Announcements

- Exam next Monday
  - Bring F-158 Scantron. You need to purchase this yourself and bring it with you.
  - Bring a pencil to complete your scantron
  - Bring your student ID
- Multiple Choice
- Maybe short-answer

Announcements

- Discussion sections this week
  - Ongoing—will focus on memory
- Discussion sections next Monday
  - Pre-exam
    - 1:00-1:50 (ET202)
    - 5:00-5:50
  - Will be question-answer review for exam

*If you are enrolled in Monday discussions and want to attend another session this week on memory, you may do so***
Announcements

- **I-clicker:**
  - Error in computation of credit, and only gave full or no credit
  - We REMOVED the i-clicker posting because people were too confused.
  - We will re-post it once we calculate percentage points
  - There are STILL about 50 unregistered I-clickers in the class (almost 10% of class)

Today’s Lecture Outline

1. Memory Systems Continued
2. Emotion and memory
3. When memory fails
4. Early memories-if time

Memory Systems
Properties Of Memory Systems

- Serve different functions

- Vary in
  - capacity: how much information can be maintained
  - duration: how long information stays there

Memory Systems

- Sensory memory
  - Details that persists after stimulus gone (large capacity, extremely short duration)

- Working memory
  - Conscious information being used at present (limited capacity-duration depends on attention)

Adapted from Fig. 6.1 Leahey & Harris, 2001
Long-term memory

- Information stored for later retrieval
  - Incidental
    - Not actively trying to remember information
  - Intentional
    - Effortful remembering

How do you know?

- Incidental memory
  - Mere exposure
  - But something else needed as well

A penny for your thoughts…
Incidental memory

- Exposure, often repeated
- Active attention and engagement with information

Intentional memory

- Active attempts to remember information
  - Exposure
  - attention/engagement
  - active rehearsal
  - Links between information and existing knowledge
Craik & Tulving: Types of Links Affect Memory

- Subjects answer questions about words.
  - Appearance
  - Sound
  - Meaning

Example: “Child”

- Does the word have 4 letters? (Appearance)
- Does the word rhyme with this word, mild? (Sound)
- Does the word fit in this sentence: “Pizza ________ tastes good.” (Meaning)

Afterward, given surprise memory test for the words

- Angel
- Child
- Cake
- Dance
- Flame
- Moose
Depth of Processing

- Results: Meaning > Sound > Appearance
- By focusing on meaning, participants engaging in “Deep Processing”
- Forms connections with meaning. Richer connections = better memory

Summary: Long-term memory

- Very large capacity
- Can remain for long periods of time

What about emotions?
Howes, Siegel, Brown (1993)

Write down everything you remember about your three earliest recollections.

Types of Events
Why do we seem to remember emotional events so well?

- Normal memory processes

- Special Emotion Mechanisms

Why do we seem to remember emotional events so well?

- Normal Memory explanations
  - Same factors that affect our memory for non-emotional events affect
  - Example: we rehearse more, we remember more

- Special Emotion Mechanisms
  - Flashbulb
  - Repression
  - Inverted U

Flashbulb memories: detailed, accurate, & permanent?
Flashbulb memory (Brown & Kulik, 1977)

Vivid, detailed memories of surprising and important events, as though a “picture” taken of the event

People typically remember:
- where they were
- who told them
- how they felt
- what happened once they found out

But, just because we say we remember, doesn't mean we are accurate
Schmolck et al. (2000)

- 222 college students
  - "Describe how you first heard the news of the verdict in the OJ Simpson double murder trial"
- Interviews:
  - 3 days post-verdict
  - 15 or 32 months later

Initial interview: 98% described “flashbulb type memory”
Follow-up interviews: 79% described “flashbulb type memory”
- 22% interviewed 15 weeks later described a different situation than they had initially
- 50% interviewed 32 weeks later described a different situation than they had initially

Neisser & Harsch (1992): Challenger explosion
Interviewed 4 days and 2½ years afterward
Compared memories between times
2 ½ years

People “moderately to highly confident” of their memories
More intense emotions predicted more confidence
About 40% of details changed from first interview
More confident people were NOT more accurate

Memory for emotion is not permanent or perfectly accurate
“Flashbulb” memory doesn't occur

Repression
- Experience trauma
- Information is so terrible that it is pushed from conscious awareness
- Once “trauma” associated with information is removed, re-access the information
There is a pain - so utter -
It swallows substance up -
Then covers the abyss with a trance -
So memory can step around, across, upon it -
As one within a swoon -
Goes safely where an open eye would drop him -
Bone by bone

Emily Dickinson

Repression: Necessary Components
- Experience trauma
- Information pushed from conscious awareness
- Once "trauma" associated with information is removed, re-access the information

How to Study Repression?
- Williams (1994)
  - Interviewed women 20 years seen in a hospital because of child sexual abuse
  - 38% failed to mention experience (many reported other sexual violence)
Goodman, Quas et al. (2003)
- Interviewed young adults who were involved, 14 years previously, in legal cases as victims of sexual assault
- Asked about lots of things, including prior victimization
- Didn’t tell them we knew what happened

How many told us about abuse?
- 81% disclosed
- 10% denied ever being a victim
- 4% reported other case
- 3% reported some details but said they didn’t want to talk about it

Synopsis
- 84% clearly reported case; 26 (16%) clearly did not

How Common Is Forgetting?
- The percentage of adults who did not disclose is fairly small (only 15%)
- Did the most traumatized individuals forget?
Those who forgot were

- Younger
- Experienced LESS severe abuse

Almost 30% of those who were young forgot. Only 13% of those who were older did.

Abuse Severity

- Disclosers
- Nondisclosers
SO, is this repression?

- No
- Younger age: more forgetting
- Less severe abuse: more forgetting
- And...this only focused on one requirement for repression

Repression

Necessary Components

1. Experience trauma
2. Traumatic event must be forgotten/pushed from awareness
3. After distress removed, can remember

Repression: Necessary Components

- Experience trauma
- Information so terrible that it is pushed from conscious awareness
  - Thus, some forgetting may occur (we saw a little bit of this, but for younger kids and less severe abuse)
- For repression, we would need to demonstrate that once “trauma” associated with information is removed, re-access the memory
Yerkes Dodson Principle

- Emotion affects memory in an inverted U.

Evidence for Inverted U?

- Only when you consider "type of information recalled"
Evidence for Inverted U?

- Peripheral
  - Information unrelated to the cause of the emotion
- Central
  - Information directly related to the cause of the emotion

Inverted “U” (Memory Narrowing)

Yuille and Cutshall

- 21 Witnesses observed shooting
  - Interviewed by police immediately afterward
  - 13 interviewer by researchers 5 mo later
- Research interview Accuracy
  - lower for people descriptions
  - higher for objects and actions
Rush, Quas, Yim 2010

- Children and adults came to lab, completed a stressful activity
- Memory of the activity tested
  - Central questions “What did you have to say about yourself?”
  - Peripheral questions “What did the room look like?”

Central/Peripheral

- Attention narrows on most important information, so that’s what is remembered best
- This isn’t necessarily a special emotion mechanism
How does emotion affect memory?

Emotional events are likely to be:
- noticed
- rehearsed
- processed deeply
- Richly connected in LTM

This process is especially true for the most important, central aspects of event.

What about failures of memory?

- Is our memory perfect?
  - Forgetting
  - False memories
- What factors lead to memory failures?
- What are the consequences of memory failures?
Causes of Memory Failure

- **Inadequate encoding** – information is not attended to or is not transferred to LTM
- **Decay** – memory traces decay in strength over time
- **Interference** – memories learned before or after some given memory interfere with retrieval
- **Distortion** – memories are modified over time

Interference

- "Memories interfering with memories"
- One memory competing with or replacing another
Retroactive interference

- When a NEW memory interferes with remembering OLD information
- Learn new phone number, can’t remember old number
- Learn new language, difficulty remembering old one

Proactive interference

- When an OLD memory interferes with remembering NEW information
- Example: Memories of where you parked your car on campus the past week interferes with ability to find car today

http://www.cbsnews.com/video/watch/?id=4852622n&tag=segmentExtraScroller;housing

For the full story, Part 1:
http://www.cbsnews.com/video/watch/?id=5153451n&tag=related;photovideo
Part 2:
http://www.cbsnews.com/video/watch/?id=5153459n&tag=related;photovideo
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Distortion

- External examples that can lead to distortion
  - Stereotypes
  - Conversations with others
  - Question phrasing—THIS WAS ONLY ONE DISCUSSED
Question Phrasing

- **Loftus and Zanni, 1975:**
  - "Did you see the broken headlight?"
  - "Did you see a broken headlight?"

- **Loftus & Palmer, 1974:**
  - "How fast were the cars going when they hit each other?"
  - "How fast were the cars going when they smashed into each other?"

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**Loftus & Palmer**

**AVERAGE SPEED ESTIMATES**

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<th>Term</th>
<th>Speed (mph)</th>
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<tr>
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</tr>
<tr>
<td>collided</td>
<td>39.3</td>
</tr>
<tr>
<td>bumped</td>
<td>38.1</td>
</tr>
<tr>
<td>hit</td>
<td>34.0</td>
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<tr>
<td>contacted</td>
<td>31.8</td>
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