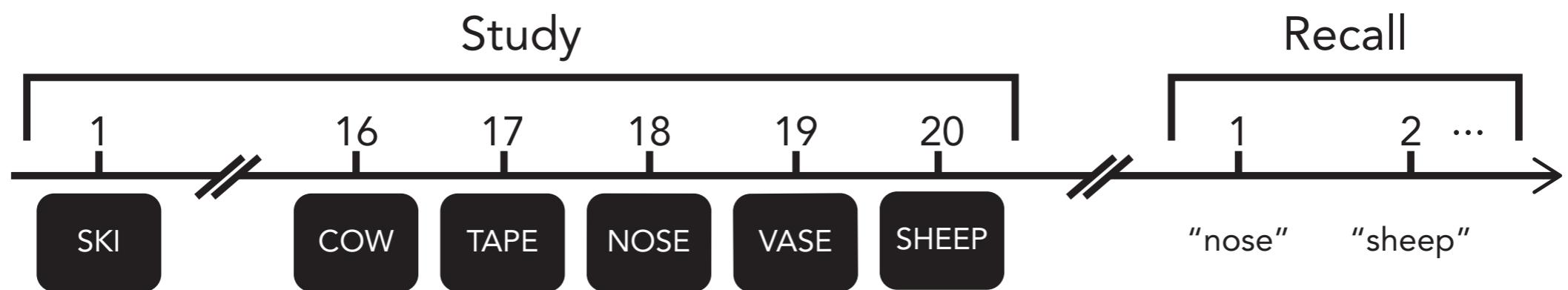


# Free recall and memory search

PSYC 51.09: Human Memory  
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# Free recall



# Free recall variants

- **Immediate free recall:** study a list, then recall immediately after the last word disappears from the screen
- **Delayed free recall:** study a list, then wait before recalling
- **Continual distractor free recall:** fixed-duration distraction after every item

[Free recall] is a touchstone. If we can come to understand what is going on in free recall, then we can have some confidence that we understand the more basic [memory] processes and how they come together in one particular situation.

Bennet B. Murdock, *Human Memory: Theory and Data*, (1974)  
p 307.

# Free recall dynamics

- Where do you start?
- How do you transition between recalls?
- What do you remember overall?
- Errors

testing room

hungry

itchy

exams

weather

NOTEBOOK

SKULL

LEAF

BANANA

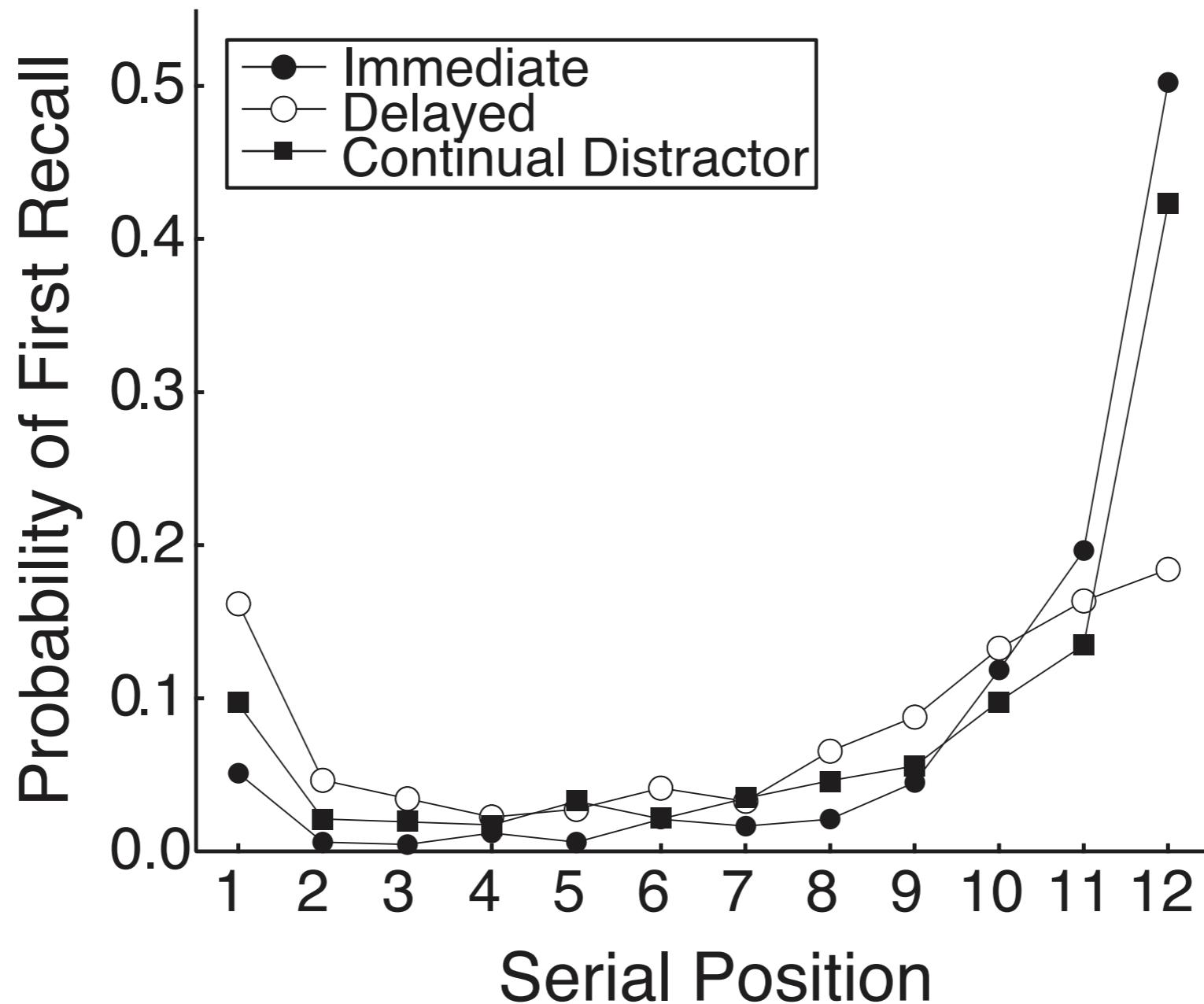
SHARK



# Heraclitus



# $p(\text{first recall})$



testing room

hungry

itchy

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weather

NOTEBOOK

SKULL

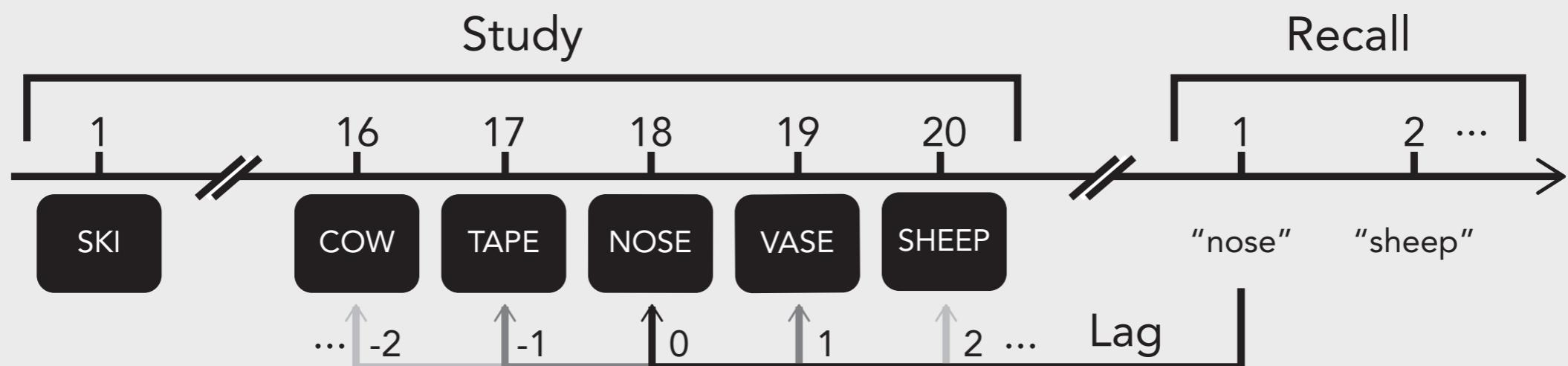
LEAF

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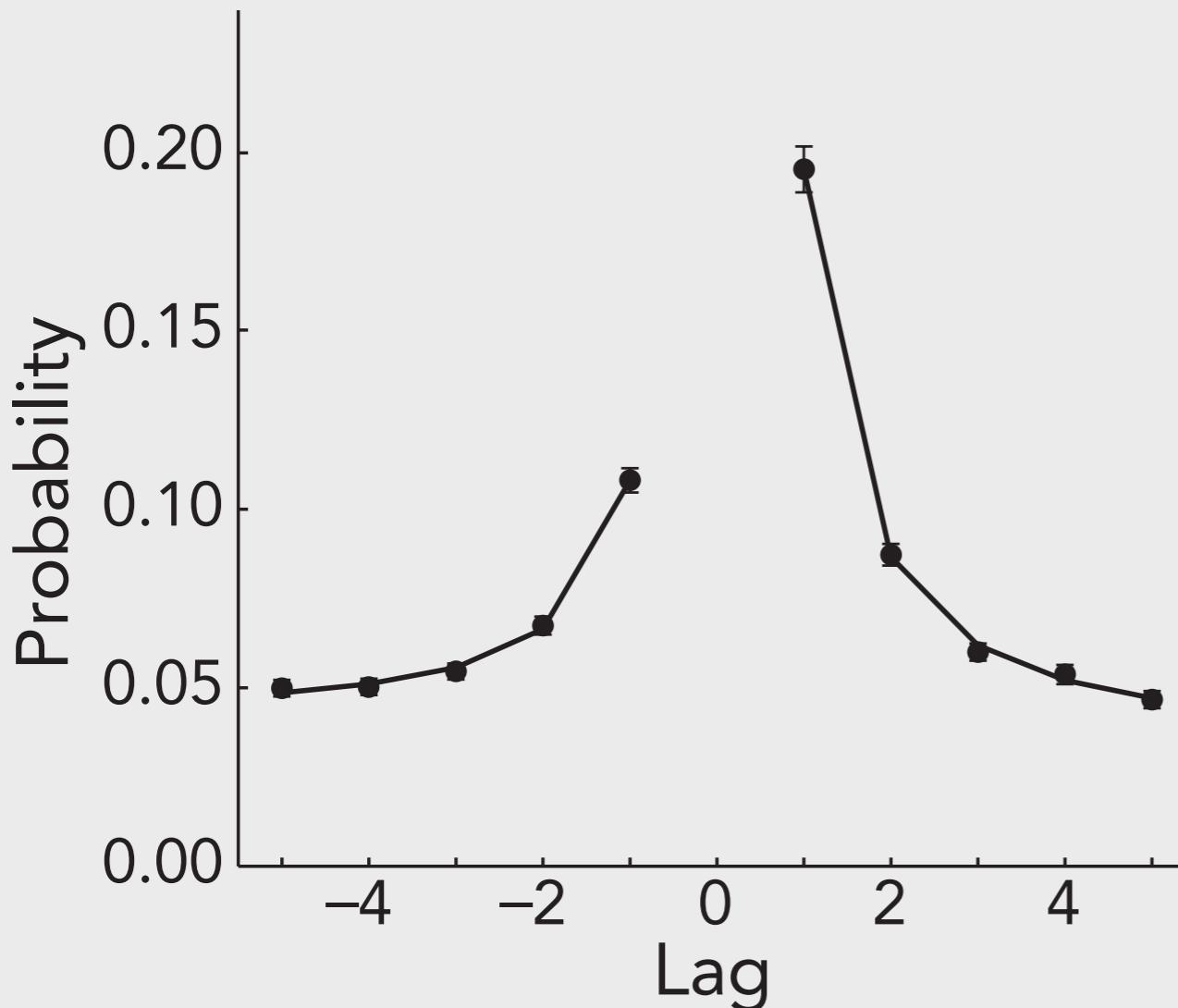
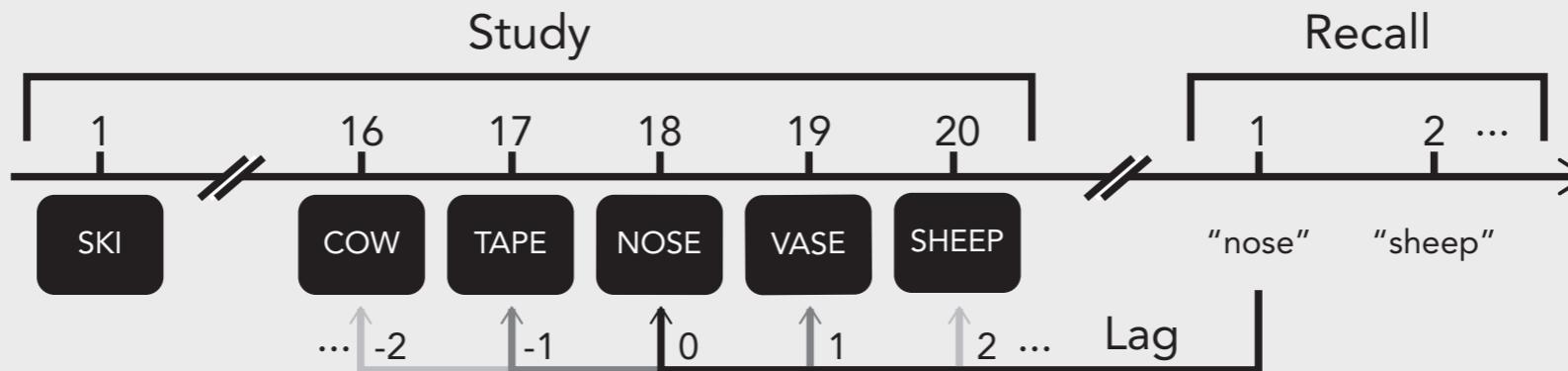
SHARK



# Temporal clustering

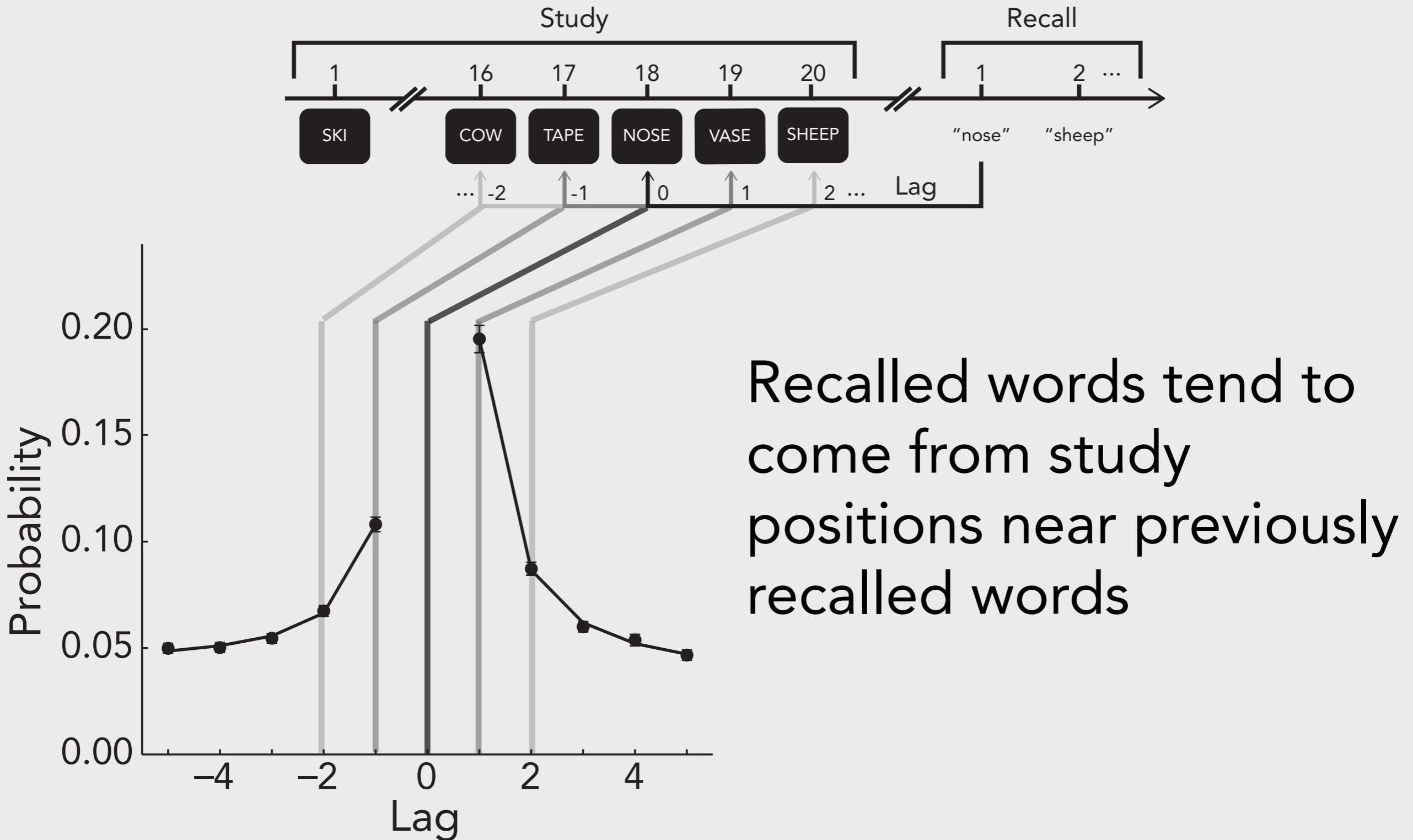


# Temporal clustering

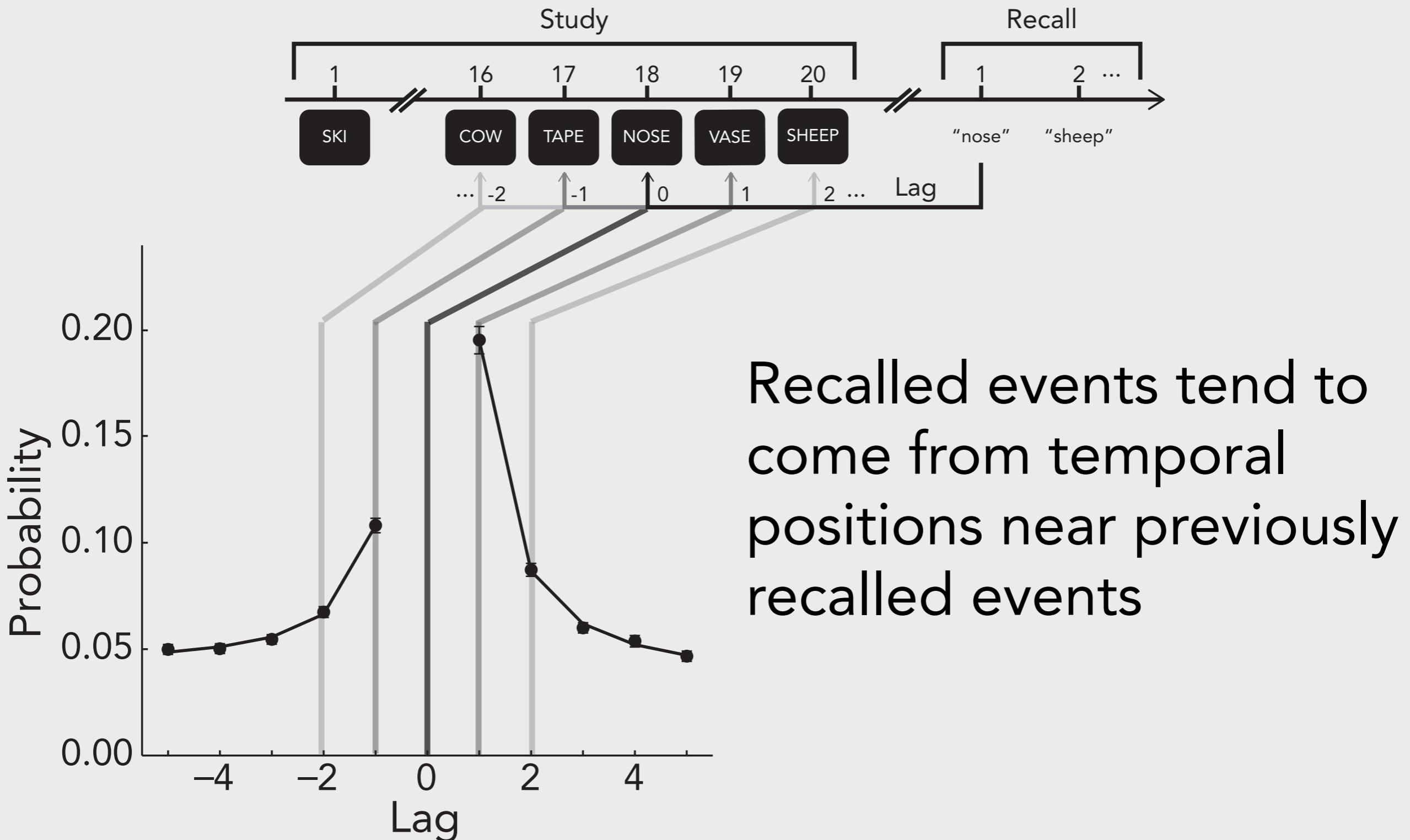


Recalled words tend to come from study positions near previously recalled words

# Temporal clustering

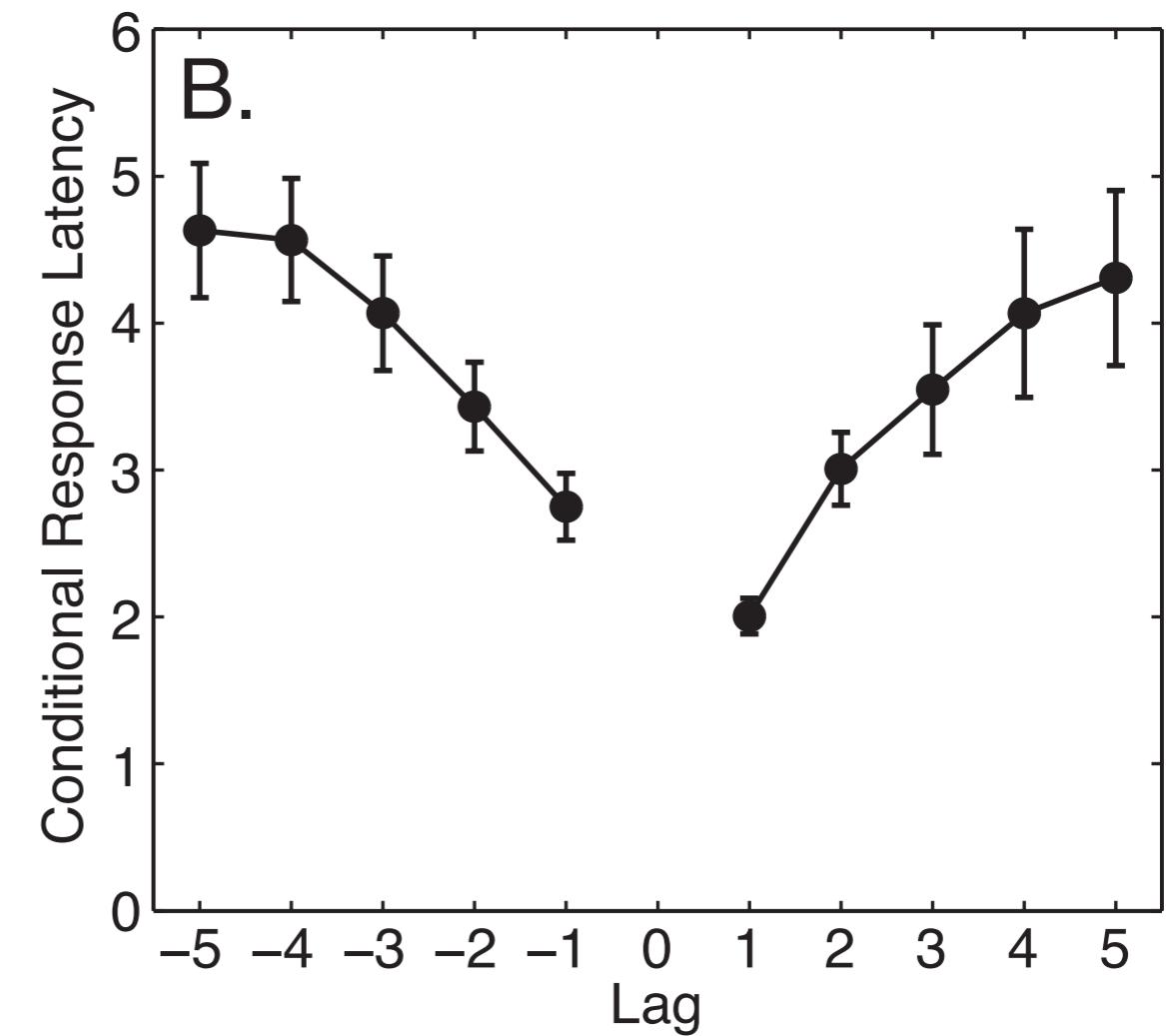
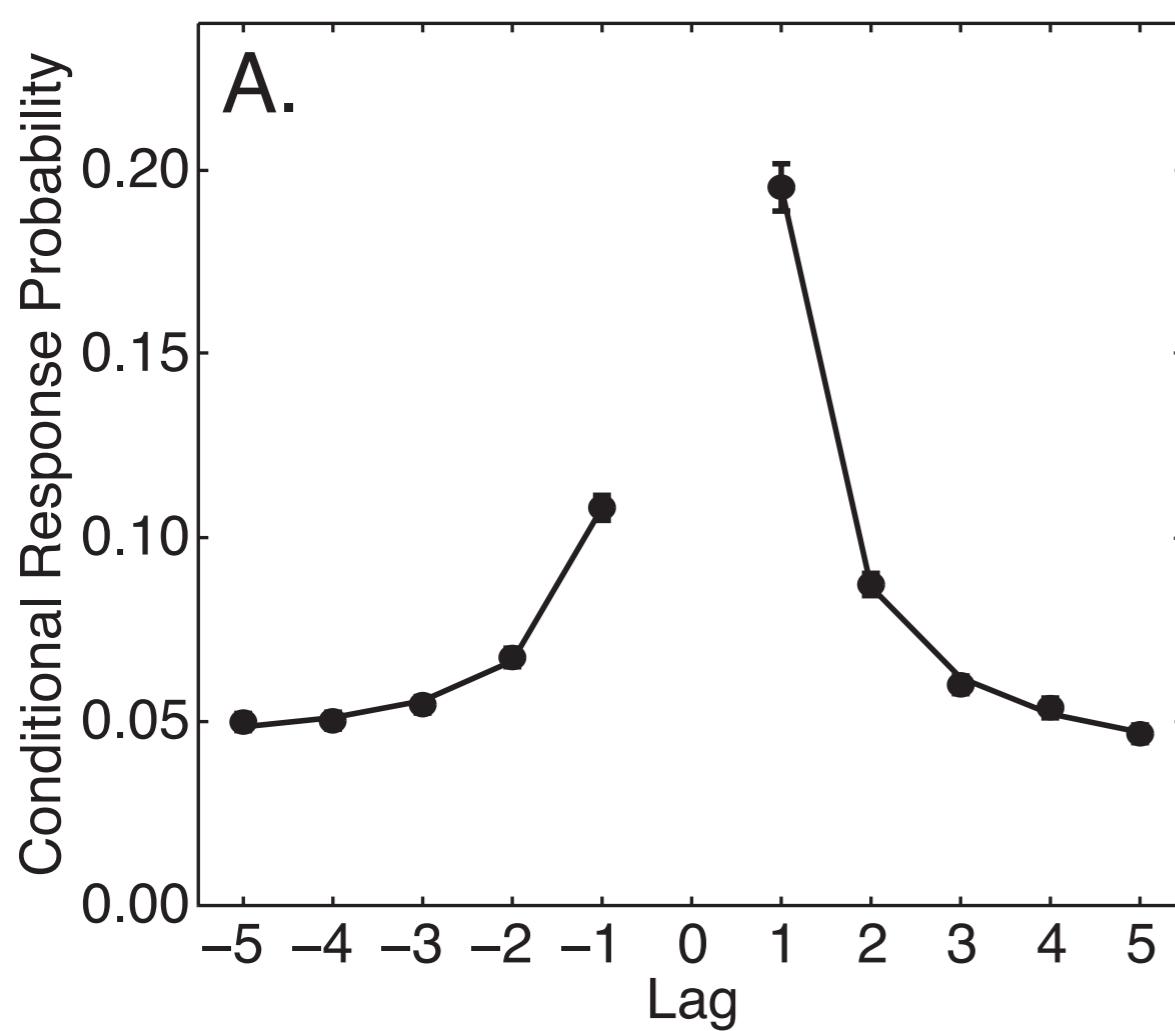


# Temporal clustering is ubiquitous and timescale invariant



# Transitioning between items

Temporal clustering (the contiguity effect)



testing room

hungry

itchy

exams

weather

NOTEBOOK

SKULL

LEAF

BANANA

SHARK

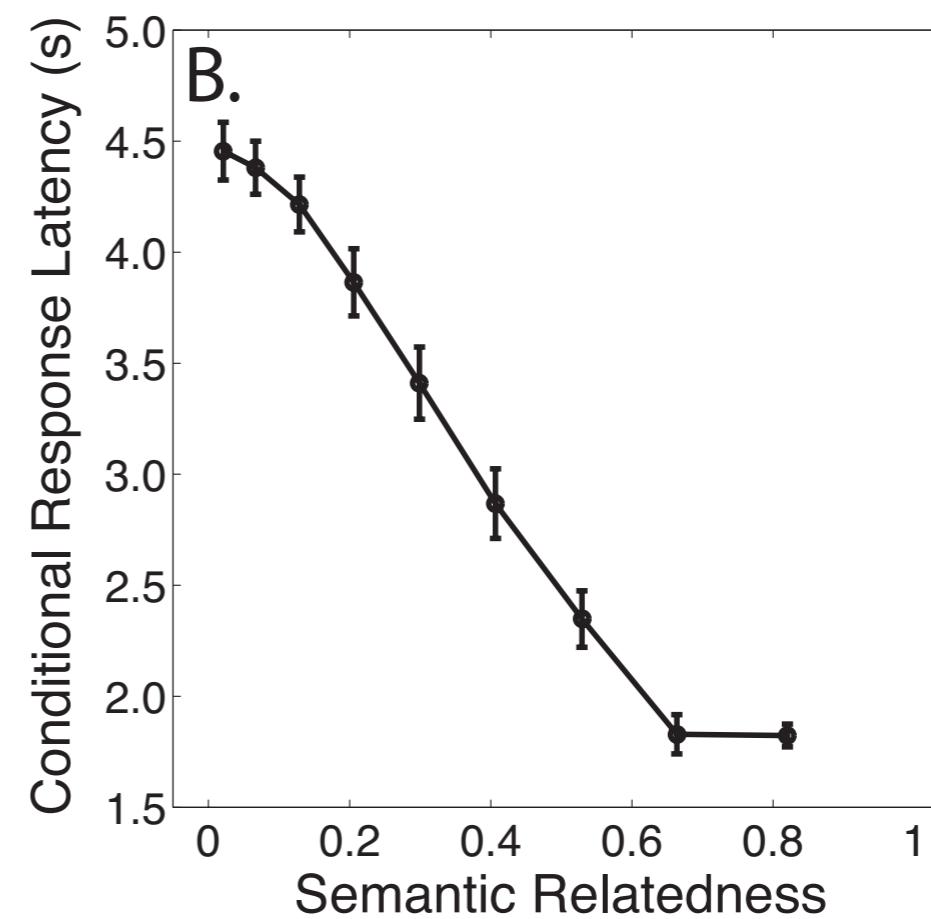
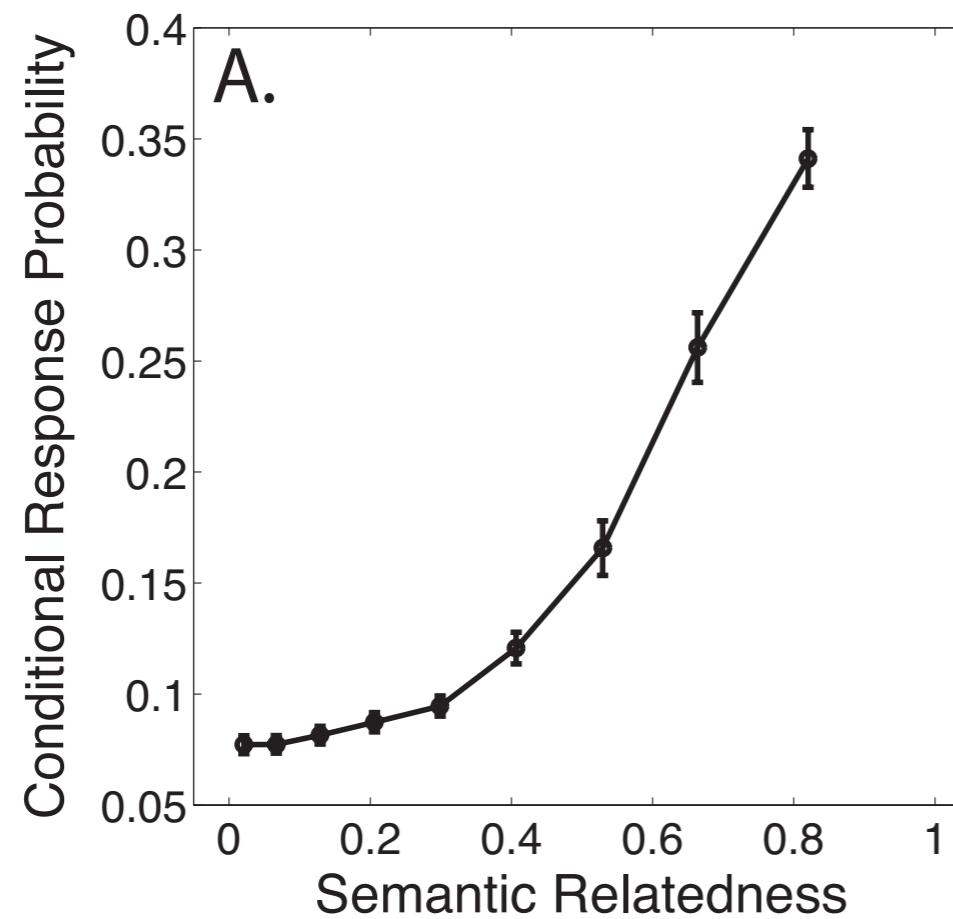


# How does context explain long-term recency and long-range contiguity?

- Intuition: telephone poles
- What matters is the relative similarities between the contexts associated with items— not the absolute similarities

# Transitioning between items

## 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...

# Structured chaos

- The world is complicated
- Our brains are set up to capitalize on patterns in incoming information
- We use this to predict the future and optimize our behaviors
- It's (perhaps) why we have brains