Announcements

- Grade Query Tool Updated with
  - Exam Scores
  - Aplia Scores
  - Cumulative scores and comparison to class
- Chapter 7 Aplia due Tonight
- Chapter 8 Aplia due Monday night
- *Earliest Memory – still time to complete!*
Returning to Memory...
V. Stage of Processing Model

- Encoding
- Storage
- Retrieval
V. Stage of processing

A. Encoding: getting information into memory
   1. What is encoded – significant stuff!
   2. Contextual cues
   3. Mood/state dependent memory is result of contextual cues
The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.
What do you recall?
V. Stage of Processing Model

- Encoding
- Storage
- Retrieval
Encoding Specificity and State-Dependent Memory

![Graph showing the number of words recalled under different learning conditions.](image)

- **Dry**
  - Tested underwater: 0
  - Tested on land: 0
- **Wet**
  - Tested underwater: 16
  - Tested on land: 12

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State Dependent Memory

Encoding → Storage → Retrieval
V. Stage of processing

B. Storage – not a secure vault!
   1. ECT disrupts
   2. Memories can change after storage!

Diagram:

- Encoding
- Storage
- Retrieval
Loftus Experiment

- Subjects shown video of an accident between two cars
- Some subjects asked: How fast were the cars going when they smashed into each other?
- Others asked: How fast were the cars going when they hit each other?
Memory Construction Elizabeth Loftus’ classic experiment

Depiction of actual accident

Eyewitnesses reconstruct memories when questioned

Leading question:
“About how fast were the cars going when they smashed into each other?”

Memory construction
Loftus’s Results

- Speed estimates depended on how the question was phrased.

- Subject’s memory for broken glass also depended on the phrasing of the speed question.

- But this was a false memory: there was no broken glass.

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Percent Reporting Broken Glass one week later
**H.M.: Amnesia and Preserved Memory**

- Bilateral medial-temporal lobe resection
- Dense Anterograde Amnesia (episodic)
- Could learn skills in absence of awareness of having learned them

**Mirror Tracing**

**Tower of Hanoi**
Procedural Learning

- Slow to learn, but resistant to decay
- Can use as a therapy for amnesic patients:
  - The Method of Vanishing Cues (Glisky and Schacter, 1986)

A sequence of characters enclosed in quotation marks is called a ________. (answer: STRING)

1st trial hints required: S, T, R, I, N
2nd trial hints required: S, T, R
3rd trial hints required: S, T
4th trial hints required: S
5th trial hints required: none!
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Storage is Vulnerable:

- Misleading information can distort existing memories
- Misleading information can create memories for things that never happened
  - False Memories
  - The “Lost in the Mall Study”
Lost in a shopping mall

Suggestive narrative

It was 1981 or 1982. I remember that Chris was 5. We had gone shopping at the University City shopping mall in Spokane. I was 12. Somehow, we had lost Chris. After some panic, we found Chris being led down the mall by a tall, oldish man (I think he was wearing a flannel shirt). Chris was crying and holding the man's hand. The man explained that he had found Chris walking around crying his eyes out just a few moments before and was trying to help him find his parents.

Chris, Mother, and Sister each wrote down anything they could recall about this.

Repeated for 5 days.
Lost in a shopping mall

- Chris “remembered” what the old man who'd found him looked like.
- He could remember where in the mall he was found by the old man.
- He could remember what the old man had said to him.
- He could remember what his mother had said to him.
- He could remember what he felt like
Lost in a shopping mall (Loftus & Pickrell, 1995)

Suggestive narrative

N = 24
Instruction: recall events that were supplied by a close relative
3 true events, 1 research–created false event (lost in a shopping mall)
3 test occasions (write, interview, interview)

Sample for 20-yo Vietnamese American woman from Seattle: "You, your mom, Tien and Tuan, all went to the Bremerton K-Mart. You must have been five years old at the time. Your Mom gave each of you some money to get a blueberry ICEE. You ran ahead to get into the line first, and somehow lost your way in the store. Tien found you crying to an elderly Chinese woman. You three then went together to get an ICEE."
Lost in a shopping mall (Loftus & Pickrell, 1995)

Results:

From among 72 possible true events, 49 remembered (68%)
False event:
   T1 (booklet): 7 (29%)
   T2 (interview): 6 (25%)
   T3 (interview): 6 (25%)

Conclusion:

“People can be led to believe that entire events happened to them after suggestions to that effect”.

From Facebook post by the younger brother:
Just to make this clear, I WAS lost and it was f**ckin' scary!! :)
Interviewers can create false memories

- Children aged 3-6
- Interviewer inquired about:
  - Real Events
  - Two events that never happened
    - Hand caught in mousetrap that required hospital visit
    - Taking a hot-air balloon ride with classmates
- Repeated on 7-10 different days
- False recollections > 40% (and True recollections > 90%)

Ceci, Huffman, Smith, Loftus, 1994, Consciousness and Cognition
Interviewers can create false memories

- **Vivid**: Added many details
  - Recalled it happening at a previous residence
  - Recalled drive to the hospital in a the family van
- **Persistent**: Many refused to believe the event(s) were not true upon debriefing
  
  “But it did happen … I remember it!”

Ceci, Huffman, Smith, Loftus, 1994, *Consciousness and Cognition*
Memory as Constructive

- Highly common for folks to falsely recall “Doctor” or “Sleep” as on the list in class.
- Illustrates that we encode the “gist” and not verbatim information
Memory Construction

- We filter information and fill in missing pieces
- Misinformation Effect
  - incorporating misleading information into one's memory of an event
- Source Amnesia
  - attributing to the wrong source an event that we experienced, heard about, read about, or imagined (misattribution)
  - Campaign strategists can exploit it to spread misinformation
  - Iraq and Weapons of Mass Destruction
How Can We Ever Tell if a Memory is True?

A mental representation is identified as a memory to the extent that it involves:

- A sufficient number of features
- The proper configuration of features
- That make sense in terms of our current understanding
Why do we forget?

- It’s adaptive!
  - Frees the cluttered mind…
  - Prioritizes things to remember
  - Avoid Proactive Interference

- Decay: Fading over time if not reactivated
Why do we forget?

- Interference
Why do we forget?

- Motivated Forgetting (self-serving bias)
- Participants were presented with a list of choices (between two internships, roommates, cars etc)
- Participants remembered the positive features associated with their ultimate choices better than the negative features (Henkel & Mather, 2007).
Why do we forget?

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- Participants were presented with a list of choices (between two internships, roommates, cars etc)
- Participants remembered the positive features associated with their ultimate choices better than the negative features (Henkel & Mather, 2007).
- And!!!
  - When they were deceived into thinking they had actually chosen the other option instead (due to a friendly “reminder” from the experimenter), they continued to remember the false choice more positively.
How Can We Improve Memory?

- L01
- L03
- L04
- L05
- L06
- L02
- L07
- L08

Explain the models describing the organization of long-term memories.

Summarize the variables influencing retrieval from short- and long-term memory.
What to Study: Mnemonics

What are the ‘Big Five’ personality traits?

- Openness to experience
- Conscientiousness
- Extraversion
- Agreeableness
- Neuroticism

OCEAN
Where to Study: Context-Dependent Memory

The best place to study is in the room where you will take the test.
How to Study: Keep Retrieving

The more often a memory is retrieved, the stronger it will become.

Mass vs distributed practice
How to Study: Use Your Own Words

Strengthen memories by increasing the number of connections between the new and existing information.
When to Study: Distribute Practice Over Time

Every time the brain retrieves a memory, it is stored even stronger.

Mass vs distributed practice
Sleep-related processing might reorganize existing memories to accommodate new information.