Memory & the Law – Part 1: The Basics of Memory and Forgetting

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Groom Loses Memory of Wedding

The bride wasn't left waiting at the altar: she was left waiting at the airline terminal.

Honeymoon plans for a Texas couple came to an abrupt end when the groom suffered a case of amnesia, went missing and lost all memory of being married, police said on Wednesday.

Sean McNulty, 30, was found outside an abandoned hotel near Houston airport three days after he was to leave on a honeymoon to Italy, and five days after he tied the knot.
Guess what? TV viewers remember sex, violence -- but not commercials

You don't have to be a TV addict - or a media gadfly - to know that the boob tube has unfortunately lived up to its name in recent years. There's more sex, violence and dirty language than ever, and what once may have horrified the viewing public has become the norm.

Now, the first study to measure whether explicit programming helps advertising may, if taken seriously, affect networks where it will hurt them most: the bottom line.

A published study reports that the more sex and violence there is on a TV show, the less viewers remember the ads. Seems that viewers are so affected by the content of those shows that they don't remember much of anything. On the other hand, those who watched more family-oriented programs had a much better recall of commercials. The decline in memory occurred with adults of all ages, with both men and women and among those who both did and did not like the program.
Customer, teller have a chat before Plantation bank robbery

At 2:45 p.m. June 7, a teller at Union Planters Bank in Plantation asked a customer how he was feeling that day. The customer, wearing a fishing hat that covered the upper part of his face, said, “I'm fine but I have a gun. Give me your money. All of it.”

The teller handed the robber $1,034 from her drawer. The man placed the money in a clear plastic bag and walked out of the bank, returning to wipe his fingerprints off the front door handles. The robber was taped on surveillance cameras and the tape was turned over to the FBI. Although the teller testified to seeing a gun, no gun was visible in the video.

What do we know about memory?

1) Memory is not like a video recorder that produces “perfect recollection”…

2) Memory is not a “thing”…

3) Most people show “over confidence” in their ability to recall information – even about seemingly vivid, emotional experiences…

4) “Forgetting” is governed by a several regularities of perception and memory…
Sensory Memory

- very brief memory that is based upon a sensory register...

- the information in sensory memory is:
  (a) relatively raw and unprocessed
  (b) passively recorded
  (c) a fairly accurate representation

- studies have shown that sensory memory has a rather limited capacity and holds information for a short period of time
Iconic Memory

- the normal iconic memory will last for 250-300 msec in duration
- thereafter, it begins either to decay or incurs interference from subsequent visual information
- during the first 50 msec we encode the visual information, after which we begin to plan our next visual fixation

Sperling (1960)

<table>
<thead>
<tr>
<th>Fixation</th>
<th>Display</th>
<th>Tone</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/0 sec</td>
<td>G T F B Q Z C R K P S N</td>
<td>Tone occur at a delay of 0, .15, .30, .50, or 1 sec</td>
<td></td>
</tr>
<tr>
<td>Pitch of tone signals which row to report</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"G, T, F, B"
Sperling (1960)

Figure 2.4. Results on iconic memory.
SOURCE: Adapted from Sperling (1960).

Information-Processing Model…
Attention

- the conscious selection of information for further processing by the cognitive system
- are there times when you require “focus” to complete a particular task?
- are there tasks that you can complete rather “effortlessly”, including performing two tasks at once?

Attention

- “divided” vs. “selective” attention tasks

http://www.youtube.com/watch?v=vJG698U2Mvo
Attention

➢ “divided” vs. “selective” attention tasks

➢ two main issues in attention research:
  1) capacity of the attentional window…

“cocktail party” effect
Attention

- inattentional (or “change”) blindness
Short-Term Memory (STM)

- STM retains information only temporarily (30 sec - 2 min)
- the information is no longer an exact sensory image of the stimulus; rather, it is encoded into a mental representation of the stimulus
STM Capacity

- George Miller (1956)…”the magical number seven, plus or minus two”
- subitizing: perceivers estimated when greater than 7 items were displayed

STM Capacity

- George Miller (1956)…”the magical number seven, plus or minus two”
- subitizing: perceivers estimated when greater than 7 items were displayed
- span of immediate memory: perceivers can hold about 7 items (or “chunks”) of information

nonsense syllable experiment
Forgetting from STM

- **Decay**
  - information in STM eventually disappears if it is not maintained

- Brown (1958) / Peterson & Peterson (1959)

\[ \text{C H J} \rightarrow \text{Count backwards by 3 from 506} \rightarrow \text{recall letters} \]

delay was varied from 3 to 18 sec

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**Figure 4.2** Correct recall as a function of recall interval
Information-Processing Model…

Long-Term Memory (LTM)

- large (infinite) capacity
- items are transferred from STM to LTM based upon the use of “control processes”
  - strategies that a person uses to facilitate the acquisition and retrieval of knowledge (rehearsal, coding, imaging, etc.)
- contents include memory for experiences and information that have accumulated over a lifetime
**Procedural Memory**

- Semantic Memory
- Episodic Memory
- Autobiographical Memory

**Declarative Memory**

- Sensory Stage
- Pattern Recognition Stage
- Semantic-Associative Stage

**Depth of Processing**

**“what”**

**“how”**
Forgetting from LTM

- **Hermann Ebbinghaus**
  - in 1885, he conducted a series of memory experiments with *himself* as the subject
  - he attempted to memorize lists of “nonsense syllables”, and to chart his “forgetting” over time
  - his results demonstrated a “forgetting curve” that is now considered a “law” or regularity of memory
Autobiographical Memory

- memory for events, objects, and issues related to oneself
- a vital part of your identity (“self”), shaping your personal history and your sense of who you are

Flashbulb Memories
- memory for a situation in which you first learned of a very surprising and emotionally arousing event
- six types of information generally included:
  1) the place
  2) the ongoing event that was interrupted by the news
  3) the person who gave the news
  4) the emotions experienced by the individual at that time
  5) the emotions experienced by others
  6) the aftermath
Autobiographical Memory

- Flashbulb Memories
  - how accurate are our memories for such events?

24 hours after Challenger disaster

I was in my religion class and some people walked in and started talking about it. I didn’t know any details except that it had exploded and the schoolteacher’s students had all been watching which I thought was so sad. Then after class I went to my room and watched the TV program talking about it and I got all the details from that.
2 ½ years after Challenger disaster

When I first heard about the explosion I was sitting in my freshman dorm room with my roommate and we were watching TV. It came on a news flash and we were both totally shocked. I was really upset and I went upstairs to talk to a friend of mine and then I called my parents.

Why does memory fail?

- though often reliable, memory is fallible…

- Schacter (1999) describes the 7 “sins” or categories of memory failure
  - the first three describe aspects of forgetting
  - the next three refer to memory distortions
  - the final sin concerns intrusive recollections
“Forgetting” Sins...

- Transience - memory faces quickly over time

**decay**

Information in memory eventually disappears if it is not accessed

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“Forgetting” Sins...

- Transience - memory faces quickly over time

![Graph showing the decay of memory over time with a percentage of list retained when relearning over time in days since learning list.](chart.png)
“Forgetting” Sins…

- **Transience** - memory faces quickly over time

**interference**

similar items interfere with one another in either storage or retrieval
“Forgetting” Sins…

- Absent-mindedness - inattentive or shallow processing that contributes to weak memories of ongoing events or forgetting to do things in the future
“Forgetting” Sins…

- **Blocking** - even when a fact or event has been encoded deeply, and has not been lost over time, it may sometimes be temporarily inaccessible

  **tip-of-the-tongue phenomenon**

  people are unable to produce a word or a name, but they have a powerful subjective conviction that the item is available in memory

“Distortion” Sins…

- **Misattribution** - sins of commission in which some form of memory is present, but is misattributed to an incorrect time, place, or person

  **source confusion**

  individuals may misattribute the source of some information, or may assert that they saw a face in one context when they encountered it in another, or that they perceived an event that they only imagined
“Distortion” Sins…

- **Misattribution** - sins of commission in which some form of memory is present, but is misattributed to an incorrect time, place, or person

  *cryptomnesia*

  people sometimes misattribute a spontaneous thought or idea to their own imagination, when in fact they are retrieving it (without awareness of doing so) from a specific prior experience

“Distortion” Sins…

- **Suggestibility** - the tendency to incorporate information provided by others, such as misleading questions, into one's own recollections

  http://www.youtube.com/watch?v=PQr_IJyYzbA

  http://www.youtube.com/watch?v=_RLvSGYxDIs
Bias - memory encoding and retrieval are highly dependent on, and influenced by, preexisting knowledge and beliefs; likewise, memories of past experiences may be colored by present mood and emotional state.

- **Consistency Bias**: we tend to exaggerate the consistency between our past and present feelings/beliefs.
“Failure to Forget” Sin…

- **Persistence** - involves remembering a fact or event that one would prefer to forget; for example, intrusive recollections of traumatic events or chronic fears and phobias

**Directed Forgetting**
When instructed to “forget”, most individuals are able to do so – however, individuals suffering from PTSD are unable to suppress trauma-related content.