

TOR ENDESTAD:

## Metaphors of Memory: to Reconstruct a Dinosaur

In our attempt to understand memory both scientists and laymen are forced to try to describe something unobservable. We can experience the effect of not remembering but have no introspective access to the mental processes that constitute a memory. In every day use of language to describe memory, a number of metaphors are in frequent use. We talk about memories that can be “lost”, be “found”, be searched for etc.

Numerous metaphors have been suggested to guide our scientific understanding of memory. Memory has been said to be like a wax tablet, an encyclopaedia, a muscle, a telephone switchboard, a computer and a hologram. Theorists have proposed core-context units, cognitive maps, memory tags, kernels, loops etc.

(Underwood 1972). However one feature is common to most metaphors about memory. They seem to be based on the idea of an organized space; a storage of some kind. The space might have a structure of networks with nodes or paths or hierarchies with localizations and classifications.

The nodes or localizations represent verbal, perceptual, propositional or other entities of memories. This of course has a tremendous impact both on how we scientifically understand memory and how we talk about and understand memory in every day life.

In these terms we talk about “storing” memories, of “searching” for and “locating” them. We organize our thoughts; we “look for” memories that have been “lost”. If we are lucky, we “find” them. In memory research two contrasting metaphors have inspired the enquiry: the multiple store metaphor and the archaeology metaphor.

### The multiple store metaphor

The idea that it is useful to describe memory as composed of separate “stores” has guided theoretical research on memory over the last 40 years. Based on an analogy with the stores in computers, most of the research has been based on the distinction that Atkinson and Shiffrin (1968) made between a short term and a long term store in memory. The short term store is believed to hold information over a short period of time. During this time it has a certain probability of being transferred into the long term store. In the original model this was linked to the kind of processing that was performed with the information. Repetition would be one way of increasing the probability that information were transferred. The long term store was thought of as an infinite space where information was kept until it was found and brought forward.

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The idea of separate stores in memory has been derived partly from the various memory stores found in computers. This has also had implications for how we have conceptualized the kind of units that can be stored in memory. A great deal of emphasis has been on verbal word-like materials, where units are not unlike those found in high level computer programs. Implications of this model are that memory traces are static structures with active processes between stores. In this context, to retrieve is to locate a memory and select appropriate information. Memories are viewed as complete; all information in a trace is available at the same time.

The store metaphor has inspired laboratory research on memory to the extent that the Atkinson and Shiffrin model often is called “the standard model” of human memory. The model has been developed to include a multitude of stores and processes to account for the empirical data (figure 1).

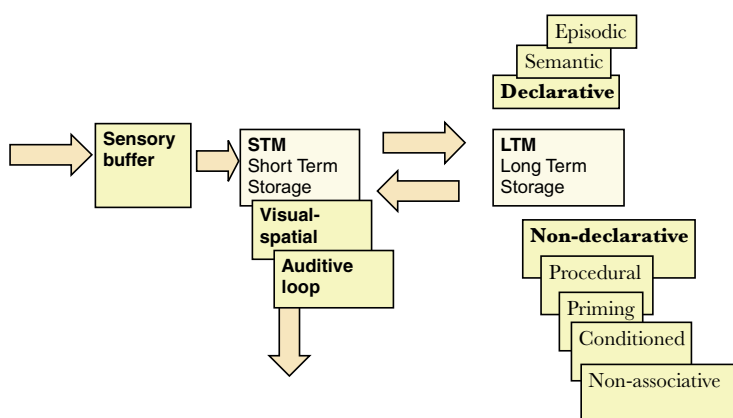


Figure 1. Extension of the Atkinson & Shiffrin model.

Several researchers have criticized the multiple store models for not capturing important memory phenomenon like false memories or incomplete memories. At the same time the multiple store metaphor has inspired researchers to perform well controlled experiments with lists of simple materials. Researchers observing memory phenomena in “real life” have questioned the validity of store inspired research. As an alternative Neisser (1967) proposed a different metaphor to account for everyday memory.

### Memory as archaeology

In parallel with the store metaphor another metaphor encapsulating different aspects of memory has been developed. Bartlett (1932) observed that episodes are remembered in terms of common knowledge. This common knowledge Bartlett believed was a structure similar to schemata. The basic idea behind this metaphor is that remembering is some kind of reconstruction of memories from available information rather than a verbatim reproduction of the contents of memory. From remembering a general theme and some details we reconstruct our memory of an event, such as a story that has been told to us. Schema refers to an active organization of past reactions or of past experiences, which must be supposed to be operating in any well-adapted organic response.” (Bartlett, 1932, p. 213).

These ideas were conceptualized by Neisser (1967) who stated the importance of the dynamic, reconstructive nature of human memory. He suggested that remembering “... likens the constructive work of a palaeontologist who uses a small set of bone fragments as well as general knowledge about dinosaurs and other similar animals in order to reconstruct and piece together the skeleton: “out of a few bone chips, we remember the dinosaur”.

The implications of the archaeology metaphor are that memory traces are incomplete as opposed to the “all in one” structure in the store model. To remember is a process where memories are constructed, not found or selected. In this case to remember is a question of probability of match between an actual event and what is remembered (Koriat & Goldsmith, 1996).

### **Some remarks on metaphor and memory**

There is no way to prove a metaphor wrong or right. Metaphors are conceptual tools that help us to understand phenomena in a more or less appropriate way. They provide a framework within which memory phenomena are analyzed and explained.

Metaphors highlight some aspects of a phenomenon and hide others. This means that it is important to recognize that research can be guided by metaphor to such a degree that we miss important attributes of a phenomenon. Both the multiple store metaphor and archaeology metaphor capture important aspects of memory. The store metaphor has guided laboratory research while the archaeology metaphor has guided studies of memory in everyday settings. Researchers guided by the store metaphor have studied memory driven by theory while researchers guided by the archaeology metaphor have studied memory as it occurs in a more phenomenological way. The two models seem to reflect fundamentally different ways of thinking about memory. As Koriat & Goldsmith (1996, pp. 186) argue, “... even if agreement could be reached about the memory phenomena that ought to be studied, the experimental procedures, and the appropriate context of enquiry, the two metaphors would still imply different perspectives for looking at and interpreting the data”.

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