Memory II

Reconstructive Memory Forgetting

Observe this crime scene

Memory & Gist

- Memory is better for meaningful significant features than for details of language or perception

➔ gist is remembered better than detail

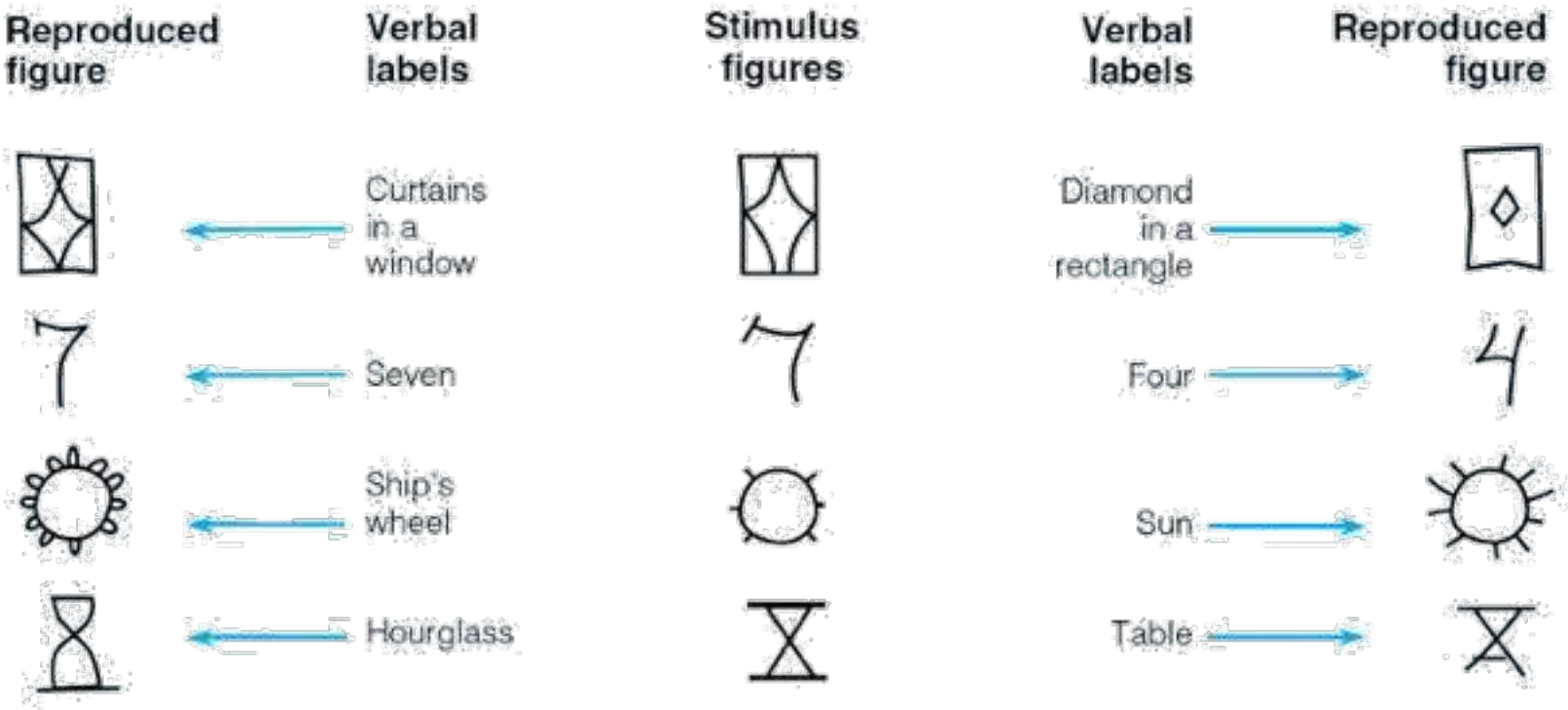
What does a penny look like?

Reconstructive nature of memory

- Memory is often side-effect of comprehension
  - details can be filled in or reconstructed at retrieval time

- Constructive approach to memory
  - Memory = actual events + knowledge, experiences, expectations

Verbal labels can distort visual memories



Carmichael, Hogan, & Walter (1932)

Remembering Objects from a Graduate Office

chair ✓

desk ✓

skull ✓

books ✗

(30% of subjects falsely remember books)

Brewer & Treyens (1981)

Misinformation Effect

- Memory for event can be influenced by information given after the event

Studied scene

Misinformation: “Did another car pass the red datsun while it was stopped at the stop sign?

Reconstructed memory

Elizabeth Loftus

Explaining Misinformation Effect

- Three hypotheses:
  - ✓ **Overwriting**
    - misleading information alters the memory trace
  - ✓ **Source confusion / Misattribution (张冠李戴)**
    - Perhaps the memory of the question is confused with the memory of the visual scene
  - ✓ **Misinformation acceptance**
    - Ss. believe the information in the postevent is true because questioner is a person of authority

Overwriting Hypothesis seems unlikely

- McCloskey and Zaragoza (1985)
- See event: yield sign (让车标志)
- Receive misinformation, “as the car passed the...”

  misleading: “...stop sign?”

  nonmisleading: “...yield sign?”

- Forced choice test:

  yield sign OR stop sign ➔ 35% drop in accuracy for misleading information

  yield sign OR no U-turn ➔ no difference in accuracy for misleading information

- A memory of the original event is still retained

Relevance to Criminal Justice System

(刑事司法)

- most obvious case
  - crime ➔ study
  - picture of suspect (mugshot) ➔ misinformation
  - lineup ➔ test

  (脸面照片)
- Eyewitness may recognize suspect from mugshot, not from crime scene
- Conclusions:
  - Do not let potential witnesses see suspects
  - Interrogate without asking leading questions (询问, 审问)

Traditional Lineup

Identify the person you saw earlier in the slides

Issues with lineups

- Faulty eyewitness testimony is the single largest factor leading to false convictions (Wells, 1993)
- Big problem:
  - Eyewitnesses often assume perpetrator is in lineup

(行凶者)

77,000 suspects are arrested each year after being identified by eyewitnesses (Dolan, 1995).
Some proportion (not clear exactly what proportion) of these cases lead to false convictions because of faulty eyewitness testimony.
If others do not resemble the perp the one who comes closest may be picked.

Improved Lineup: Sequential Presentation

A sequential lineup forces a comparison with memory not others.

Unbalanced lineups

- Problem:
  - If distractors do not resemble the real perp, the one who comes closest may be picked
- Solution:
  - All distractor items need to fit description given by witness and be sufficiently diverse
  - No individual should stand out

"It was . . . the cat! No, the woman! Heck, it could have been any one of them."

Improving lineups

adding distinctive features to foils if target has distinctive feature

Fig. 1. Examples of faces used in Experiments 1 and 2 before (top) and after (bottom) the digital addition of a distinctive feature (from left to right: a bruise, a mole, a piercing, a mustache, a scar, and a tattoo).

Zarkadi, Wade and Stewart (2009)

Biased Lineup?

(from Geoff Loftus)

Recovery of Lost Memories?

- Several lawsuits have relied on eyewitness testimony of repressed memories. These memories were “recovered” by family member or therapist **(治疗专家)**

- Claim: repression follows stress **(精神压力)**, but repressed material can be returned to consciousness with the removal of stress (e.g., Zeller, 1950, 1951; Merrill, 1954)

- Problem: are these repressed **(被抑制的)** memories or false memories (based on misinformation)?

Recovered memory vs. False Memory

- How do we know whether repressed memories are accurate? Hard to falsify

- In some cases, traumatic information is misremembered or simply "made up" **(造成创伤的, 惊骇的, 痛苦的)**
  - ✓ Loftus has been involved in many cases
  - ✓ Points out problems of
    - ➢ hypnosis (催眠术)
    - ➢ suggestive questioning (提示的；暗示的)
    - ➢ dream interpretations (梦的解释)

Elizabeth Loftus

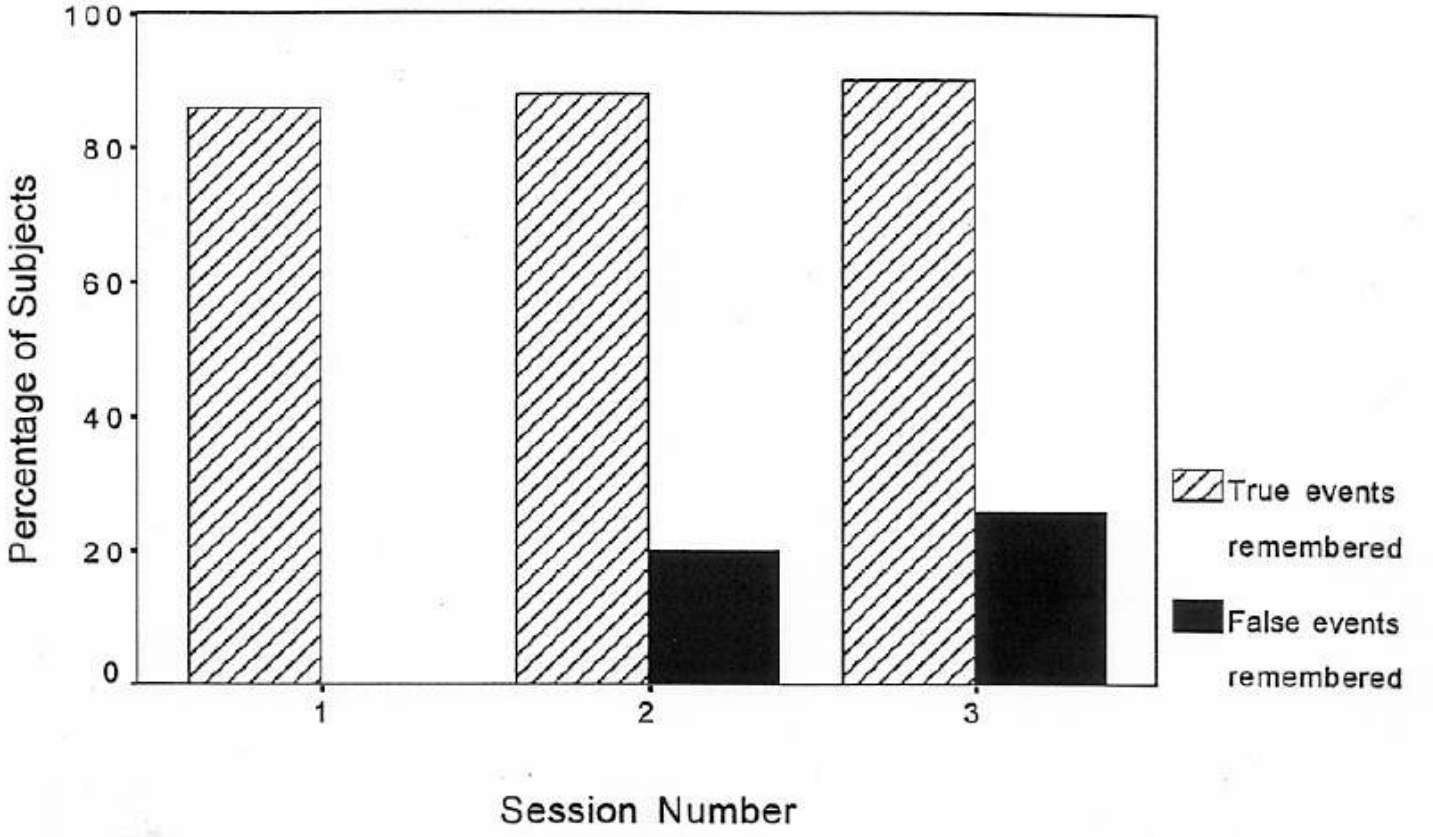
Can false memories be implanted?

- Experiment:
  - Experimenter interviews relatives of Ss.
  - Experimenter then told Ss. of true and false events from their childhood
  - Example false memory: being lost at a mall at age 5
  - After that, Ss. rated stories on whether they remembered from childhood
- Results:
  - 68% of the true events and
  - 29% of false events “remembered”

You, your mom, and your brother went to Kmart. You were 5 years old. Your mom gave each of you some money to get a blueberry Icecream. You ran ahead to get into the line first, and lost your way in the store. Your mom found you crying to an elderly woman.

Loftus and Pickrell (1995)

Lost in the mall study



Loftus and Pickrell (1995)

Lost in the mall study

Are all of your memories real?

False Memory in the Lab

- Deese, Roediger, McDermott paradigm
- Study the following words

- Recall test ....
- Recognition memory test

  Use ratings 1) sure new 2) probably new 3) probably old 4) sure old

- TEST:

Results

- Critical lures (“sleep”) are words not presented but similar to studied words. These words are often falsely recalled (sleep: 61% of Ss.)
- Recognition memory results

proportion of items classified with confidence levels:

confidence rating	4	3	2	1	
studied items	.75	.11	.09	.05	(e.g. “REST”)
not studied					
unrelated	.00	.02	.18	.80	(e.g. “COFFEE”)
critical lure	.58	.26	.08	.08	(e.g. “SLEEP”)

Accuracy and Confidence

- False memory experiment shows sometimes confidence is high while accuracy is low

Accuracy and Confidence

- Eyewitness testimony requires accuracy and confidence

  - “eyewitness testimony is likely to be believed by jurors, especially when it is offered with a high level of confidence” (Loftus, 1979)

  - That's him! I'm absolutely positive! I'll never forget that face as long as I live!”

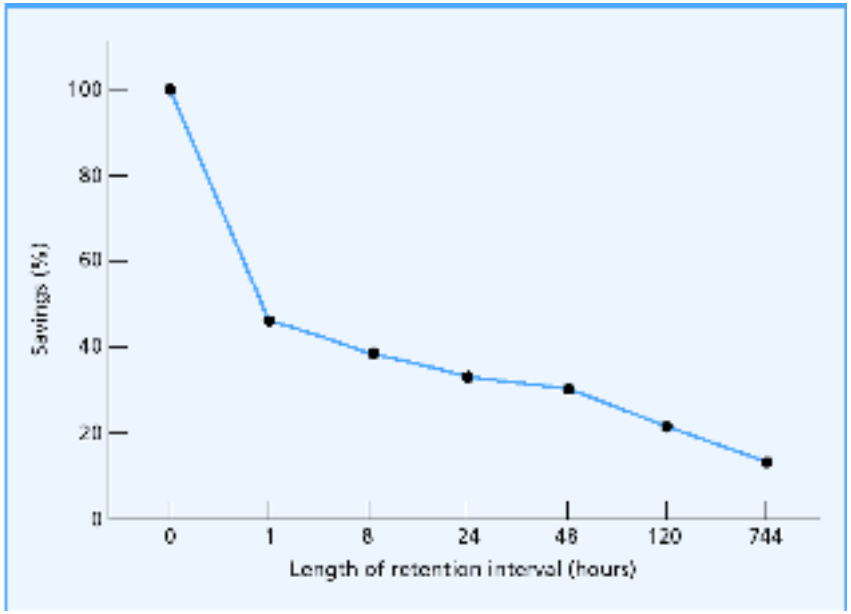
  - Confidence ≠ Accuracy

(Wells & Bradfield,1999; Loftus & Busey)

Forgetting

Forgetting Functions

- ***Forgetting*** is the inability to recall or recognize previously encoded information. Although some instances of forgetting are due to poor initial encoding, and others are due to the lack of the right cues at the right time, many instances of forgetting result from postencoding mechanisms.



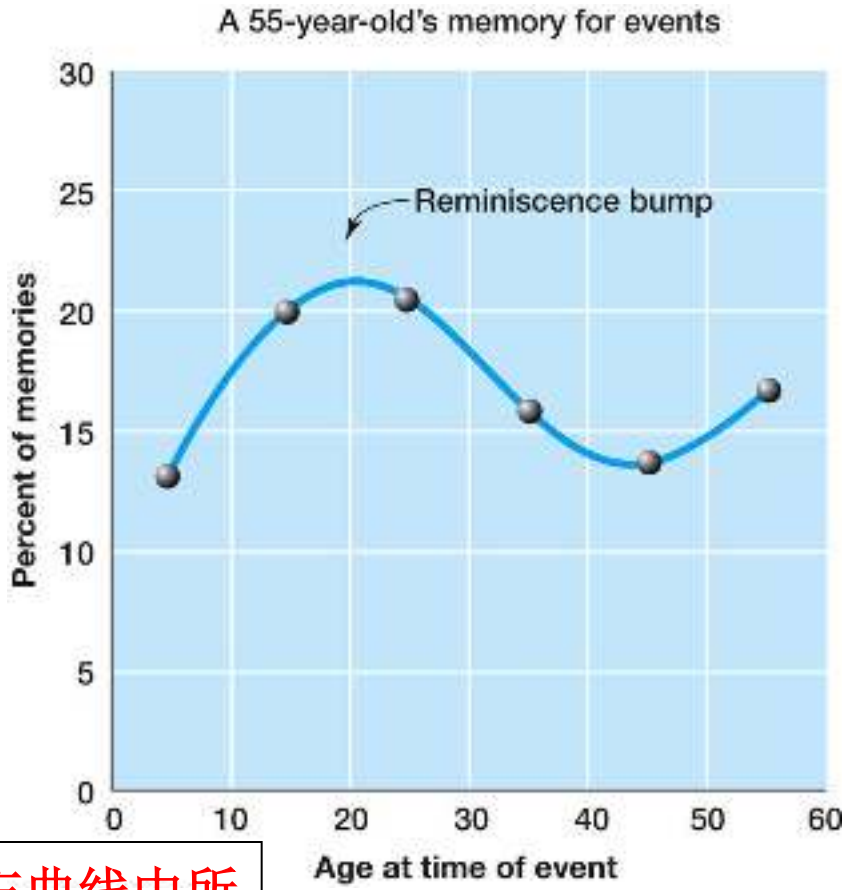
Forgetting over time as indexed by reduced savings.

Ebbinghaus (1885-1913)

Reminiscence Bump

Enhanced memory for (episodic and semantic) facts of adolescence (青春期) & young adulthood.

- Possible explanations for reminiscence bump:
  - encoding is better in periods of rapid change, followed by relative stability.
  - primacy effect (many “first times”)
  - more positive events
  - **Neurological account**: the time of the best cognitive functioning



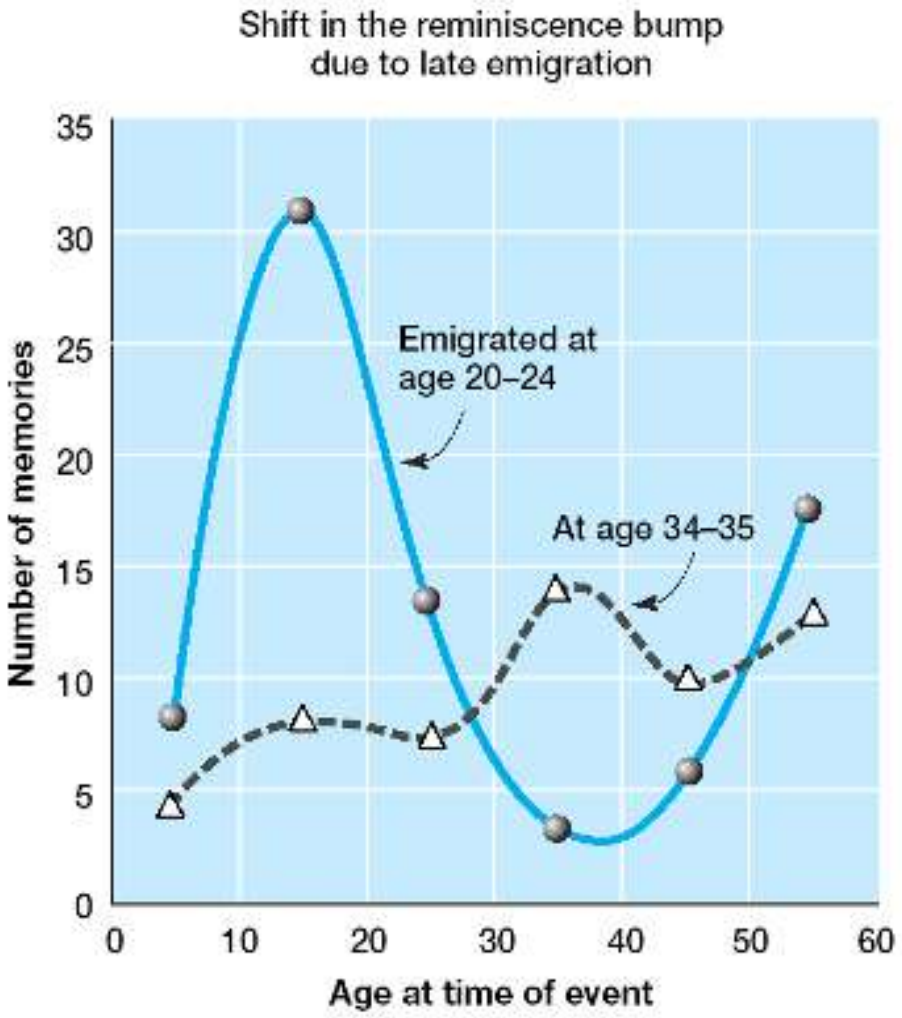
记忆隆(**the reminiscence bump**):在遗忘曲线中所表现出的对某一特定时期的事件的记忆反弹趋势。

Schrauf & Rubin (1998)

Reminiscence Bump

- One explanation for reminiscence bump: encoding is better in periods of rapid change, followed by relative stability

- Evidence from those who emigrated to the US after young adulthood indicates reminiscence bump is shifted



Neurological account: the time of the best cognitive functioning

Schrauf & Rubin (1998)

Is there a purpose of forgetting?

- Computational level explanations for forgetting

  - Anderson & Schooler (1991)

  - It is efficient for our memory system to make recent and frequent memories more readily accessible

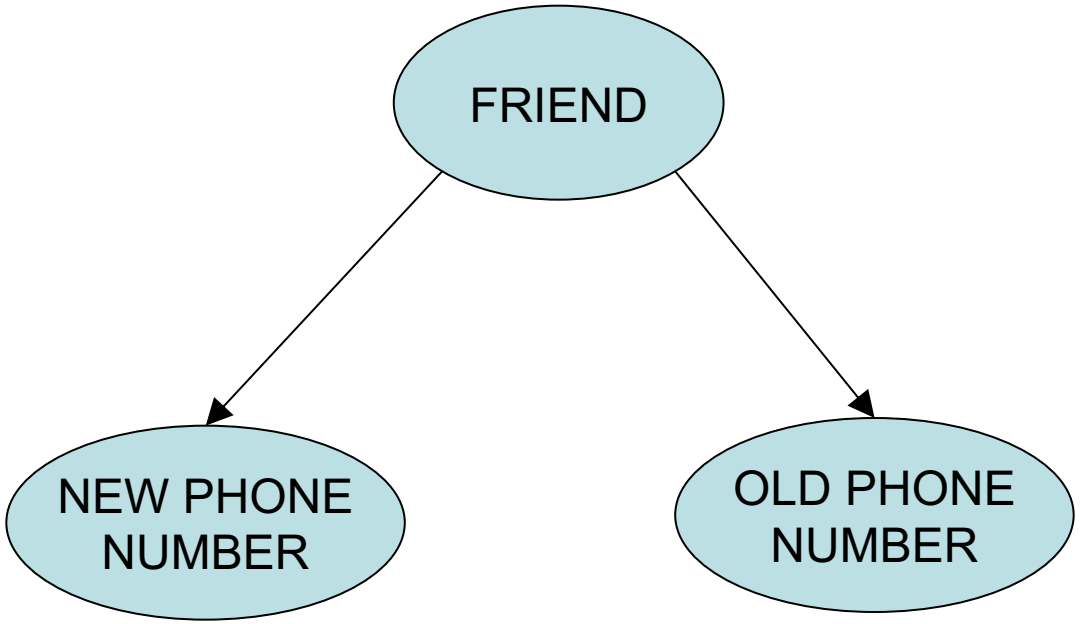
Algorithmic level explanations of forgetting

- **Decay**
  - Memories just fade and disappear (difficult to test this)
- **Interference**
  - Memory is still there but we can't retrieve it
  - newer memories interfere with older memories ➔ **Blocking**
- **Suppression & Repression** ➔ controversial (!)

Ample evidence indicates that many instances of forgetting are caused by interference. Interference theories hold that if the same cue is bound to a number of representations, these representations compete during retrieval, resulting in interference. Newer memories interfere with older ones, and older ones with newer ones; and the result is that neither old nor new stimuli or events are perfectly recalled—even though the information is still in memory, we have forgotten because retrieval attempts have failed.

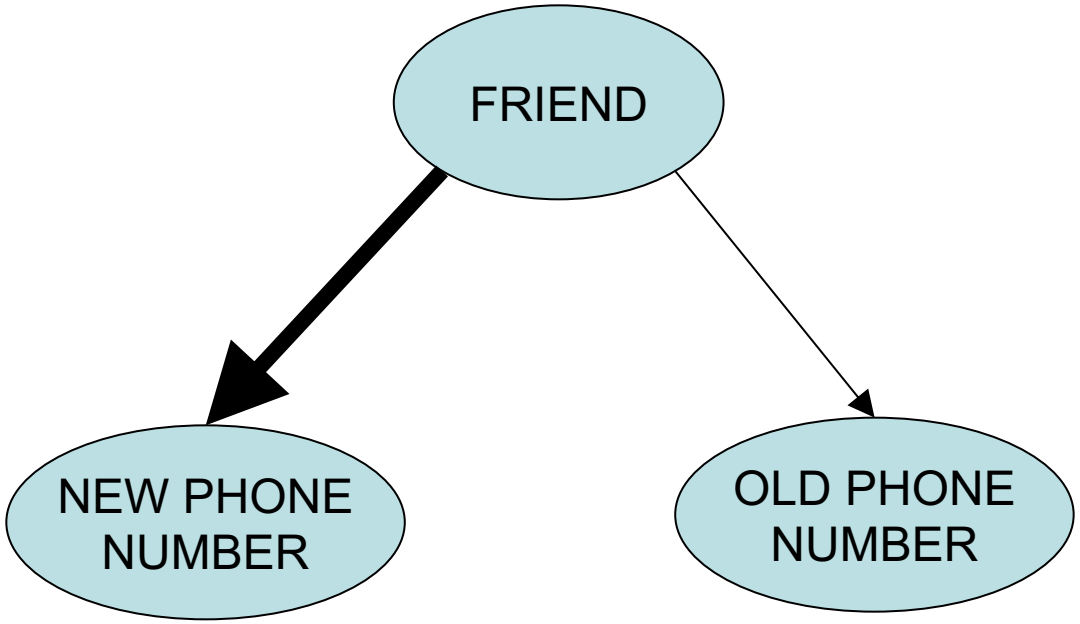
Example

- You call a friend, but realize you need an older phone number that you have not used for a while. With effort, you recall the correct old phone number



Blocking

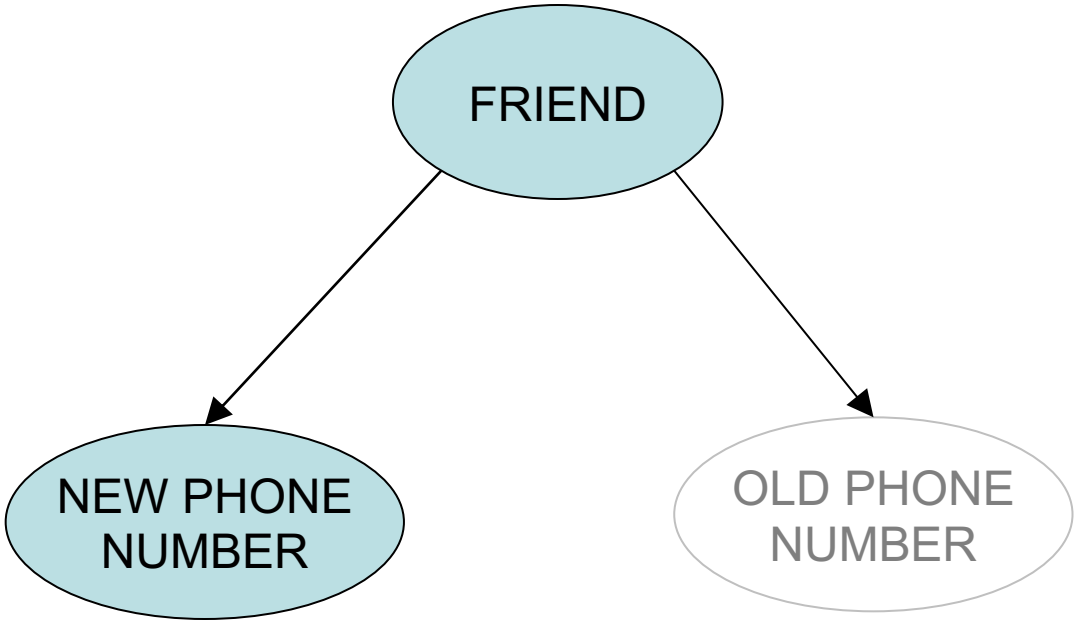
- One explanation: The old number is **blocked** by the new association



Blocking theories hold that forgotten information still resides in memory but is temporarily blocked by a dominant competing representation

Retrieval Induced Forgetting

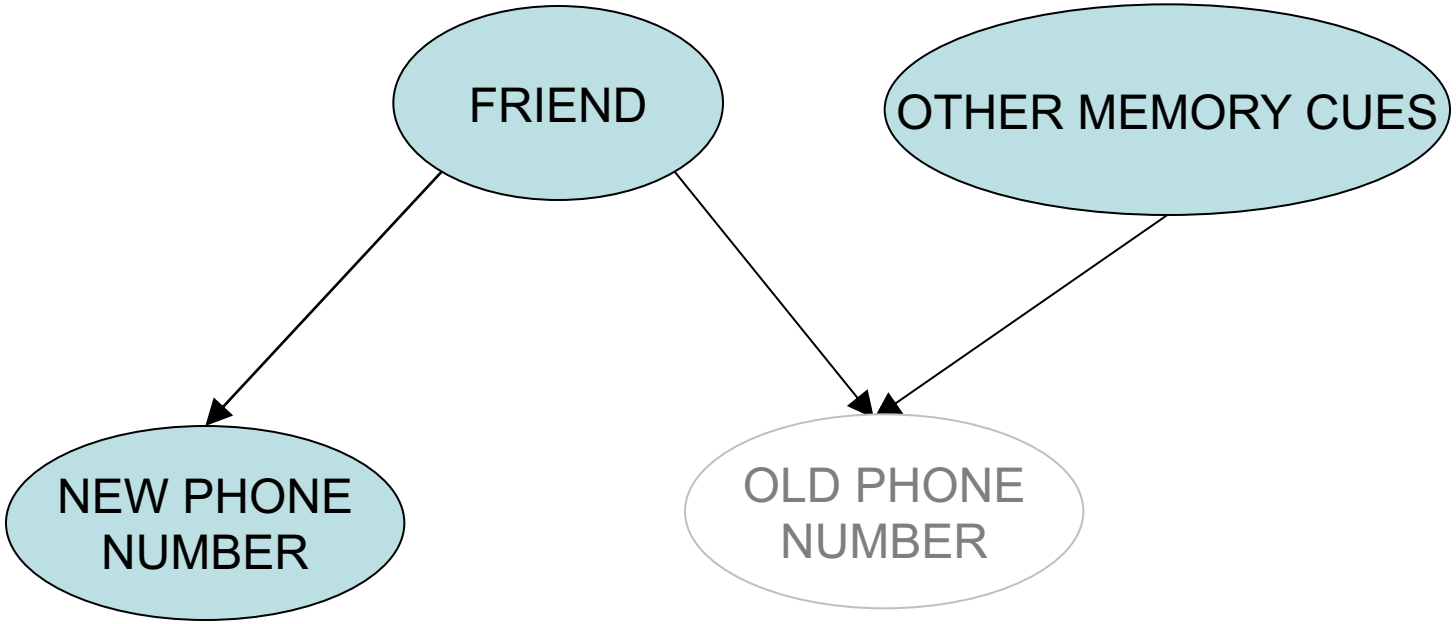
- An alternative explanation for the problem of retrieving the old phone number is that the old memory has been **suppressed** because the new phone number was retrieved ➔ retrieval induced forgetting



(the old phone number memory has been weakened)

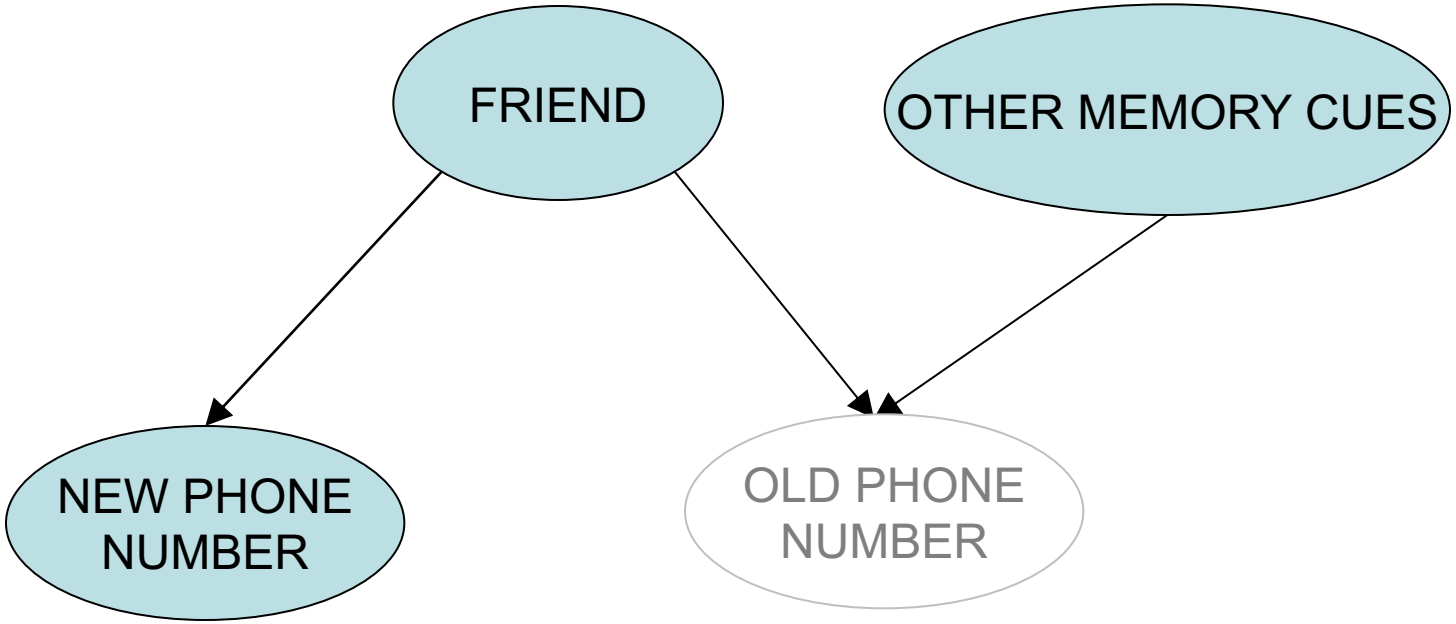
Blocking or Suppression?

- Blocking would predict that using a new cue would remove blocking effect. Suppression would predict the memory cannot be accessed with a new cue either



Blocking or Suppression?

- Anderson & Green show that other memory cues are not effective either and argue for suppression



Inhibitory processes in memory?

- Suppression is an example of an inhibitory **process**
- Can we actively inhibit or suppress our memories? How would that work?
- Note: many memory researchers do not buy into concept of suppression of memories. More research needs to be done