Causes of Forgetting (why are memories forgotten with time?)

- **Decay**: memories may fade or erode
  - poorly supported
- **Retroactive Interference**: newer learning may disrupt older memories
- **Retrieval failure**: memory is intact but cannot be accessed
  - Encoding specificity
  - Retrieval can be partial
    - Tip of the Tongue (TOT)
Recognition w/o Recall
(aka, ‘tip-of-the-tongue’)

Groggy
Dopey
Bashful
Shy
Sneezy
Sickly
Drowsy
Sleepy
Merry
Happy
Grumpy
Angry
Brainy
Doc
Forgetting Curves

• Ebbinghaus (1885) nonsense syllable experiment (non-linear forgetting)
  – over the course of days, he kept on relearning lists of nonsense syllables (e.g., RUR, HAL, BEIS, etc.)
  – forgetting was measured as **percent savings** (how long did it take to re-learn versus original learning)
Autobiographical Memory

• **Hyperthymesia** (aka, Highly Superior Autobiographical Memory – HSAM)
  – Normal IQ
  – Normal working memory
  – Normal on LTM list-learning
  – Limited to self-relevant details
    • Normal memory for what happened to other people
  – Appears to reflect enhanced consolidation
    • Obsessive rehearsal of most important daily events
Self-reference Effect
(better encoding for events in reference to yourself)

MPFC activated during self-referential condition.
HS Year Book Study
(no forgetting?)

![Graph showing percentage of correct answers over time since graduation. The graph compares name matching and picture cueing methods.](image)
College Locations Study

Non-linear forgetting for street names

Linear forgetting for landmarks
College Course Material
(non-linear forgetting, but higher asymptote)
Reminiscence Bump
Memory Errors

• Bartlett (1932): memory is often reconstructed based on schemata (schemas)
  – Schema: general knowledge or expectation based on past experiences (i.e., the ‘gist’ of things)
    • e.g., the ‘ordering at a restaurant’ schema
  – serial reproduction: repeated recall
    • Native American story, “War of the Ghosts”, became more distorted and westernized with each reproduction
      – “foggy and calm” became “dark and stormy”

“One night two young men from Egulac went down to the river to hunt seals and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party". They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them..."
Providing Context can Cause Intrusions

Nancy arrived at the cocktail party. She looked around the room to see who was there. She went to talk with her professor. She felt she had to talk to him but was a little nervous about just what to say...

Nancy woke up feeling sick again, and she wondered if she really were pregnant. How would she tell the professor she had been seeing? And the money was another problem.

<table>
<thead>
<tr>
<th>TABLE 8.1</th>
<th>NUMBER OF PROPOSITIONS REMEMBERED BY PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDIED PROPOSITIONS (THOSE IN STORY)</td>
<td>INFERRRED PROPOSITIONS (THOSE NOT IN STORY)</td>
</tr>
<tr>
<td>Theme Condition</td>
<td>Neutral Condition</td>
</tr>
<tr>
<td>29.2</td>
<td>20.2</td>
</tr>
</tbody>
</table>
Schemas and Visual Memory

• People correctly recalled that there were chairs and desks
• People falsely recalled that there were books
Schemas and List Memory

- **Deese-Roediger-McDermott (DRM) procedure**
  - Read the list “bed, rest, awake, tired, dream, wake, snooze. . . .”
  - Recalled “sleep” even though it was not on the list.
Eyewitness Memory

• Misinformation Effect
  – Loftus and Palmer, 1974
    • View a series of slides depicting a car accident
    • Post-event misinformation
      – memories are malleable and can be updated and changed

How fast were the cars going when they _____ each other?

![Bar chart showing estimated speeds in mph for different verbs: Contacted, Hit, Bumped, Collided, Smashed.]

Figure 8.4
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Misinformation with Picture Test

- Elizabeth Loftus (1978)
  - viewed accident slides with stop or yield sign
  - “Did another car pass the red Datsun while it was stopped at the stop/yield sign?”
  - recognition of slides

  - **two alternative forced choice testing** (2-AFC)
    - no need to compare hit and false alarm rates
Eyewitness Lineups

- Lineup as recognition experiment
  - maximize ID of guilty suspects (hits)
  - minimize ID of innocent suspects (false alarms)
- How to choose the known-innocents?
  - the use of mock eyewitnesses
  - match-to-description, or resemble-suspect?
- Double-blind lineups
  - Investigator could give it away
  - Could inflate confidence
- Simultaneous vs Sequential
  - sequential lineups emphasize absolute identification
    - reduces identification of innocent suspects
    - however, also reduces identification of guilty suspect

![Graph showing mean reported confidence in identification]

Figure 8.7
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Recovered Memories

• Therapy and police interrogation can result in falsely recovered memories
  – Practices that might cause false memories
    • Hypnosis
    • Imagination exercises
    • Leading questions
  – Memories can be implanted
    • Loftus and Pickrell (1995): 3 true events and one false “lost-in-the-mall”
      – Booklets describing stories (4-6 years) were created by interviewing relatives
      – Participants asked to fill in additional details
      – 68% of true stories and 29% of false stories ‘remembered’
False Memories Increase with Time

• Hyman, Husband, and Billings (1995)
  – embarrassing stories (e.g., spilling punch bowl at a wedding)
    • recalled 80-90% of true events
    • no false recall in first interview
    • 20% in a second interview
    • some participants *elaborated* upon their false memories (added details never presented)

• Can implant false memories of committing a crime too
Photos Boost False Memories
Erasing Traumatic Memories

**Test group**

**Day 1** Training: tone + shock

**Day 2** Test 1: tone only

**Day 3** Test 2: tone only

Rat learns to fear tone

Rat freezes in response to tone

Injection of anisomycin follows

Rat does not freeze
Flashbulb Memories

• personal events at time of disaster
• why are these memories so strong?
  – serial reproduction
  – physiological response
Flashbulb Memories

• Undue confidence in flashbulb memories
  – emotional response increases confidence

• Flashbulb memories become inaccurate with time
  – 3,000 people were interviewed after 9/11
  – 37% gave a substantially different account (but were confident) one year later
  – Increased to 43% after 3 years