





RETRIEVAL AND RECOGNITION


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- Y **Recall or retrieval of memory refers to the subsequent re-accessing of events or information from the past, which has** been previously encoded and stored in the brain. In common parlance, it is known as **remembering**. During recall, the brain “replays” a pattern of neural activity that was originally generated in response to a particular event, echoing the brain’s perception of the real event. In fact, there is no real solid distinction between the act of remembering and the act of thinking.
 - Y These replays are not quite identical to the original, though – otherwise we would not know the difference between the genuine experience and the memory – but are mixed with an **awareness** of the current situation. One corollary of this is that memories are not frozen in time, and new information and suggestions may become incorporated into old memories over time. Thus, remembering can be thought of as an act of **creative reimagination**.

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- Y Because of the way memories are encoded and stored, memory recall is effectively an on-the-fly **reconstruction** of elements scattered throughout various areas of our brains. Memories are not stored in our brains like books on library shelves, or even as a collection of self-contained recordings or pictures or video clips, but maybe better thought of as a kind of collage or a jigsaw puzzle, involving different elements stored in disparate parts of the brain linked together by **associations** and **neural networks**.
- Y Memory retrieval, therefore, requires re-visiting the nerve pathways the brain formed when encoding the memory, and the strength of those pathways determines how quickly the memory can be recalled. Recall effectively returns a memory from long-term storage to short-term or working memory, where it can be accessed, in a kind of mirror image of the encoding process. It is then re-stored back in long-term memory, thus re-consolidating and strengthening it.



Y The efficiency of human memory recall is astounding. Most of what we remember is by **direct retrieval**, where items of information are linked directly a question or cue, rather than by the kind of **sequential scan** a computer might use (which would require a systematic search through the entire contents of memory until a match is found). Other memories are retrieved quickly and efficiently by **hierarchical inference**, where a specific question is linked to a class or subset of information about which certain facts are known. Also, the brain is usually able to determine in advance whether there is any point in searching memory for a particular fact (e.g. it instantly recognizes a question like “ What is Socrates’ telephone number?” as absurd in that no search could ever produce an answer).

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- Υ There are **two main methods** of accessing memory: recognition and recall. **Recognition is** the association of an event or physical object with one previously experienced or encountered and involves a process of comparison of information with memory, e.g. recognizing a known face, true/false or multiple-choice questions, etc. Recognition is a largely unconscious process, and the brain even has a dedicated **face-recognition area**, which passes information directly through the **limbic areas** to generate a sense of familiarity, before linking up with the **cortical path**, where data about the person's movements and intentions are processed.
 - Υ **The recall** involves remembering a fact, event or object that is not currently physically present (in the sense of retrieving a representation, mental image or concept), and requires the direct uncovering of information from memory, e.g. remembering the name of a recognized person, fill-in-the blank questions, etc.

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- Y Recognition is usually considered to be “superior” to recall (in the sense of being more effective), in that it requires just a single process rather than two processes. Recognition requires only a simple **familiarity decision**, whereas a full recall of an item from memory requires a two-stage process (indeed, this is often referred to as the **two-stage theory** of memory) in which the search and retrieval of **candidate items** from memory is followed by a familiarity decision where the correct information is chosen from the candidates retrieved.
 - Y Thus, recall involves actively **reconstructing** the information and requires the activation of all the neurons involved in the memory in question, whereas recognition only requires a relatively simple decision as to whether one thing among others has been encountered before. Sometimes, however, even if a part of an object initially activates only a part of the **neural network** concerned, recognition may then suffice to activate the entire network.



Thank you