Cognitive Psychology

Lecture 8: Everyday Memory & Memory Errors

Outline for today

Throughout, we should keep in mind…

Memory is constructive!

- Memory distortions
  - Source misattributions
- Inferences
- Schema

Memory is malleable!

- Misinformation effect
- Issues for eyewitness identification
- Issues for “recovered” memories

≠

Folders

Files

Reported memories are fallible

- Omissions
- Distortions
- Report things that don't happen

Autobiographical Memory

- Episodic memory for specific experiences from our life, *plus* personal semantic memories of facts from our life

- Recent experiences
  - Rich in perceptual details and emotional content
  - Dominated by episodic memories
- Distant experiences
  - Become more semantic
  - Episodic memories fade over time

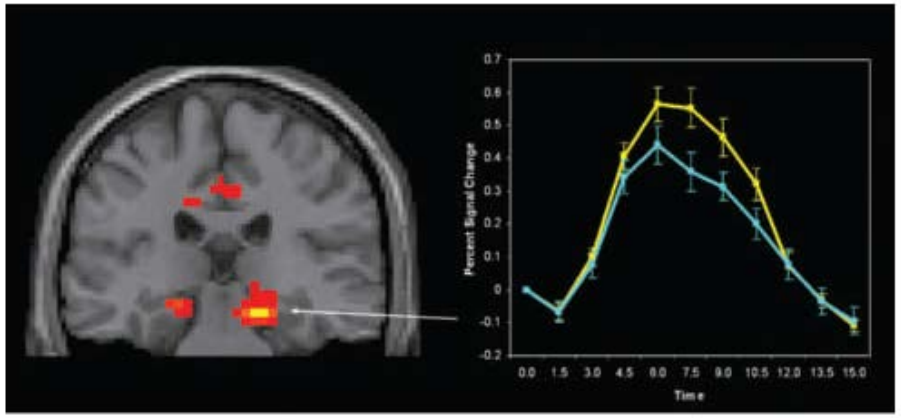
Autobiographical Memory

- Is measuring your ability to remember lists of words (“laboratory memory”) the same as asking you to remember a past experience (autobiographical memory)?
  - Laboratory memories versus autobiographical memories

- Autobiographical memories are “multidimensional”
  - Spatial, emotional, and sensory components
- Far more complex than laboratory memories

Autobiographical Memory

- Compared pictures participants took themselves to pictures of the same place, taken by someone else
  - ”Own” photos activated larger network of brain areas
  - Areas associated with self, visual space, recollection (associated with “mental time travel”)



(c) Hippocampus

O photos = more activation

Figure 8.2 (a) fMRI response of an area in the parietal

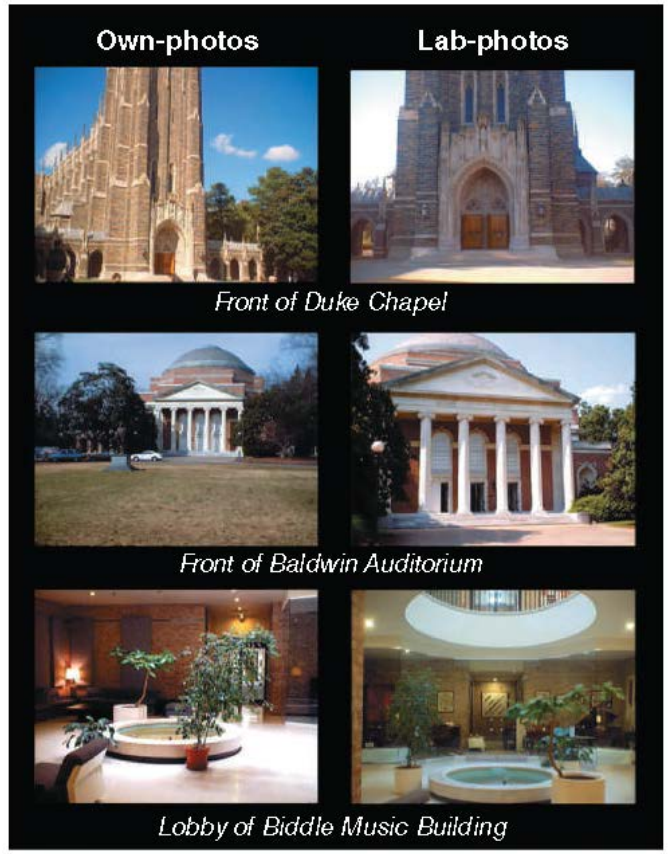


Figure 8.1 Photographs from Cabeza and coworkers' (2004) experiment. Own-photos were taken by the subject; lab-photos were taken by someone else. *(Source: R. Cabeza, S. E. Prince, S. M. Daselaar, D. L. Greenberg, M. Budde, F. Dolcos, et al., Brain activity during episodic retrieval of autobiographical and laboratory events: An fMRI study using novel*

Autobiographical Memory

Memory over the lifespan

- What events are remembered well?
  - Significant events in a person's life
  - Highly emotional events
  - Transition points
- Particularly distinctive events

Autobiographical Memory

Memory over the lifespan

- "Reminiscence Bump"
  - Participants over the age of 40 asked to recall events in their lives

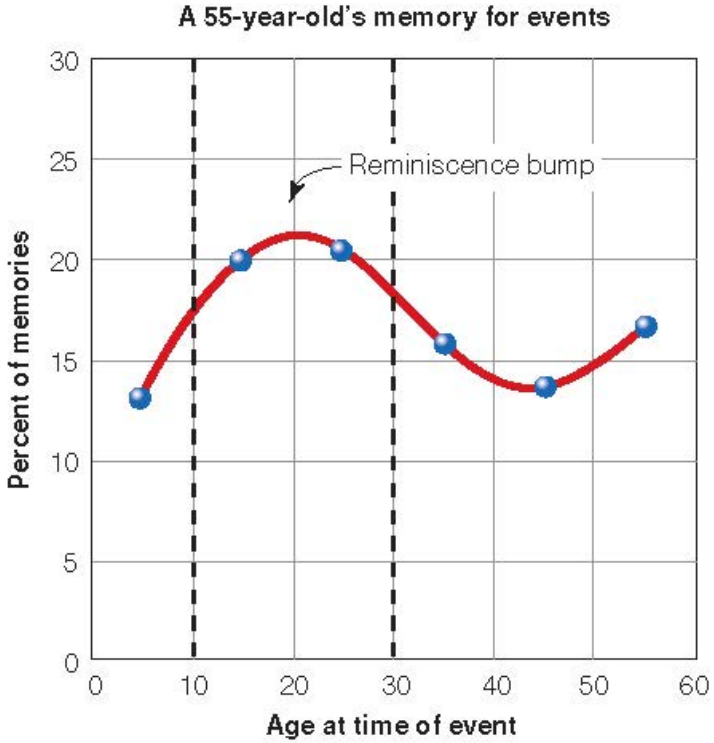


Figure 8.3 Percentage of memories from different ages recalled by a 55-year-old, showing the reminiscence bump, which occurs for events experienced between about 10 and 30 years of age (dashed lines). *(Source: R. W. Schrauf & D. C. Rubin,*

Autobiographical Memory

Memory over the Lifespan

- The “Reminiscence Bump”
  - Self-image hypothesis
    - Memory is enhanced for events that occur as a person’s self-image or life identity is being formed
  - Cognitive hypothesis
    - Encoding is better during periods of rapid change that are followed by stability
    - Reminiscence bump is shifted for those emigrated later in life
  - Cultural life-script hypothesis
    - Personal events are easier to recall when they fit the cultural life script

Memory is constructive

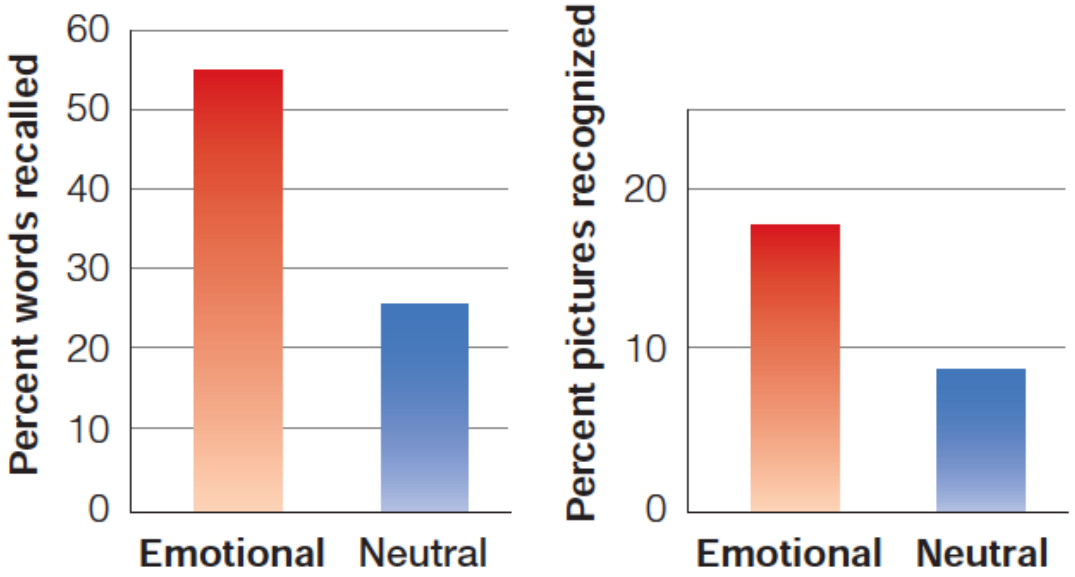
- Memory = What actually happens + person's knowledge, experiences, and expectations

Memory & Emotions

- What about memories we have that seem vivid and detailed? I'm *confident* those memories are accurate

Emotional Events

- Remembered more easily and vividly
- Emotion improves memory, becomes greater with time (may enhance consolidation)

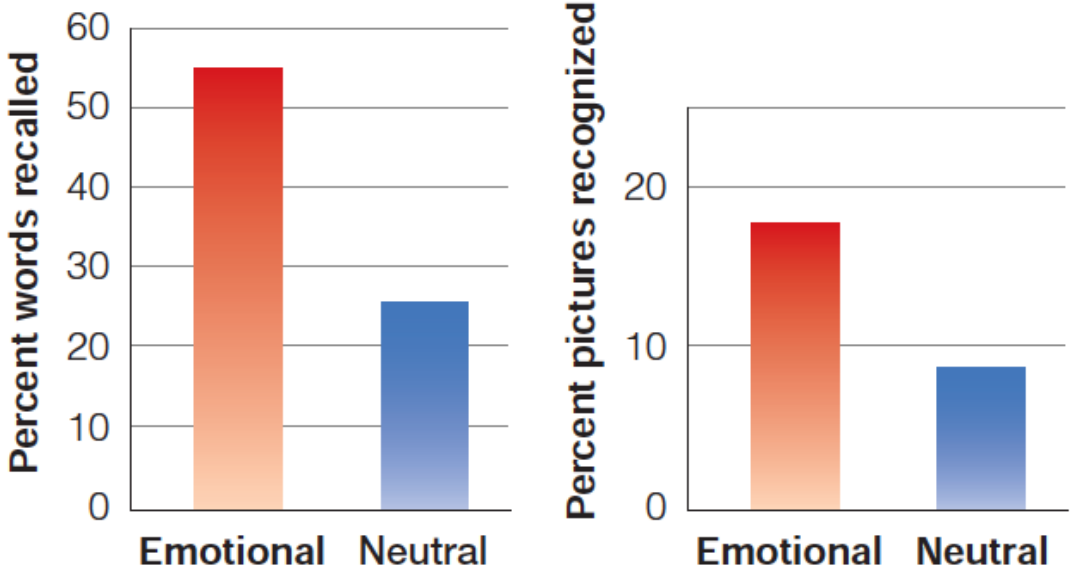


Memory & Emotions

- What about memories we have that seem vivid and detailed? I'm *confident* those memories are accurate

Emotional Events

- Brain activity in amygdala
- Emotional > neutral
- BP: damage to the amygdala
  - Controls had enhanced memory when shown emotional image, BP did not



Flashbulb vs. Everyday Memories

- What about memories we have that seem vivid and detailed? I'm *confident* those memories are accurate

Flashbulb Memories

- Memory for circumstances surrounding shocking, highly charged important events
  - 9/11
  - Kennedy assassination
  - *Challenger* explosion
- Where you were, and what you were doing
- Highly emotional events; memories seem vivid, and very detailed

But are "flashbulb memories" special?

Flashbulb Memories

Neisser & Harsch, 1992

- Interviewed 2 1/2 years after Challenger
- Confidence does not always mean accurate
- “Flashbulb memories” decay like any other

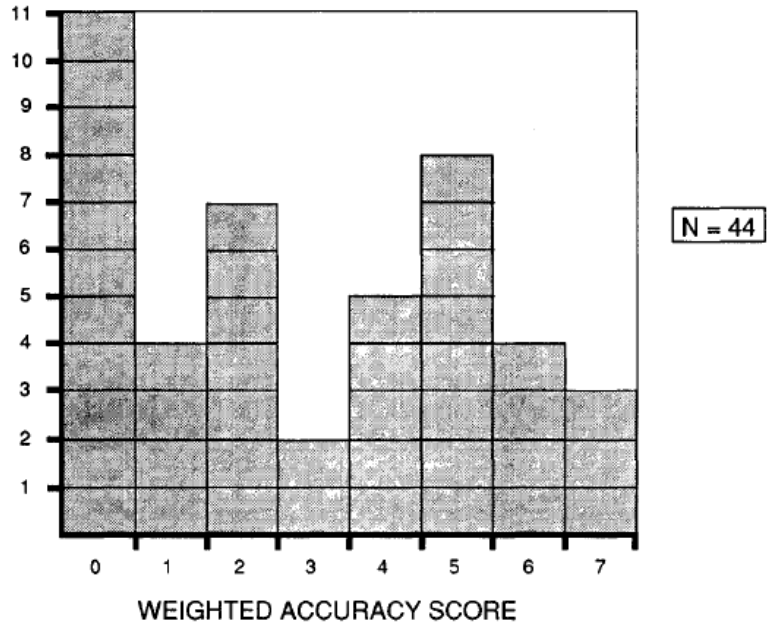


Figure 2.1. Frequency distribution of accuracy scores on the recall questionnaire, fall 1988 (WAS–2/1).

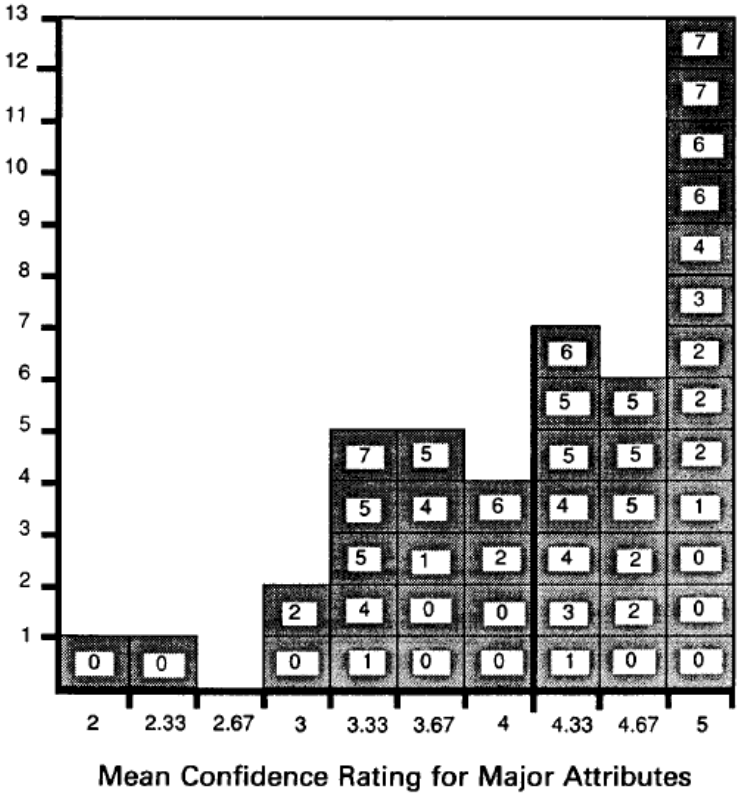


Figure 2.2. Frequency distribution of confidence ratings on the recall questionnaire, fall 1988. The number inside each cell is the subject's accuracy score, WAS–2/1.

Flashbulb vs. Everyday Memories

- "Flashbulb memories" decay like any other
- Though, they may be special in that our **belief** in their accuracy remains high **despite** poor accuracy
- Flashbulb memories = everyday memories

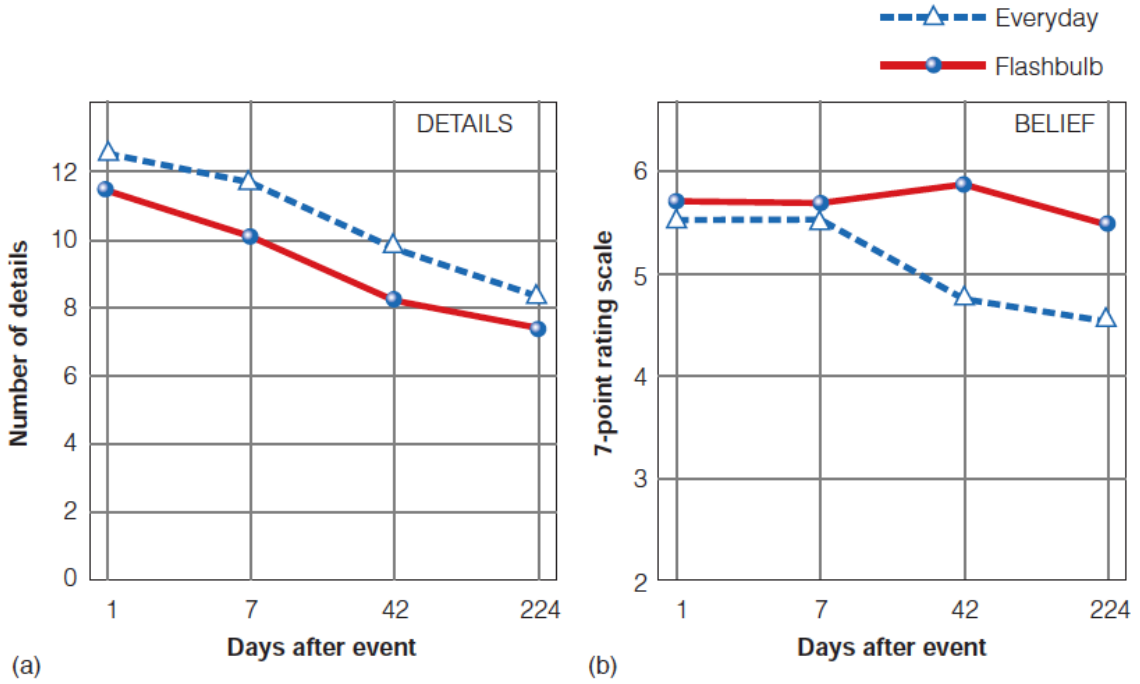


FIGURE 8.8 Results of Talarico and Rubin's (2003) flashbulb memory experiment. (a) The decrease in the number of details remembered was similar for memories of 9/11 and for memories of an everyday event. (b) Participants' belief that their memory was accurate remained high for 9/11, but decreased for memories of the everyday event. (Source: J. M. Talarico & D. C. Rubin, "Consistency and Key Properties of Flashbulb and Everyday Memories," *Psychological Science, 14*, 5, Fig. 1 & 2. Copyright © 2003 American Psychological Society. Reproduced by permission.)

Flashbulb vs. Everyday Memories

- Though, compared to an "everyday event" that happened around the same time as 9/11…
  - Flashbulb > everyday

- This could be do to the high emotional content
- Could also be due to memory rehearsal (no special mechanism)
  - **Narrative Rehearsal Hypothesis**

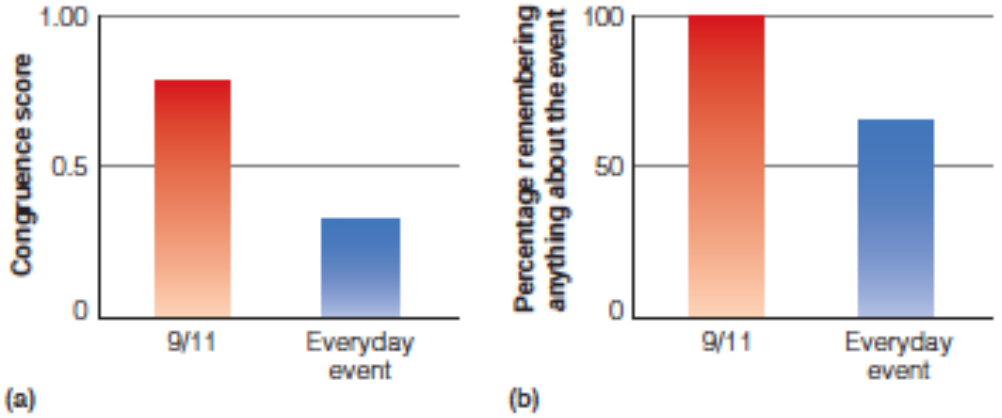


FIGURE 8.9 Results of Davidson et al.'s (2006) flashbulb memory experiment. (a) Congruence score for 9/11 memories and memories for the everyday event, measured 1 year after the events. (b) Percent of participants who were able to remember at least something about the 9/11 and everyday events. Note that 35 percent of the participants could not remember anything about the everyday event. (Based on data from Davidson et al., 2006, and personal communication.)

Flashbulb vs. Everyday Memories

Flashbulb memories

- Demonstrates…
  - Memory can be influenced by the emotional context surrounding the event (during encoding)
  - Memory can be influenced by events that occur after the memory has already been encoded
    - E.g., Narrative Rehearsal Hypothesis
    - E.g., Memory intrusions: believing you originally heard about the Challenger explosion on TV because you saw it on TV many times after
  - Confidence does not necessarily mean accurate

Memory is constructive

- We can learn about how memories are constructed by seeing how memory goes wrong

- Memory distortions happen all the time, and only in extreme cases are they unrelated to events that actually happened

Source Monitoring

- **Source memory**: process of determining origins of our memories

- Source monitoring error: misidentifying source of memory
  - Also called “source misattributions”

- Cryptoamnesia: Unconscious plagiarism of another’s work due to a lack of recognition of its original source
  - Implicit memory

Source Monitoring

Source Monitoring: Who told me the gossip at the party?

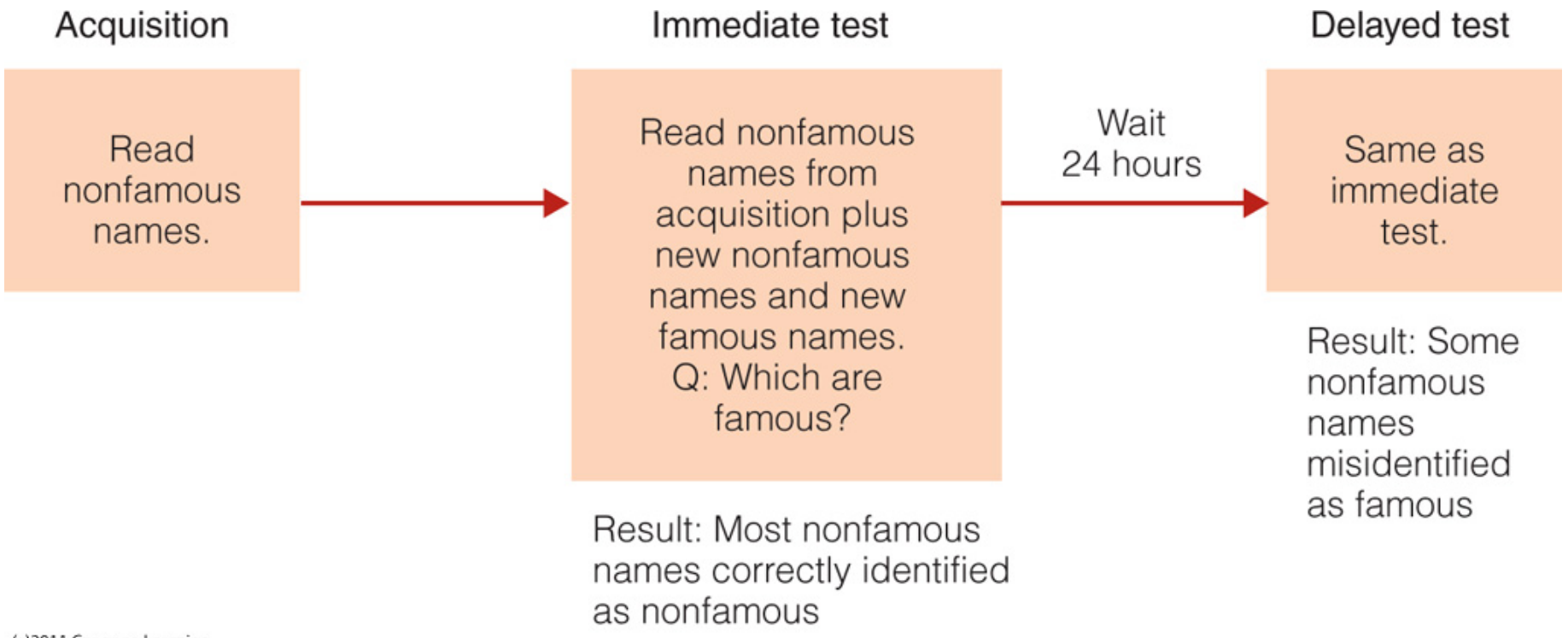
Reality Monitoring: Did I turn the stove off or just think about it?

Cryptoamnesia: “I just wrote the greatest song in the world! I think I’ll call it Bohemian Rhapsody”

Source Monitoring

Becoming Famous Overnight

Design of Jacoby et al.'s (1989) "becoming famous overnight" experiment.



Source Monitoring

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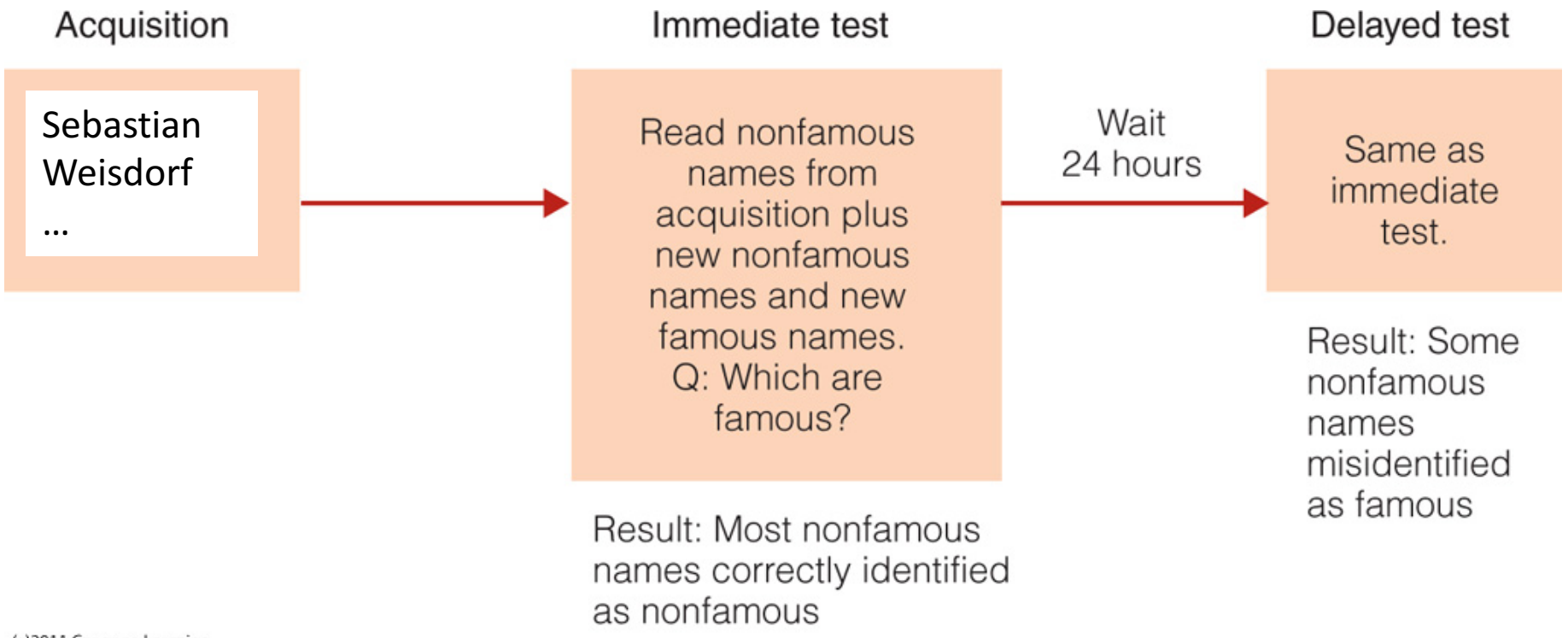

Source Monitoring

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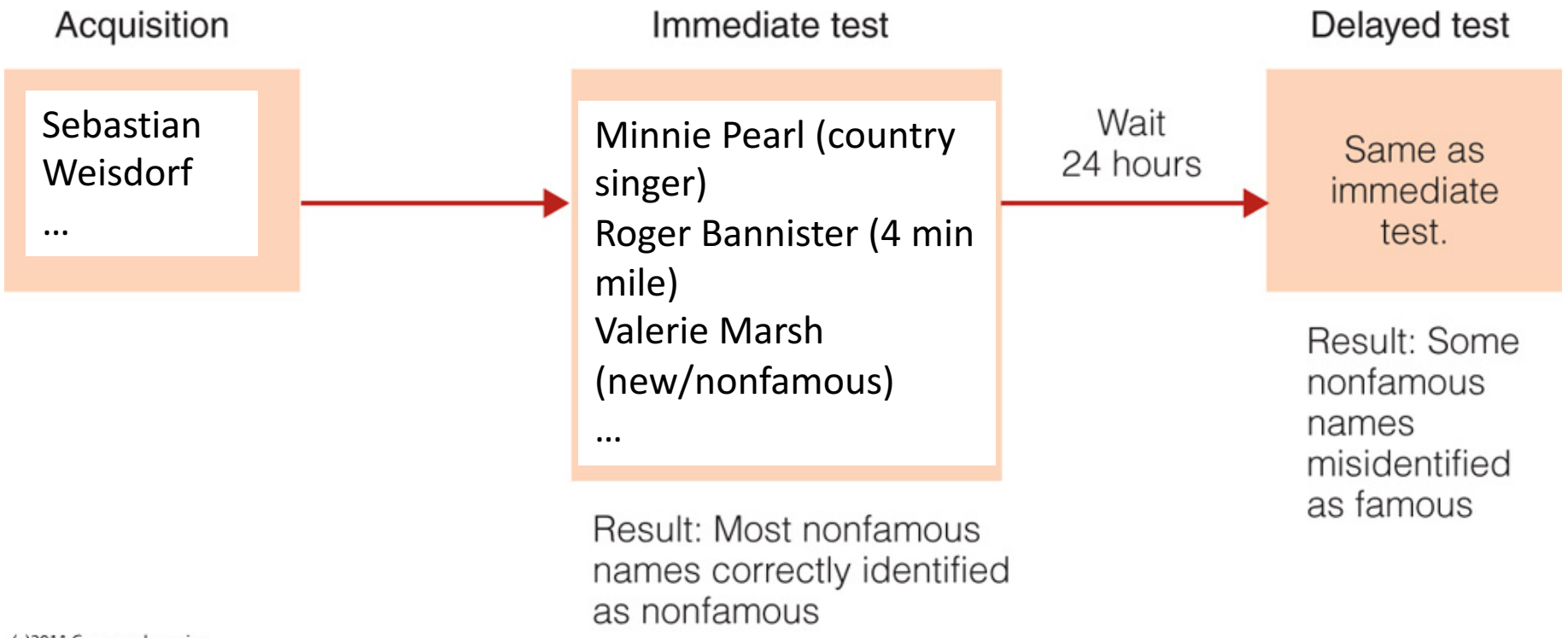
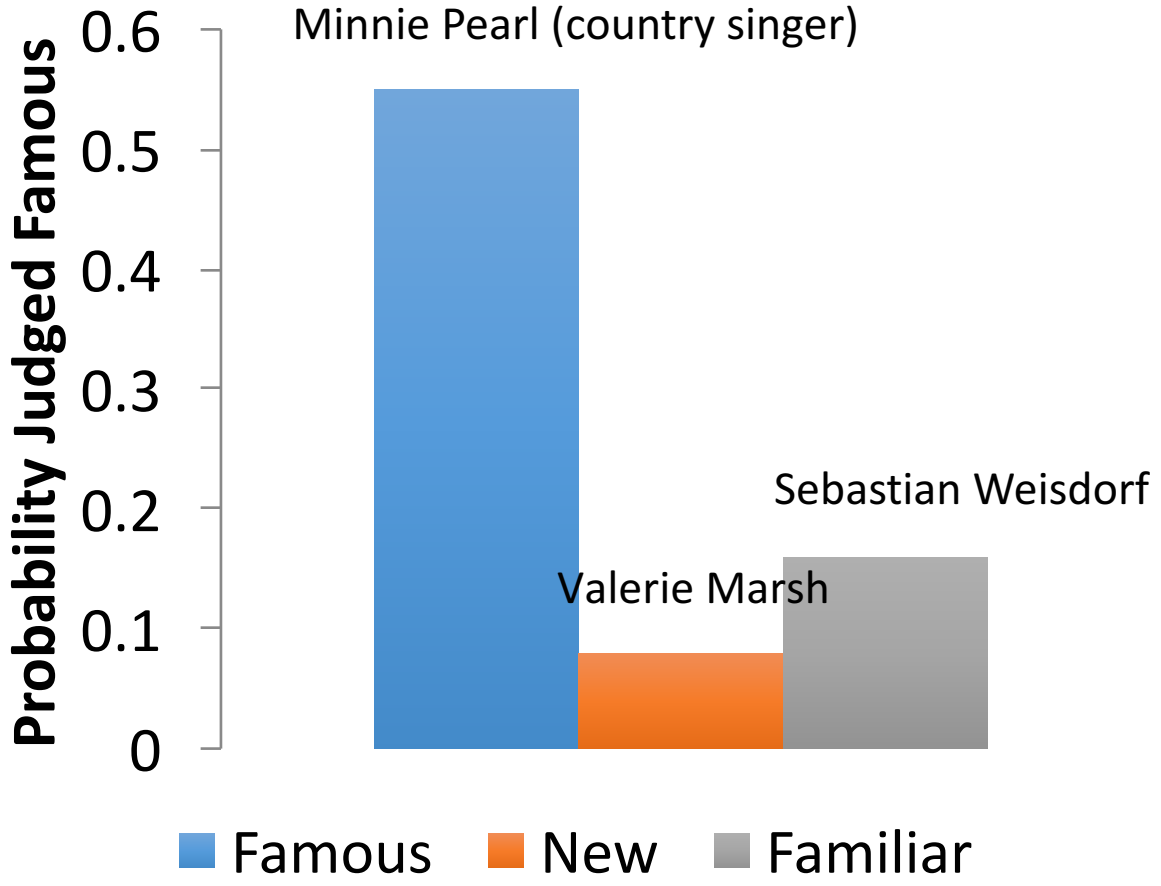


Source Monitoring

Adapted from Jacoby et al. 1989

- After 24 hours, some non-famous names were misidentified as famous
- Explanation: some non-famous names were familiar, and the participants misattributed the source of the familiarity
  - Failed to identify the source as the list that had been read the previous day

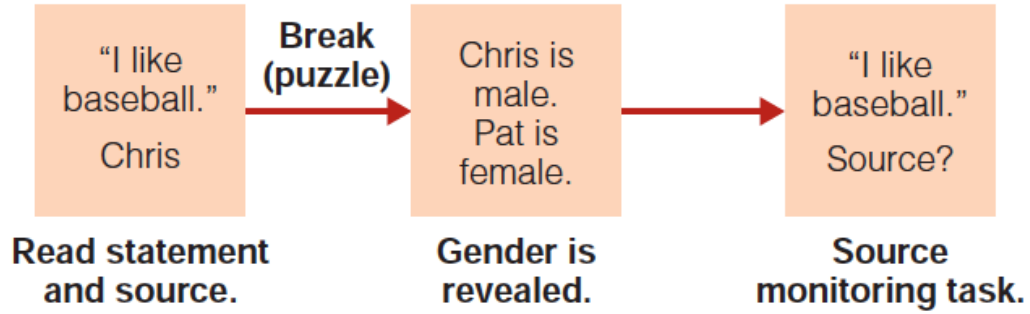


Making inferences

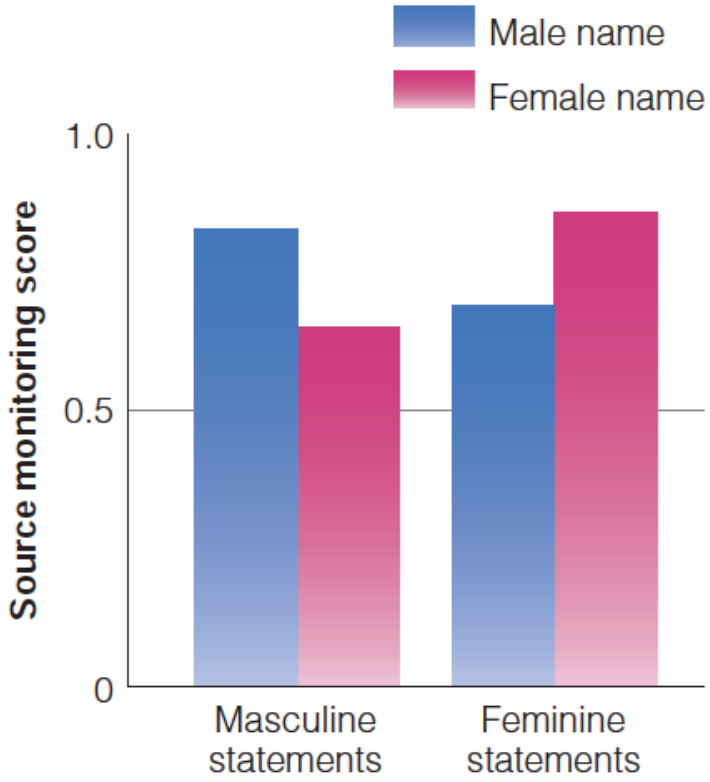
- Memory is constructive
- Memory can be influenced by **inferences** that people make based on their experiences and knowledge
- Source Monitoring errors can occur because we impose our own **knowledge, experiences, and expectations** about what we believe would be a likely source
  - We make an **inference** about the source

Making Inferences

- **Gender Stereotypes**
  - Source-monitoring can be influenced by our **expectations** leading to errors



● **FIGURE 8.11** Design of Marsh and coworkers' (2006) source monitoring and gender stereotype experiment.



● **FIGURE 8.12** Result of March and coworkers' (2006) experiment.

Making Inferences

- **Bartlett's "The War of the Ghosts"**
  - Read a store from Indian Canadian Folklore and asked to repeatedly reproduce it
    - Reproductions became shorter, contained omissions, and inaccuracies
  - Important result: The reproductions began to conform to the participants *own cultural folklore*
    - The store began to resemble something that would happen in England
    - They mixed information from two sources: the story and their own cultural folklore
- Memories can be influenced by our previous knowledge

Making Inferences

- **Pragmatic inferences**: based on knowledge gained through experience
  - Memory often includes information that is implied by or is consistent with the to-be-remembered information but was not explicitly stated

Making Inferences

Pragmatic inferences

Exp. Grp: “John was trying to build the birdhouse. He was pounding the nail when his father came out to watch him and help him do the work”.

- *“pounding” strongly implies John was using a hammer*

Ctrl. Grp: “John was trying to fix the birdhouse. He was looking for the nail when his father came out to watch him and help him do the work.”

- *“looking for a nail” does not imply John was using a hammer*

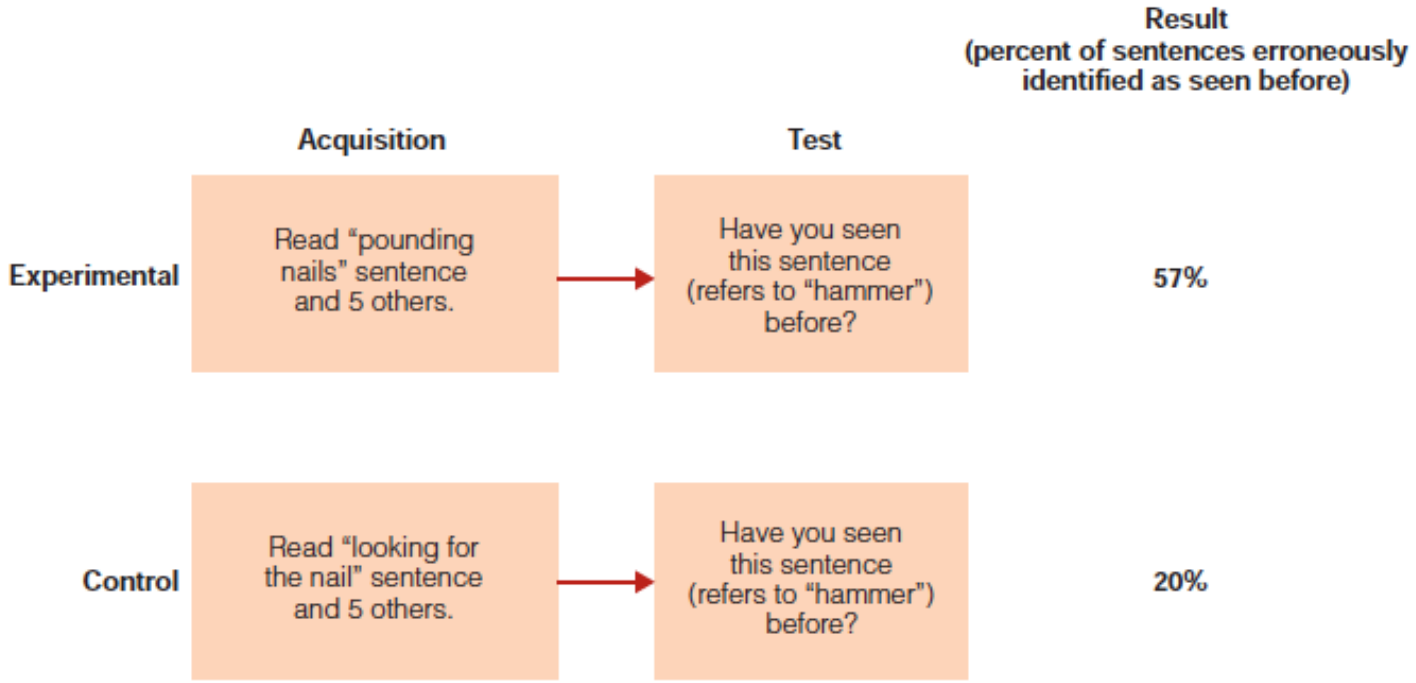
Did you see: “John was using a ***hammer*** to fix the birdhouse when his father came out to watch him and help him do the work.”

Making Inferences

Pragmatic inferences

- Exp. Group more likely to be misled into believing they saw a sentence with the word ”hammer”.

FIGURE 8.13
Design and results of Bransford and Johnson's (1973) experiment that tested people's memory for the wording of action statements. More errors were made by participants in the experimental group, who identified more sentences as being originally presented even though they were not.



Making Inferences

- **Schema:** knowledge about some aspect of the environment
  - e.g., Post office, ball game, classroom

- **Script:** conception of sequence of actions that usually occurs during a particular experience
  - Going to a restaurant; playing tennis

Making Inferences

- Schemas and scripts influence memory
  - Memory can include information not actually experienced but inferred because it is expected and consistent with the schema
  - Office waiting room: books not present but mentioned in memory task

- The constructive nature of memory can lead to errors or “false memories”

Memory is constructive

- Advantages
  - Allows us to “fill in the blanks”
  - Cognition is creative
    - Understand language
    - Solve problems
    - Make decisions

Memory is constructive

- Disadvantages
  - Sometimes we make errors
  - Sometimes we misattribute the source of information
    - Was it actually presented, or did we infer it?
  - Cognitive Psychologists exploit these errors to learn about memory processing
    - Similar to how we use perceptual illusions and ambiguous figures

When memory goes wrong: The power of suggestion

- **Misinformation effect**: misleading information presented after a person witnesses an event can change how that person describes the event later
  - Misleading postevent information (MPI)

- Obvious real-world importance in eyewitness testimony

When memory goes wrong: The power of suggestion

Loftus and coworkers (1975)

1. See slides of traffic accident with stop sign
2. After, they were asked ”Did another car pass the red Datsun while it was stopped at the **[STOP or YIELD]** sign?”
3. Then shown more pictures of the scene with the car stopped at a stop sign or yield sign and asked which ones they had seen earlier
4. Those exposed to the ”yield sign” question (MPI) were more likely to say they saw the image of a car stopped at the yield sign (false memory)

When memory goes wrong: The power of suggestion

Loftus & Palmer (1974)

- Subjects see film of a car accident
- "How fast were the cars going when they _____ each other?"

Verbs given to different groups

"smashed into"

"collided with"

"bumped into"

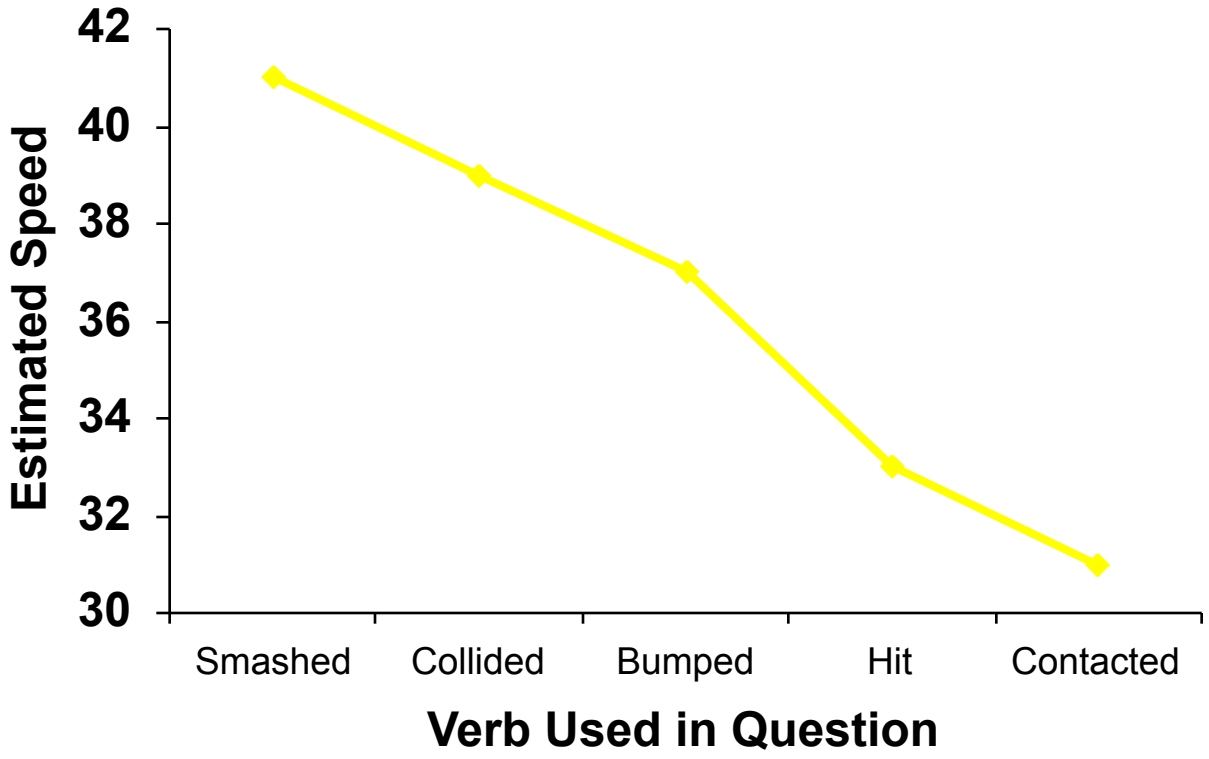
"hit"

"contacted"

When memory goes wrong: The power of suggestion

Loftus & Palmer (1974)

Memory can be distorted by misleading retrieval cues



When memory goes wrong: The power of suggestion

- Watch videotape of a white car driving along a road.
- Asked either:
  - "How fast was the white car going when it passed the barn while on the country road?"
  - "How fast was the white car going while on the country road?"
- **There was no barn**.
- One week later, asked what they saw in the tape
  - Misinformed: 17% report a barn
  - Valid: 3% report a barn

When memory goes wrong: The Power of Suggestion

Implanting False Memories

Hyman and coworkers (1995)

- Participants' parents gave descriptions of childhood experiences
- Participant had conversation about experiences with experimenter; **experimenter added new events**
- When discussing it later, participant "remembered" the new events as actually happening

Lyndsay et al. (2004)

- Had participants look at a photograph while hearing the false story
- Twice as likely to have a false memory than those who did not see the photograph

When memory goes wrong: The Power of Suggestion

- Hypotheses about the misinformation effects

Explanation	Basic Principle
Memory trace replacement (Loftus)	MPI replaces original memory.
Retroactive interference	MPI interferes with (but does not eliminate) original memory.
Source monitoring error	MPI is mistakenly identified as what was originally experienced.

Can we trust our memory?

- Can we trust eyewitness testimony?
- One of the most convincing types of evidence to a jury
  - Assume that people see and remember accurately
- But, like other memory, eyewitness testimony can be inaccurate
  - Mistaken identity
  - Constructive nature of memory

Errors in Eyewitness Testimony

Weapon Focus Effect

Wells & Bradfield (1998)

- Participants view security videotape with gunman in view for 8 seconds
- Everyone identified someone as the gunman from photographs afterwards
- The actual gunman's picture was not presented

Errors in Eyewitness Testimony

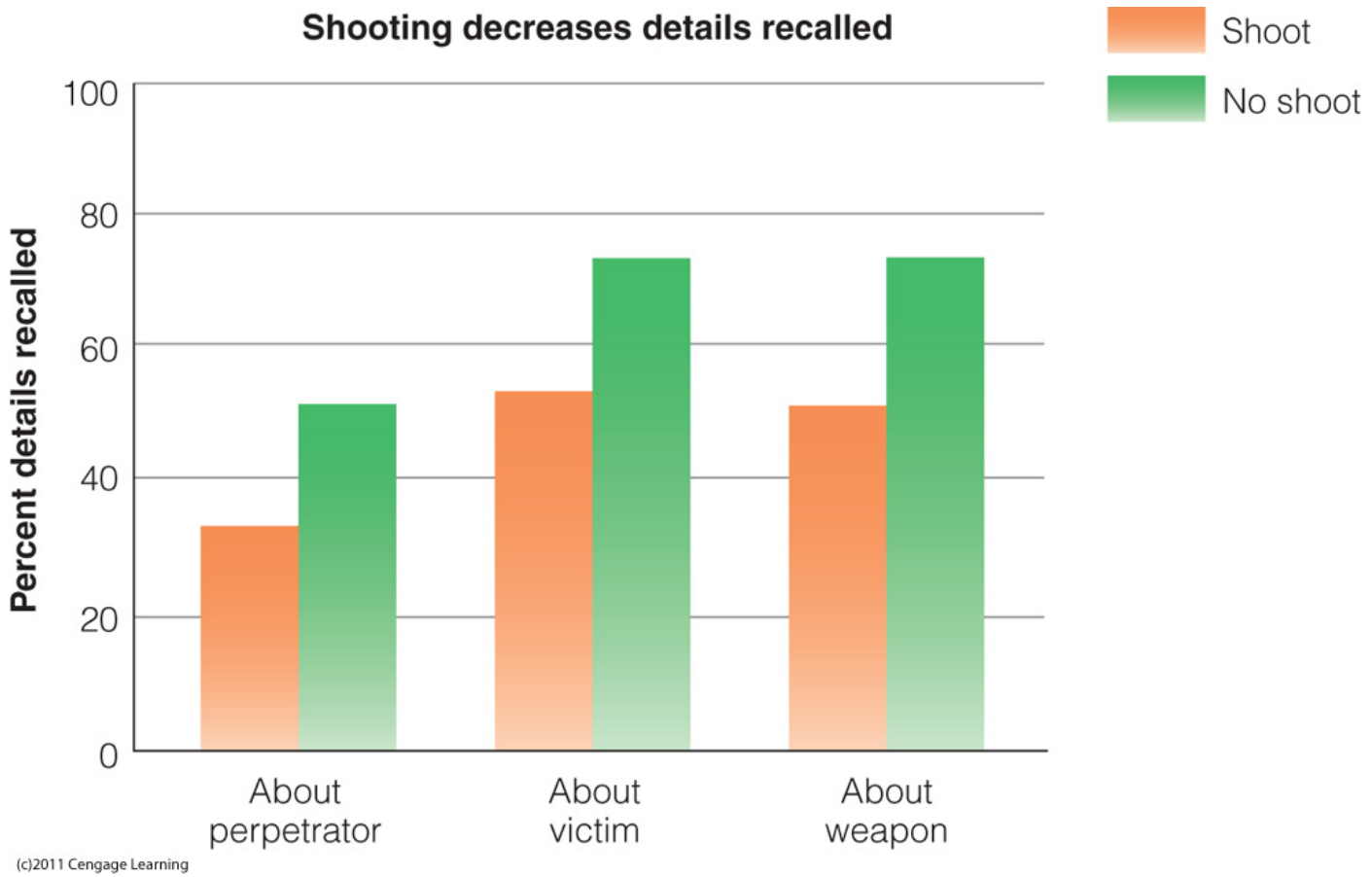
Weapon focus effect

- Focus on weapon
- Might miss other relevant information (about perpetrator) if attentional focus is too narrow

Errors in Eyewitness Testimony

Weapon Focus Effect

Caption: Results of Stanny and Johnson's (2000) weapons-focus experiment. Presence of a weapon that was fired is associated with a decrease in memory about the perpetrator, the victim, and the weapon.



Errors due to Familiarity / Misattribution

Donald Thompson

- Arrested on charge of raping a woman
- Identified by the victim as the rapist
- Alibi: “I was on a live TV talk show at the time of the rape”
  - To talk about memory errors! (Thompson is a well-known memory researcher)

The real story:

- The victim was watching TV at the time of the attack, and remembered Thomson’s face
- …but remembered it as the face of the rapist!

Errors due to suggestion

- Suggestive questioning
  - Misinformation effect
- Confirming feedback
  - **Post-identification feedback effect**
  - Confidence in one's memories may be increased by postevent questioning
  - May make memories easier to retrieve

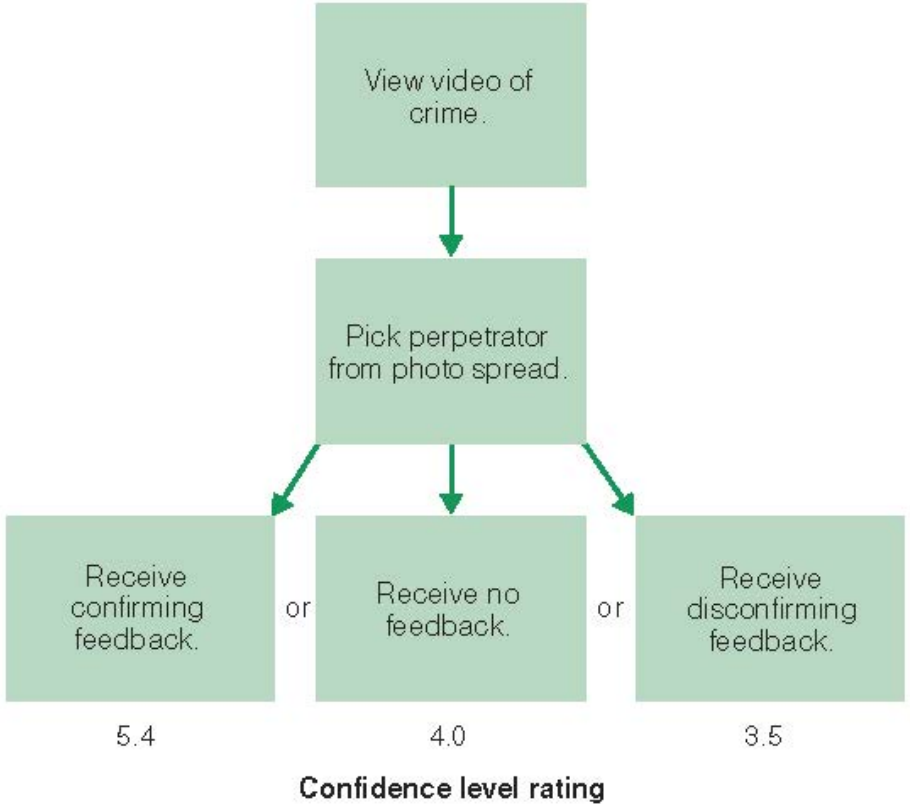


Figure 8.18 Design and results of Wells and Bradfield's (1998) "Good, You Identified the Suspect" experiment. The type of feedback from the experimenter influenced subjects' confidence in their identification, with confirming feedback resulting in the highest confidence.

What is being done?

- Inform witness perpetrator might not be in lineup
- Use “fillers” in lineup similar to suspect
- Use sequential presentation (not simultaneous)
- Use a “blind” lineup administrator and get immediate confidence ratings
- Improve interviewing techniques
  - Cognitive interview