

2B.2.2 Reasons for forgetting

Decay, interference and displacement

There are many different explanations of forgetting but all tend to focus on just one or two particular aspects of this complex phenomenon. Probably the two most well-known theories are interference theory and decay theory. **Interference** occurs when competing information causes us to forget something (e.g. learning the Spanish word for an object after learning the French word). **Decay** occurs when the passage of time causes us to forget (i.e. the memory trace fades). These theories are popular because they appear to fit with common-sense views of the way memory works. However, evidence suggests that they may not give a complete picture of how forgetting occurs. They are also limited in terms of practical implications: suggesting, for example, rather obvious things like avoiding learning for French and Spanish vocabulary tests at the same time!

Displacement is another intuitively appealing explanation of forgetting. The idea is that trying to store too much information may cause previously encoded material to be pushed out, i.e. displaced. It is a good candidate for explaining forgetting in STM because this appears to have a capacity limit (7 ± 2 according to Miller) but would not apply to LTM since such capacity limitations do not seem to apply to this store.



Reading: Gross pages 259-264



SAQ 7

- Briefly summarise evidence for and against trace decay theory in (i) STM and (ii) LTM.
- How is interference usually studied in the laboratory?
- Explain the difference between *response competition* and *unlearning* as explanations of interference.
- Why has it been difficult to demonstrate interference outside the 'laboratory'?

Retrieval failure: cue-dependent forgetting

According to Tulving, what matters in explaining forgetting is not whether a piece of information has been lost from memory completely (for example through decay), but rather whether or not it can be found. Some psychologists have even suggested that all the information that we have ever learned is available somewhere in the memory system, but that much of it may no longer be accessible. (This is known as the 'Permanent Memory Hypothesis', and is discussed further in Eysenck, 1993).

Tulving suggested that success or failure at recall is determined by the **retrieval cues** that are present at the time of recall. The better, or more numerous, the retrieval cues, the better the recall. Retrieval cues can be *internal* (demonstrated in the case of state-dependent forgetting), or *external* (context-dependent forgetting).



Reading: Gross pages 261-263



SAQ 8

Explain what is meant by:

- a) state-dependent forgetting
- b) context-dependent forgetting
- c) Tulving's encoding specificity principle (ESP)
- d) cues deriving from extrinsic knowledge
- e) cues deriving from intrinsic knowledge

The retrieval cue hypothesis is a very plausible account of certain aspects of forgetting. According to the proponents of retrieval failure theory, it is unnecessary to use the idea of trace decay to explain the forgetting of information over time. A change in retrieval cues can disrupt forgetting and, as cues alter over a period of time, memories will gradually become more and more inaccessible. For example, physical cues that are associated with our childhood years disappear as houses, and even whole neighbourhoods, are pulled down.

Lack of consolidation

Before a memory becomes firmly established, a period of time is required for **consolidation**. Disruption during this time can result in a loss of memory. It has been suggested that certain biochemical changes in the nervous system are responsible for laying down memories and if these are disrupted during consolidation, then the information is lost. This disruption can be caused by a number of factors including brain surgery, concussion, electro-convulsive therapy (ECT) and drugs. It leads to the loss of long term memory for the duration of the disruption. For example:

- ▶ Yarnell & Lynch (1970) questioned American footballers with concussion at varying time intervals after their injury, about what particular play had preceded the concussion. The players could answer this question immediately after the concussion, but if asked again 3-20 minutes later, they were unable to recall the events.
- ▶ Hudspeth *et al* (1964) identified the approximate amount of time that ECT disrupts consolidation by giving participants training in tasks before their shocks. Training was undisturbed if it took place one hour before treatment but became increasingly disrupted the closer it took place to the electric shocks.



Reading: Gross page 666



SAQ

Outline some of the factors that can influence consolidation of memories.