School of Psychology

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The Psychology of witness Memory
Some of my research
Memory processes

- A brief introduction into some of the processes involved in human memory
- What can go wrong
- What can we do to improve the accuracy of eyewitness memory
Memory as trace evidence
When/why do eyewitnesses go wrong?

I. Acquisition/Encoding: Witness’s perceptions at the time of the event

II. Storage: Witness stores memory to avoid forgetting

III. Retrieval: Witness retrieves information from storage when needed.
We construct the world we live in

- Our experience of the world comes via our sense organs
- The data arriving through our sense organs are incomplete and ambiguous
- We need to disambiguate the information we receive
- We form hypotheses about the world around us
Sometimes we get it wrong!
All in the mind

• So, the world you perceive is only in your head

• The reality you experience is a construction – a best guess interpretation of the limited, ambiguous information made available to you

• But there is lots of stuff you don’t even notice
Factors which affect eyewitness memory
Our memories change over time
Diary studies

Every day for 5 years psychologist Willem Wagenaar recorded the most significant events of his life.

He then spent a year testing his recall (who, what where and when) for each of these 2400 events.

Wagenaar’s study is of particular value because it tests retention for personally significant events.

Overall, Wagenaaar’s recall was good – much better than would be predicted by Ebbinghaus’ estimates of forgetting over much shorter periods

After 1 year recall was approximately 54%, dropping to about 42% after 2 years, and 30% after 5 years.

Even details of very significant events were forgotten over time.
Memory for traumatic Events

• We do not know enough about the affects of trauma on memory
  • Ethics
  • Ground truth
• Some indication of enhanced memory, some of reduced accuracy
• People suffering from trauma may find it hard to give a coherent account.
• We should be very careful when trying to assess the veracity of an account of a traumatic event.
“Flashbulb memory”: Where were you when...?
Memory for traumatic Events

- Aug 2001, flight AT236 developed fuel leak mid-Atlantic. For 30 minutes passengers had very grave fears for their lives.

- Many, but not all, have developed PTSD

- Recent study of survivors found that both those with PTSD and those without had good but not perfect recall of episodic details of the event

- Those with PTSD were more likely to include irrelevant details when recounting both traumatic and non-traumatic events
## Appendix B

Sequence of Events That Occurred During the Air Transat Incident, Including the Number of Individuals Recalling Each Event

<table>
<thead>
<tr>
<th>Event</th>
<th># of participants recalling the event*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Watched movie (choke)</td>
<td>6</td>
</tr>
<tr>
<td>2. Other TV programs followed (newsw, Just for Laughs)</td>
<td>2</td>
</tr>
<tr>
<td>3. Breakfast</td>
<td>6</td>
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<tr>
<td>4. Seat belt sign came on</td>
<td>3</td>
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<tr>
<td>5. Pilot: &quot;ETA to Lisbon, temperature...&quot;</td>
<td>2</td>
</tr>
<tr>
<td>6. FA: &quot;Emergency situation, return to seats&quot;</td>
<td>4</td>
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<tr>
<td>7. TV turned off</td>
<td>2</td>
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<tr>
<td>8. Interior lights flickered</td>
<td>3</td>
</tr>
<tr>
<td>9. Pilot: &quot;Making emergency landing, take off shoes, put on life jackets&quot;</td>
<td>10</td>
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<tr>
<td>10. FA showing how to put them on (very briefly)</td>
<td>9</td>
</tr>
<tr>
<td>11. FA had shaky voice, cried</td>
<td>5</td>
</tr>
<tr>
<td>12. Put on the life jackets</td>
<td>11</td>
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<tr>
<td>13. Some passengers left about their life jackets</td>
<td>3</td>
</tr>
<tr>
<td>14. FA repeated instructions</td>
<td>2</td>
</tr>
<tr>
<td>15. Passengers became increasingly panicked</td>
<td>3</td>
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<tr>
<td>16. Passengers praying/praying voices</td>
<td>2</td>
</tr>
<tr>
<td>17. Pilot: &quot;Going in for emergency landing, when I say 'brace! Brace!' you brace!&quot; was forward and put hands behind your head...</td>
<td></td>
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<tr>
<td>18. Pilot making several &quot;1 minute to impact&quot; statements</td>
<td>2</td>
</tr>
<tr>
<td>19. Silence</td>
<td>4</td>
</tr>
<tr>
<td>20. Interior lights turned off</td>
<td>8</td>
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<tr>
<td>21. Only the emergency corridor strip lights were on</td>
<td>2</td>
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<tr>
<td>22. Engines stopped</td>
<td>2</td>
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<tr>
<td>23. Wind shearing</td>
<td>8</td>
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<tr>
<td>24. Everything went quiet</td>
<td>5</td>
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<tr>
<td>25. Oxygen masks came down</td>
<td>6</td>
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<tr>
<td>26. Passengers started to panic</td>
<td>13</td>
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<tr>
<td>27. Put on oxygen masks</td>
<td>8</td>
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<tr>
<td>28. Mask didn't work</td>
<td>7</td>
</tr>
<tr>
<td>29. Mask smelled like something burning</td>
<td>6</td>
</tr>
<tr>
<td>30. Airplane started making violent turns, as if going in circles</td>
<td>4</td>
</tr>
<tr>
<td>31. Airplane was on an angle (left to right)</td>
<td>3</td>
</tr>
<tr>
<td>32. Germ of coming down too fast</td>
<td>4</td>
</tr>
<tr>
<td>33. Everyone started screaming</td>
<td>3</td>
</tr>
<tr>
<td>34. Assumed the brace position</td>
<td>6</td>
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<tr>
<td>35. Could hear engines</td>
<td>5</td>
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<tr>
<td>36. Pilot: &quot;Mourn to go into the water&quot;</td>
<td>5</td>
</tr>
<tr>
<td>37. More panic, then quiet</td>
<td>2</td>
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<tr>
<td>38. Pilot: &quot;We have a runway! We have a runway!&quot;</td>
<td>3</td>
</tr>
<tr>
<td>39. Walker turned to land</td>
<td>5</td>
</tr>
<tr>
<td>40. Pilot: &quot;Brace! Brace! Brace!&quot;</td>
<td>19</td>
</tr>
<tr>
<td>41. Violent landing</td>
<td>13</td>
</tr>
<tr>
<td>42. Grinding of the tires and landing gear</td>
<td>13</td>
</tr>
</tbody>
</table>

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*Maximum number of individuals recalling a scenario fluctuated across events due to unique individual timelines (i.e., falling, being taken to hospital).
Memory for Repeated Events

• Research on children’s memories of repeated (i.e., reoccurring) events showing that young children struggle to remember specific features of multiple events (e.g., Powell & Thompson, 1997).

• Similarly, research with adults indicates that when repeated events follow a similar “script”, adults are incapable of remembering specific details of each event (Hudson, 1986).

• Much more work needed
Post-Event Misinformation

Research shows that leading or suggestive questions have a very powerful influence on our memory.

And the change is probably permanent – it may be impossible to undo the damage later.
Leading Questions

Participants watch a film of a traffic accident (Loftus & Palmer, 1974)

Participants estimate speed when smashed /collided/bumped /…Contacted
Co-witness discussion and Post-Event (Mis)information

Paterson & Kemp (2006a) suggest co-witness discussion may be one of the most persuasive forms of PEI.

Social contagion of memory
Memory Conformity
The Oklahoma bombing, 1995. The aftermath, the Ryder truck, Timothy McVeigh and John Doe #2
Social Contagion of memory
Social contagion of memory: Co-witnesses

- Witnesses talk
- A powerful source of post-event information
- Witnesses are unaware of memory change
- Have high level of confidence in their memories
- Cannot be prevented by warning after the fact
Even “real” events can be misremembered

80% of Participants “yield” and report at least one piece of misinformation

25% attempt to ID “JohnDoe”
Shared / Transactive memories
False Memories

- We have seen that memory can be inaccurate and we can induce change in memory, but can we make people remember things that never happened?
- That is, can we create “false memories?”
False Memory Research

  - Gave students 4 short narratives of childhood experiences – but one was false
  - “Lost for an extended time in a shopping mall at age 6 and rescued by an elderly person”
  - First checked if recalled: vague or no memories
  - After several suggestive interviews, 25% reported being lost in a mall and some gave rich and vivid details
  - But perhaps this is a common experience….
Balloon ride

  - Participants told parents provided photos
  - Asked to recall this event
  - After 3 interviews 50% had complete or partial memories of the event – many with lots of additional details
But it never happened!
Just Record everything?
MacDonald & Kemp (in Prep) Police Body Worn Cameras

Being introduced around the world

What impact does reviewing the recording have on memory

Participants followed treasure hunt and then 1 week later reviewed their video

For half participants video had been edited to include new information they had not seen
More than 90% of participants reported at least one piece of misinformation.
So why is my memory so “bad”?  

- Feeling let down by Darwin?  
- Your memory isn’t bad – just not “designed” for giving evidence  
- Sometimes it’s good to forget.  
- I don’t want to remember all the emotions I experienced when a loved one died.  
- I don’t want to remember all the embarrassing things I have done.  
- PTSD can be thought of as a failure of memory change.
Human memory

- Memory is not veridical
- It is vulnerable to distortion
- Once altered, the original memory is either hard or impossible to access
- We cannot distinguish unaltered from altered memories
- What can we do?
- Testing Effect – early complete recall protects memories against forgetting and distortion
The testing effect (Roediger, 2006)

Testing (retrieving from memory) results in better recall at a later time than does additional study or rehearsal.
• Designed to help witnesses record and recall events
• Free and available now for iPhone and Android
• Witnesses can record events using text or speech and can add photos. All entries are time, date and location “stamped”
• Witness can then send a report to police by email
• Based on psychological research showing that comprehensive early recall helps protect memory against subsequent distortion.
• Provides links to support services
• Designed for use by all witnesses including victims of family violence
iWitnessed can be used for any type of event, ranging from traffic accidents to terrorism.

iWitnessed was designed to collect and preserve eyewitness evidence. It has a lot of helpful features if you are a witness or victim of an incident.
iWitnessed uses a guided recall procedure that has been designed to help you remember details of an event.

You can enter information as text, images, or audio recordings.
Each report can be ‘stamped’ with the date, time, and GPS location.

iWitnessed can also be used to document both one-off and recurring events.
Advantages of iWitnessed:

iWitnessed uses a guided recall procedure that has been designed to maximise the value of the information recorded while also helping protect your memory of the event.

iWitnessed can be used for any type of event, including both one-off and recurring events.

iWitnessed records both written and oral accounts, with the latter shown to be more user-friendly (McPhee et al, 2014).

You can add images such as photographs or screenshots.

Each entry is ‘stamped’ with the date, time, and GPS location.

If you are concerned about security you can choose to protect your entries with a PIN code.

The information is stored on your device. You may choose to send it to someone by email.

iWitnessed provides direct links to support services and information about the psychological effects of trauma.
The Science of Memory and the Law

- Difficult cases
- Raises some sensitive issues which many do not want to hear at present
- How do we evaluate 30 year old memory evidence?
- Impact of media converge, Social media?
- Confidence vs Accuracy
- Expert evidence
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Questions?