

COGNITION IN ACTION

LECTURE THREE: MEMORY IN THE REAL-WORLD II

Dr Kate Williams

1

MEMORY IN THE LAB VS. REAL-LIFE

- Research into memory typically restricted to the lab and often involved non-sense stimuli or stimuli presented in isolation.
 - This is not how we experience the world
- Bartlett (1932): research should test meaningful material (stories/pictures).
 - People tend to remember material in terms of meaning they extract from it.
 - E.g., they remember the gist of a story rather than exact words.
 - They would also distort the story to fit with pre-existing schemas.
 - This enabled understanding of memory in new ways.
- Neisser (1976): supported the view: not only should experiments use more naturalistic stimuli but they should also be conducted in real-life settings

2

MEMORY IN THE LAB VS. REAL-LIFE

- However, Conway (1991): there are fundamental differences between everyday memory in real-life settings and memory tested in the lab
 - Memory in real-life tends to involve personal experience
 - These memories hold considerably more significance to the individual
- Koriart and Goldsmith (1996): lab research uses quantitative measures of memory, real-world research emphasises qualitative aspect of memory trace.
- Neisser (1996): In real-life, we may wish to remember something reassuring or an incident to impress someone else.
 - In the lab, the focus is on retrieving as many test items as possible (accuracy)
 - Whereas the motives to remember in the real-world tend to be selective rather than accurate

3

AUTOBIOGRAPHICAL MEMORY

- Our subjective memories for events we have personally experienced
 - Memory of our own lives
 - Includes information about ourselves
 - Helps build our personality and gives us a sense of self
 - Core to making us who we are

Personal facts:
 Name,
 residence, car
 owner, etc.

→

**Autobiographical
memory**

←

Personal experiences:
 1st day at school,
 16th birthday

4

AUTOBIOGRAPHICAL MEMORY: ORGANISATION

- Contains LOTS of information
 - Includes a knowledge base: an ordinary mechanism that fluctuates over time
 - Involves sampling: picking out specific details and reconstructing an event

Three broad levels of specificity

ONE	TWO	THREE
- Periods in lifetime - Typically education & work	- General events - A category of info: e.g., "I have dance class on a Thursday"	- Knowledge of specific event "Last Thursday I left dance class early"

Each level cues the next Conway (1996)

5

FLASHBULB MEMORIES

- Memory for shocking events
 - E.g., Sept 11 terror attacks, death of princess Diana
- Stands out from other memories (not like everyday memory)

- Key aspects about flashbulb memories that differentiate it from others:

 1. Informant: person who supplied info
 2. Place where the news was heard
 3. The ongoing event
 4. The individual's own emotional state
 5. Emotional state of others
 6. Consequences of the event for the individual



6

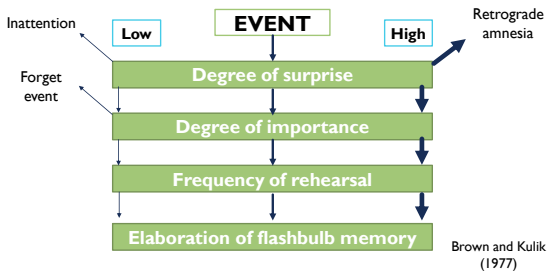
FLASHBULB MEMORIES

- Brown and Kulik (1977): first study on FbM for assassination of JFK
 - All but one of 80 participants remembered circumstances and surroundings in which they heard the news.
- Flashbulb memories involve a recollection of an event that is so emotionally powerful that it is highly vivid and richly detailed in 'photographic quality'
 - The event is capable of illuminating trivial aspects of the observers current activities and surroundings – the details of your own life that surround the event
- Thought to involve a special neural mechanism for important memories
 - A Powerful form of memory encoding – no forgetting process
- This memory process may have evolved because it would offer a survival advantage
 - It enables us to remember vivid details of past catastrophes, to help us avoid similar dangers in the future



7

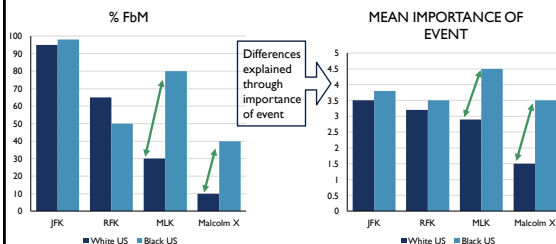
FLASHBULB MEMORIES: ENCODING ACCOUNT



8

PERSONAL IMPORTANCE FOR FLASHBULB MEMORIES

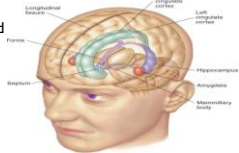
- Brown and Kulik (1977): tested black and white participants from the US on flashbulb memory details for the assassinations of JFK, RFK, MLK, & Malcolm X



9

FLASHBULB MEMORIES: NEURAL THEORY

- Livingston, 1967:
 - Makes use of neuroscience to explain how the brain produces FbMs.
 - Reticular system responds to novelty and surprise
 - Located in the brain stem and controls automatic functions
 - Limbic system evaluates the importance of the event related to its 'biological significance'
 - This contains the hippocampus (LTM) and the amygdala (emotion)
- The limbic system discharges into the reticular system causing memory formation for events above 'criterion'



10

FLASHBULB MEMORIES: NEURAL THEORY

- Davidson and Glisky (2002): FbMs following death of Princess Diana were stronger for younger than older adults
 - Possibly due to general decline in memory for older adults.
 - However, no relationship found between flashbulb effects and measures of frontal or temporal lobe function
 - This was expected since these brain areas are known to be involved in context retrieval and memory storage, respectively.
 - Instead they speculated that the creation of flashbulb memory might be mediated by the brain's emotional centres such as the amygdala rather than those involved in memory.

11

FLASHBULB MEMORIES: ARE THEY REALLY SPECIAL

- Some research has challenged the view that FbMs are 'special' and instead suggest they are subject to errors and forgetting:
 - Neisser and Harsch (1992): tested people a day after the Challenger explosion
 - When tested three years later most had forgotten at least half the details they initially remembered
 - Talarico and Rubin (2003) flashbulb memories following the World Trade Centre attack showed an accuracy decline over the months that followed.

12

FLASHBULB MEMORIES: NEISSER'S CRITIQUE

- Neisser (1982): Believed they are formed in the same way as ordinary memories
 - Their apparent durability is merely consequence of frequent retrieval.
 - This ultimately strengthens the memory trace
 - Several studies have confirmed link between extent of rehearsal and FbMs (e.g., Teckan & Peynircioglu, 2002; Hornstein et al., 2003).
 - FbMs are also seen as a form of context-dependent learning:
 - The dramatic and powerful event acts as a contextual cue to recall more trivial aspects of the event (Groome, 1999).
 - Links back to Tulving's **Encoding-specificity principle**

13

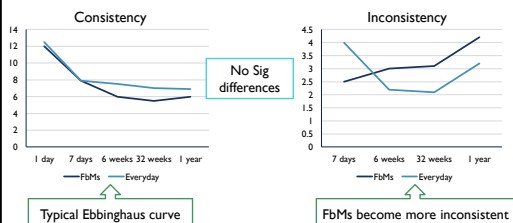
FLASHBULB MEMORIES: CONWAY'S REBUTTAL

- Brown and Kulik never stated FbMs were *complete* records of events (just a special mechanism that records brain events)
 - They also did not state they were fully accurate or completely immune to forgetting
- Suggested the fallibility of FbMs reported in other studies reflects a lack of interest in the event on the part of some participants tested.
 - FbMs only occur for people when the event in question holds particular personal significance
 - And if the event has a future consequence on their own lives
 - E.g., Americans (particularly those in New York) would see the attacks on world trade centre as more of a major consequence to them personally and their life compared to the Challenger disaster
- Need to consider the event (location, type, etc.) and the participants being tested.
 - E.g., Curci et al. (2001): death of French President Mitterand produced FbMs in many French nationals, but not in Belgian citizens, for whom there were likely to be fewer direct consequences

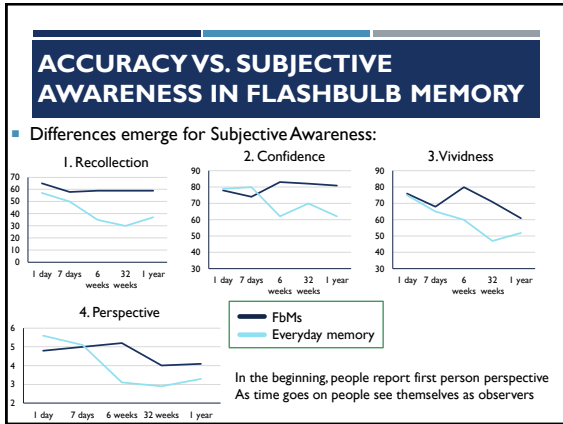
14

ACCURACY VS. SUBJECTIVE AWARENESS IN FLASHBULB MEMORY

- Talarico and Rubin (2007): FbMs are not special due to exceptional accuracy
 - Instead they are due to exceptional Confidence and Subjective awareness
 - Subjective awareness (how we experience something) is what makes FbMs different to other memories



15



16



17

- ### EYEWITNESS MEMORY: CONSIDERATIONS OF IMPORTANCE
- Devlin report (1976): even when only evidence is EW ID = 74% conviction rate.
 - EW ID accepted even when contradicted by physical &/or expert evidence (jury's tend to be suspicious of paid experts)
 - Eyewitnesses are:
 - Perceived as independent
 - No vested interest in outcome of trial
 - (Usually) have no scientific, legal, or Ψ expertise
 - Peers of the jury, lay-people
 - Not paid to give testimony – perhaps even had to spend money

18

EYEWITNESS MEMORY: CONSIDERATIONS OF IMPORTANCE

- However, EWs are not always independent
 - They may be getting something out of it
 - Do genuine acts of altruism really exist?
- CPS sometimes use a co-accused (who will get a lesser sentence) as a witness.
 - E.g., Michael Stone case: cell mate used as prosecution witness, claims Stone admitted murders
- Some people want 15-minutes of fame: 24 hour news channels, tabloids paying to hear EWs story

19

EYEWITNESS MEMORY: RESEARCH TO HIGHLIGHT ISSUES WITH IMPORTANCE

- Loftus (1974): Undergraduate students used as mock jury presented with "evidence" about a murder

Type of "Evidence"	% Conviction
1. Circumstantial	18%
2. Circumstantial + EW ID	72%
3. Circumstantial + EW ID but with expert contradicting EW	68%

- Rattner (1988): 205 cases of exoneration by physical evidence in US.
 - Mistaken EW ID main source of errors
 - Executions halted in Illinois.

20

EYEWITNESS MEMORY: RESEARCH TO HIGHLIGHT ISSUES WITH IMPORTANCE

- Brandon & Davies (1973); Huff, Rattner, & Sagarin (1986):
 - Examined over 1000 wrongful convictions due to EW error
- Introduction of physical evidence e.g., finger printing, DNA much more reliable and exemplifies mistakes by EWs.
- Wells et al. (1998): 40 cases where DNA evidence exonerated a suspect wrongly identified by EWs
 - In 5 cases the wrongly convicted person had been on death row



21

INFLUENCES ON EYEWITNESS MEMORY

- EWs may inadvertently can pick out innocent person.
- False IDs are often “honest errors”
 - Perhaps due to over eagerness to be helpful?
- Recall prone to distortion by prior knowledge/expectation (as highlighted by Barlett, 1932) may apply to EWTs
 - EWs susceptible to reconstructive error (Zaragoza & Lane, 1998)
- EW memory particularly prone to error when events involve violence due to EVs being less perceptive when in a frightened state (Loftus & Burns, 1982)

22

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- Eyewitness recall of an event can also be distorted by contamination from post-event (mis)information (Wright et al., 2000).
- Misleading info can intentionally/unintentionally be communicated to EWs:
 - Leading questions from investigators or content of questions
- (Mis)information can “fill-in” gaps/contradict memory
- Co-witness effects:
 - In time between witnessing event & police arriving, EW may talk to other witnesses who may have seen something different (possibly due to difference in interpretation, difference in viewpoint, etc.), which can **contaminate** the EWs memory.

23

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- Lots of experimental work by Elizabeth Loftus:
 - Loftus & Palmer (1974):Video of car accident
 - PEQ:“How fast were cars travelling when they hit/smashed/bumped/etc.
 - Week later:“Did you see broken glass”: response depends on wording
 - Reports of car speed ranged depending on wording.
 - Suggests the phrasing of questions is important
 - Highlights the interaction between visual and verbal memory
 - The question was verbal but it constructed a visual memory
 - The questioning changed their memory – they claimed to have seen something that did not happen

24

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- How/why does post-event (mis)information influence memory?
- Loftus suggests memory is NOT like a recording – it changes and is reconstructive in nature
- Loftus suggests two types of info are encoded to memory:
 1. Info encoded during initial event
 2. Info encoded after event (e.g., by learning new info)
 - Both cannot be remembered (especially if they contradict each other)
 - Info from both sources becomes integrated to single memory representation
 - Memory is updated either by adding/subtracting info.

25

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- Loftus, Miller, & Burns (1978):
- Ps shown car sat at stop sign. 
- PEQ: “Did another car pass while car was stopped at give-way sign?” 
 - Ps given recognition test for original vs. misleading slide
 - Sig decrease in recognition accuracy for original slide when misleading info given
- They also suggest memory becomes increasingly vulnerable with increasing interval between witnessing the event and receiving contaminated info due to original trace being weaker.

26

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- How does misinformation affect memory?
- **Destructive Updating hypothesis**.....
 - We have single memory representation, which can be updated with leading info
 - New or contradictory post-event info may integrate into existing memory
 - Original memory trace destroyed and replaced by post-event misleading trace
 - In EW situations there is no opportunity to re-encode the info.
- However, Loftus' work has received major backlash and criticism.

27

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- **Non-retention Account:**
- McCloskey and Zaragoza (1985): even if misinformation has no effect on memory, misled participants will still choose original items less than controls
 - Why? Because perhaps the original item has decayed anyway or was never encoded to begin.
 - Thus, PEQ provides a source of memory
 - Those who cannot remember the original item can base their choice from the misinformation in the PEQ.
 - So, does not show a destructive memory effect

28

EYEWITNESS MEMORY: EFFECTS OF POST-EVENT (MIS)INFORMATION

- Major issue with suggestibility research: Demand characteristics
 - Is there a change or do people go along with it because they assume experimenter must be correct?
 - Shows there is a problem with the paradigm.
- Control Ps:
 1. Remember original item → choose original (50% of Ps are correct straight away)
 2. Do not remember original item → ½ guess original, ½ guess misinfo
- Misled Ps
 1. Remember original item → choose original
 2. Do not remember original or misinfo → ½ guess original, ½ guess misinfo
 3. Remember original & Misinfo → ½ guess original, ½ guess misinfo
 4. Remember misinfo → choose misinfo

29

EYEWITNESS MEMORY: MODIFICATION OF PARADIGM TO TEST NON RETENTION ACCOUNT OF MEMORY

- McCloskey & Zaragoza (1985): modified test.
 - Remove misinformation as a choice at test –
 - Equalises guessing rates across conditions - Removes demand characteristics
 - If memory for original item remains, misled Ps should choose original
 - If original memory decayed, misled Ps should perform at chance
- However different studies have produced different findings:

Misinfo effect with modified test:

Chandler (1989, 1991);
Chandler & Gargano (1998)
Belli et al. (1992)
Ceci et al. (1987)
Toglia et al. (1992)

NO misinfo effect with modified test:

Belli (1993); Belli et al. (1992)
Bonto & Payne (1991)
Loftus et al. (1989)
McCloskey & Zaragoza (1985)
Zaragoza et al. (1987)

Retention intervals 3-7 days

Retention intervals 30 min or less

30

EYEWITNESS MEMORY: REVISION OF DESTRUCTIVE UPDATING HYPOTHESIS

- Loftus & Hoffman (1989): original trace not destroyed
 - Misinfo weakens original trace leading to disintegration of features
 - Original trace may remain in degraded form and retrievable
- Reversed suggestibility effect: Lindsay & Johnson (1989):
 - Ps read narrative describing cluttered office scene
 - Some info consistent with yet to be seen slide
 - Some info inconsistent (8 additive items suggested)
 - Ps then view slide depicted from narrative
 - Yes/no test for items in picture
 - Misled Ps state they have seen the suggested items more than controls.
 - Shows source monitoring error rather than just error remembering items

31

CONSTRUCTED MEMORIES IN REAL WORLD:ALIENS AND FALSE MEMORY

- Clancy et al (2002) studied 3 groups:
 - Abductees: no autobiographical memory for event
 - Abductees: memories had been 'recovered'
 - Non abductees
- Gave them a critical lure test
 - Item consistent with schema
 - Exposed them to items such as 'sour, sugar, honey, tart' etc
 - Would they falsely recognise 'sweet' as the critical lure?



32

CONSTRUCTED MEMORIES IN REAL WORLD:ALIENS AND FALSE MEMORY

- Results (Clancy, 2002)
 - Recovered memory alien abductees: more likely to falsely recognise words not seen before
- Argued that the problem could be one of source monitoring
 - Judging where information originated from:
 - Misattribute an internally generated memory as an externally generated memory
 - E.g. From TV or reality!
 - Makes more vulnerable to schema-effects



33

EYEWITNESS MEMORY: SUMMARY

- So can witness memory be adapted?
 - To some degree, but not as easily as we might think.
 - Need to consider social factors or demand characteristics
 - Should not underestimate EW wanting to be helpful
 - Weak memories likely to be most vulnerable
 - Blending of memories may be possible
 - Retrieval failures and source misattribution need to be considered.