Memory systems, processes and forgetting

Supported GRE teaching and original transfer practice

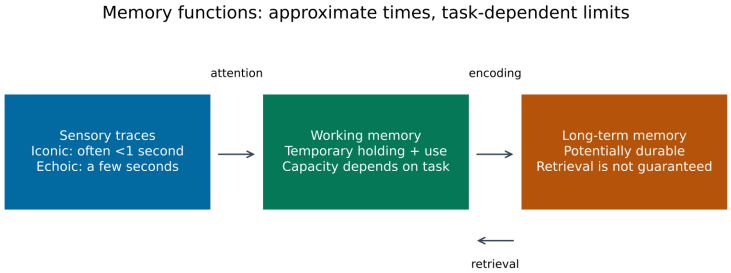
Memory systems, processes and forgetting

- Describe the stores of the modal model and **working memory** 工作记忆.
- Separate explicit memory (episodic and semantic) from **implicit memory** 内隐记忆.
- Explain forgetting by interference and retrieval failure.
- Read the **serial position curve** 系列位置曲线.

The modal model

- Sensory memory: a brief, almost complete copy of the input. Sperling (1960) showed that a visual (iconic) image fades in under a second; the sound (echoic) trace lasts a few seconds.
- Short-term memory: a few items for about 20 seconds without rehearsal. Miller's 1956 estimate was 7 ± 2 items; later work suggests about 4 chunks.
- Long-term memory: lasting and practically unlimited.
- Chunking recodes items into familiar units ("FBI", "CIA") so that more information fits.

Figure: The modal model



- Attention moves information into working memory, encoding into long-term memory; retrieval is never guaranteed
- Match each part of the diagram to the text.

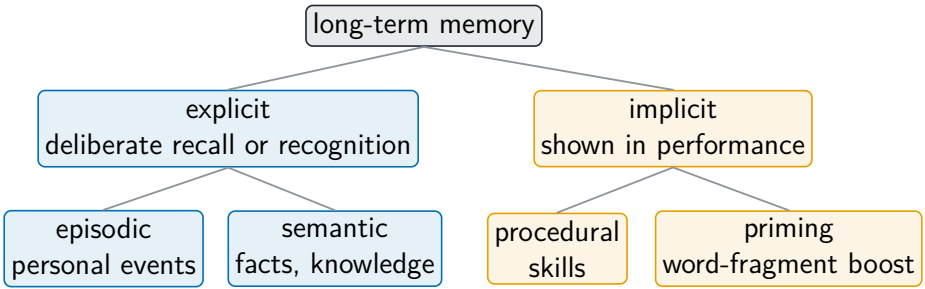
Working memory

- The central executive directs attention and coordinates the other parts.
- The phonological loop holds speech-like material; the visuospatial sketchpad holds images and locations.
- Two tasks that use the same part interfere more than tasks that use different parts.

Kinds of long-term memory

- Explicit (declarative) memory is deliberate recall or recognition. Episodic memory holds personal events; semantic memory holds facts.
- **Implicit memory** shows in performance without conscious recollection: skills (**procedural memory 程序性记忆**) and **priming 启动效应**, where earlier exposure makes later processing easier.
- Molaison lost new explicit memory but kept implicit learning, so the two can be separated.

Figure: Kinds of long-term memory



- Long-term memory by awareness and content.
- Match each part of the diagram to the text.

Forgetting

- **Proactive interference 前摄干扰**: old learning disrupts new learning.
- **Retroactive interference 倒摄干扰**: new learning disrupts old learning.
- Retrieval failure: the memory is stored but the cue does not reach it. Encoding specificity says recall is best when the cues at retrieval match those at learning. Divers who learned words underwater recalled them better underwater (Godden and Baddeley, 1975).
- Decay alone explains little; most exam cases are interference or retrieval failure.

The serial position curve

- Primacy reflects extra rehearsal, which moves the early items into long-term memory.
- Recency reflects items still in short-term memory. A 30-second distracting task removes recency but leaves primacy.

Worked example: interference

- Old disrupting new: **proactive interference**.
- New disrupting old: **retroactive interference**.
- Name the memory being lost and the memory causing the problem before choosing the label.

Worked example: naming the memory

- Riding a bicycle after years without practice: procedural (implicit).
- Remembering a tenth birthday party: episodic (explicit).
- Completing "ele____" as "elephant" because the word appeared earlier, without remembering having seen it: **priming** (implicit).
- Knowing that Paris is the capital of France: semantic (explicit).

Common errors

- Treating working memory as a single store.
- Calling every forgetting "decay".
- Mixing up proactive and **retroactive interference**.

Common errors (2)

- Saying a distracting task removes primacy; it removes recency.
- Treating 7 ± 2 as an exact, universal capacity.

Key terms

- **working memory**: A limited system that holds and works on a small amount of information for a short time.
- **implicit memory**: Memory shown in performance without conscious recollection.
- **procedural memory**: Memory for skills and habits.
- **priming**: Easier processing of a stimulus because of earlier exposure to it or something related.

Check yourself

- Learning Spanish makes it harder to recall French learned earlier. Which interference is this?
- A list is followed by 30 seconds of counting backwards. Which part of the **serial position curve** disappears?
- Which kind of memory did Henry Molaison keep for new skills?