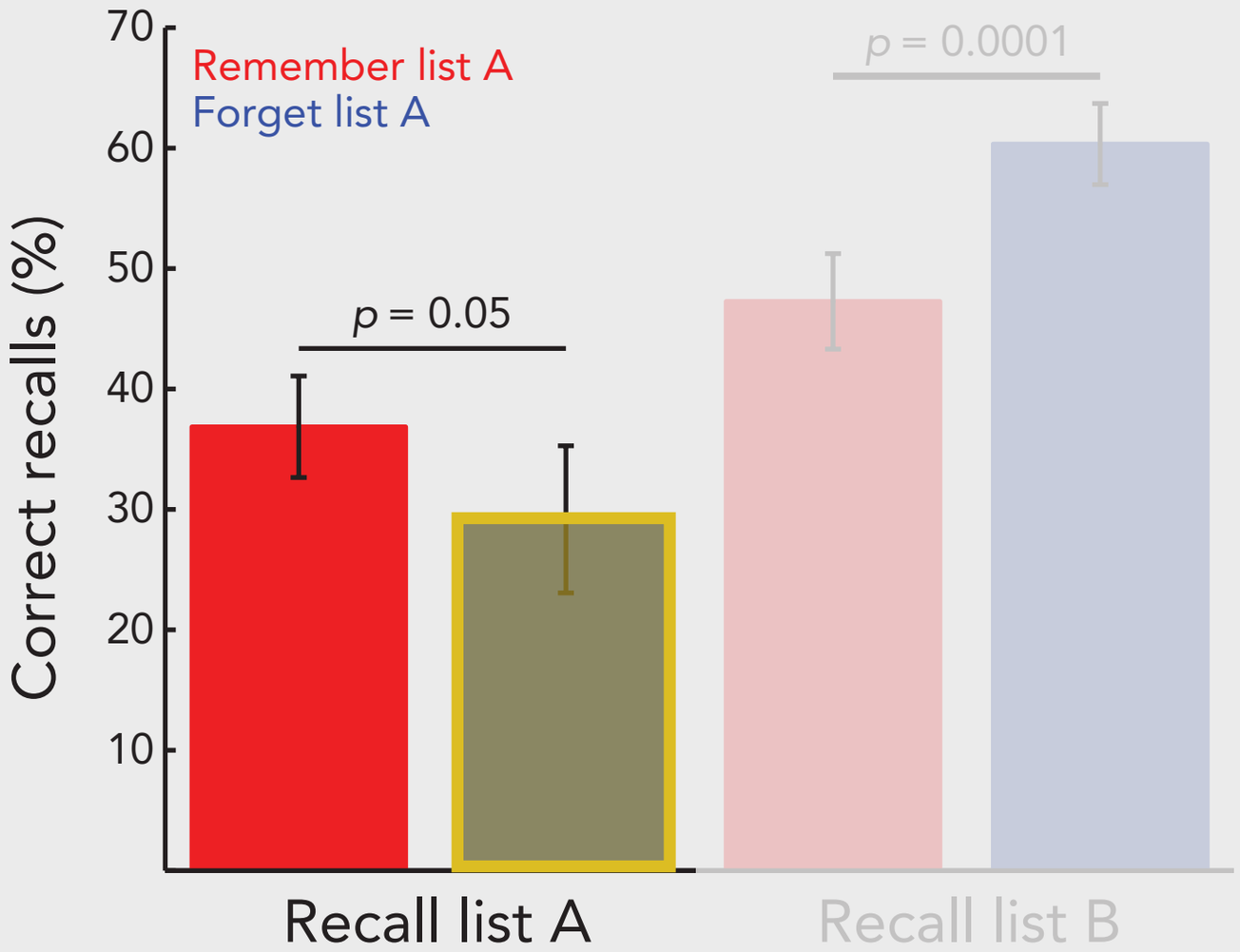




Manning et al. 2016

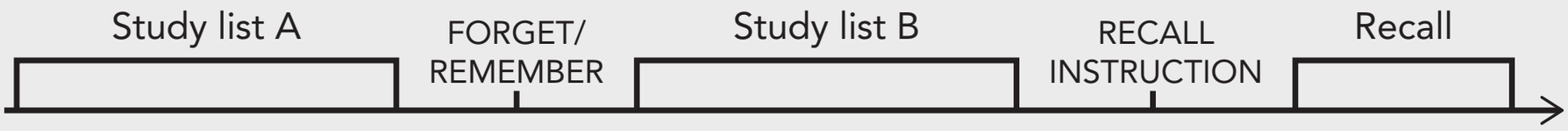
List method directed forgetting

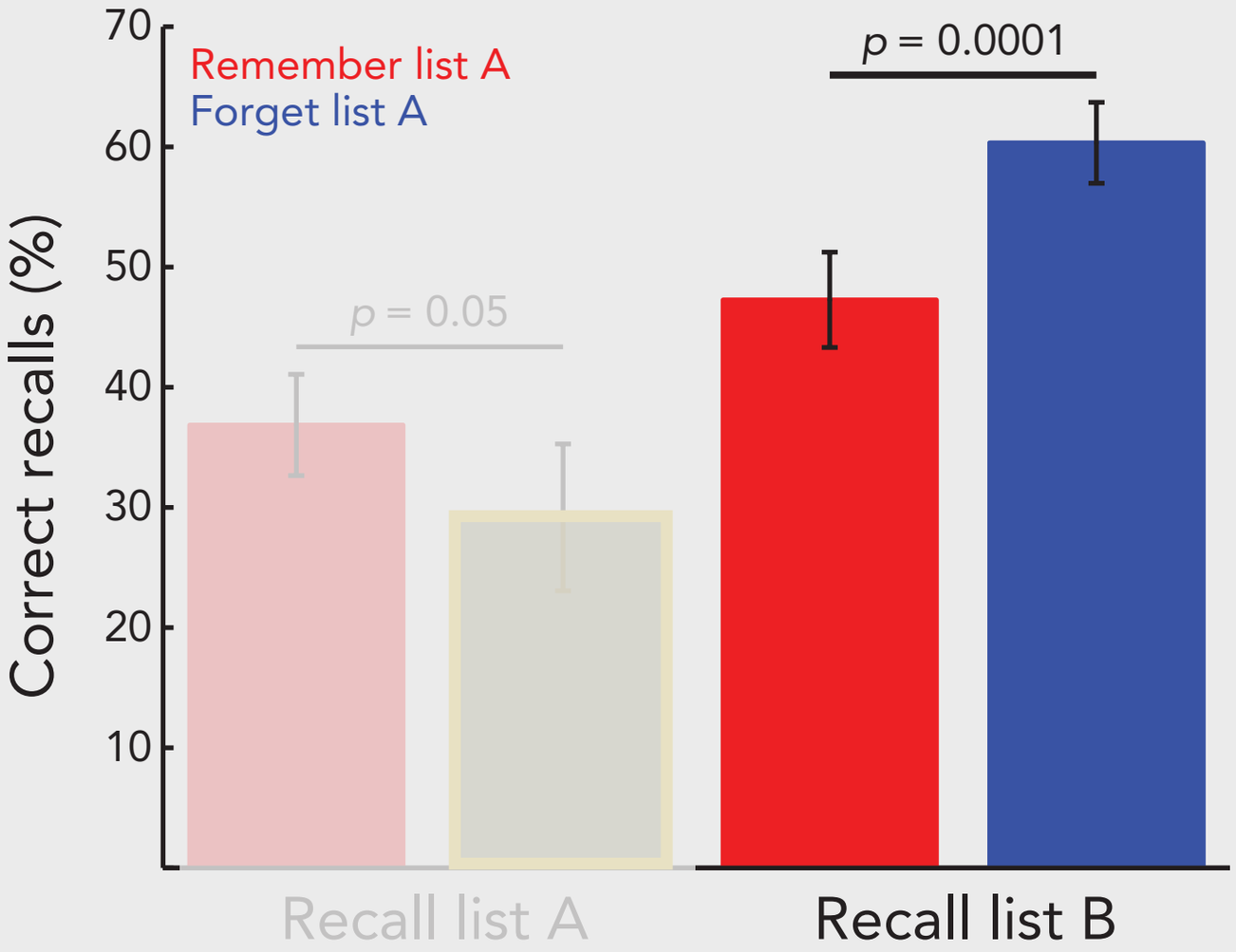




Manning et al. 2016

List method directed forgetting





Manning et al. 2016

List method directed forgetting

hungry

itchy

exams

weather

IRON LAWYER HOTEL PUPIL RADIO

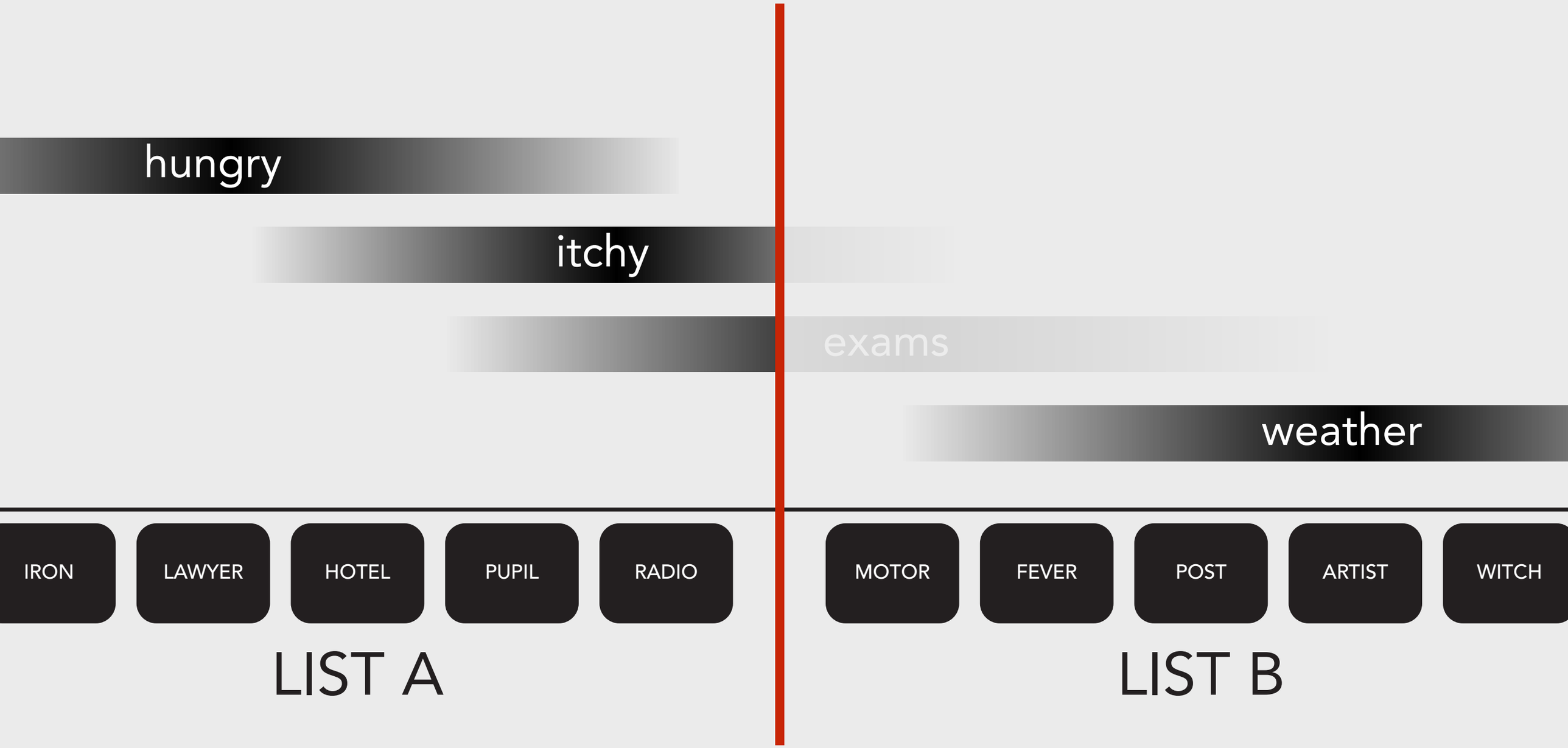
LIST A

MOTOR FEVER POST ARTIST WITCH

LIST B

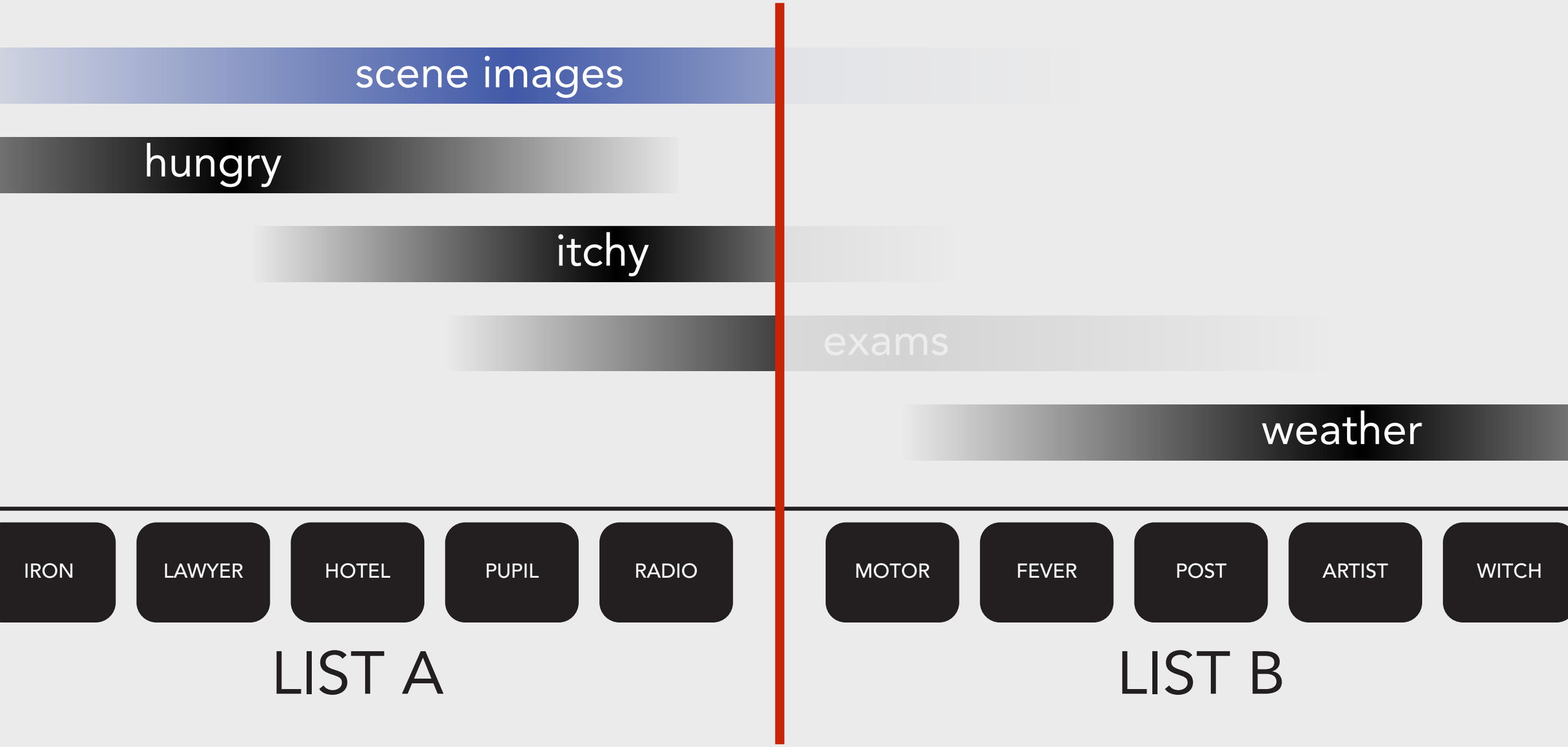
Manning et al. 2016

List method directed forgetting



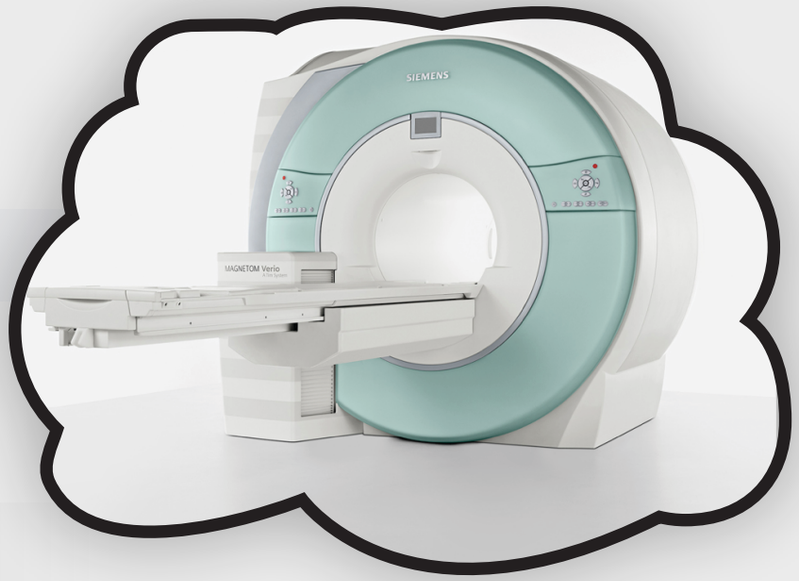
Manning et al. 2016

List method directed forgetting



Manning et al. 2016

List method directed forgetting



scene images

hungry

itchy

exams

weather

IRON LAWYER HOTEL PUPIL RADIO

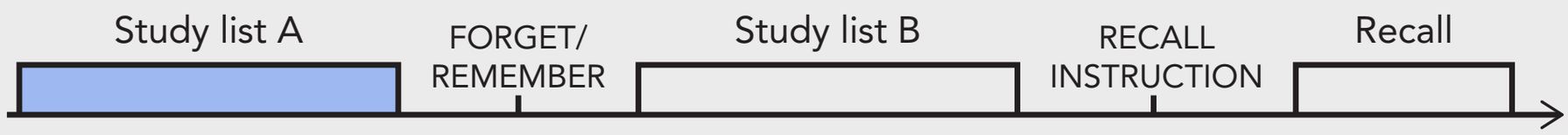
LIST A

MOTOR FEVER POST ARTIST WITCH

LIST B

Manning et al. 2016

Directed forgetting with scenes: evidence for contextual flushing?

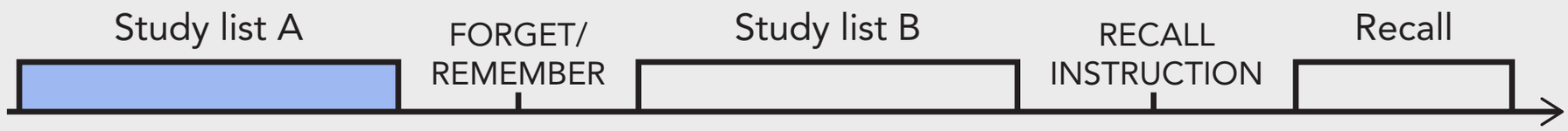


- Predict a larger decrease in scene activity following a forget instruction

- Decrease in scene activity should predict fewer list A recalls

Manning et al. 2016

Directed forgetting with scenes: evidence for contextual flushing?



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Manning et al. 2016

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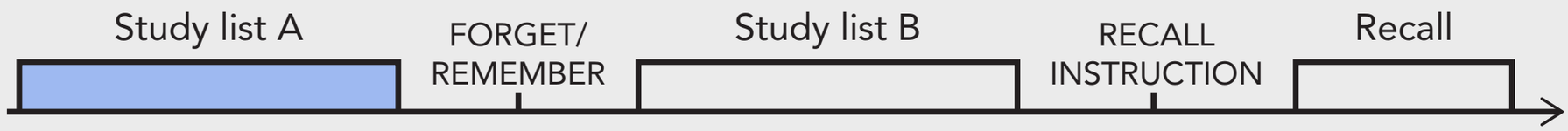

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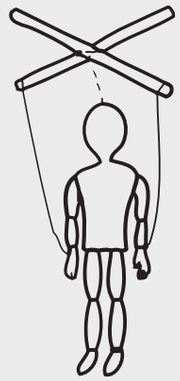
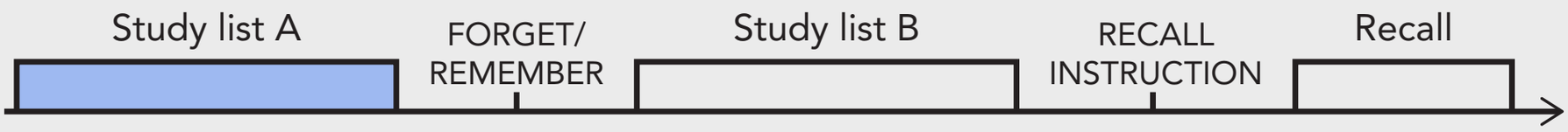
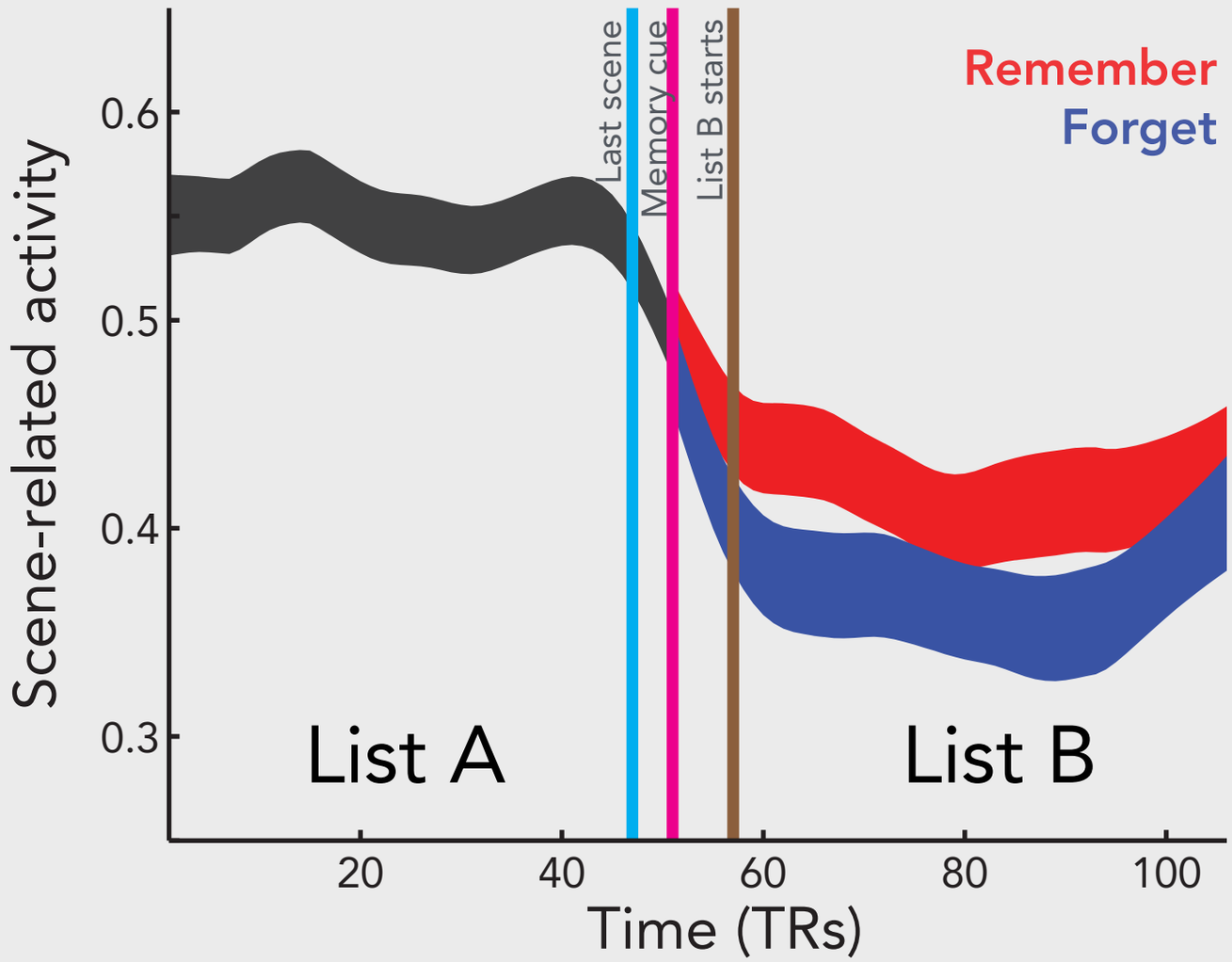


Manning et al. 2016

Directed forgetting with scenes



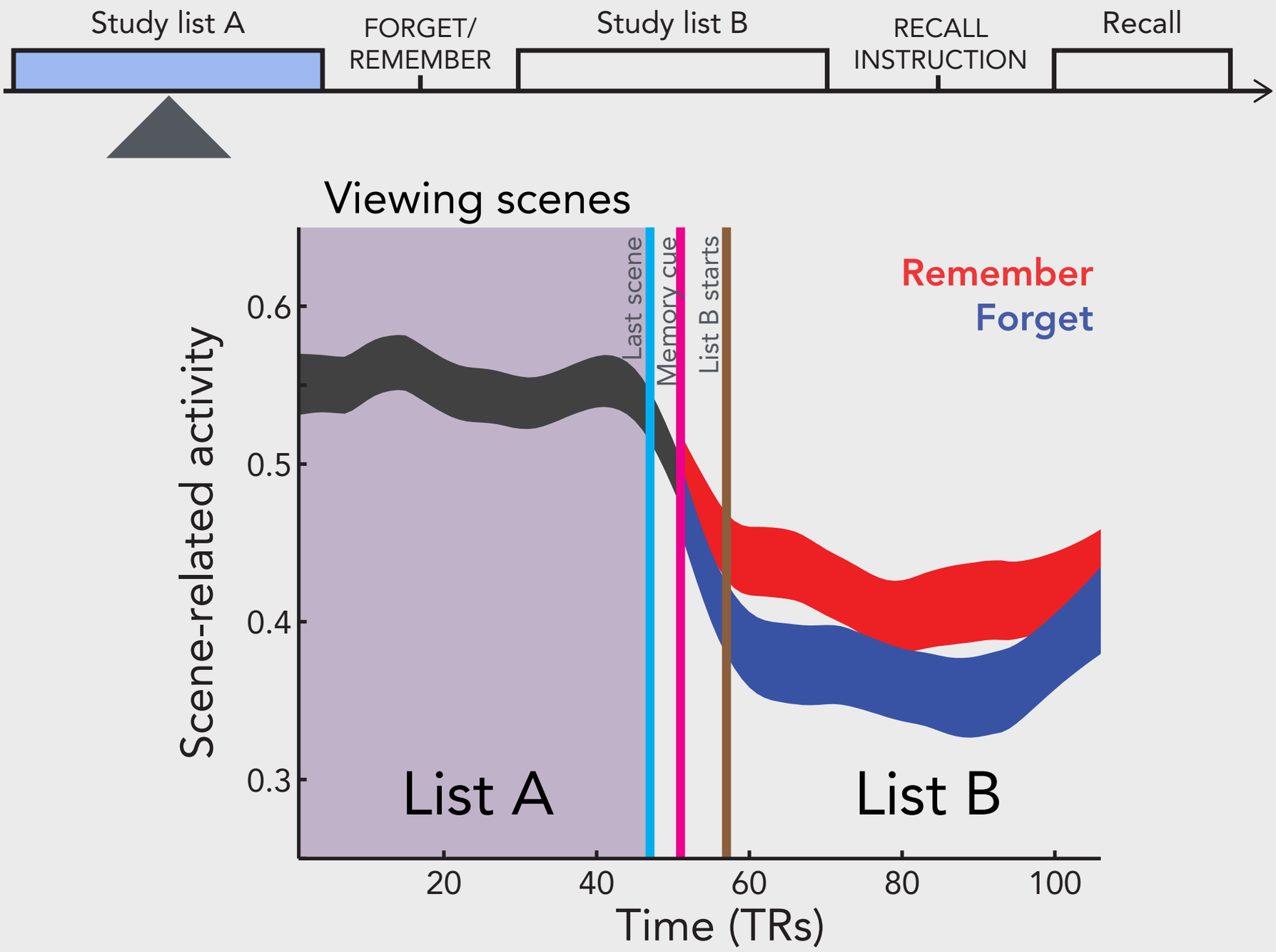


Remember

Forget

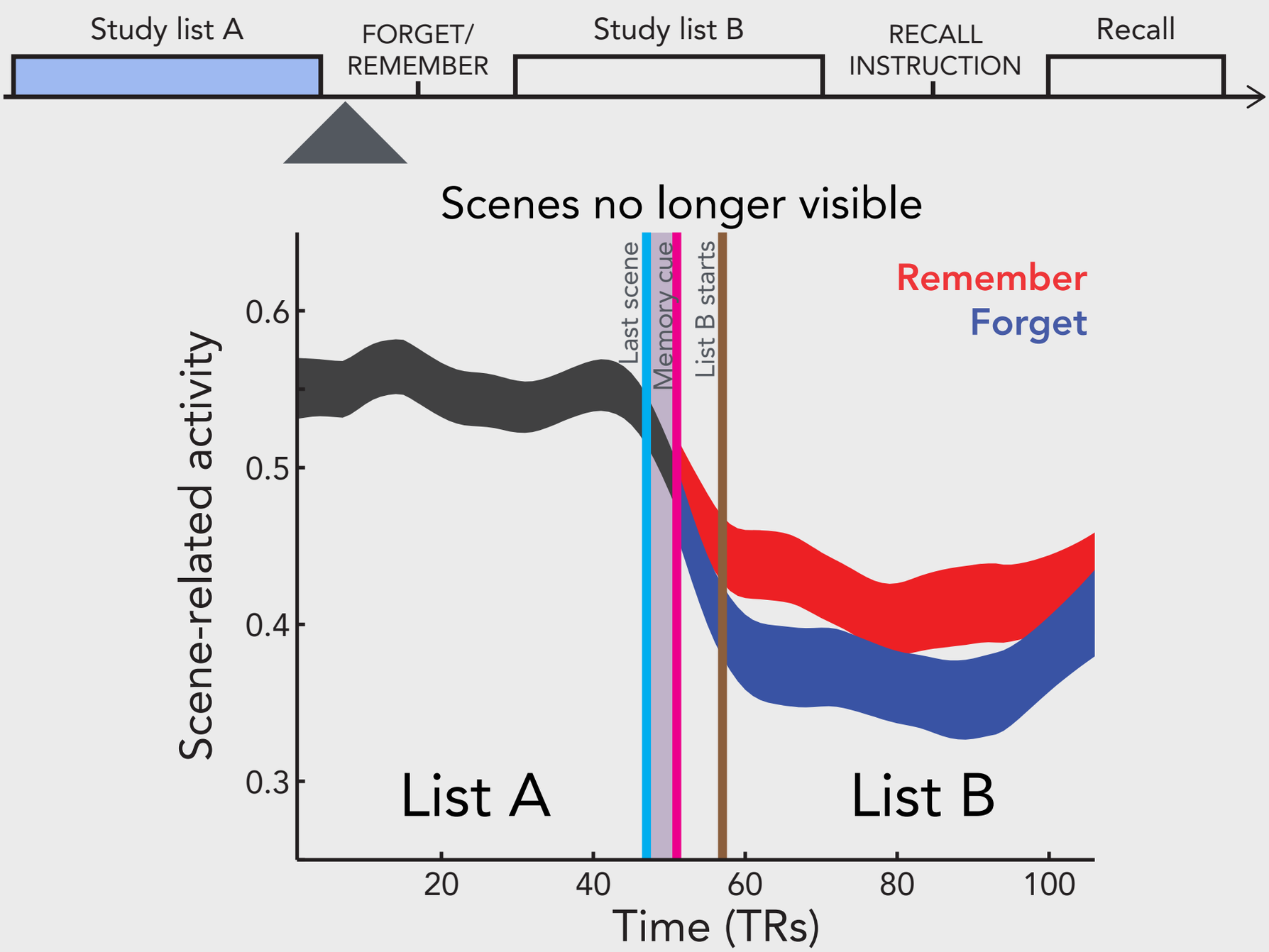
Manning et al. 2016

Directed forgetting with scenes



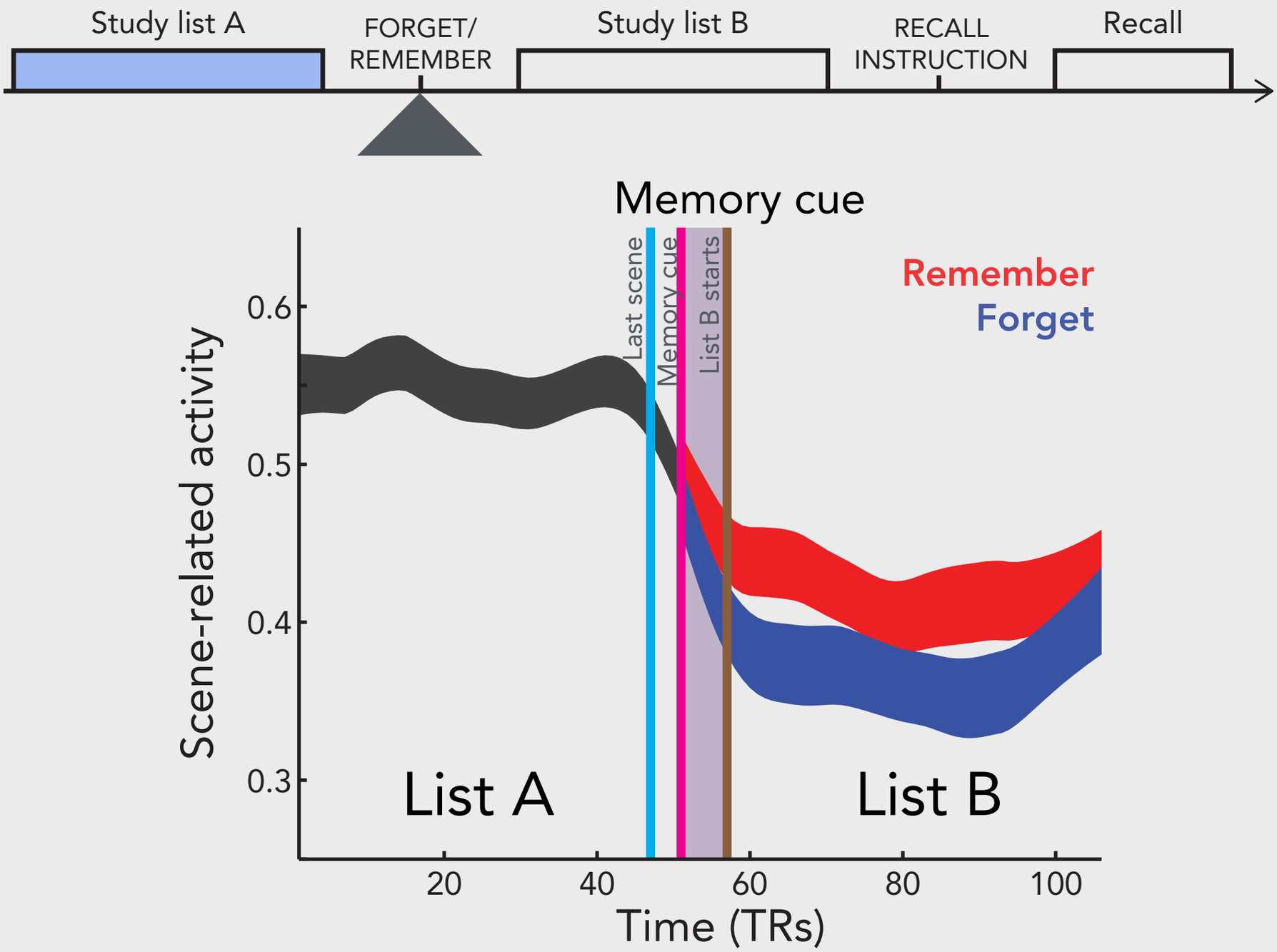
Manning et al. 2016

Directed forgetting with scenes



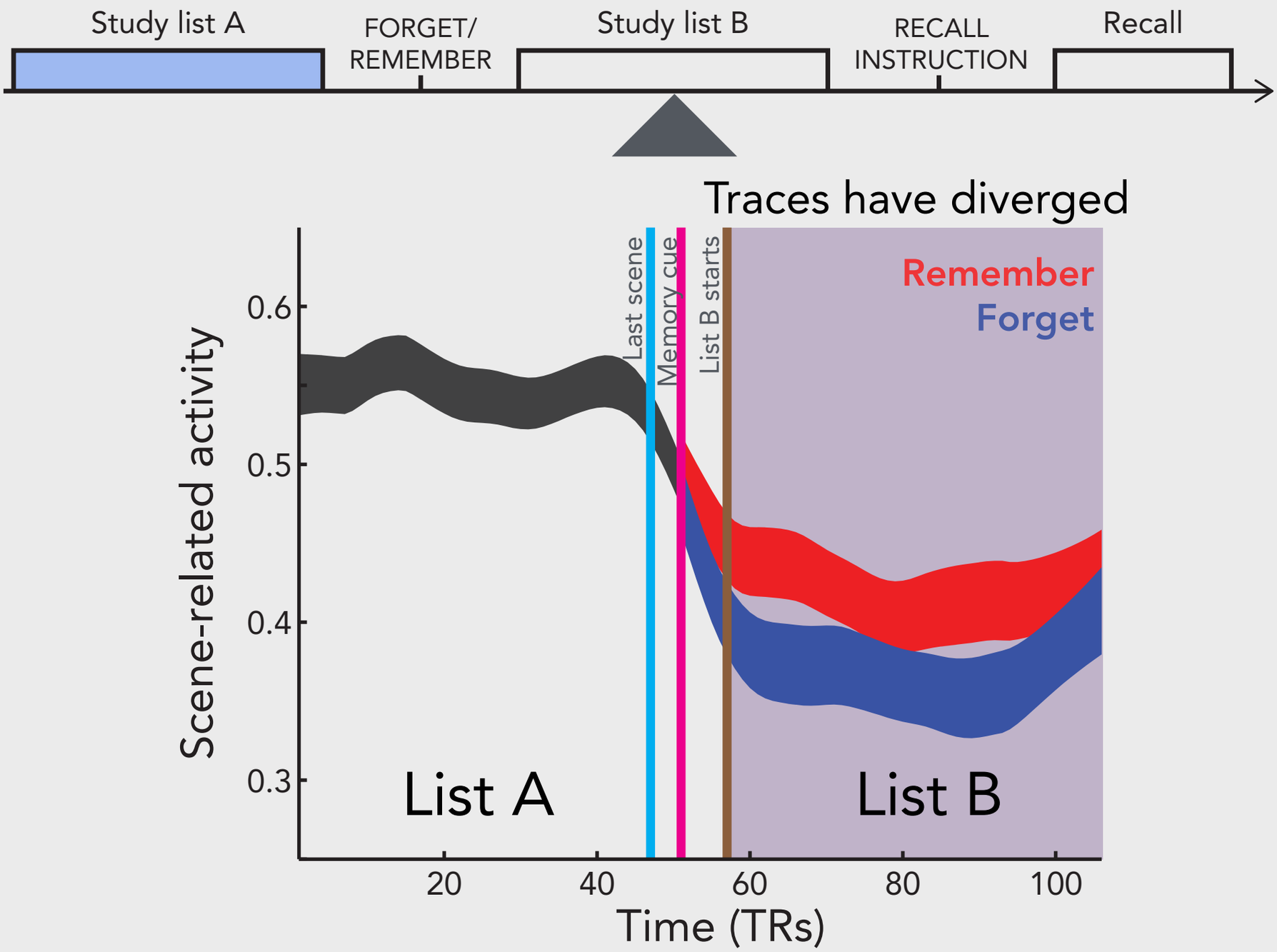
Manning et al. 2016

Directed forgetting with scenes



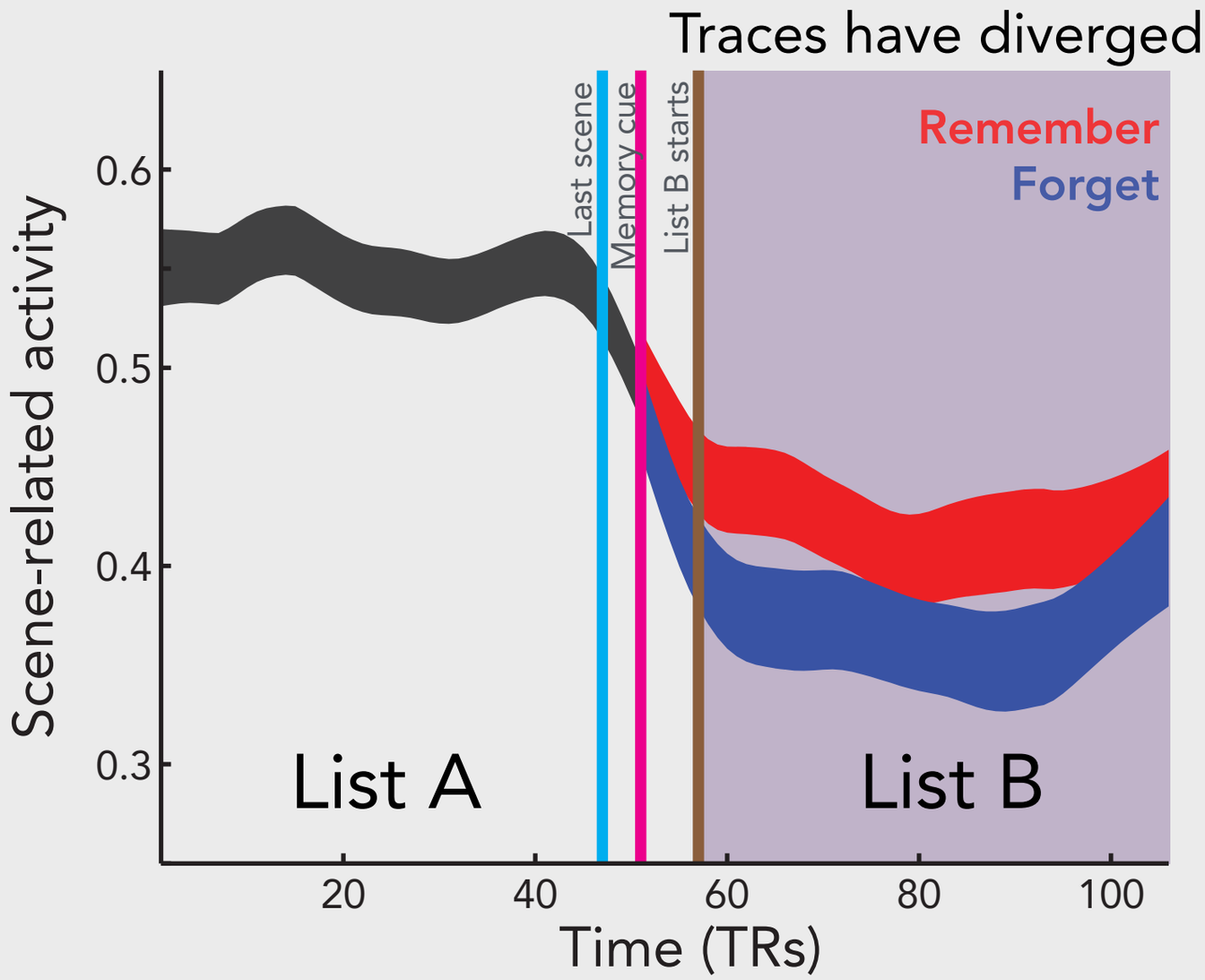
Manning et al. 2016

Directed forgetting with scenes



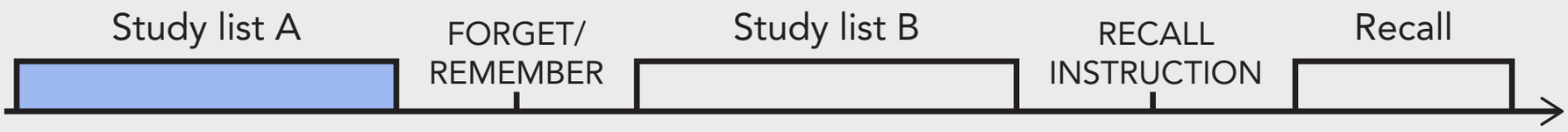
Manning et al. 2016

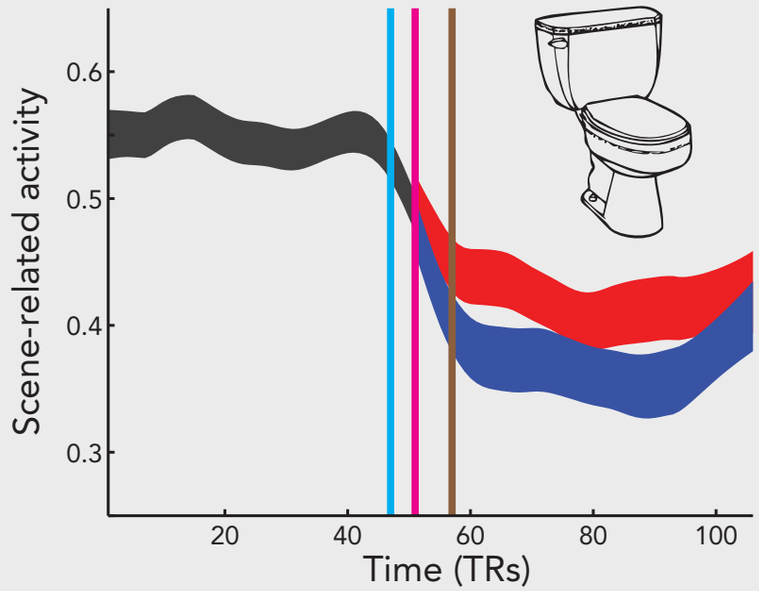
Directed forgetting with scenes

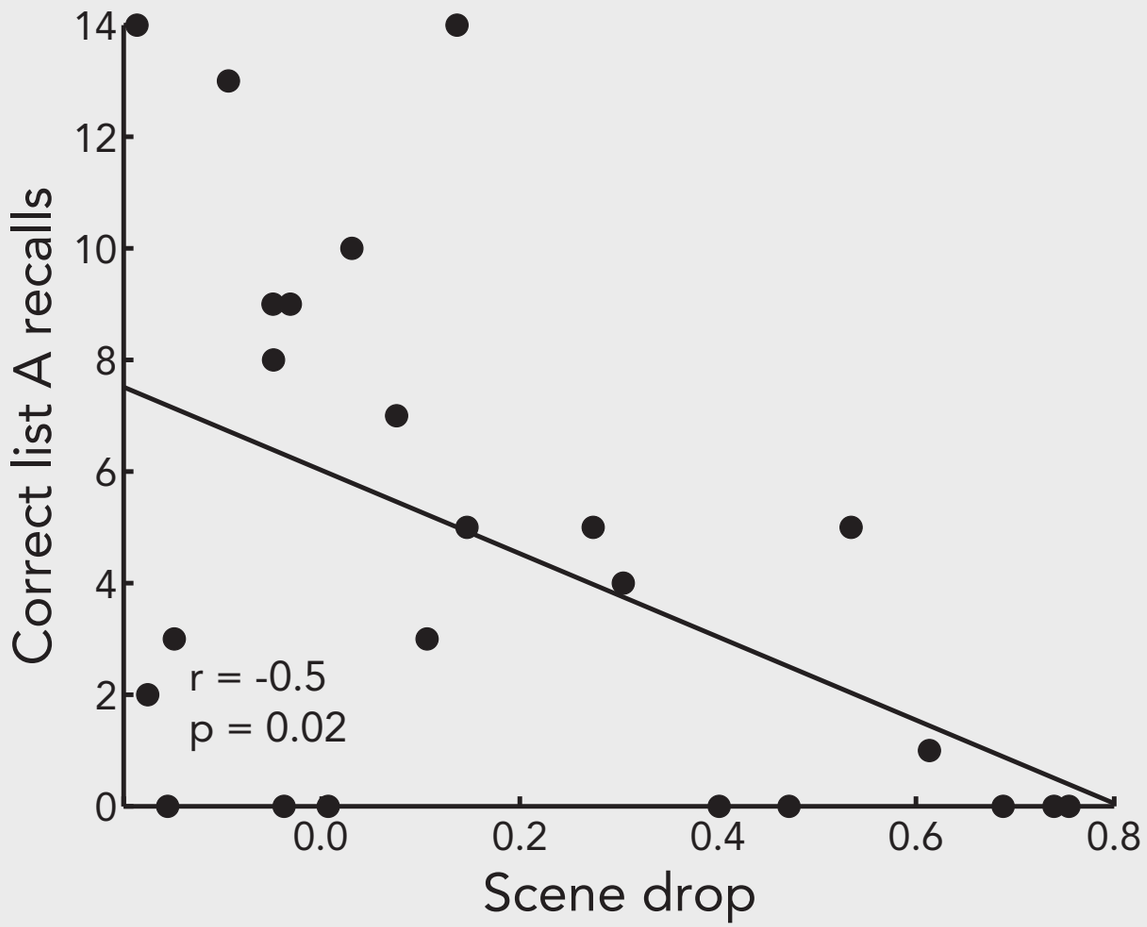


Manning et al. 2016

Directed forgetting with scenes

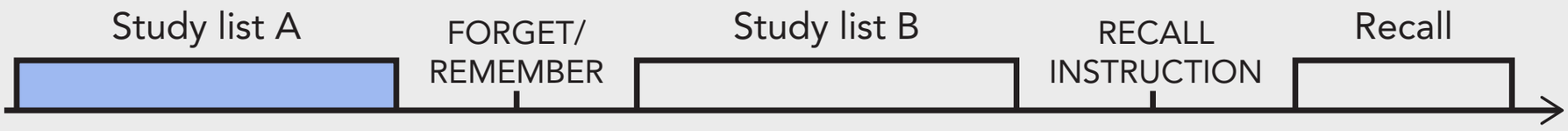


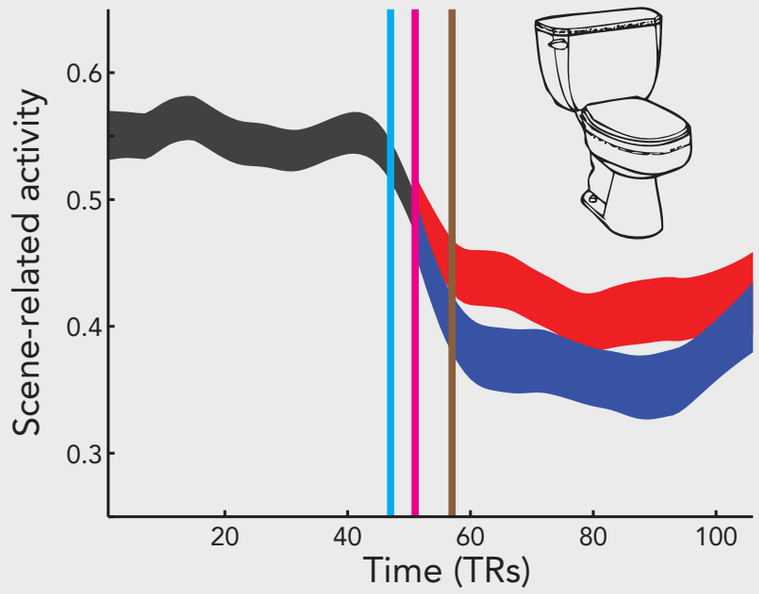


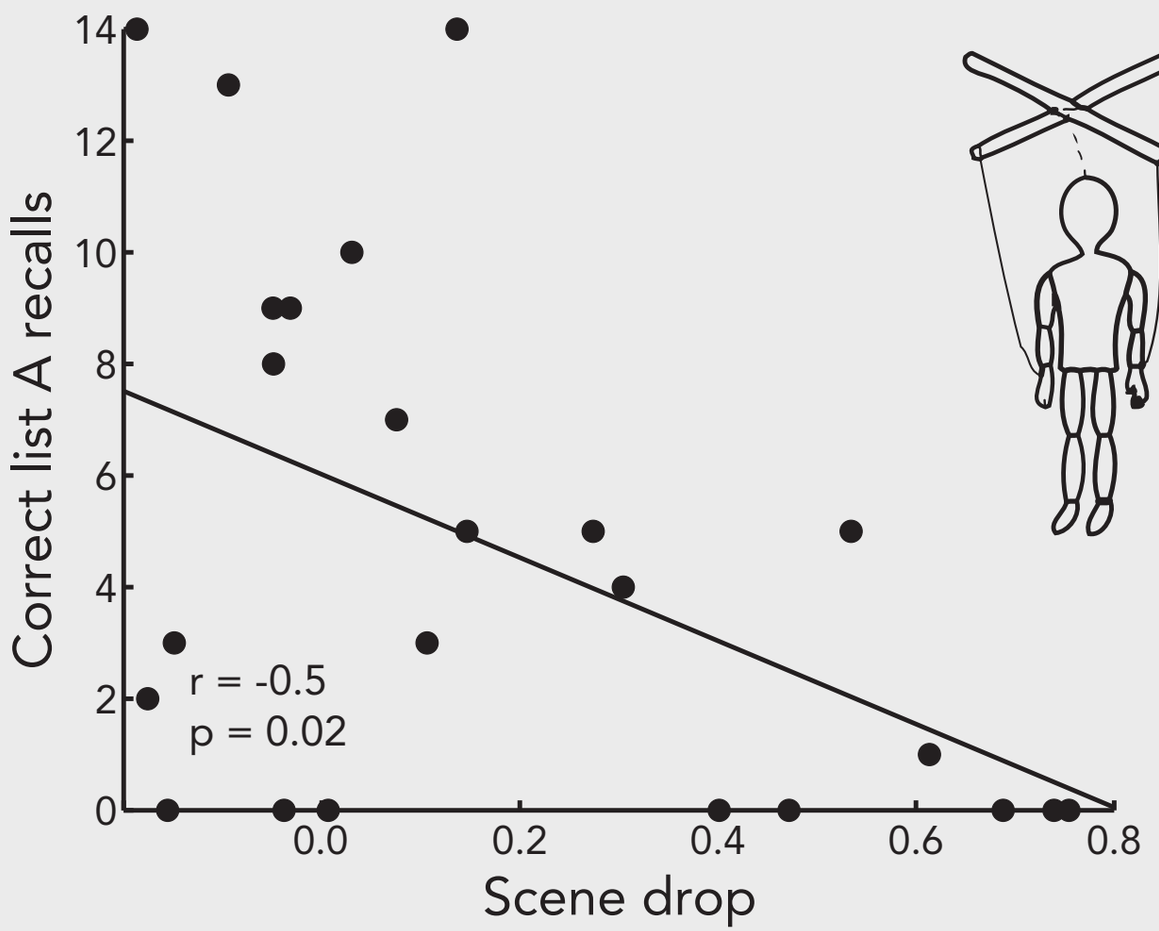


Manning et al. 2016

Directed forgetting with scenes

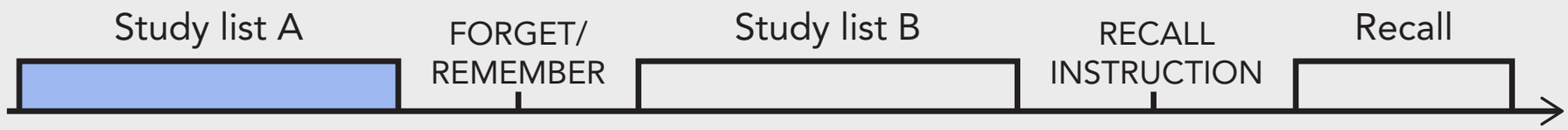




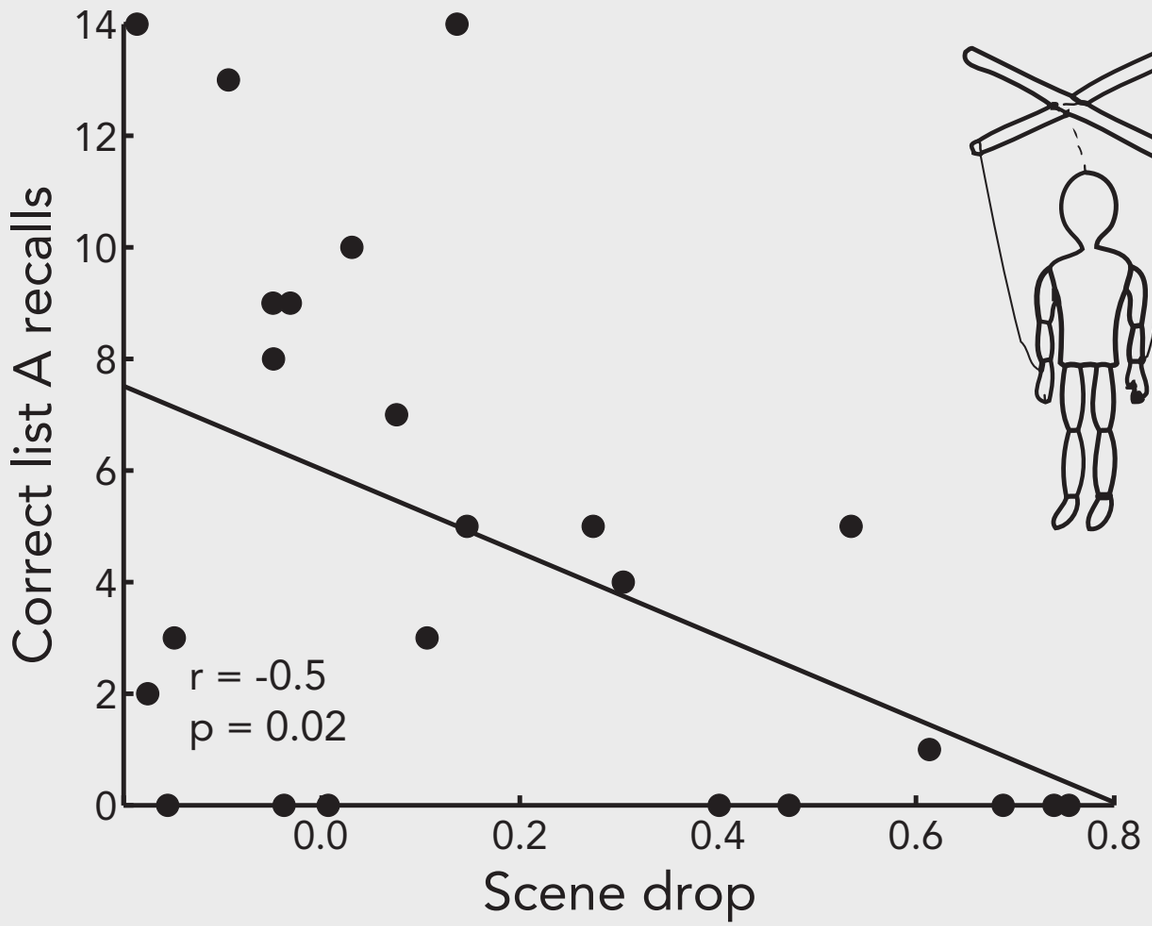


Manning et al. 2016

Directed forgetting with scenes

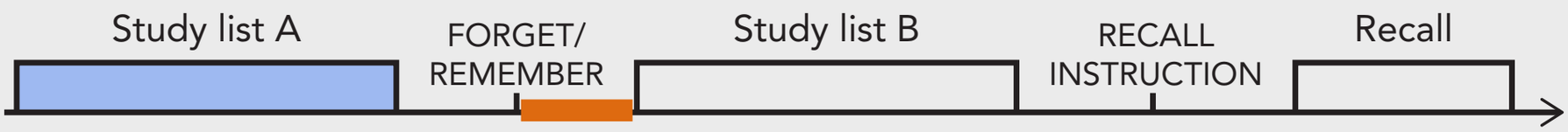


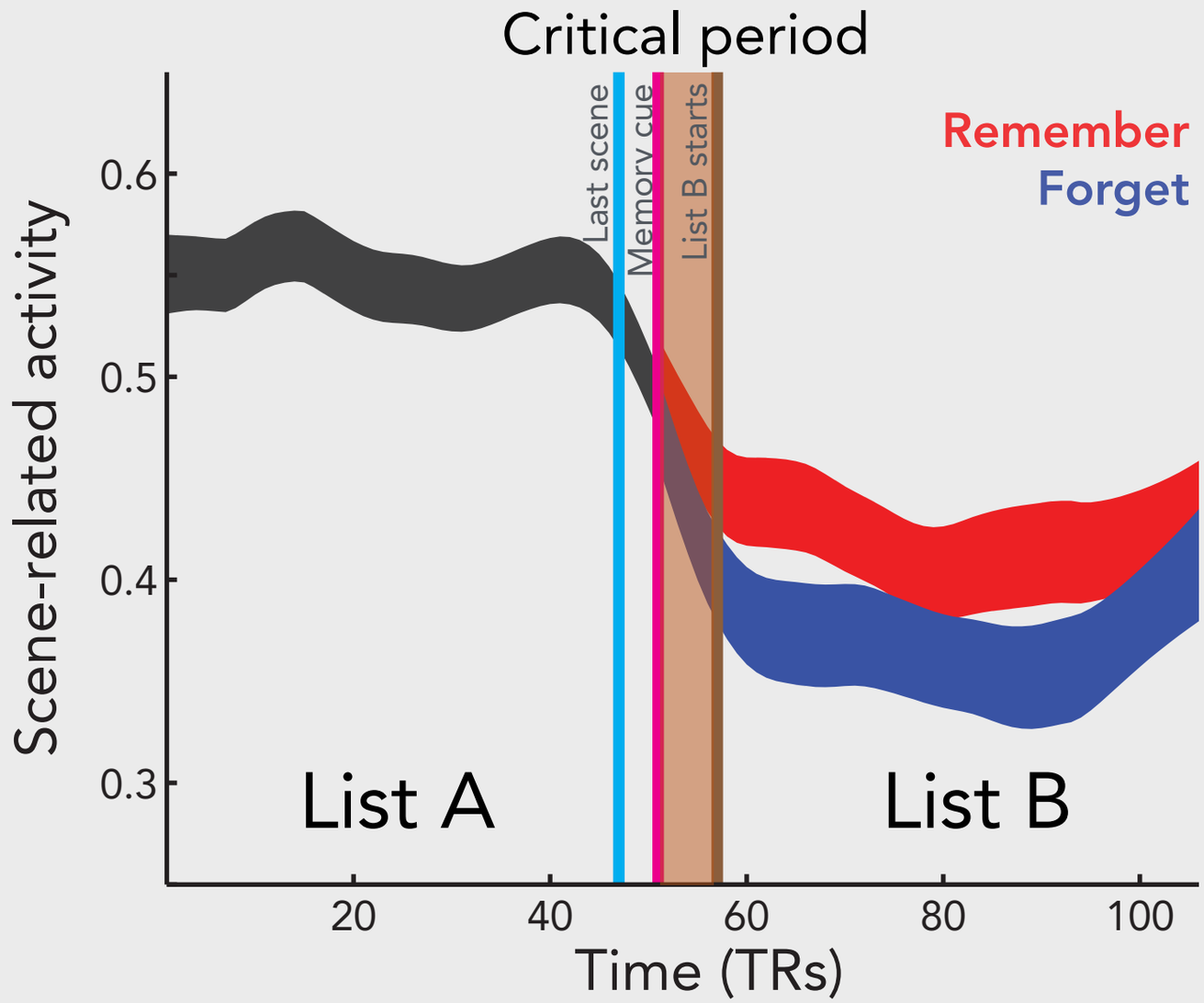
Participants who flush list A context have difficulty recalling list A words



Manning et al. 2016

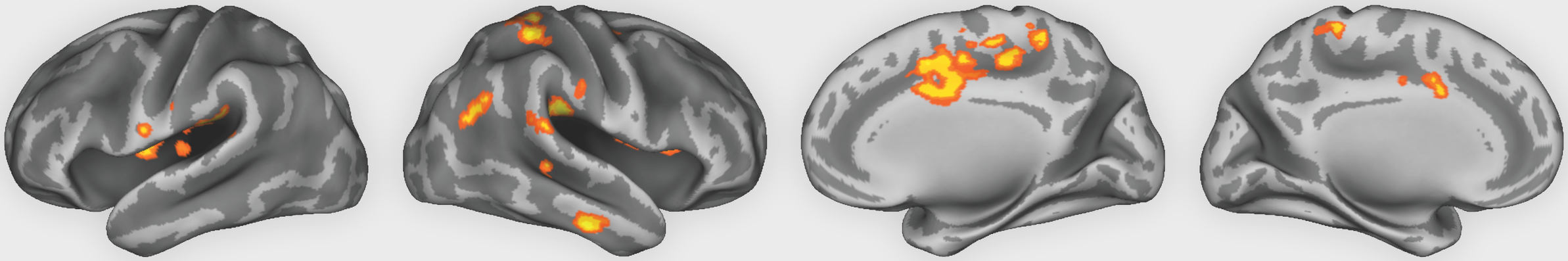
Directed forgetting with scenes





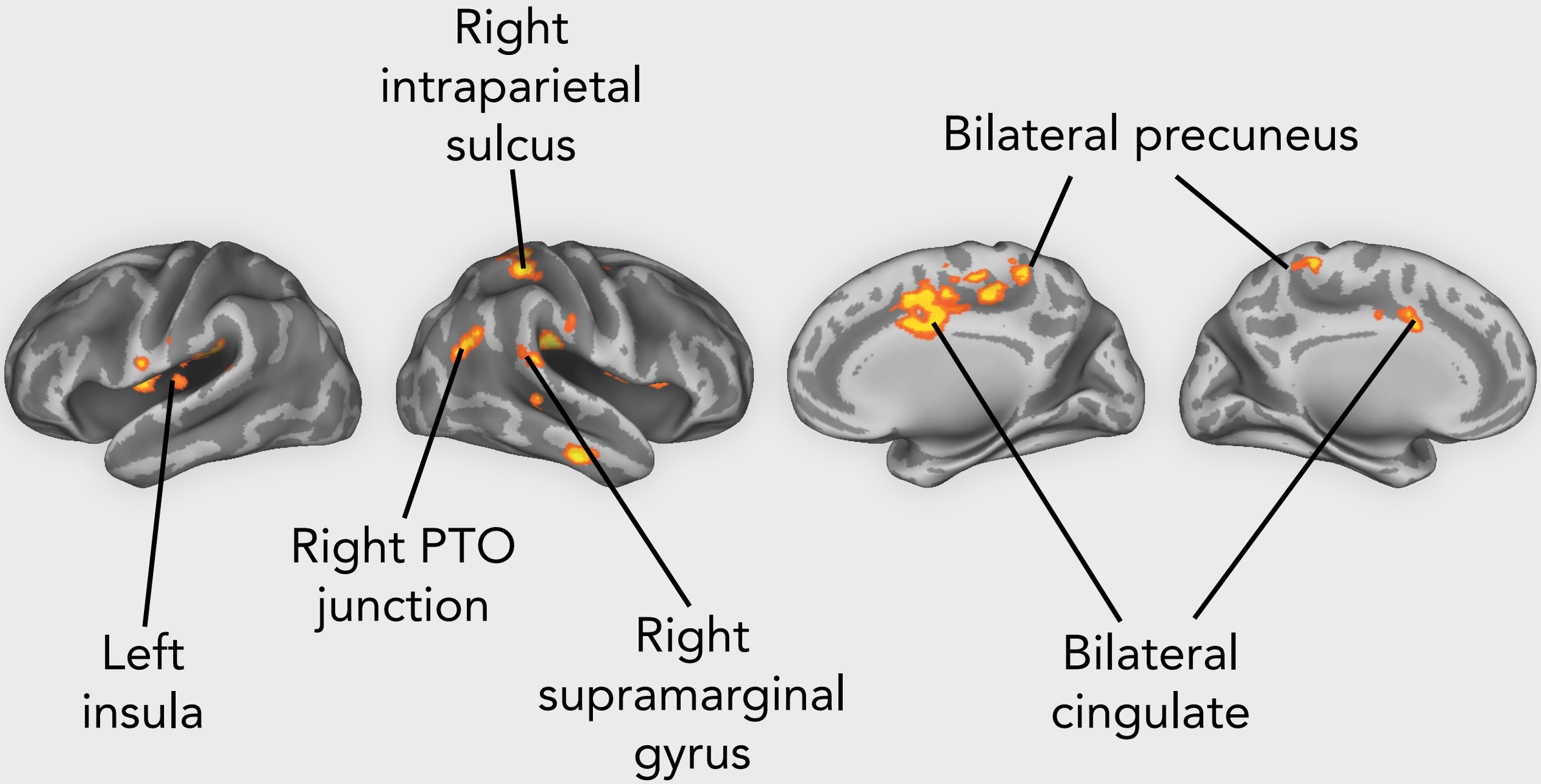
Manning et al. 2016

Contextual flushers



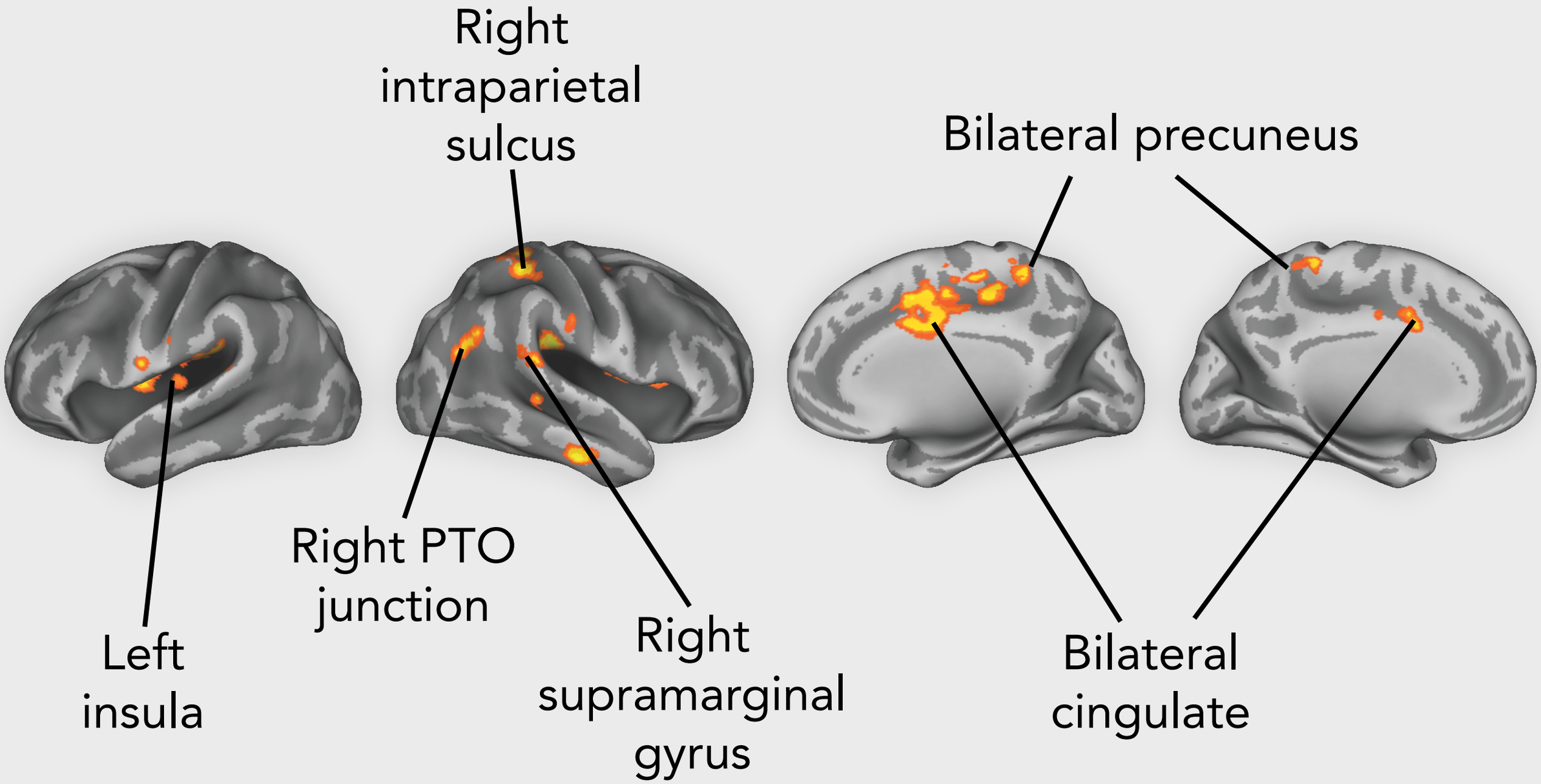
Manning et al. 2016

Contextual flushers



Manning et al. 2016

Contextual flushers



Event boundary regions: Zacks et al., 2010
Manning et al. 2016

Events & context

Cooking

Washing dishes

Events & context

Cooking

Washing dishes

Phone call

Events & context

Cooking

Washing dishes

Phone call

Events & context

Cooking

Washing dishes

Phone call

Events & context

Cooking

Washing dishes

Phone call

Events & context

Cooking

Phone call

Washing dishes

Brain hack

testing room

hungry

itchy

exams

weather

NOTEBOOK

SKULL

LEAF

BANANA

SHARK