

18. FORGETTING

Forgetting (retention loss) refers to apparent loss of information already encoded and stored in an individual's long term memory. It is a spontaneous or gradual process in which old [memories](#) are unable to be recalled from memory storage. It is subject to delicately balanced optimization that ensures that relevant memories are recalled. Forgetting can be reduced by repetition and/or more elaborate cognitive processing of information. Reviewing information in ways that involve active retrieval seems to slow the rate of forgetting.

Forgetting functions (amount remembered as a function of time since an event was first experienced) have been extensively analyzed. The most recent evidence suggests that a power function provides the closest mathematical fit to the forgetting function.

Theories of forgetting

The four main theories of forgetting apparent in the study of psychology as follows;

Cue-dependent forgetting

[Cue-dependent forgetting](#) (also, [context-dependent forgetting](#)) or retrieval failure, is the failure to recall a [memory](#) due to missing [stimuli](#) or cues that were present at the time the memory was [encoded](#). It is one of five [cognitive psychology](#) theories of forgetting. It states that a memory is sometimes temporarily forgotten purely because it cannot be retrieved, but the proper cue can bring it to mind. A good [metaphor](#) for this is searching for a book in a library without the [reference number](#), title, author or even subject. The information still exists, but without these cues retrieval is unlikely. Furthermore, a good [retrieval](#) cue must be consistent with the original encoding of the information. If the sound of the word is [emphasized](#) during the encoding process, the cue that should be used should also put emphasis on the [phonetic](#) quality of the word. Information is available however, just not readily available without these cues.

Trace decay

Trace decay focuses on the problem of availability caused when memories decay. Hebb said that incoming information causes a pattern of neurons to create a neurological memory trace in the brain which would fade with time. Repeated firing causes a structural change in the synapses. Rehearsal of repeated firing maintains the memory in STM until a structural change is made.

Organic causes

Forgetting that occurs through physiological damage or dilapidation to the brain are referred to as organic causes of forgetting. These theories encompass the loss of information

already retained in [long term memory](#) or the inability to encode new information again. Examples include [Alzheimer's](#), [Amnesia](#), [Dementia](#), consolidation theory and the gradual slowing down of the central nervous system due to [aging](#).

Interference theories

[Interference theory](#) refers to the idea that forgetting occurs because the recall of certain items interferes with the recall of other items. In nature, the interfering items are said to originate from an over stimulating environment. Interference theory exists in three branches, Proactive, Retroactive and Output. Retroactive and Proactive inhibition each referring in contrast to the other. Retroactive interference is when new information (memories) interferes with older information. On the other hand, proactive interference is when old information interferes with the retrieval of new information.^[1] Output Interference occurs when the initial act of recalling specific information interferes with the retrieval of the original information.

Decay theory

Decay theory states that when something new is learned, a neurochemical, physical "memory trace" is formed in the brain and over time this trace tends to disintegrate, unless it is occasionally used.

Definitions and Controversy

Forgetting can have very different causes than simply removal of stored content. Forgetting can mean access problems, availability problems, or can have other reasons such as [amnesia](#) caused by an accident.

A debatable yet popular concept is "[trace decay](#)", which can occur in both short and [long-term memory](#). This theory, applicable mostly to [short-term memory](#), is supposedly contradicted by the fact that one is able to ride a bike even after not having done so for decades. "[Flashbulb memories](#)" are another piece of seemingly contradicting evidence. It is believed that certain memories "trace decay" while others don't. Sleep is believed to play a key role in halting trace decay, although the exact mechanism of this is unknown.