

Using Knowledge in the Real World

PSY 3319: Cognitive Psychology

PPT Slides: 6

Professor Kit Cho

7 Sins of Memory

■ Sins of Omission

1. Transience – Forgetting over time
2. Absentmindedness – Encoding failure; lapses of attention; forgetting to do things
3. Blocking – Temporary loss of access (e.g., Tip-of-Tongue)

Man with mask, but not wearing it, holds up bank

Police say he fled toward Maxatawny Twp. after robbery.

June 25, 2006 | The Morning Call

A man who robbed a Citizens Bank branch in Kutztown on Saturday morning took the precaution of bringing a mask to the job, but apparently forgot to wear it, providing police with a clear photograph of his face.

Borough police said they responded at 10:28 a.m. to a robbery at the bank at 601 E. Main St. The suspect, who had long, frizzy hair and a multicolor bandana, already had fled on foot with an undetermined amount of cash.

Police said the man handed a teller a note demanding money. He said he had a gun, but did not display one, according to police.

The man, who had what appears to be a surgical or dust-filtering mask hanging around his neck below his chin, but not placed over his nose and mouth, was photographed repeatedly by security cameras. He appears to be in his 40s, about 6 feet tall, police said.

Police Cpl. Paul Clery said officers don't know why the robber didn't wear his mask.

"I guess he wasn't the most intelligent guy," Clery theorized. "Most criminals aren't. Either he forgot, or -- who knows?"

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7 Sins of Memory

■ Sins of Omission

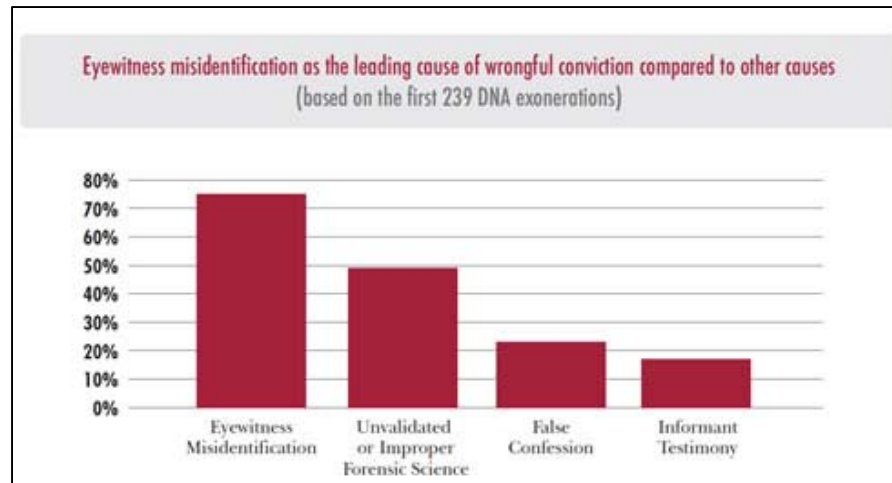
1. Transience – Forgetting over time
2. Absentmindedness – Encoding failure; lapses of attention; forgetting to do things
3. Blocking (tip of the tongue)– Temporary loss of access (e.g., Tip-of-Tongue)

<https://www.youtube.com/watch?v=YN8uFJz9gTk>

7 Sins of Memory

- Sins of Commission

4. Misattribution – Source-monitoring error
5. Suggestibility – Information provided by others incorporated into own memory
6. Bias – Held beliefs, knowledge, and feelings distorts acquisition of new information



Data from:
Innocenceproject.org

7. Persistence – Inability to forget information (rumination)

Memory is a RECONSTRUCTIVE Process

“Human Memory Works like a Tape Recorder or Video Camera, and Accurately Records Events We’ve Experienced”

- 600 undergraduates at a midwestern university, 27% agreed that memory operates like a tape recorder (Lenz, Ek, & Mills, 2009)



Early Reconstructive Memory Research

- (Sir) Frederick Bartlett (1932)
- Asked people to remember folklores (“The War of the Ghosts”); somewhat weird stories
- People’s memory were tested at different intervals (15 mins, 4 months later)
 - At the long interval,
 - Information about the main plot and sequence of event was high
 - Specific information such as names forgotten
 - People added information to the story or altered existing information to make it sound more normal

Metamemory

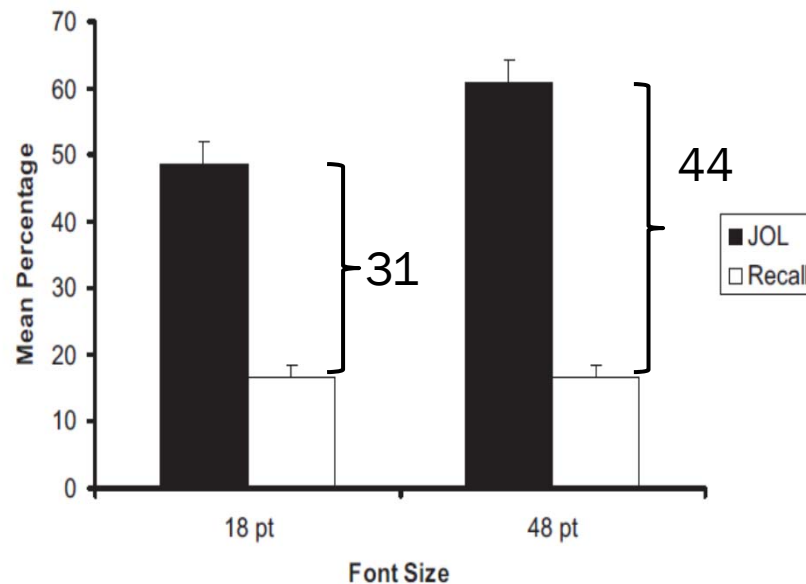
- Recalling when/if something occurred
 - External
 - Item Identity/Presentation Modality: In what color was the word presented?
 - Item Location: Was it presented in List 1 or List 2?
 - Internal (reality): Did I already talk about this, or did I just think of it but never said it aloud?
 - Cryptomnesia (unconscious plagiarism): person mistakenly think an idea is their own

Judgments of Learning (JOLs)

- Subjective judgments on future memory performance
 - Item by item basis: “How likely are you to remember the information when tested on it later?”
 - Aggregate ratings: “How many items did you recall from the previous list?”
- JOLs are inaccurate when people base their decision on extrinsic (learning conditions or learning strategy) rather than intrinsic cues (actual difficulty of the to-be-learned item).
 - e.g., identical cue-target pairings in a list of various word pairs
 - kiwi – kiwi (identical; overconfident)
 - tree - cup (unrelated; accurate JOL)

Judgments of Learning (JOLs)

- Rhodes & Castle (2008)
- Present words in size 18 (CAT) or size 48 (**CAT**) font, randomly intermixed.
 - After each word → JOL judgment



- Overall, people were overconfident in their memory ability, but more so when the font size was large!

Judgments of Learning (JOLs)

- Nelson & Dunlosky (1991)
- People studied a list of 60 unrelated nouns (OCEAN-TREE).
 - Half of items, immediate JOL
 - Study: OCEAN-TREE
 - JOL: HOW CONFIDENT ARE YOU THAT IN ABOUT TEN MINUTES FROM NOW YOU WILL BE ABLE TO RECALL THE SECOND WORD OF THE ITEM WHEN PROMPTED WITH THE FIRST? (OCEAN-TREE)?
 - Half of items, delayed JOL
 - Study: OCEAN-TREE → CUP-COMPUTER → BEAR-NAPKIN...
 - JOL: OCEAN-TREE, CUP-COMPUTER, BEAR-NAPKIN...
- JOL more accurate with delay JOLs.
 - Why?

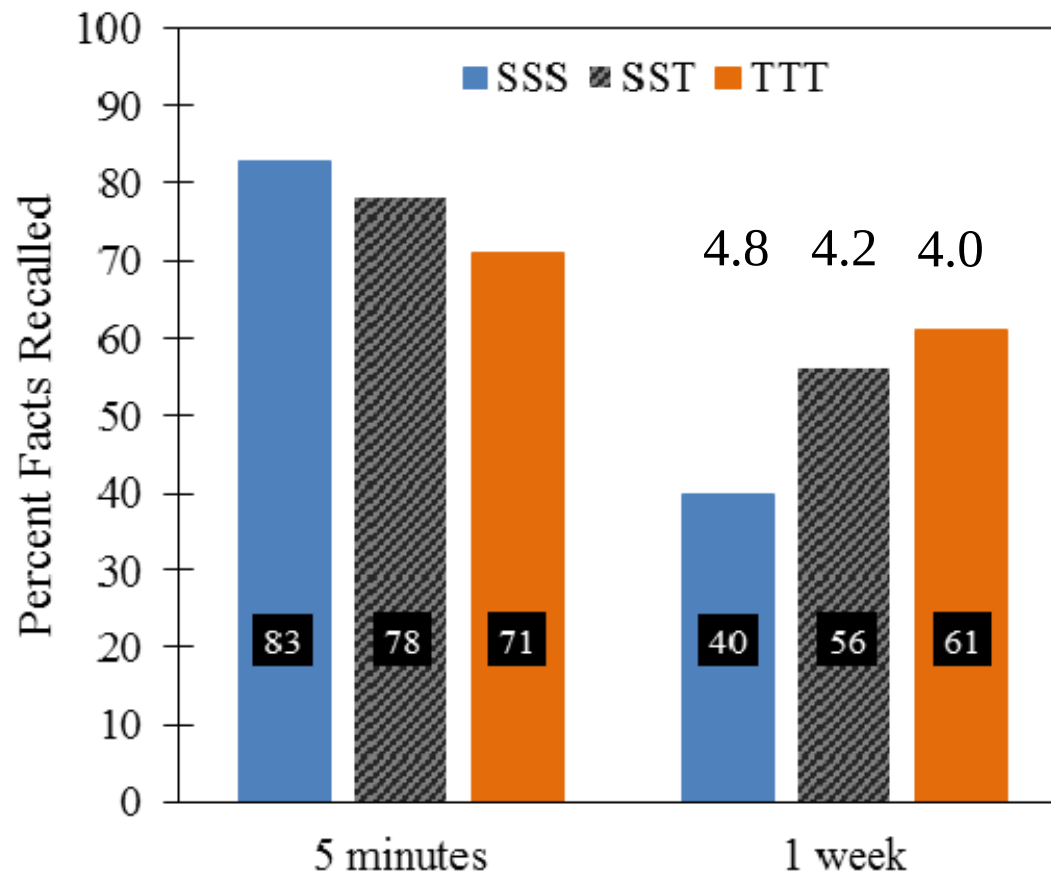
Judgments of Learning (JOLs)

- Testing reduces overconfidence
- Roediger & Karpicke (2006)
 - Remember prose passages (e.g., sun, sea otters)
 - Three groups of participants
 - Repeated Study (3x; SSS),
 - Restudy Twice, Test Once (SST),
 - Repeated Free-recall Test w/o Feedback (TTT)
- Half of the participants were tested 5 minutes later, the other half 1 week later and told to make confidence judgments.

How well would you remember the passage 1 week later?

1 = not very well to 7 = very well

Roediger & Karpicke (2006) Results



- Repeated restudy better at short delay; repeated testing better at long delay.
- Repeated restudy more likely to lead to overconfidence in future memory performance.

How well would you remember the passage 1 week later?

1 = not very well to 7 = very well

Prospective Memory

- Remembering to do something in the future or “remembering to remember”
 - Time-based (remembering to brush your teeth at 10:00 PM)
 - Event-based (remembering to purchase milk when you get to the grocery store)
- Event-based easier because event serves as a strong retrieval cue to another event.
- Age and stress inversely related to prospective memory abilities

Deese-Roediger McDermott Effect (1995)

- First reported by Deese in 1959
 - Effect was reintroduced by Roediger and McDermott in 1995
- Task: People study a list of semantic associates (pillow, dream, tired, yawn)
- Recall of item in the middle of the list = ~50%
- Recall of nonstudied critical item (sleep) = ~60%
- Recall of nonstudied related associate (e.g., alarm) = ~15%
- Conclusions
 - (1) People are as likely to recall the nonstudied critical item as they are to an item studied in the middle of the list
 - (2) Low false alarm rate to non-studied related associates (people aren't just guessing and writing down related words)

Deese-Roediger McDermott Effect (1995)

- DRM effect increases with...
 - Faster presentation rate
 - Age
 - Auditory (vs. Visual Presentation)
- Think aloud protocol provides evidence that people generate nonstudied critical item during study AND at the time of recall
- People HIGHLY confident that they studied nonstudied critical item

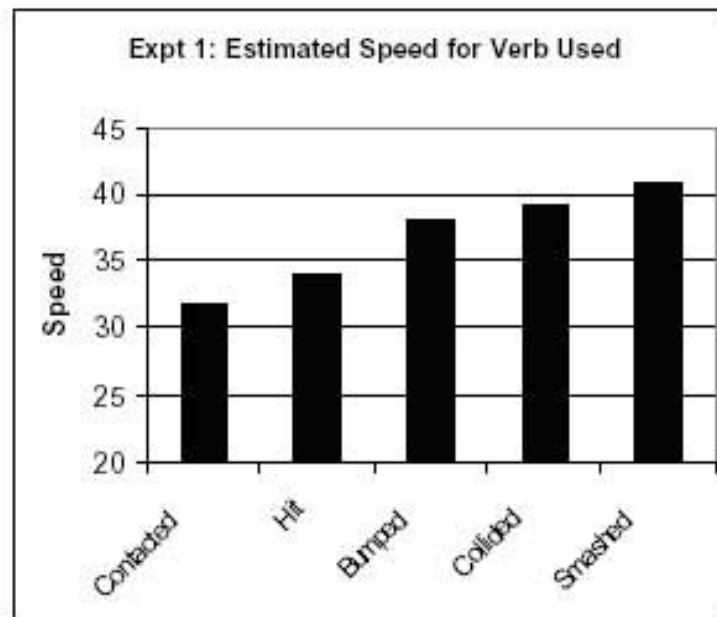
Leading Questions and Memory Distortions

- Loftus and Palmer (1974)
 - Showed film depicting car accident
- Students were asked to describe the accidents and answer questions about what they had seen
- How quickly were the cars going when they
 - “made contact”
 - “hit”
 - “bumped”
 - “collided”
 - “smashed”



Loftus and Palmer (1974)

- Results: People more likely to give higher speed estimate when verb implies greater impact.



Loftus and Palmer (1974)

- In another experiment, 3 groups of participants—how fast were the cars going when they..
 - Smashed
 - Hit
 - Control (no question)
- 1 week later → Did you see any broken glass?

Response	Smashed	Hit	Control
Saw Broken Glass	32%	14%	12%

- More likely to report seeing broken glass with “Smashed” vs. “Hit” and “Control”
 - Evidence supporting a genuine memory fabrication.

Choice Blindness

- When memory of an event is *weak*, they are much more susceptible to manipulation.
 - People do not notice the original choice that they made or why they made their choice.
- Implication for American legal system: Eyewitness testimonies...
 - given months after event occurred, and
 - were encoded under high stress
 - both factors suggest memory of event will be weak

The Misinformation Effect

- Misinformation effect: People more likely to remember misinformation rather than the originally, encoded information
- Paradigm: Okado and Stark (2005)



- People highly likely to say that critical item in the misinformation phase was part of the original phase
- Source Misattribution
 - Inability to distinguish whether the original event or some later event was the true source of information

Implanted Memories

- Research has shown that it is possible to implant a new memory of an event that never happened
 - This can be magnified by showing people photos of themselves, or by encouraging mental imagery (imagination inflation) → confabulation (hypnosis?)

Childhood Memories: Fake Photos



Implanted Memories

- Lost-in-the-mall (hospital) paradigm (Loftus): subjects narrates a series of childhood events—most are true but one is false
 - Example: subject went to the hospital at age 4 and was diagnosed as having low blood sugar
 - First Interview: “... No I can’t remember anything about the hospital or the place. It was the general hospital where my mom used to work? She used to work in the baby ward there...but I can’t...no. I know if I was put under hypnosis or something I’d be able to remember it better, but I honestly can’t remember.”
 - Third Interview: “... I don’t remember much about the hospital except I know it was a massive, huge place. I was 5 years old at the time and I was like ‘oh my god I don’t really want to go into this place, you know it’s awful’...but I had no choice. They did a blood test on me and found out that I had a low blood sugar...”

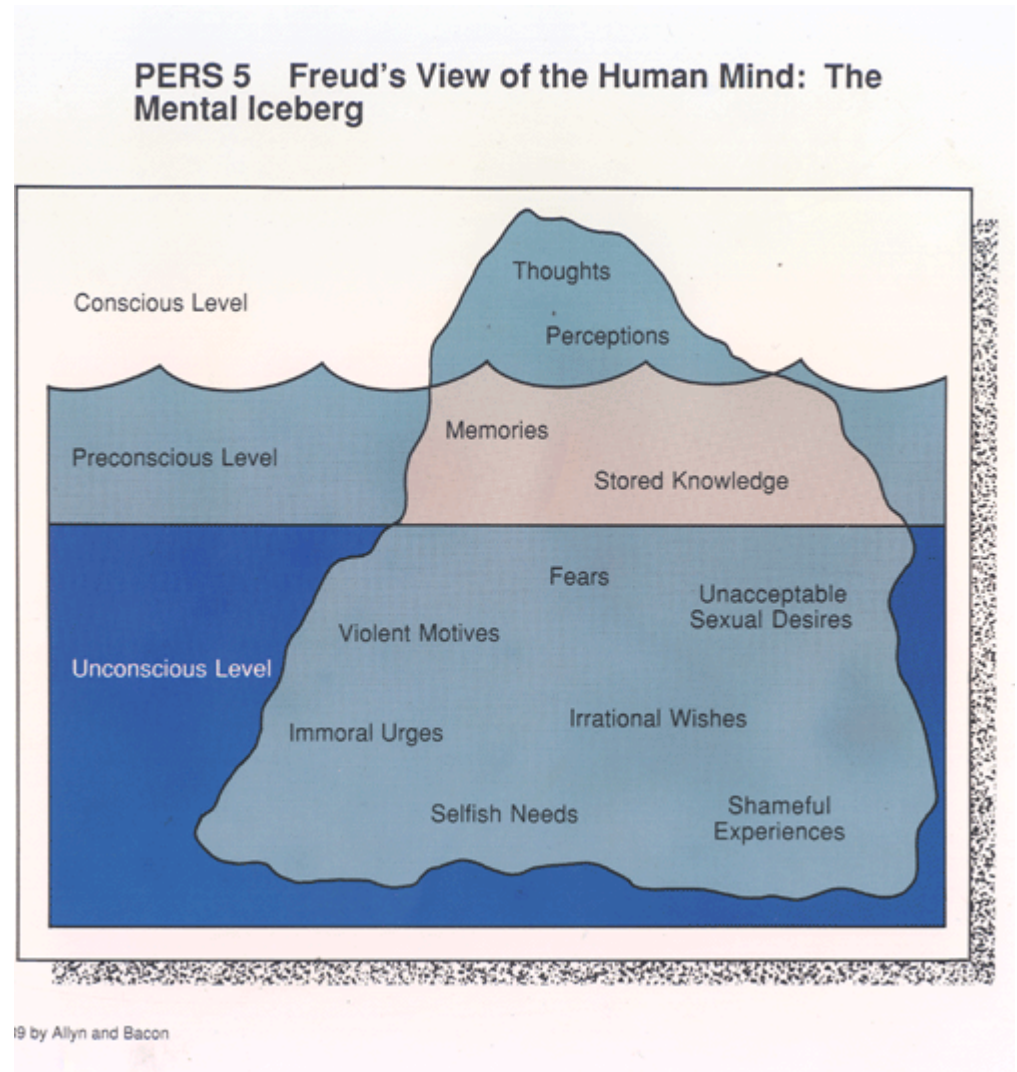
Long-lasting Effects of False Memory

- Geraerts et al. (2008)
 1. Participants completed food preference questionnaire
 2. 1-week later, received false feedback on profile of their early childhood experiences with certain food
 - Some subjects told that they got sick after eating egg salad when they were a child
 - They were then told to elaborate on that experience
 3. Brought back to the lab 4 months later for a “food test” study.
 - Experimental group 30% less likely to eat egg salad sandwich



Repressed and Recovered Memories

- Repression
 - Intentional forgetting of painful or traumatic experiences.
 - It is difficult to verify that repression actually exists, even if participants provide extremely detailed information about the event.



Line-up Identification

The Truth	Your Decision	
	“Suspect Present”	“Suspect Absent”
Suspect Present	✓ (HIT)	✗ (MISS)
Suspect Absent	✗ (FALSE ALARM)	✓ (CORRECT REJECTION)

- The goal is to increase HITS and CORRECT REJECTIONS, while reducing misses and false alarms.

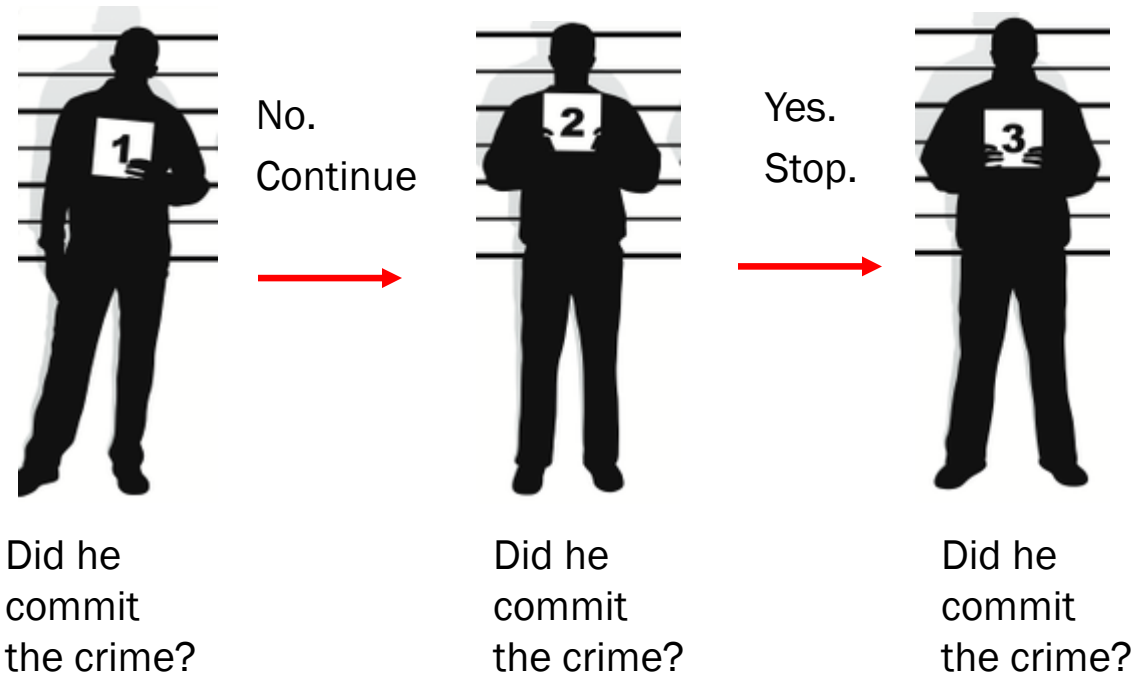
Simultaneous Lineup

All suspects presented at the same time.



Did you see the person who committed the crime?

Sequential Lineup



Suspects are presented one at a time. The person do not know how many subjects there are.

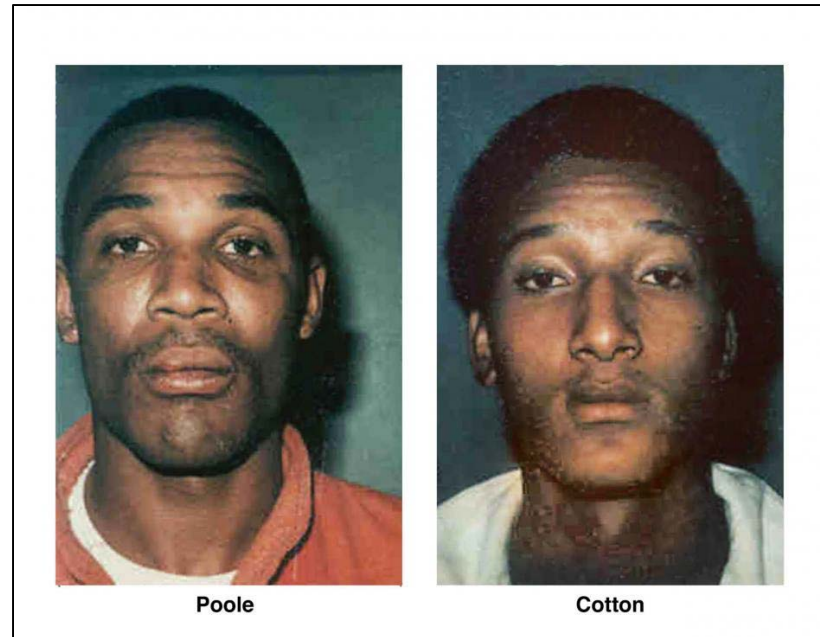
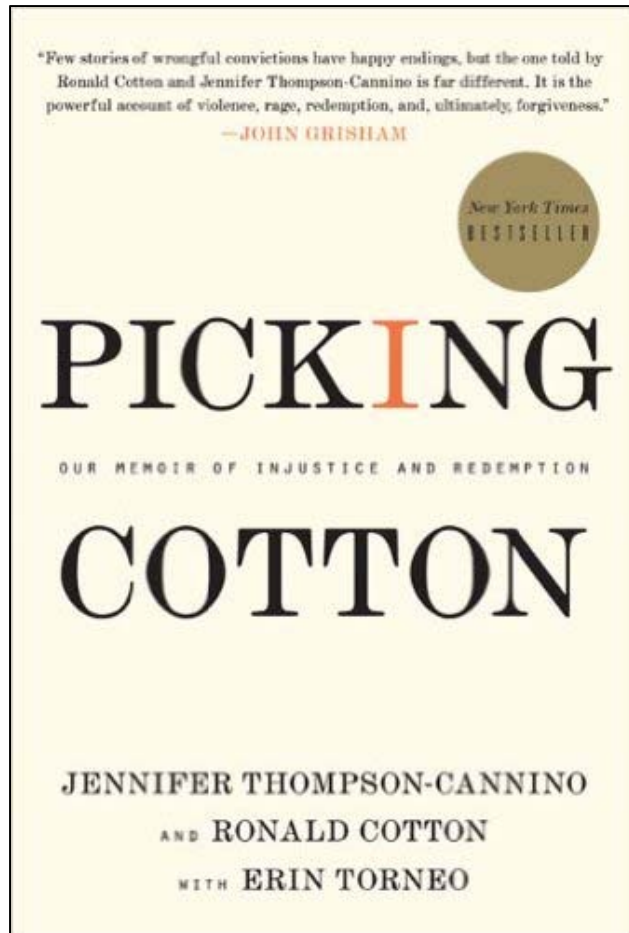
A decision is made for each suspect.

Simultaneous vs. Sequential?

- Wells (1993): Sequential lineups decreases false alarms (but also decreases hits)
 - People use an ABSOLUTE judgment strategy (don't know how many suspects are left)
 - In simultaneous lineup, people use RELATIVE judgment strategy
- Highly confident eyewitness identification testimony was used to convict innocent people in approximately 72% of all DNA exoneration cases (Innocence Project, 2015)
- Authorities should ALWAYS use a double-blind procedure.

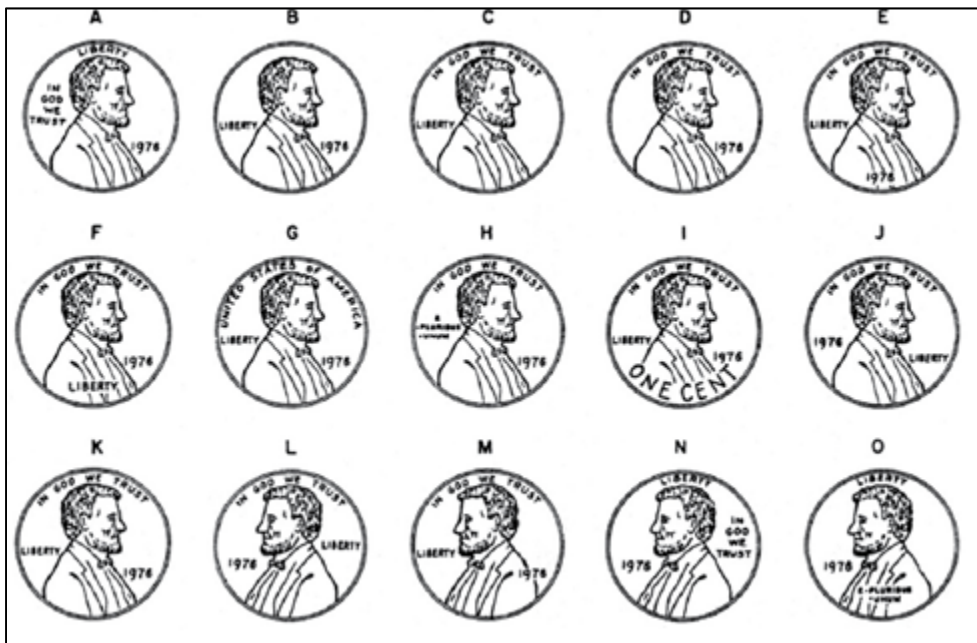
Elizabeth Loftus' TED talk:

<https://www.youtube.com/watch?v=PB2Oegl6wvI>



Overconfidence in Memory

- People often become unjustifiably confident in the accuracy of their own memories—especially for common objects.
 - If information isn't strongly encoded into memory with attention, memory of those information will not be accurate.
- Nickerson and Adams (1976): Penny Experiment

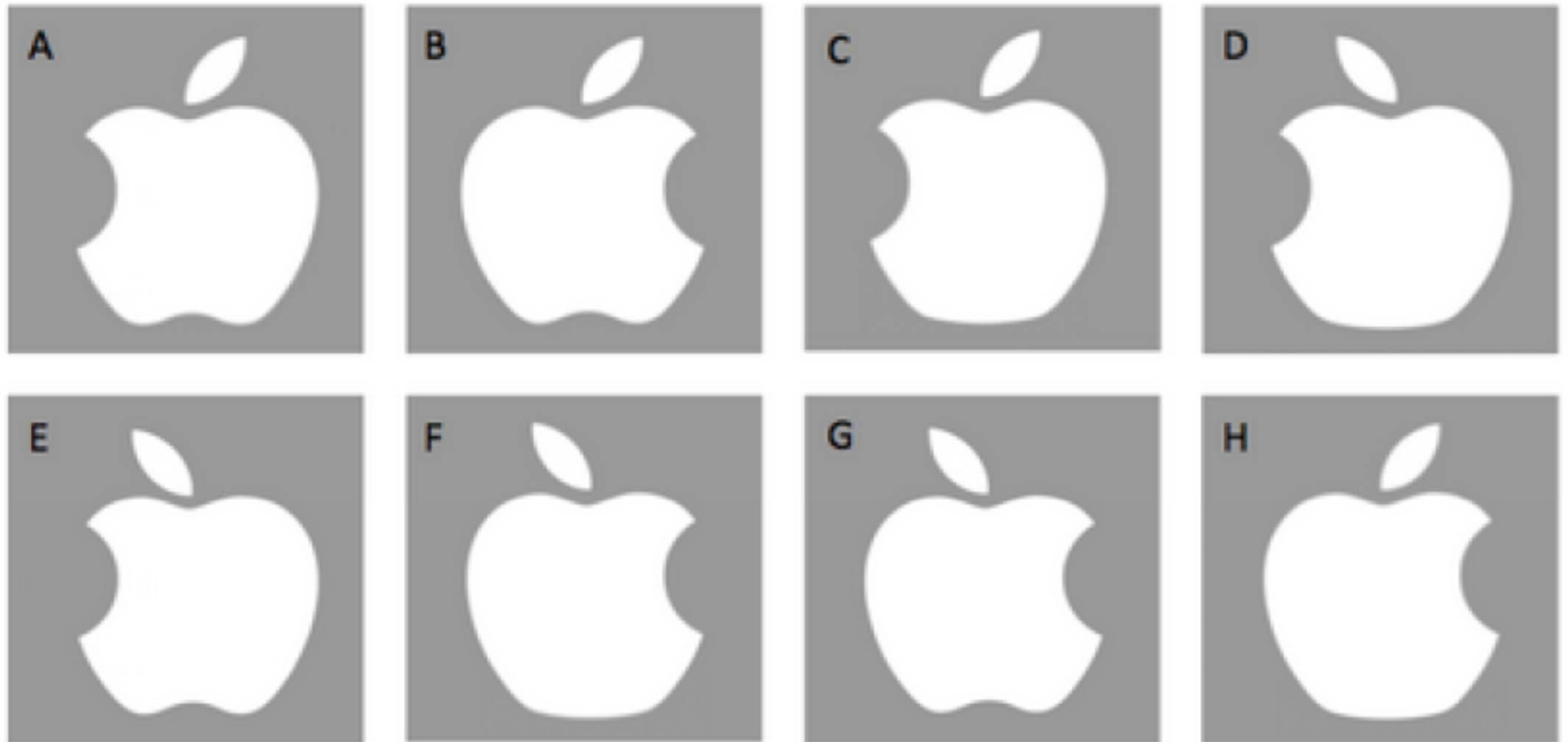


People were lousy at identifying the penny.



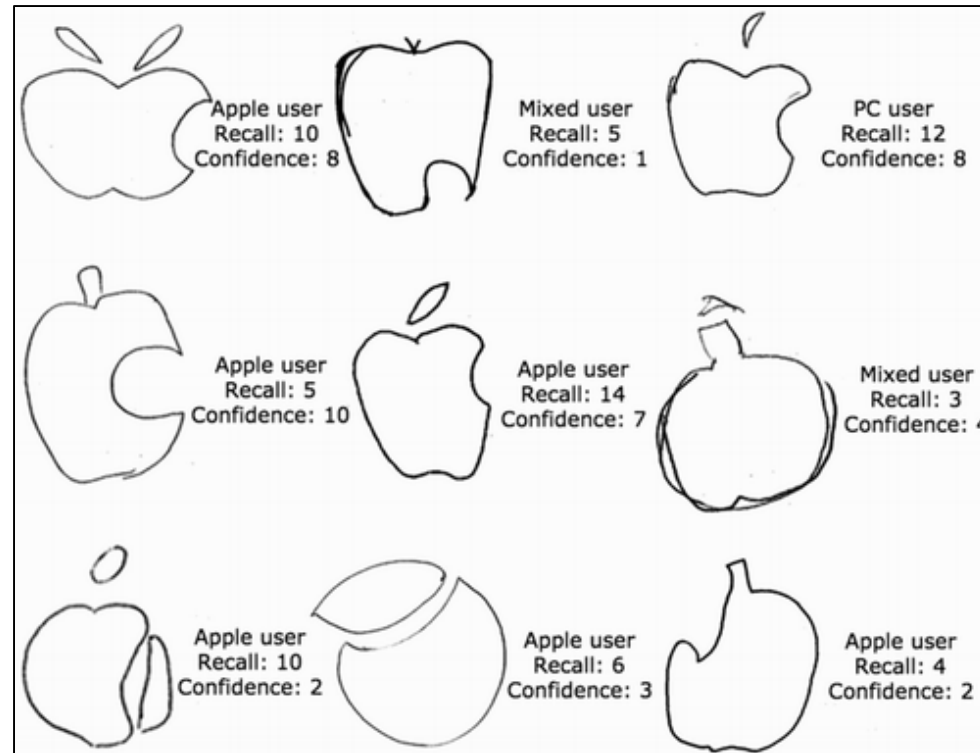
People couldn't draw the penny, either.

Which is the Apple logo!?!?



Apple Logo

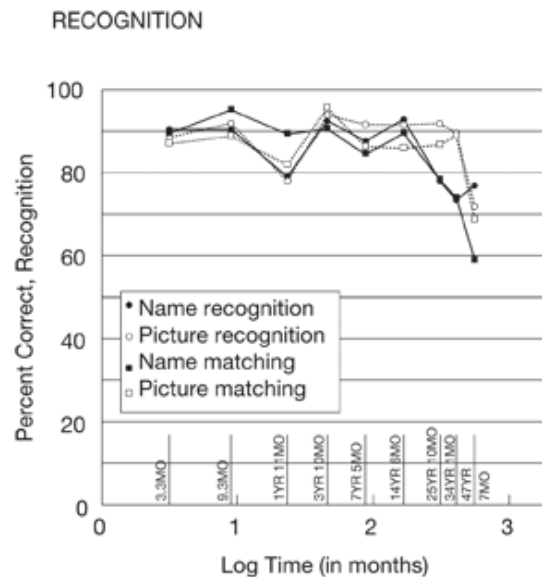
- Blake, Nazarian, & Castel (2015)



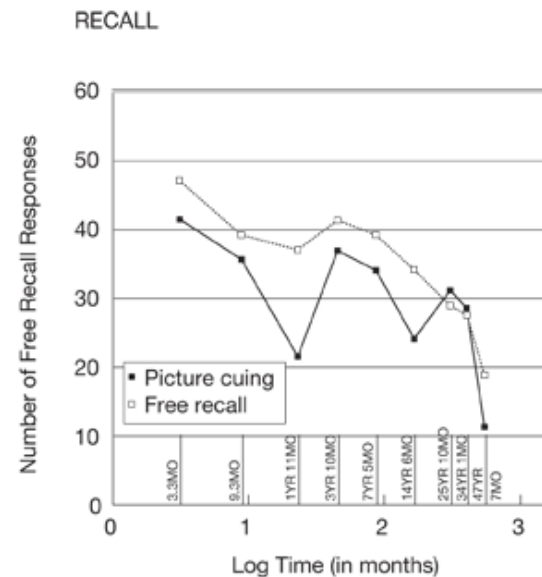
- Examples of the Apple logo drawn from memory by participants in the present study, as well as the user type, assigned score, and confidence judgement. The logo in the center is the only one out of the 85 that received a perfect score of 14.
- There was no correlation between confidence and accuracy (in other words, people's metacognition were lousy).

Autobiographical Memory

- Autobiographical Memory
 - The study of one's lifetime collection of personal memories
- Bahrick, Bahrick, and Wittlinger (1975): “Fifty Years of Memory for Names and Faces.”
 - 400 participants—age 17 to 74
 - Retention interval of 2 weeks to 57 years
 - Tested on recognition and free recall



(a)



(b)

Bahrick's Work

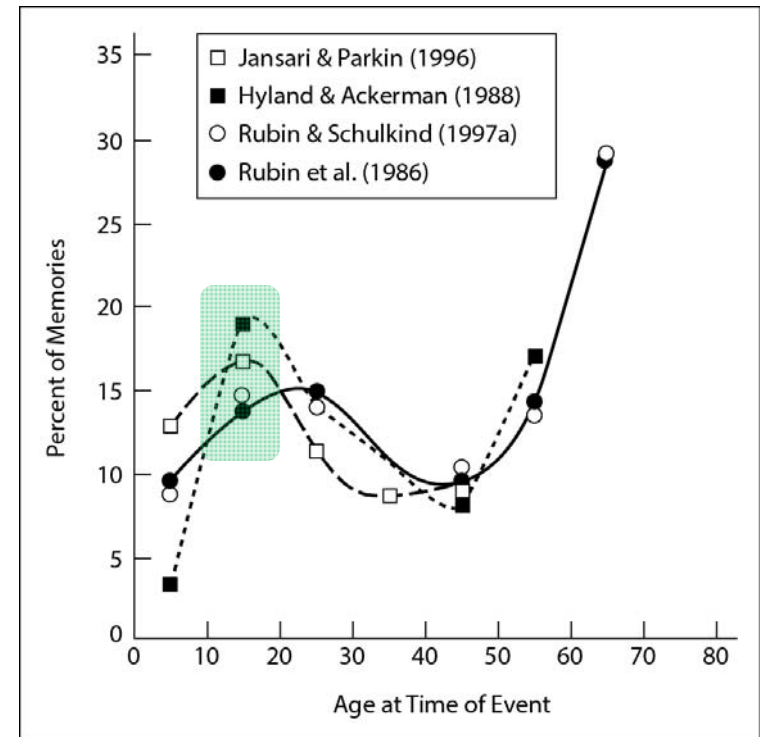
- Why is memory so strong for names and faces in this study?
 1. Overlearning: Information learned repeatedly in class
 2. Distributed practice: Information acquired over a longer period of time

Infantile Amnesia

- The inability to remember life events that occur before the age of 5
 - Freud thought this was due to psychological repression
 - To avoid unwanted psychosexual thoughts
 - Scientific explanation: The brain is still immature (developing)
 - Autobiographical memory comes with development of...
 - sense of self
 - language development
 - neurological development (e.g., hippocampus)
 - Not a real amnesia (does not involve catastrophic forgetting)

Reminiscence Bump

- For older adults, memory better for life events between the ages of 15-20
- Why?
 - More first-time events
 - Cultural scripts
 - Belief that more memorable events should occur around this age
 - Copeland, Radvansky & Goodwin (2009): When reading a novel, people remember more events about the character when he/she was around 20 (!)



Spontaneous Memory

- Autobiographical memories that triggered by an environmental cue
 - Odors are particularly effective cues
- Often emotionally intense
 - Why?

Flashbulb Memories

- Vivid memories of decades-old traumatic events (e.g., JFK assassination, O.J. Simpson verdict, 9/11, Columbine shooting, Virginia Tech shooting)
- Brown and Kulik (1977): Seemingly realistic as to resemble a photograph taken with a flashbulb
 - Are flashbulb memories special?
- Talarico & Rubin (2003)
 - Right after 9/11 event, questioned undergraduates at Duke about their memories of 9/11 (e.g., Who or what first told you the information? When did you first hear the news?) and a standard memory event (e.g., what did you have for breakfast last Monday?)
 - Groups were retested on same memory questions:
 - A week later
 - 6 weeks later
 - 32 weeks later

Flashbulb Memories

- Talarico & Rubin (1997): Results
- Were flashbulb memories MORE ACCURATE than regular, everyday memories?
 - NO. Memory accuracy faded over time and at the same rate for both types of memory.
 - People reported being more CONFIDENT about the accuracy of their flashbulb memories.