

# Chapter 8

## Using Knowledge in the Real World

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## Ch 7 review

- Semantic Memory
  - Network Model, Feature Comparison Model, Revised Network Model
- Connectionism
- Semantic Priming
- Schemata & Scripts
- Concepts & Categorization

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## Chapter 8 Outline

- Reductionism & Ecological Validity
- Seven Sins of Memory
- Facts about the World
- Situation Models and Embodied Cognition
- Metamemory
- False Memories
- Autobiographical Memories

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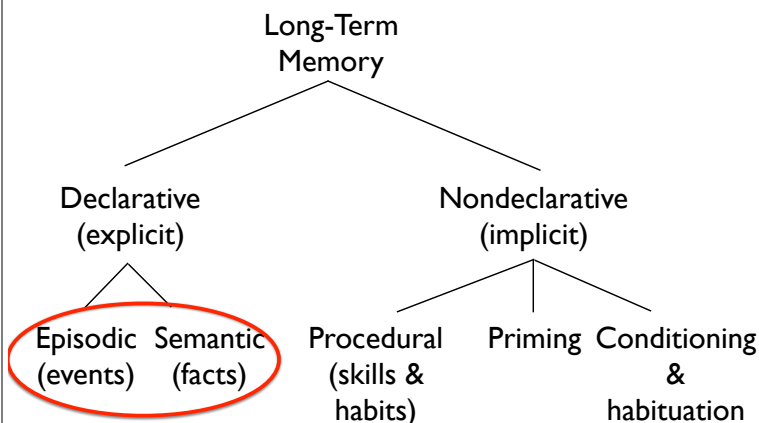
## Combining Episodic and Semantic Memory

- Reductionism:
  - break down constructs into smaller constructs, study the parts
- Ecological Validity: are findings useful in everyday life?
  - Aka “External Validity”
- Real-life situations use many memory systems

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## Squire (1993) Taxonomy of Long-Term Memory



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## Combining Episodic and Semantic Memory

- Materials
  - use meaningful information (rather than nonsense syllables)
- Methods
  - Accuracy (rather than RT)

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## The Seven Sins of Memory (Schacter, 1999)

Sin	Description
<b>Transience</b>	Losing access to information across time, whether through forgetting, interference, or retrieval failure
<b>Absent-mindedness</b>	Everyday memory failures caused by insufficient attention or superficial, automatic processing during encoding
<b>Blocking</b>	Temporary retrieval failure such as the tip-of-the-tongue state, in either episodic or semantic memory
<b>Misattribution</b>	Remembering a fact correctly from past experience but attributing it to an incorrect source or context
<b>Suggestibility</b>	Incorporating information provided by others into your own recollection and memory representation
<b>Bias</b>	Knowledge, beliefs, and feelings distort recollection of previous experiences and affect current and future judgments and memory
<b>Persistence</b>	Remembering facts or events, including traumatic memories (one would rather forget). Failure to forget because of intrusive recollections and rumination

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## Exaptation

- Trait evolved for one function is co-opted for another function
- Example:
  - Bird's Feathers
    - initially for temperature regulation
    - later for flight
- Schacter discusses human memory system "sins" as being side-effects of Exaptation

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## Facts about the World

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## Memory for Detail vs. Meaning

- Observation: people remember "the gist" or basic facts, but don't remember the details
- Sachs (1967) - subjects read paragraph, then immediately had a recognition test.
- IV:
  - Varied # of words between reading information and the recognition test
  - Test questions for either the surface form or the meaning.
- DV:
  - % recall
- Results: after about 80 syllables (a few sentences) surface detail was lost, but meaning remained

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## Propositions

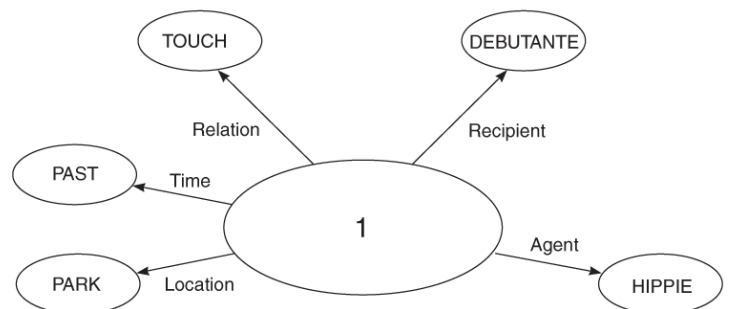
- Proposition: statement of fact
- Elaborated Propositions:
  - multiple facts, connected
  - similar to Semantic Network
  - Nodes & Pathways

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## "The hippie touched the debutante in the park"

(1) THE HIPPIE TOUCHED THE DEBUTANTE IN THE PARK.



Or:

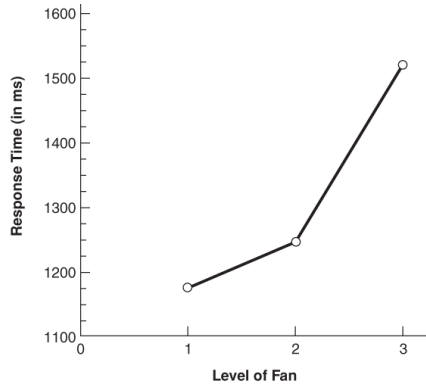
(1) TOUCH (HIPPIE, DEBUTANTE, PARK, PAST)  
Relation (agent, recipient, location, time)

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## Propositions and Interference

- Anderson (1974)
- The higher # of associations “fan” slower the RT
- The “Fan Effect” or “Associative Interference Effect”



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## Propositions and Interference

- Bunting et al (2004)
- People with higher Working Memory capacity are more immune to the Fan effect

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## Situational Models

- Memory is not passive
- People *actively* process information about the world
- Making *models* in or to make useful *predictions* of how the world works

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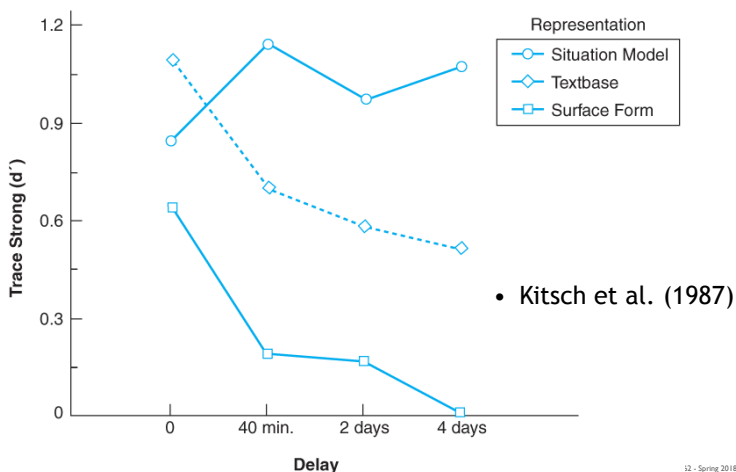
## Levels of Representation

- Surface Form:
  - The exact words in exact order
- Textbase
  - Propositional representation
- Situational Model
  - the “state of affairs”
  - Example: in a story of a murder, you imagine the thoughts & feelings of the victim and perpetrator, even if not mentioned in the text

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## Memory vs. Levels of Representation



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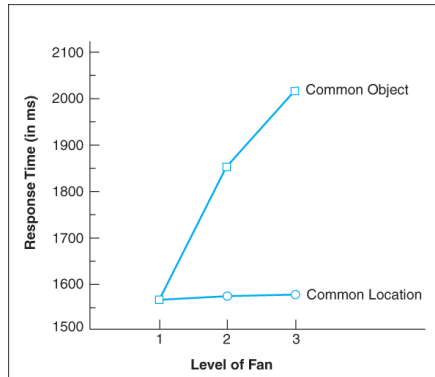
## Situational Models & Memory

- Remember these facts:
  - The potted palm is in the hotel.
  - The potted palm is in the museum.
  - The potted palm is in the barber shop.
  - The pay phone is in the library.
  - The welcome mat is in the library.
  - The waste basket is in the library.

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## Radvansky (et al. 1993)



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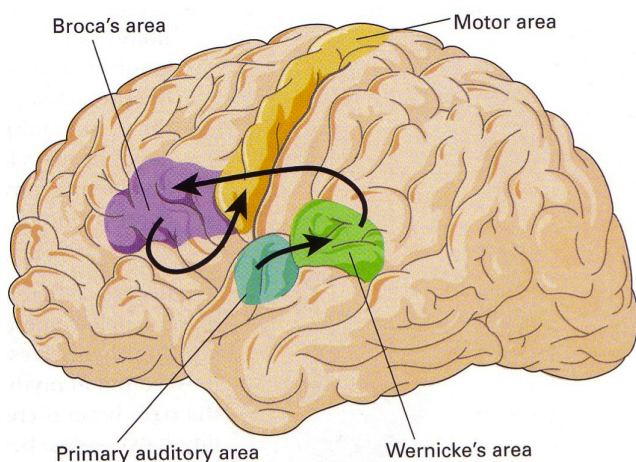
## Ch 7 Review: Clinical cases

- **Agnosia** - inability to know what an object is
- **Anomia** - inability to name objects (but do know what it is)
- **Aphasia** - problems with speech
  - Receptive aphasia (Wernicke's)
  - Expressive aphasia (Broca's)
- All represent different forms of Semantic Network Disruption

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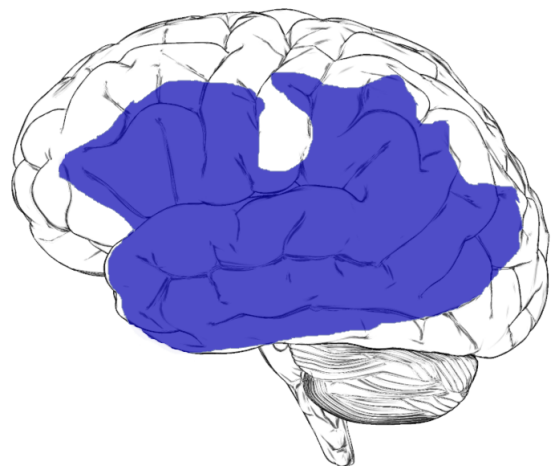
## Broca's and Wernicke's Areas



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## Areas where damage can cause Aphasia



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## Metamemory

- memory *about* a memory
- self knowledge: how *accurate* is my memory?
- Kinds:
  - Source Monitoring...
  - Prospective Memory...
  - Knowing what you Know...

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## Source Monitoring

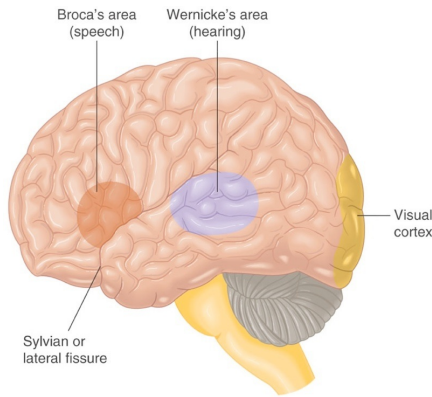
- memory for *where information came from*
- Did Abraham Lincoln really hunt vampires?
- Did I turn off the stove?

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## Neurobiology of Auditory Hallucinations

- SPECT shows activity in Broca's Area, which is involved in speech Production
- Wernicke's area not active.
- Conclusion - auditory hallucinations are a form of "talking to one's self" rather than "hearing voices that aren't there"



© 2005 Wadsworth - Thomson

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## Source Monitoring Accidents

- Cryptomnesia - to plagiarize something w/o conscious awareness.

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## Prospective Memory

- to remember to do something *in the future*
  - is there a cue?
- Event-based Prospective Memory
  - to remember to do something associated with *a certain event*
  - The event is a cue

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## Knowing what you Know

- Judgments of Learning
- Prediction: will I remember it later / have I learned it well enough?
- Knowing when to stop studying
- Tip:
  - make the judgment after a delay
  - why? gives time for information to be lost from working memory

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## Feeling of Knowing

- aka Familiarity
- "will I remember" / "will I recognize it"?
- Tip of the Tongue State

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## False Memory

- False Memories...
- Semantic Integration...
- Leading Questions & Memory Distortion...
- The Misinformation Effect
- Source Misattribution and Misinformation Acceptance...
- Stronger Memory Distortion Effects...
- Repressed and Recovered Memories...

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## The DRM Paradigm

- Deese (1959), Roediger & McDermott (1995, 2000)
- Study lists of words
- Test for Recognition or Recall
- Critical Lures: highly related words *which were not studied*

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## The DRM Paradigm

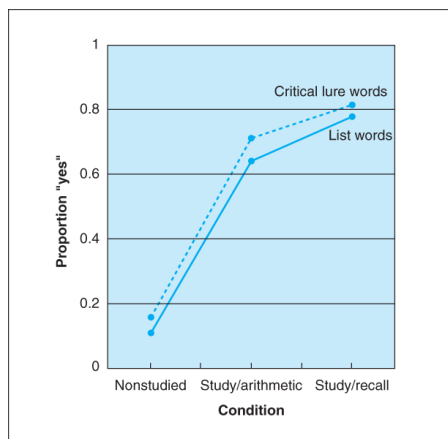
- Did you “remember” the word “sleep?”
- (40% of people did)
- In recognition, false memory to the lure (sleep) is often as strong as accurate memory for target items (blanket, doze).
- Content versus technical accuracy?
- “False Alarm”

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## The DRM Paradigm

- if the subject recalls the lure this strengthens the false memory on Recognition test



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## Technical vs. Content Accuracy

- Technical Accuracy:
  - Recalling or recognizing exactly what was experienced (generally quite poor).
- Content Accuracy:
  - Recalling or recognizing the meaning or content of what was experienced (generally quite accurate).

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## Semantic Integration

- Bransford and Franks (1971)
- Subjects studied simple sentences that together told a story:
  - The ants were in the kitchen.
  - The ants ate the Jelly.
  - The jelly was sweet.
  - The jelly was on the table.

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## Semantic Integration

- At test, subjects “remembered” seeing complex sentences that captured the meaning of the simple sentences that were actually present at study:
- *The ants in the kitchen ate the sweet jelly on the table.*
- The simple sentences were integrated into one sentence that captured the story’s gist.

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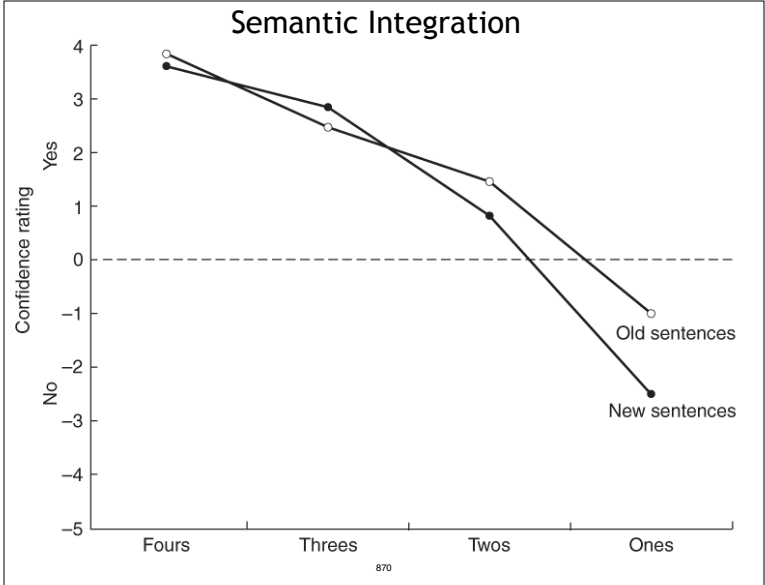
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# Semantic Integration

- Memory for complex sentences not actually seen was higher than for simple sentences that were seen.

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## Leading Questions & Memory Distortion

- Loftus & Palmer, 1974
- Subjects saw the same film of a car accident
- Later, different subjects were asked: How fast were the cars going when they:
  - smashed?
  - collided?
  - bumped?
  - contacted?

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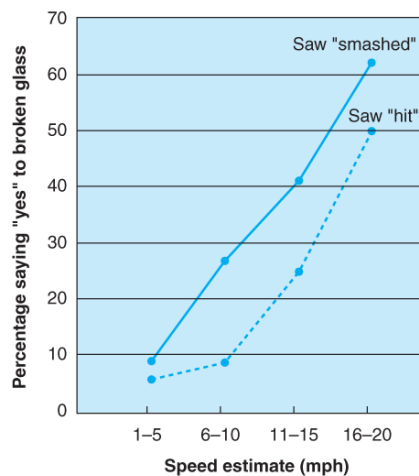
## Leading Questions & Memory Distortion

- Subjects estimates of speed varied with the verb they got in the question phase of the experiment.
- Subjects who got the stronger verb "remembered" the cars were going faster.
- Two weeks after the film: Did you see the broken glass (note: No glass was present in the original film)?

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## Leading Questions & Memory Distortion



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## Leading Questions: Possible Explanations

- Memory Impairment:
  - A genuine change in memory of an experienced event as a function of some later event.
- The Response Bias Explanation:
  - No memory impairment- subjects use the verb to infer that the cars must have been traveling faster (or slower) than previously remembered.
- The broken glass expt. suggests the former

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## Misinformation Effect

- Two groups see pictures of car accident, showing Stop Sign
- One group gets misinformation mentioning “Yield Sign”
  - Results in 20% lower accuracy
  - ... and faster to respond with the incorrect answer
- Three factors
  - Source Misattribution...
  - Misinformation Acceptance...
  - Overconfidence...

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## Source Misattribution

- inability to remember or judge *where* information came from
- Sense of *familiarity* can be confused with *truth*

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## False Fame Effect

- Jacoby et al. (1989)
- Subjects read list of non-famous names
- Later asked to judge who is “famous”
- Many of the non-famous names picked
- Probably due to recency / familiarity

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## Misinformation Acceptance

- Secondhand memories or information *after the fact* are remembered with the original event
- Theory of Reconsolidation:
  - when memory is *remembered* it becomes *malleable* - easier to edit or change

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## Implanted Memories

- Loftus & Hoffman (1989)
- Researchers ask subject’s parents for childhood events
- Question subjects about the events
- One of the events is a fake
- By third questioning, 25% of subjects remember the fake memory

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## Implanted Memories: Hot Air Balloon Ride

- Wade et al. (2002)
- Digitally altered childhood photos to include a hot-air balloon ride picture
- 50% of subjects later reported it happened
- But wait - why should they doubt the memory?

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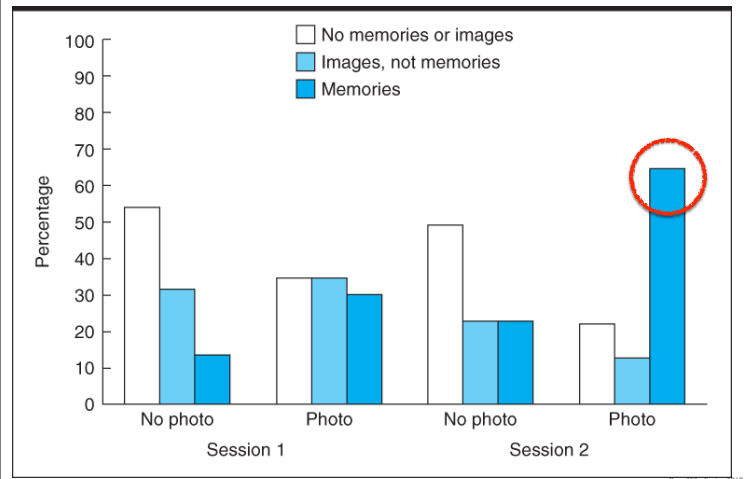
## Green Slime

- Lindsay et al. (2004)
- No altered photo. Fake story about putting green slime in teacher's desk
- Subjects who saw a (genuine) class photo: 70% remembered the slime event after second visit.

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## Green Slime



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## Memory Overconfidence

- Most people vastly overestimate how accurate their own memories are

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## Memory Distortions

- Things that increase memory distortion:
  - repetition
  - imagining it yourself
  - trying hard to remember
  - being asked questions
- Things that don't decrease memory distortion:
  - knowing about the phenomenon
  - being warned about misinformation

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## Issues

- If memory is malleable and unreliable...
- Can we ever trust it?
  - e.g. Eyewitness testimony in trials

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## Repressed and Recovered Memories

- Freud's theory of the unconscious
  - our mind represses (forgets or hides) pain/trauma
  - Evidence for this is weak but probably exists
- Recovering memories
  - imagery
  - suggestive questioning
  - repetition

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## McMartin Preschool Trial

- Preschool run by McMartin family in Manhattan Beach CA
- In 1983, student's mother Judy Johnson reported son had been raped and made allegations of bestiality (sex with animals).
- Police sent form letter to parents advising them to "Please question your child to see if he or she has been a witness to any crime..."
- Hundreds of children interviewed by CII (an abuse therapy clinic)

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## McMartin Preschool Trial - 2

- More allegations arose, many "bizarre":
  - Chuck Norris was an abuser, hot-air balloon rides given, witches were seen, underground tunnels, students flushed down toilets, ritual slaughter of animals, satanic rituals.
- Case went to trial in 1987
- Jury acquitted on all counts in 1990
- Cost \$15 million

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## McMartin Preschool Trial - 3

- Judy Johnson diagnosed with schizophrenia, died of alcoholism before the trial.
- Former student in 2005:
 

"Never did anyone do anything to me, and I never saw them doing anything. I said a lot of things that didn't happen. I lied. ... Anytime I would give them an answer that they didn't like, they would ask again and encourage me to give them the answer they were looking for. ... I felt uncomfortable and a little ashamed that I was being dishonest. But at the same time, being the type of person I was, whatever my parents wanted me to do, I would do"

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## Autobiographical Memories

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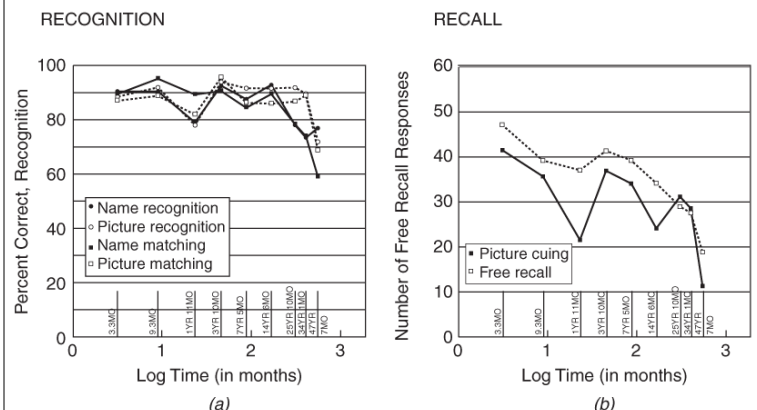
## Autobiographical Memories

- The study of one's lifetime collection of personal memories.
- Bahrick's study on very-long-term memory of high school classmate's names and faces: *Fifty years of Memory for Names and Faces*
- Used six different types of memory tests.
- Recognition held up nicely through the years, but recall performance was poor.
- Picture Recognition remained in 80%-90% range for over 35 years

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## Bahrick's Results



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## Prolonged Acquisition

- Why Bahrick's results so much better than laboratory studies?
- Overlearning
- Distributed practice: Extended period of time in which to learn information (as opposed to Massed Practice)

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## Other Autobiographical Studies

- Psychologists testing their own memories (e.g. Linton 1975, Wagenaar 1986 and others)
- Methods:
  - kept journal of daily events
  - later tested memory with recall with various cues
- Findings:
  - pleasant events remembered better
  - few events truly forgotten

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## Infantile Amnesia

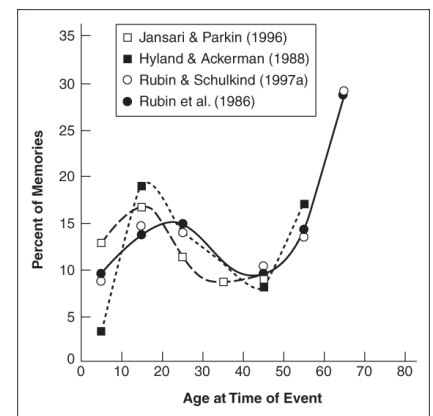
- Most people's first clear memory is age 2-4
- Freud believed it was true forgetting of traumatic content.
  - no evidence for this
- Modern theories
  - information not forgotten
  - memory systems simply not developed so good Episodic LTM is impossible

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## Reminiscence Bump

- Superior memory for events between ages 15-25
- Theories:
  - "first times" easier to remember
- Cultural scripts?



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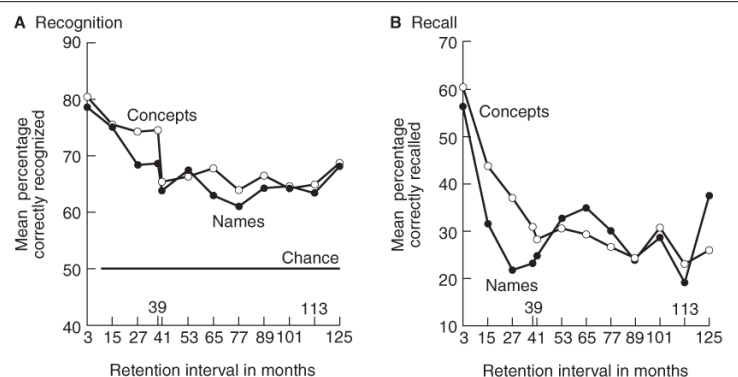
## Memory for Cognitive Psychology

- Conway et al. (1991)
- Tested student's memory of cognitive psychology topics 3 months to 12 years after the course.
- Although recall dropped (from 60% to 25%), recognition only dropped a bit (80% to 70%)
- Conclusion: we are overly pessimistic about our long term memory abilities (recall)
  - recall is worse
  - recognition and relearning are better

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## Memory for Cognitive Psychology



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