

# The Constructive Character of Memory: Evidence from Memory Errors

# Memory Exercise

- Have you ever had a strong, vivid memory and later learned you were wrong (or realized that what you remember could not have happened)? If so, write it down.

# Studying Memory Fallibility

We are all aware of cases of our own false or altered recall

What are we to make of it?

Another instance of breaking memory—learning about a system from cases in which it does not perform as expected

But how can error or alteration in memory be studied?

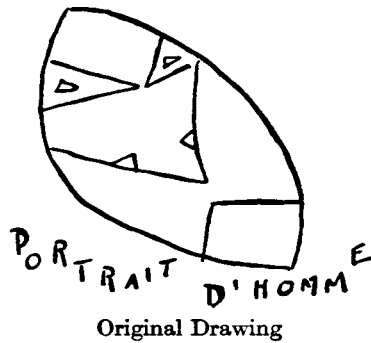
Frederick Bartlett: in quest for a naturalistic study of memory, examined how subjects remembered pictures and stories

From this he came to emphasize the constructive character of memory

# Transformed Memories of Drawings

Method of Serial Reproduction or Game of Telephone

Subjects saw the previous image, then drew it themselves from memory



Reproduction 1



Portrait d'homme

Reproduction 2



Portrait d'un homme

Reproduction 3



Portrait d'un homme.

Reproduction 4



Portrait d'un homme.

Reproduction 5



Portrait d'un homme!

Reproduction 6



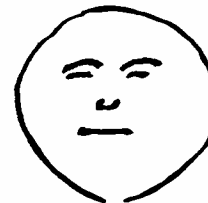
Portrait d'un homme

Reproduction 7



Un homme Egyptien.

Reproduction 8



L'Homme Egyptien.

Reproduction 9



L'homme Egyptien

# Transformed Memory of Drawings II



Original Drawing

Reproduction 1



Reproduction 2



Reproduction 3



Reproduction 4



Reproduction 5



Reproduction 6



Reproduction 7



Reproduction 8



Reproduction 9



Reproduction 10



Reproduction 11



Reproduction 12



Reproduction 13



Reproduction 14



Reproduction 15



Reproduction 16



Reproduction 17



Reproduction 18

# Bartlett's Analysis of the Changes

1. Transformations in the direction of accepted conventional representations
2. Elaboration of features that cannot be labeled until a recognized form is produced
3. Multiplication of details not readily assimilated
4. Once a recognizable form is produced, simplification into conventionalized representation
5. Assignment of a name influences what is reproduced
6. Preservation of detached details once recognized form is achieved

# The War of the Ghosts

One night two young men from Egulac went down to the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party". They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

"What do you think? We wish to take you along. We are going up the river to make war on the people".

One of the young men said: "I have no arrows".

"Arrows are in the canoe", they said.

"I will not go along. I might be killed. My relatives do not know where I have gone. But you", he said, turning to the other, "may go with them."

So one of the young men went, but the other returned home.

And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say: "Quick, let us go home: that Indian has been hit". Now he thought: "Oh, they are ghosts". He did not feel sick, but they said he had been shot.

So the canoes went back to Egulac, and the young man went ashore to his house, and made a fire. And he told everybody and said: "Behold I accompanied the ghosts, and we went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick".

He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of his mouth. His face became contorted. The people jumped up and cried.

He was dead.

# Serial Reproduction of The War of the Ghosts

## Reproduction 10

### The War of this Ghosts

Two Indians were out fishing for seals in the Bay of Manpapan, when along came five other Indians in a war-canoe. They were going fighting. "Come with us," said the five to the two, "and fight."

"I cannot come," was the answer of the one, "for I have an old mother at home who is dependent upon me." The other also said he could not come, because he had no arms. "That is no difficulty" the others replied, "for we have plenty in the canoe with us"; so he got into the canoe and went with them.

In a fight soon afterwards this Indian received a mortal wound. Finding that his hour was come, he cried out that he was about to die. "Nonsense," said one of the others, "you will not die." But he did.



# Bartlett's Analysis of the Changes

The story became shorter and more coherent

“No trace of an odd, or supernatural element is left: we have a perfectly straightforward story of a fight and a death.”

Achieved by:

- Omissions: ghosts omitted early; the wound became a matter of flesh, not spirit
- Rationalization: growing coherence among parts
- Transformational of details into more familiar and conventional
- Changing order of events

# Transformations of Last Sentence

When the sun rose he fell down. And he gave a cry, and as he opened his mouth a black thing rushed from it.

When the sun again rose he suddenly felt faint, and when he would have risen he fell down, and a black thing rushed out of his mouth.

He felt no pain until sunrise the next day, when, on trying to rise, a great black thing flew out of his mouth.

He lived that night, and the next day, but at sunset his soul fled black from his mouth.

He lived through the night and the following day, but at sunset his soul fled black from his mouth.

He lived during the night and the next day, but died at sunset, and his soul passed out from his mouth.

Before the boat got clear of the conflict the Indian died, and his spirit fled. Before he could be carried back to the boat, his spirit had left this world.

His spirit left the world.

("Nonsense", said one of the others, "you will not die.") But he did.

# Method of Repeated Reproduction

Now individual subjects are asked to repeat the story after various intervals after reading the story twice

# The War of the Ghosts

Two men from Edulac went fishing. While thus occupied by the river they heard a noise in the distance.

"It sounds like a cry ", said one, and presently there appeared some men in canoes who invited them to join the party on their adventure. One of the young men refused to go, on the ground of family ties, but the other offered to go.

"But there are no arrows", he said.

"The arrows are in the boat", was the reply.

He thereupon took his place, while his friend returned home. The party paddled up the river to Kaloma, and began to land on the banks of the river. The enemy came rushing upon them, and some sharp fighting ensued. Presently some one was injured, and the cry was raised that the enemy were ghosts.

The party returned down the stream, and the young man arrived home feeling none the worse for his experience. The next morning at dawn he endeavoured to recount his adventures. While he was talking something black issued from his mouth. Suddenly he uttered a cry and fell down. His friends gathered round him.

But he was dead.

SUBJECT H: 20 hours

# The War of the Ghosts

## **Subject P (a painter), first reproduction and 30 months later**

Two youths were standing by a river about to start seal-catching, when a boat appeared with five men in it. They were all armed for war.

The youths were at first frightened, but they were asked by the men to come and help them fight some enemies on the other bank. One youth said he could not come as his relations would be anxious about him; the other said he would go, and entered the boat.

.....

In the evening he returned to his hut, and told his friends that he had been in a battle. A great many had been slain, and he had been wounded by an arrow; he had not felt any pain, he said. They told him that he must have been fighting in a battle of ghosts. Then he remembered that it had been queer and he was very excited.

In the morning, however, he became ill, and his friends gathered round; he fell down and his face became very pale. Then he writhed and shrieked and his friends were filled with terror. At last he became calm. Something hard and black came out of his mouth, and he lay contorted and dead.

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Some warriors went to wage war against the ghosts. They fought all day and one of their number was wounded.

They returned home in the evening, bearing their sick comrade. As the day drew to a close, he became rapidly worse and the villagers came round him. At sunset he sighed: something black came out of his mouth. He was dead.

# Stepwise Reconstruction after 6.5 Years

1. Brothers.
2. Canoe.
3. Something black from mouth.
4. Totem.
5. One of the brothers died.
6. Cannot remember whether one slew the other or was helping the other.
7. Were going on journey, but why I cannot remember.
8. Party in war canoe.
9. Was the journey a pilgrimage for filial or religious reasons?
10. Am now *sure* it was a pilgrimage.
11. Purpose had something to do with totem.
12. Was it on a pilgrimage that they met a hostile party and one brother was slain?
13. I think there was some reference to a dark forest.
14. Two brothers were on a pilgrimage, having something to do with a totem, in a canoe, up a river flowing through a dark forest. While on their pilgrimage they met a hostile party of Indians in a war canoe. In the fight one brother was slain, and something black came from his month.
15. Am not confident about the way brother died. May have been something sacrificial in the manner of his death.
16. The cause of the journey had both something to do with a totem, and with filial piety.
17. The totem was the patron god of the family and so was connected with filial piety.

# Bartlett's Main Conclusions from the Method of Repeated Reproduction

1. The general form, or outline, stays constant for a subject after first recall
2. Style, rhythm, and precise mode of construction rarely faithfully reproduced
3. Form and items become stereotyped, and then don't change
4. Story is rationalized (Westernized)—symbolization
5. With infrequent reproduction, continuing omission, simplification, and transformation of items into more familiar detail
6. In some cases, elaboration, often influenced by images

# Schemata

“‘Schema’ refers to an active organization of past reactions, or of past experiences, which must always be supposed to be operating in any well-adapted organic response. That is, whenever there is any order or regularity of behavior, a particular response is possible only because it is related to other similar responses which have been serially organised, yet which operate, not simply as individual members coming one after another, but as a unitary mass. Determination by schemata is the most fundamental of all the ways in which we can be influenced by reactions and experiences which occurred some time in the past. All incoming impulses of a certain kind, or mode, go together to build up an active, organised setting. . . .”



# Dees, Roediger, McDermott Paradigm

## *Original list:*

<b>table</b>	<b>wood</b>
<b>sit</b>	<b>cushion</b>
<b>legs</b>	<b>swivel</b>
<b>seat</b>	<b>stool</b>
<b>couch</b>	<b>sitting</b>
<b>desk</b>	<b>rocking</b>
<b>recliner</b>	<b>bench</b>
<b>sofa</b>	

## *Test list:*

**couch**  
**shoe**  
**chair**

Recall for the lure “chair” is stronger than for many items on the original list.

The words on the list are the 15 closest semantic associates of “chair” in English

# Jennifer Thompson and Ron Cotton



The man on the left, **Ron Cotton**, who spent 11 years in prison for the rape of Jennifer Thompson. The man on the right is the rapist. During the assault, Thompson made careful effort to remember her rapist's facial features. Nonetheless she generated a composite and then picked out from a police lineup innocent man. Her memory of the perpetrator's face was changed by these activities without her awareness. She was confident that she was identifying the person who raped her.



# John Dean's Testimony

On September 15 the Justice Department announced the handing down of the seven indictments by the Federal Grand Jury investigating the Watergate. Late that afternoon I received a call requesting me to come to the President's Oval Office. When I arrived at the Oval Office I found Haldeman and the President. **The President asked me to sit down.** Both men appeared to be in very good spirits and my reception was very warm and cordial. **The President then told me that Bob-referring to Haldeman-had kept him posted on my handling of the Watergate case. The President told me I had done a good job and he appreciated how difficult a task it had been and the President was pleased that the case had stopped with Liddy.** I responded that **I could not take credit because others had done much more difficult things than I had done.** As the President discussed the present status of the situation I told him that all I had been able to do was to contain the case and assist in keeping it out of the White House. **I also told him there was a long way to go before this matter would end and that I certainly could make no assurances that the day would not come when this matter would start to unravel** (Hearings, p. 957).

# Watergate Tape Transcripts

P: Hi, how are you? You had quite a day today, didn't you? You got Watergate on the way, didn't you?

D: We tried.

H: How did it all end up?

D: Ah, I think we can say well, at this point. The press is playing it just as we expected.

H: Whitewash?

D: No, not yet-the story right now-

P: It is a big story.

H: Five indicted plus the WH former guy and all that.

D: Plus two White House fellows.

H: That is good; that takes the edge off whitewash, really. That was the thing Mitchell kept saying, that to people in the country Liddy and Hunt were big men. Maybe that is good.

P: How did MacGregor handle himself-

D: I think very well. He had a good statement, which said that the Grand Jury had met and that it was now time to realize that some apologies may be due.

H: Fat chance.

D: Get the damn (inaudible)

H: We can't do that—

P: Just remember, all the trouble we're taking, well have a chance to get back one day. How are you doing on your other investigation? (Presidential Transcripts, p. 32)

# Assessing Dean's Memory

“If history has ever proven anything, it surely proves that Dean remembered those conversations and told the truth about them. I will not quarrel with that assessment here, but we shall see that ‘truth,’ ‘accuracy,’ and ‘memory’ are not simple notions. Dean’s testimony was by no means always accurate. Yet even when he was wrong, there was a sense in which he was always telling the truth . . .” (Neisser, 1981)



# Loftus on Eye- Witness Testimony



Showed subjects a video in which there was a car accident at a stop sign

- Half the subjects later asked a question about a yield sign (“how fast was the blue car going when it went past the yield sign?”)
- Those who heard the misleading question were more likely to later remember the video as having a yield sign.

In other studies, people "recalled" a conspicuous barn in a bucolic scene that contained no buildings at all, broken glass and tape recorders that were not in the scenes they viewed, a white instead of a blue vehicle in a crime scene, and Minnie Mouse when they actually saw Mickey Mouse.

# Constructing False Memories of One's Childhood

Loftus and Pickrell asked 24 subjects, 18 to 53, to try to remember childhood events provided by a parent, an older sibling or another close relative.

Three paragraphs related events that had actually happened to the subject

A fourth paragraph related an event of being lost in a mall that had not occurred but was constructed using information about a plausible shopping trip provided by a relative. The relative also verified that the participant had not in fact been lost at about the age of five

The false event involved being lost for an extended period, crying, aid and comfort by an elderly woman and, finally, reunion with the family.

68% recall of the true memories, 29% of subjects remembered the false memory



# Hyman Study

In recollection study subjects given one false event amongst several real ones

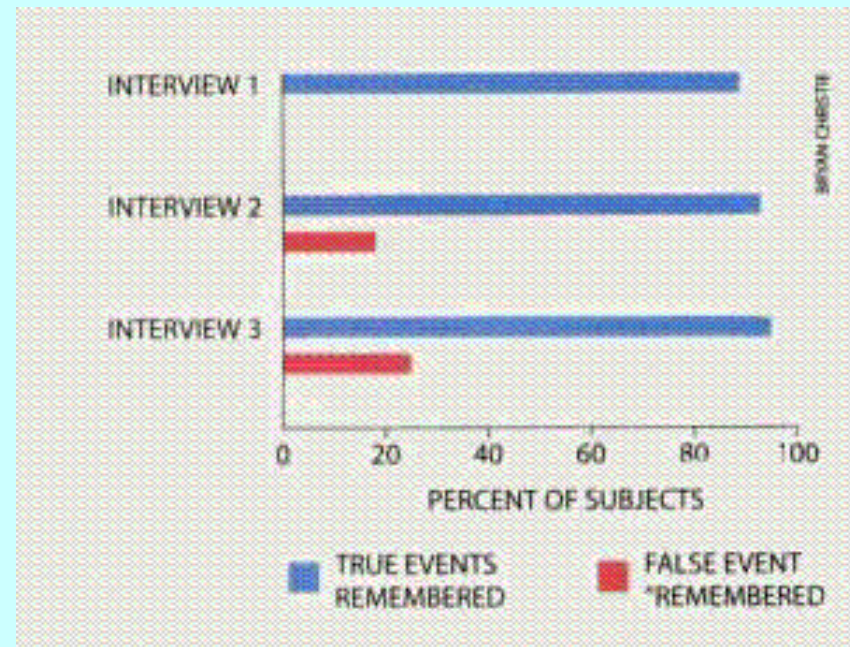
overnight hospitalization for a high fever and a possible ear infection

birthday party with pizza and a clown

No recall of false event on first interview

20% recalled something of the false event on second interview

One person remembered a male doctor, a female nurse and a friend from church who came to visit at the hospital.





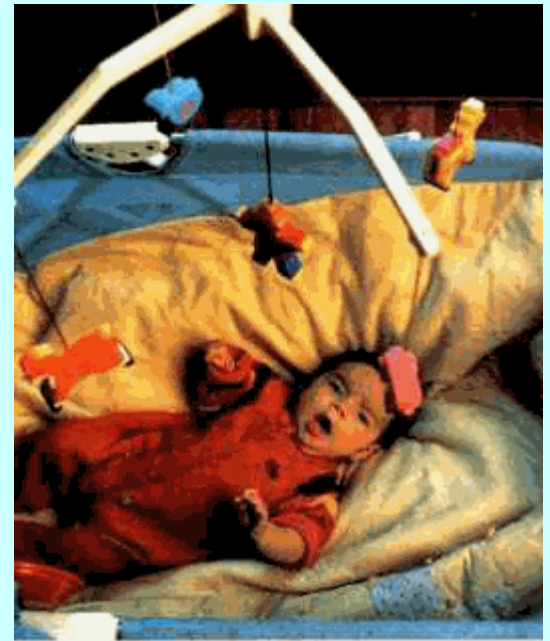
# Using Imagery to Create False Memories

Nicholas Spanos led students to believe that they had well-coordinated eye movements and visual exploration skills because the hospital in which they were born placed colored mobiles over their cribs

Half of the participants were hypnotized—  
46% false recall

Half encouraged to construct images—  
56% false recall

Others afterwards “recalled” other events  
from the hospital



# Testimony of others leads to false memory

Saul M. Kassin arranged for some students to be falsely accused by a confederate of damaging a computer by pressing the wrong key

Many signed a confession

Internalized guilt

Confabulated other details

# Piaget's False Memory

“One of my earliest memories goes back to when I was two years old. I can picture the scene quite clearly... I'm sitting in a stroller my nurse is pushing along the Champs Elyses when suddenly a man attempts to kidnap me. I'm stuck in the carriage and cannot move so I see the nurse bravely coming between me and my potential kidnapper. The man gets away and the nurse ends up with the scars I can still clearly see on her face...When I was about fifteen years old my parents got a letter from my old nurse... She wanted to apologize for mistakes she had made in the past and wanted to return the watch my father had given her as a reward for her bravery... The fact of the matter was that she had made the whole thing up... As a child I had projected the story my parents had heard and believed into my own past as a kind of visual memory.”

# Inducing False Memories in Children

Stephen Ceci:

In querying children about everyday events, also asked them about events which never occurred

“Recollect the time you got a finger caught in a mousetrap and had to go to the hospital to get the trap off”

Asked the children to think hard and try to visualize the event once every ten weeks

After ten weeks half the children had memories of one of the made up events, with elaboration

“My brother Colin was trying to get Blowtorch from me, and I wouldn't let him take it from me, so he pushed me into the wood pile where the mouse trap was. And then my finger got caught in it. And then we went to the hospital, and my mommy, daddy, and Colin, drove me there, to the hospital in our van, because it was far away. And the doctor put a bandage on this finger.”

# Memory Construction

Vivid memories of the event are generally highly imagistic

- The detail and sharpness of the image constitute its vividness
- But once a vivid image is constructed, it is difficult to determine its source

Did it originate in the event being recalled?

Did it originate in the construction of the mental image of the event?

Identifying the source seems to rely on frontal areas, which are late to develop, perhaps explaining the susceptibility of children

# Eye Witnesses and Legal Implications

Neisser: John Dean's vivid memory nonetheless not totally accurate—distortions similar to those of Bartlett's subjects

Loftus: post event interrogation can alter the manner in which individuals recall an event

Yet, eye witnesses are considered one of the most reliable forms of evidence.

What should the legal system do given these empirical results?

# Recovered Memories and the Memory Wars

Social epidemic of the 1990s: recovered memories of childhood abuse, including satanic rituals

Use of suggestion in therapy to produce the memories

Justification: the memories are repressed and only special techniques can bring them forward

Objection: no evidence that memories of this kind—repeated abuse—can be repressed

- Repetition usually enhances memory

- Repression should result in dissociative disorders, but no evidence of this

# Eileen Franklin's Recovered Memory

While George Franklin is driving his daughter Eileen to school, they come across her friend Susan and give her a ride. Instead of going to school, Franklin drives his minibus down to Half Moon Bay, stopping in the woods. Eileen and Susan play in the minibus with Franklin gets inside the minibus and starts playing with them. Eileen is in the front seat when she sees her dad climb on top of Susan Nason. "My father pinned Susan to the floor. His legs pointed towards me and he held her arms spread out. He leaned on his elbows that were up against his, eh...body, he started rubbing against her, eh... rubbing, up and down... and eh, ...he kept on doing this until I climbed over the passenger seat to see what they were doing. I got really scared when I looked at Susan's face."



# Eileen Franklin's Recovered Memory

Eileen reports she tried to make herself invisible until her father stopped. Then she and Susan get out of the minibus. Susan walks up to a rock where she tries to sit down. Eileen stays next to the minibus and picks up a leaf. When she looks up she sees the autumn sun shining through the trees. Behind Susan appears the shadow of a man who holds a large rock above his head. Susan raises her arms to protect herself. She looks at Eileen. Her eyes are filled with fear and powerlessness. A few seconds later the rock crushes Susan's skull. Eileen puts her hands against her ears to block out the sound of breaking bone.

# Eileen and George Franklin

In 1989 and 1990 Eileen Franklin recovered memories of her father murdering her 8 year old girlfriend, Susan Nason, in 1969.

- Eileen also remembered seeing him murder a woman in 1976 in an unrelated incident.
- George Franklin was convicted of the 1969 murder.
- DNA tests later showed George Franklin innocent
- Evidence subsequently found accounted for all of George's time on the day in question

At various points Eileen claimed her memories occurred

- In a dream
- Under hypnosis during therapy (she denied this at trial, but her sister later admitted that they lied about not being hypnotized)
- While looking at her 5 year hold daughter

# Discrepancies in Eileen Franklin's memory

Eileen remembered that she and Susan had played hooky from school on the day of the murder

- Susan had gone to school that day and had returned home and talked to her mother at 3 PM.

Eileen remembered her father taking a mattress from the back of the van and covering Susan's body with it

- A newspaper account mentioned a mattress
- The murderer had covered the body with a box spring (or couch?) too large to fit into her father's van

Eileen remembered that Susan was wearing a “*silver ring with a stone in it*”

- Such a ring was described in a newspaper account at the time
- Ellen was wearing two rings: one plain silver ring and a gold ring with a topaz

# Where did Eileen's memory come from?

Much of what Eileen testified to had been reported (sometimes erroneously) in newspaper accounts

Having read such accounts, Eileen may have constructed false memories

# Constructive Memory, False Memory, and Personal Identity

Much of our personal identity is grounded in our memories—what we have done, how we have reacted, etc.

What implications are there from research showing that memories are not simply a replaying of the past but constructs, sometimes false ones?