

HOW NOT TO REMEMBER NAMES



Memory 2

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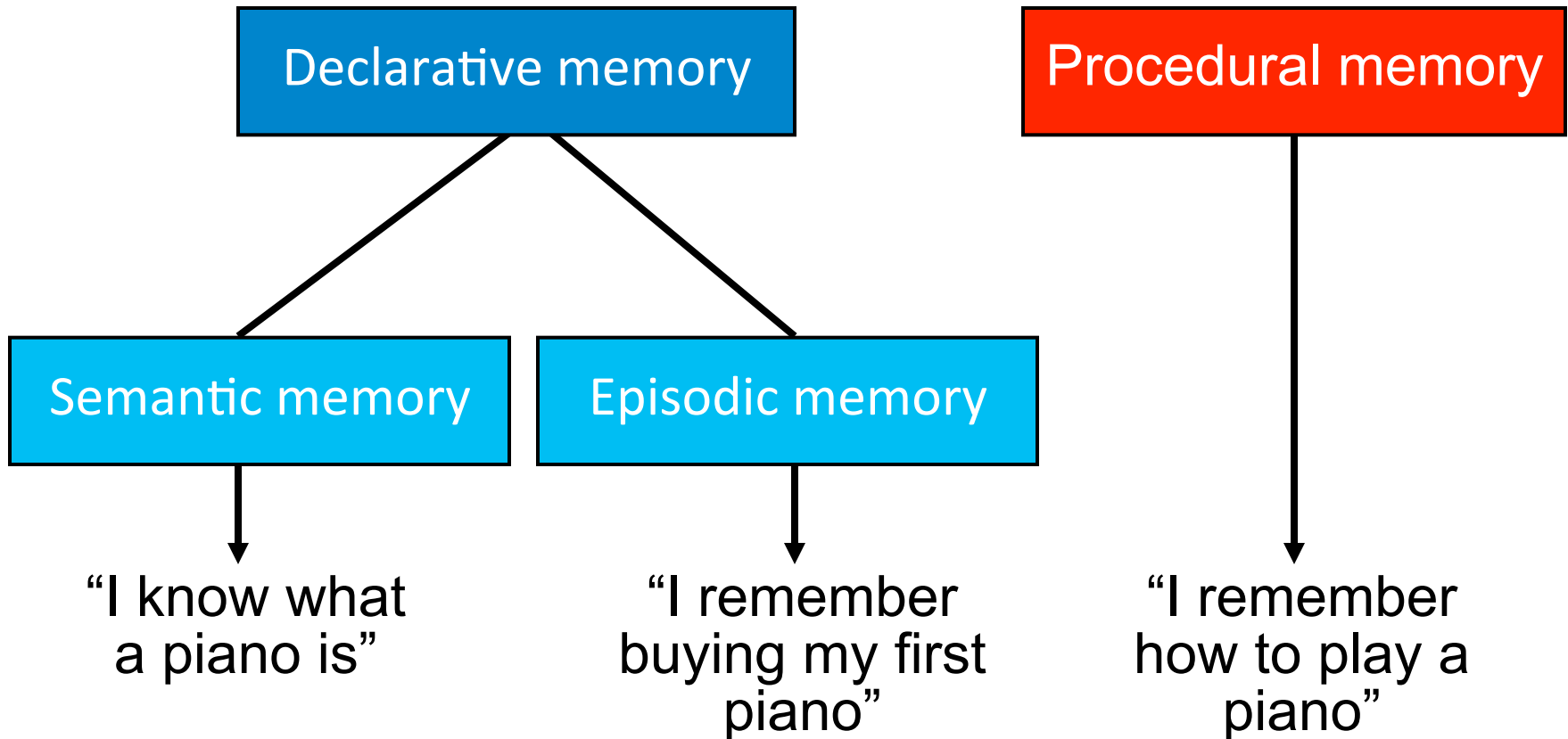
Encoding and Retrieval

- Encoding: transfer of information into LTM
- Retrieval: accessing the information from LTM

Types of Long-Term Memory

- **Procedural**
 - Memory for skills and procedures (how to)
- **Episodic**
 - Information about time and places (when, where)
- **Semantic**
 - Memory for meaning (importance)

Types of Long Term Memory



skill learning; priming; conditioning

Long-Term Memory

- Long-term memory
 - Storehouse for almost unlimited information over long periods of time
 - Easy to store procedural and semantic memories, but stores episodic information less well
 - Semantic and episodic memories grouped together as **declarative memory**

Retrieval of Long-Term Memories

- Three ways to test retrieval
 - **Recall method:** free, cued or hints
 - **Recognition method:** select correct info from alternative information (ie: multiple choice)
 - **Relearning method:** relearn previous learned information (look at time saved to relearn)

Explicit Versus Implicit Memory

- **Explicit** (declarative):
LTM knowledge that can be retrieved and then reflected on consciously
- **Implicit** (nondeclarative):
Knowledge that can influence thought and behaviour without any necessary involvement of conscious awareness

Episodic & Semantic Memory

- **Episodic:**

Stores personally experienced events
(e.g., how you spent the weekend)

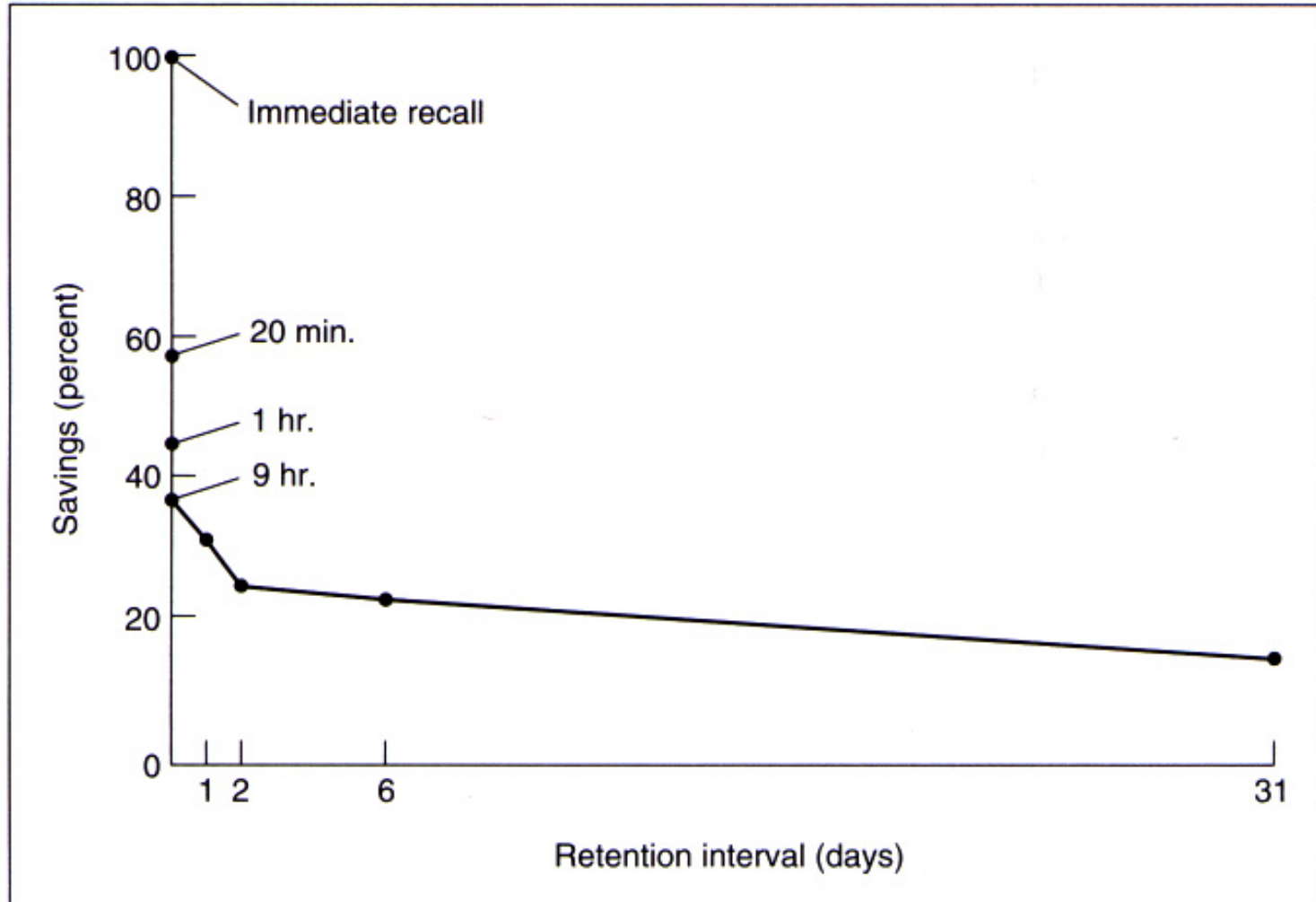
- **Semantic:**

Stores general world knowledge
(e.g., concepts and categories)

Ebbinghaus

- The founder of scientific research on memory
- Studied nonsense syllables
- Used the relearning task and savings scores
- D.V. for **savings** = number of attempts to achieve initial performance levels
- Repeated this procedure across days to assess forgetting rates

The Forgetting Curve



Storage in Episodic Memory

- Getting information into the system
- ***Encoding*** or Study phase
- Important Storage Effects:
 1. Rehearsal
 2. Organization
 3. Imagery

Storage Effects 1: Rehearsal

- A deliberate recycling of STM's contents.
- Rundus (1971)
 - Showed the primacy effect to be entirely dependent on rehearsal -- the first items in a list get the best and most rehearsal.
 - Overt rehearsal procedure allowed Rundus to count frequency of rehearsal for each word

Two Kinds of Rehearsal

- **Maintenance** (Type I)
Low-level information cycling (holding the pizza number in memory until you dial it)
- **Elaborative** (Type II)
More complex rehearsal using the meaning of the information

Craik and Lockhart (1972)



- **Depth of Processing (Levels of processing)**

Memory is determined not by how long information stays in the system, but by how the person processes it

Shallow processing leads to poor LTM traces.

Attention is focused on physical features (e.g., font, letters odd or even?, contains certain letters?)

Deep processing leads to strong LTM traces.

Attention is focused on meaning-based features (e.g., living or nonliving thing?, pleasantness rating)

Studying Depth of Processing

- Many LOP studies involve an *orienting task*:
Is it an animal? **DOG** (deep, semantic)
Is it in upper case? **table** (shallow, physical)
- Dog requires semantic processing; table does not. So, people will remember the word “dog” better than the word “table”

Storage effects 2: Organization

- The structuring or restructuring of information as it is being stored in memory
- Studied items may be re-ordered into categorical lists, or hierarchical structures
- Reorganization into memory packets, or **chunks** of information

Subjective Organization

- Organization developed by the subject for structuring and remembering a list of items without experimenter-supplied categories
- Tulving (1962): multi-trial free recall
 - Self-determined organizational structures, often unique to each individual
 - Better recall compared to yoked subjects, who simply received the same re-ordered lists to encode

Storage Effects 3: Visual Imagery

- The mental picturing of a stimulus that affects later recall or recognition
- Schnorr and Atkinson (1969):
 - Subjects studied paired associates (dog-book) either by forming a visual image or by rote repetition
 - Imagery condition did much better at remembering the second word (book) when cued with the first word (dog)

Paivio's Dual Coding Hypothesis

- Concrete words (cigar, truck) can be stored twice in long-term memory, once as a word, and once as a picture (with 2 types of code)
- Hence, concrete words are remembered better than abstract words (justice, idea), because the latter can be retrieved in two ways; whereas, the former can be retrieved in only one way

Retrieving Episodic Information

- Decay or Interference as the cause of forgetting?
- Jenkins and Dallenbach (1924)
 - After identical time delays, subjects who stayed awake remembered less than subjects who slept after learning a list

Results suggest that interference is an important factor

Availability Versus Accessibility

- **Availability:**
The memory trace exists / was encoded into long term memory
- **Accessibility:**
Degree to which the memory trace can be retrieved now
- **Retrieval failure** occurs when the information is available, but not accessible

Retrieval Failure

- When a memory is lost in the system versus lost from the system
- Temporary access problem
- Example:
Tip of the Tongue States-
When a person is temporarily unable to remember some shred of information (e.g., a name) that they know is stored in LTM



Encoding Specificity



- Tulving and Thompson (1973)
- Each item is encoded into a richer memory representation, one that includes any extra information about the item that was present during encoding
- Anything present during learning a target can serve as an effective cue for later remembering that target
- Also suggests that using another retrieval cue that was *not* part of the encoding context is less useful

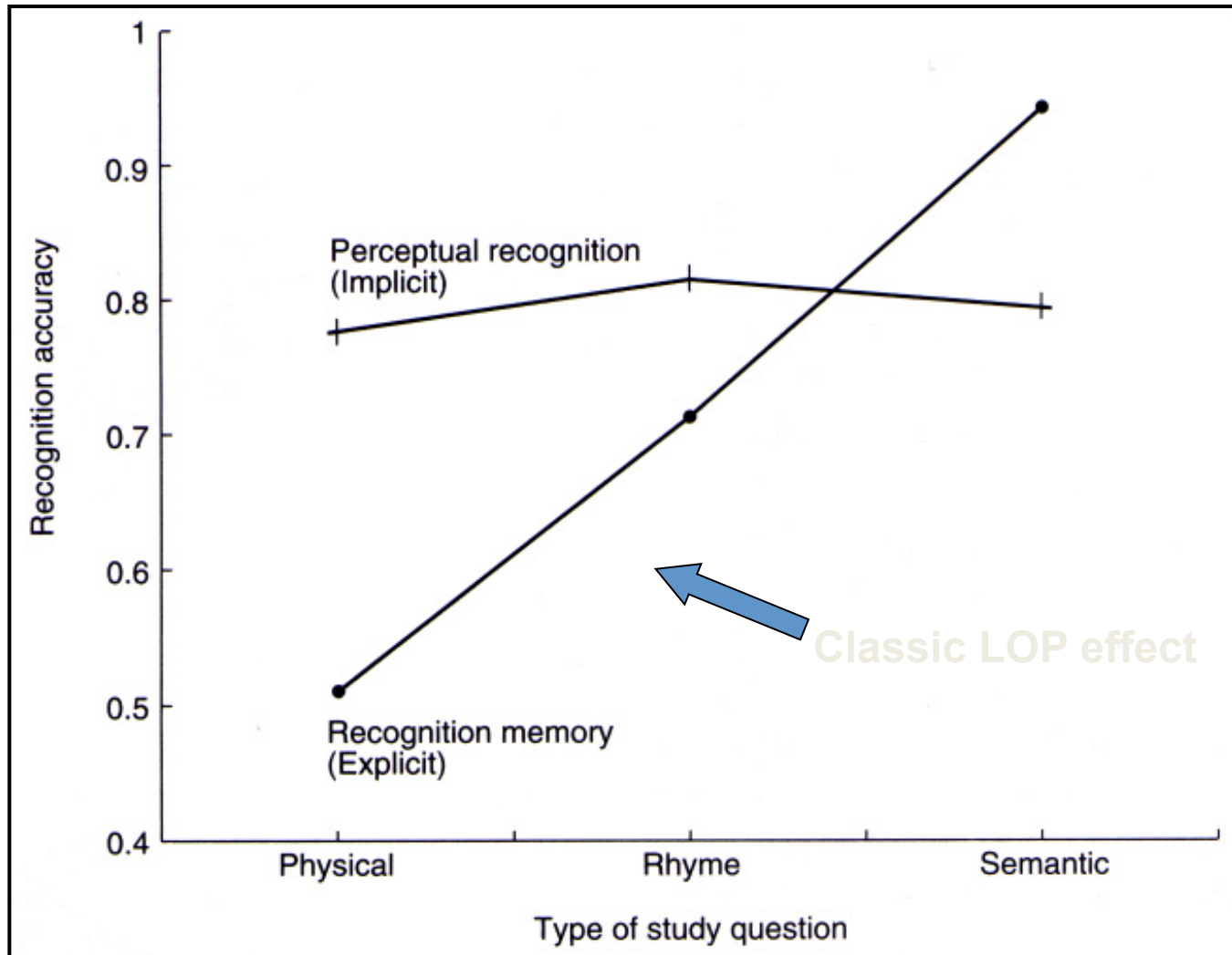
Retrieval Cues and Encoding Specificity

- Tulving and Thomson (1973): showed that retrieval is best if the encoding and retrieval contexts match
 - Weak encoding cues (ground - COLD)
 - Generate and recognize using strong cues (hot - ?)
 - Recall using weak cues (ground - ???)
- ⇒ Found that Rn using strong cues was worse than recall using weak cues, even though Rn is usually easier
- ⇒ Therefore, evidence for encoding specificity

Jacoby and Dallas (1981)

- Goal: contrast explicit and implicit memory systems
- Encoding phase: Orienting tasks varied the depth of processing:
 - Physical: does it contain the letter “L”?
 - Rhyme: does it rhyme with purse?
 - Semantic: Is it an animal?
- Retrieval phase:
 - explicit memory test: “Yes or No, was this word in the list you just saw?” (recognition)
 - implicit memory test: The study words were flashed briefly on a computer screen (e.g., 35 ms) and the subjects had to report the word they saw. (perceptual identification)

Jacoby and Dallas (1981) Results



Summary of Jacoby and Dallas

- Measures of **explicit** memory are sensitive to how the information is processed / studied (levels of processing, encoding specificity)
- Measures of **implicit** memory usually show facilitation via repetition priming **regardless** of how the information was processed / studied

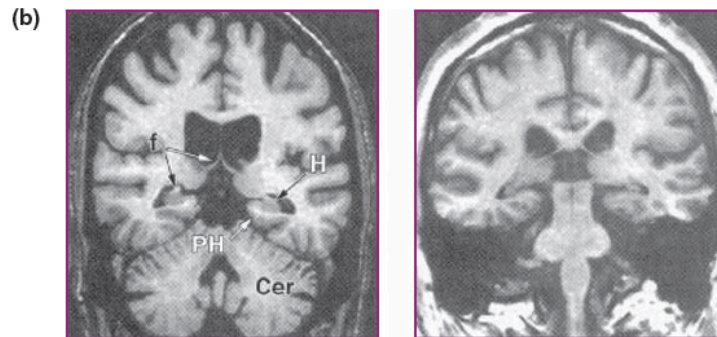
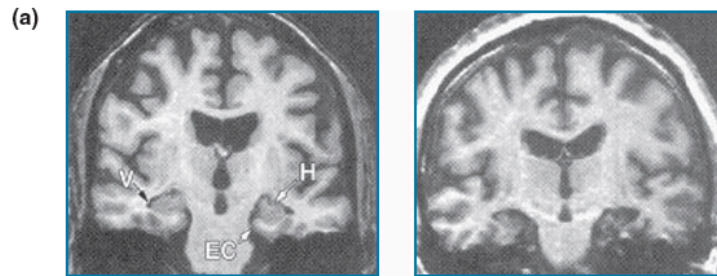
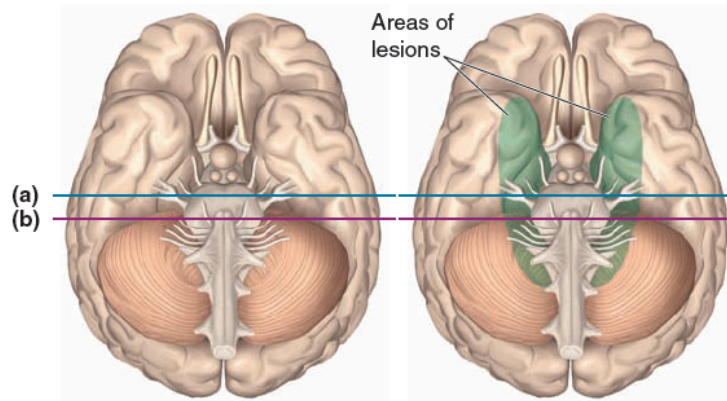
H.M.



Henry Gustav Molaison

- Severe epilepsy
- Age 27 (surgery in 1953)
- Bilateral removal of hippocampus, amygdala, surrounding cortex, +
- Studied for 50 years: multiple memory systems

HM's Brain



Coronal sections of typical person's brain

Coronal sections of H. M.'s brain

What can HM do?

- Intact short term memory
- Skill learning
- Classical conditioning
- Intact priming



H.M.:

- <https://www.youtube.com/watch?v=IKP6tBhM2T4>

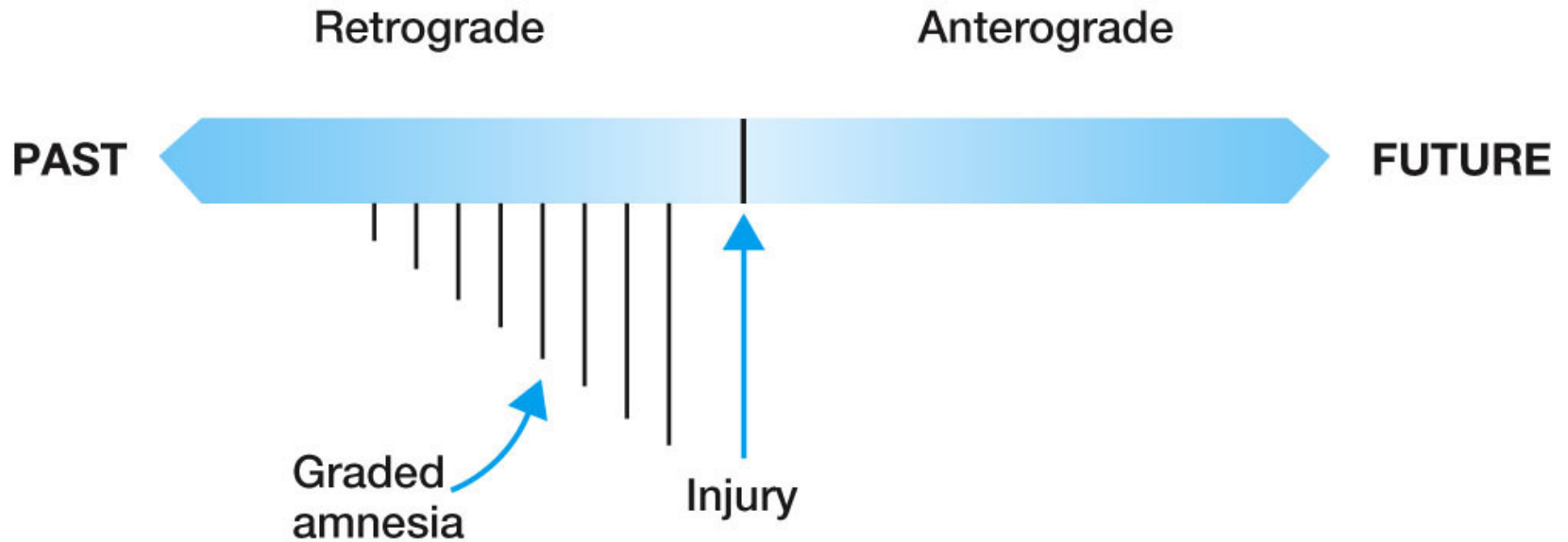
Brenda Milner:

- https://www.youtube.com/watch?v=JliczINA_Y

Types of Amnesia

- Physiologically triggered
 - Brain lesions (permanent or temporary) or Altered brain functions (red out phenomenon, drugs, etc.)
 - Recuperation within 3-6 months
 - partial depending on severity
- Material lost will never be retrieved
 - Memories not perceived or not encoded
 - Presence of both retrograde and anterograde amnesias

Types of Amnesia



Amnesia: Disorders of Memory

- **Retrograde amnesia**
 - No memory of what happened immediately before an accident or highly stressful event
 - Little or no disruption in STM
 - New long-term memories can be formed

Amnesia: Disorders of Memory

- **Anterograde amnesia**
 - Inability to store and retrieve new information
 - **Hippocampus** involved in episodic memory
 - Damage prevents formation of new long-term declarative memories