Memory part I

Memory Distortions
Eyewitness Testimony
Lineup Studies
Overview

• Memory for detail vs. gist

• Memory distortions due to
  – Schematic knowledge/General knowledge
  – Semantic associations
  – Misinformation

• Problems with photo-lineups
Remember this person....

let's say this was a person related to a crime scene
What does a penny look like?

A B C D E
F G H I J
K L M N O
1. Does the Lincoln on the penny face right or left?

2. Is anything above his head? What?

3. Is anything below his head? What?

4. Is anything to his left? What?

5. Is anything to his right? What?
What does a penny look like?
Memory & Gist

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

- “Gist” is remembered better than detail

- How do we then remember details if these are missing from memory?
Reconstructive nature of memory

- Details can be filled in or reconstructed during encoding or retrieval

- Reconstructive view of memory:
  
  Memory =
  
  actual events +
  schematic knowledge +
  other experiences +
  expectations
Some types of memory errors

• Intrusions from schematic knowledge

• Intrusions from semantic associations

• Misinformation effect
Effect of Schematic Knowledge on Memory

A simple demonstration experiment

I am going to show you a picture of a graduate student’s office. Just take a look at it for a while
What do you remember?

Potential responses:

- Chairs
- Desk
- Table
- Boxes
- Bottle of wine
- Picnic basket
- Books
- Skull

Brewer & Treyens (1981): 30% of subjects (falsely) recalled that books were present.
False memories due to “office schema”

Schema = knowledge of the typical components of an experience.

Brewer & Treyens (1981)
Verbal labels can distort visual memories

Our schematic knowledge activated by the verbal label can be used to fill in missing details when there is not a complete visual memory.
Intrusions from Semantic Associations

- Deese, Roediger, McDermott (DRM) paradigm

Did you hear:

Study List Example 1
- Picture?
- Crawl?
- Baby?

Study List Example 2
- Smog?
- Tree?
- Fire?
Another example

• Study the following words:

BED
REST
AWAKE
TIRED
DREAM
WAKE
SNOOZE
BLANKET
DOZE
SLUMBER
SNORE
NAP
PEACE
YAWN
DROWSY
SNORE
REST
COFFEE
SLEEP

• Recall test ....

• Recognition memory test. Was the following word on the list? Use ratings

  1) clearly not 2) probably not 3) maybe yes 4) sure yes

• TEST:
Recall Results

• Critical lures ("sleep") are words not presented but similar to studied words. These words are often falsely recalled

• The lure “sleep” was falsely recalled by 61% of Ss.
## Recognition Results

Proportion of items classified with confidence levels:

<table>
<thead>
<tr>
<th>confidence rating</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>studied items</td>
<td>.75</td>
<td>.11</td>
<td>.09</td>
<td>.05</td>
</tr>
<tr>
<td>not studied</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unrelated</td>
<td>.00</td>
<td>.02</td>
<td>.18</td>
<td>.80</td>
</tr>
<tr>
<td>critical lure</td>
<td>.58</td>
<td>.26</td>
<td>.08</td>
<td>.08</td>
</tr>
</tbody>
</table>

(e.g. “REST”)

(e.g. “COFFEE”)

(e.g. “SLEEP”)

Implications of DRM experiment

• Shows influence of semantic associations

• Shows that confidence can be high for incorrect responses
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

For a real-world example:
https://www.youtube.com/watch?v=PB2OegI6wvI (Wells & Bradfield, 1999; Loftus & Busey)
Misinformation Effect

• Memories can be distorted by false suggestions provided by other people after the event

• Loftus & Palmer, 1974:
  – "How fast were the cars going when they hit each other?"
  – "How fast were the cars going when they smashed into each other?"
### Results of Loftus and Palmer study

#### AVERAGE SPEED ESTIMATES FOR DIFFERENT VERBS

<table>
<thead>
<tr>
<th>Verb</th>
<th>Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>smashed</td>
<td>40.8</td>
</tr>
<tr>
<td>collided</td>
<td>39.3</td>
</tr>
<tr>
<td>bumped</td>
<td>38.1</td>
</tr>
<tr>
<td>hit</td>
<td>34.0</td>
</tr>
<tr>
<td>contacted</td>
<td>31.8</td>
</tr>
</tbody>
</table>
Loftus, Miller, and Burns (1978)

Subjects are shown a series of slides showing a pedestrian getting hit

Studied scene
Loftus et al. (Contd.)

- Answered a series of 20 questions

- Experimental condition (misinformation):
  - Did another car pass the red Datsun while it was at the stop sign? (wording opposite of picture)

- Control condition:
  - Did another car pass the red Datsun while it was stopped at the intersection
Loftus et al. (Contd.)

• Pairs of slides -- asked to pick the one they saw

Scene with Yield sign

Scene with Stop sign

OR

(correct)

(incorrect)

• Control condition: 85% picked correct sign
• Experimental condition: 38% picked correct sign
Explaining Misinformation Effect

• Two explanations
  – **Overwriting**
    • misleading information “overwrites” the original memory trace
  – **Source confusion / Misattribution**
    • The original event and misinformation are stored in separate memory traces
    • The memory of the misinformation is confused with the memory of the visual scene
Evidence against overwriting hypothesis
McCloskey and Zaragoza (1985)

- See event: yield sign

- Replication of the original experiment
  - Some subjects received misinformation:
    “…as the car passed the stop sign”
  - Test:
    yield sign OR stop sign
  - Results: 72% correct in control condition
    37% correct in misled condition
Evidence against overwriting hypothesis
McCloskey and Zaragoza (1985)

- See event: yield sign

- **Modified experiment**
  - Some subjects received misinformation: “…as the car passed the stop sign?”

  - Test the correct answer against a new foil
    yield sign OR no U-turn

Results:
- 75% correct in control condition
- 72% correct in misled condition

*In misled condition, performance is much better than chance AND it is about the same as control condition*

This is inconsistent with overwriting hypothesis
Relevance to Criminal Justice System

• most obvious case
  – crime
  – picture of suspect (mugshot)
  – Lineup

• Eyewitness may recognize suspect from mugshot, not from crime scene.

• Conclusions:
  – Do not let potential witnesses see suspects.
  – Interrogate without asking leading questions
60 Minutes video segment (2 min)

Video clip available at:
https://www.youtube.com/watch?v=P3ldO66qrb0
http://www.cbsnews.com/video/watch/?id=4852622n&tag=mncol;lst;5
Misinformation

Actual person

which face do you recognize from the STUDY PHASE?
Traditional Photo Lineup

Identify the person you saw earlier in the slides
Issues with photo lineups

• Big problem:
  – Eyewitnesses often assume perpetrator is in lineup
Recent research suggests that the sequential lineup is NOT better than the simultaneous lineup (Mickes et al., 2012; Gronlund et al., 2012; Dobolyi & Dodson, 2013; Carlson & Carlson, in press).
Balancing lineups: no individual should stand out

“...the cat! No, the woman! Heck, it could have been any one of them.”
Real-world Lineup: Who is guilty?

(from Geoff Loftus)
Conclusions and Implications

- Remembering = “reconstructing” not reciting

- Reconstruction is good most of the time, but can lead to errors

- Errors can have adverse consequences in eyewitness situations: Faulty eyewitness testimony is the single largest factor leading to false convictions (Wells, 1993)
  - 75 percent of the more than 250 convictions overturned based on DNA evidence involved mistaken identifications