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Borges. Ficciones de un Tiempo Infinito
Artes Visuales /
Ciclo de Charlas y Conferencias

Borges y la Memoria

(parte II - La Memoria de Shakespeare)

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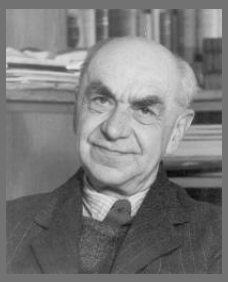
Jueves 11 de agosto, 18.30h - Auditorio 513

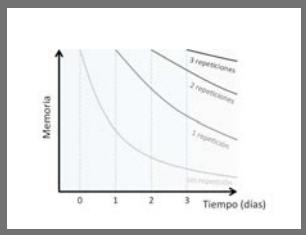
Neurociencia de Sistemas

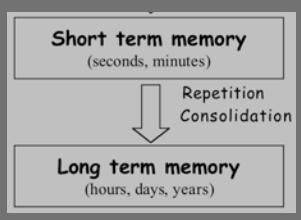
- Clase 1. Introducción
- Clase 2. Registros extracelulares y Spike sorting.
- Clase 3. Procesado de información visual.
- Clase 4. Percepción y memoria.
- Clase 5. Decodificación – Teoría de la información.
- Clase 6. Electroencefalografía – Análisis de tiempo-frecuencia y Wavelets.
- Clase 7. Potenciales evocados – Análisis de ensayo único.
- Clase 8. Dinámica no-lineal – Sincronización.

Ebbinghaus vs. Bartlett



Ebbinghaus learning curves



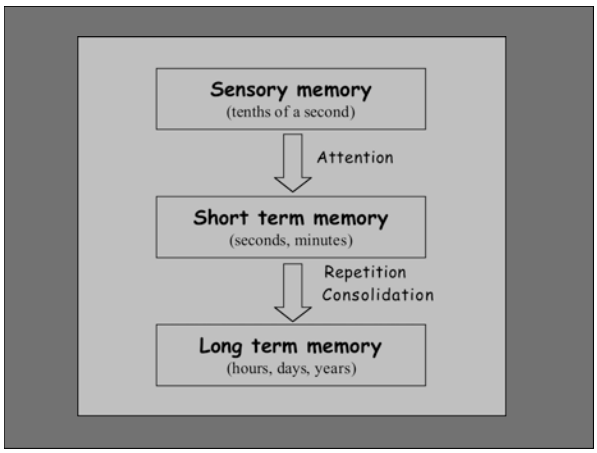


George Sperling

T D R V

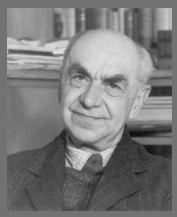
S R N L

F Z R H



Frederic Bartlett (1886-1969)

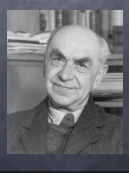
- Gave his Cambridge students folk stories to remember.
- Found that recalled stories tended to be shorter and changed according to the interpretation of the subject.
  - Recall is a constructive process
  - Memories are labile
  - We create an schema



Perception & memory

- Perception
  - Helmholtz --> we see signs

- Memory
  - Bartlett --> we create a schema



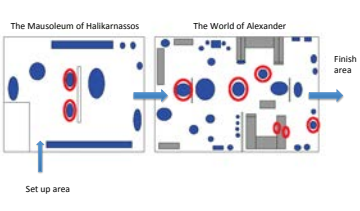
Eye tracker

Jennifer Binnie

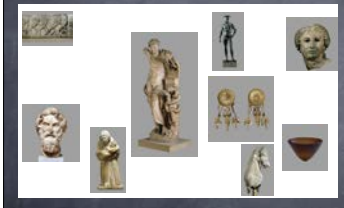
Video - Tate Britain

British Museum

Rooms map of the BM



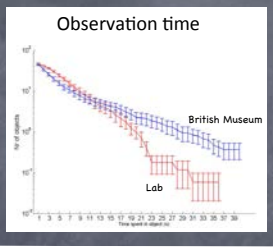
British Museum

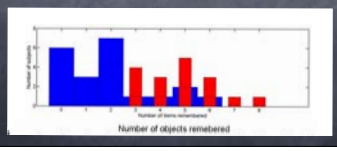


Carlos Pedreira

British Museum

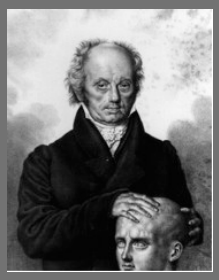
British Museum

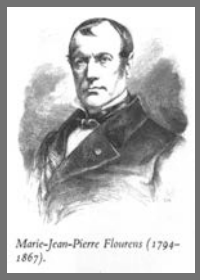




Donde estan las memorias?

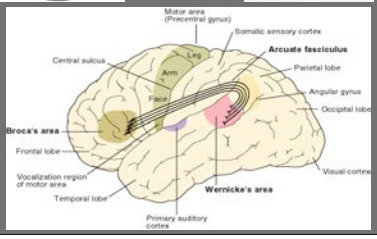
Gall vs. Flourens





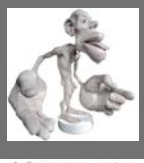
Brocca

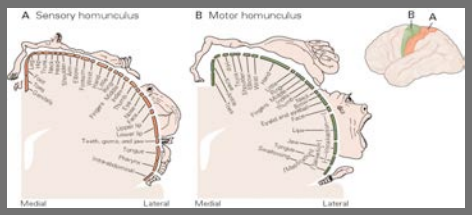
Wernicke



- Fritsch and Hitzig --> electrical stimulation in dogs
- John Hughlings Jackson (1835-1911) --> study of epileptic seizures
- Sir David Ferrier --> stimulation and lesions to show a topographical organization of motor cortex

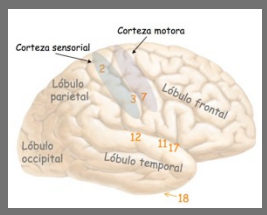
Wilder Penfield



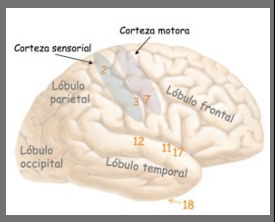


Wilder Penfield

- point 2: the patient reported feeling a tickle in her left thumb;
- point 3: a tickle in the right-hand side of her tongue;
- point 7: a twitch of the tongue.
  - Points 2 and 3 were on the sensory cortex, while point 7 was on the motor cortex.



- Point 11 [The patient reports]: "I heard something, I do not know what it was."
- Point 11 [Penfield repeated the stimulation without warning]: "Yes, I think I heard a mother calling her little boy somewhere. It seemed to be something that happened years ago. ... It was somebody in the neighborhood where I live."
- Point 12: "Yes, I heard voices down along the river somewhere—a man's voice and a woman's voice calling ... I think I saw the river."
- Point 17: "Oh! I had the same very, very familiar memory, in an office somewhere. I could see the desks. I was there and someone was calling to me, a man leaning on a desk with a pencil in his hand."
- [Penfield warns her that he will stimulate her brain, but does not]: "Nothing."
- Point 18 [At the bottom of the temporal lobe. Penfield applies a stimulus without warning]: "I had a little memory—a scene in a play—they were talking and I could see it—I was just seeing it in my memory."

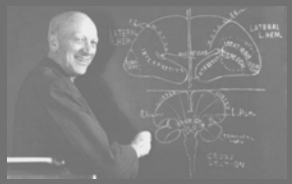


Lashley vs. Milner

Karl Lashley (1890-1958)

- Looked for the engram
- Did lesions in rats navigating a maze
- Found that what mattered was the size and not the location of the lesion
- But made 2 mistakes
  - Didn't lesion internal structures
  - Navigation is too complex a task

Wilder Penfield & Brenda Milner

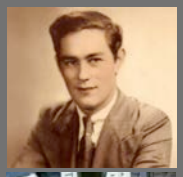


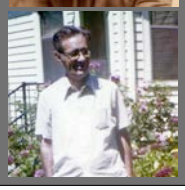
Henry Gustav Molaison (1926-2008)

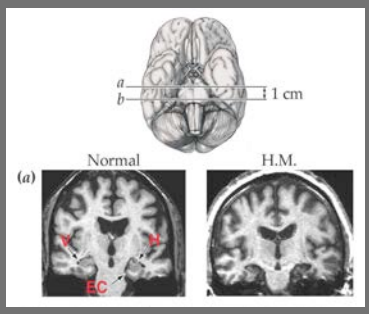
William Scoville

Hipocampus

Patient H.M.





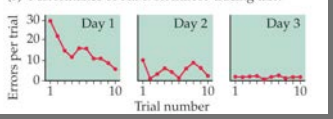


After surgery

- No language or perceptual deficits or motor deficits
- IQ unchanged (118)
- Remembered who he was
- Intact digit span –short-term memory – can hold a conversation. But forgetting occurred the moment he shifted attention.
- Anterograde amnesia

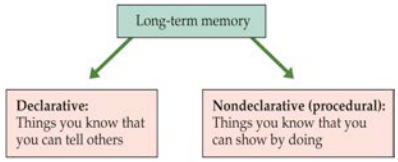
- Hippocampus is critical for (declarative) memory consolidation

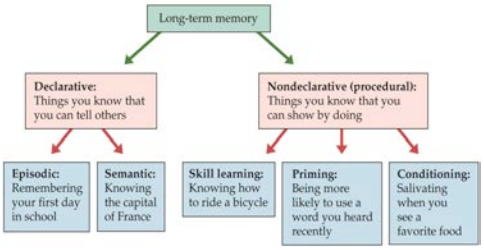
(b) Performance of H.M. on mirror-tracing task



Two types of memory:

- **Declarative memory** deals with *what* – facts and information acquired through learning that can be stated or described.
- **Nondeclarative (procedural) memory** deals with *how* – shown by performance rather than recollection.





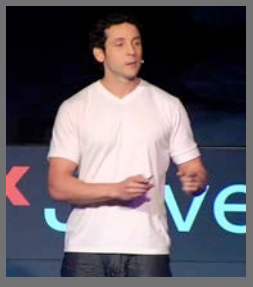
Models

- Squires
  - **Standard consolidation model**
  - Hippocampus is critical for memory consolidation
  - Once memories consolidate (in cortex), the hippocampus is not necessary anymore.
- Moscovitch and Nadel
  - **Multiple trace theory**
  - Hippocampus is always necessary for episodic memories
- Aggleton and Brown (also Eichenbaum & Yonelinas)
  - **Dual process theory**
  - Recollection in hippocampus
  - Familiary in Perirhinal cortex
- Eichenbaum
  - **Relational theory**
  - Hippocampus allows flexible association of information from neocortical modules

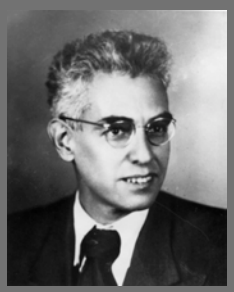
Models for rodent hippocampus

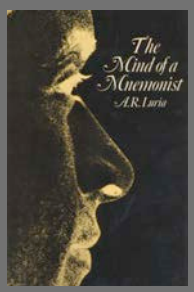
- O'Keefe and Nadel
  - **Cognitive map**
  - Hippocampus constructs and stores an allocentric representation of space
  - In humans such representation has evolved to support episodic memories
- Eichenbaum
  - **Relational theory**
  - Hippocampus allows flexible association of information from neocortical modules
  - Cognitive map is a special case of relational learning
- Buszaki
  - Hippocampal place cells are like semantic memories
  - Allow the formation of episodic memories.

Rodrigo vs. Andres...



Alexander Luria (1902-1977)





Solomon Shereshevskii (S.)

Solomon Shereshevskii (1886-1958)