# Memory and Cognition

## Book Notes

### Chapter 4 (pg 66-82)

- ❖ **Short Term Memory** – The part of the memory responsible for processing and retaining information beyond the sensory registers, but not much longer than a minute or so. Contents include consciousness.
- ❖ **Chunking** – Occurs when people take smaller units of information and group them into a larger unit. This function expands the capacity of short-term memory. Prior knowledge is a major influence on successful chunking.
- ❖ Without active attention, information ins short-term memory is largely forgotten in 30 seconds.
- ❖ **Decay and Interference**
  - ➢ **Decay**
    - ▪ **Definition** - The primary cause of forgetting is the passage of time. The more time that has passed, the more the memory trace has decayed and forgetting has occurred.
    - ▪ **Brown-Peterson Paradigm** – Students were given constant trigrams (TPZ) to remember. To keep students from rehearsing the information they had to count backwards by 3's out loud. They were then told to recall the trigram. The studied varied the amount of time between the presentation of the trigram and the cue to recall it. The more time that has elapsed, the less likely it was that the trigram was remembered. By 18 seconds, nearly all information was lost.
  - ➢ **Interference**
    - ▪ **Definition** – Information in short-term memory interferers with or in some way blocks or hinders the retrieval of other information. Because STM has limited capacity, if new information is put into it, it will displace the information that is already there.
    - ▪ **Keppel-Underwood** – They suggested that some of the forgetting that was observed in the Brown-Peterson paradigm was due to interference from items learned in previous trials. They found that there was virtually no forgetting in the first trial, but it was only observed in the second and third trial. So when there was no source of interference, there was no STM forgetting.
    - ▪ **Waugh-Norman** – They gave people a list of 16 digits. At the end of each list was a probe digit. The task was to state what digit followed the earlier occurrence of the probe in the series that was just presented.
    - ▪ **Summary** – Interference is the primary cause of forgetting in STM. This limit of STM has implications for everyday life. For example, if you are trying to keep information in mind, such as a telephone number, and are disrupted by something else, it's likely you will forget it.

- ❖ **Retrieval in STM**
  - ➢ **Parallel Search** – All items in STM are available more or less at once and are accessed in parallel. If you search in a parallel fashion, then the amount of information in the search set would not matter. All of the information would be available at once regardless of the size of the search set. As a result, the response time should not vary with set size, and there should be no difference between "yes" and "no" responses.
  - ➢ **Serial Self-Terminating Search** – This involves going through items one at a time. Once people get to the target item, the search stops or terminates. There would then be an increase in response time with an increase in set size. There would be a difference in "yes" and "no" response times, specifically with no since it would have to go through the whole set in order to find that the item is not there.
  - ➢ **Serial Exhaustive Search** – This would also involve people going through items one by one. However, they will continue through the entire set. This would increase response time with increasing set size. There would be no difference in the response time of "yes" or "no."
- ❖ **Serial vs. Parallel Issues**
  - ➢ **Cascading processes** – Complex memory process that are probably both parallel and serial components intermixed.
- ❖ **Serial Position Curves**
  - ➢ **Definition** – A U-shaped function with memory being better for information at the beginning and end of a set compared to the information between.
- ❖ **Primacy Effect**
  - ➢ **Definition –** The superior memory for information at the beginning of a set. The idea is that items at the beginning of a set have more opportunity to be rehearsed and moved into LTM. If items are given slower the primacy effect was larger, but the recency effect was less affected.
- ❖ **Recency Effect**
  - ➢ **Definition** – Superior memory for information at the end of the set.
  - ➢ The recency effect can be attributed to short-term memory. These items have not been displaced by subsequent interfering information and so are less likely to be forgotten.
  - ➢ If you do a distractor task before having the subjects recall the information, the longer the delay, the less pronounced the recency effect. However, the primacy effect, which is attributed to LTM is unaffected.
- ❖ **Reduce or Eliminate Primacy and/or Recency Effect**
  - ➢ **Memory for actions and odors**
    - ▪ When people are given a sequence of various odors, they show a strong recency effect, but only a weak or absent primacy effect.
    - ▪ Items that are difficult to name tend to show recency effect, but not primacy effect. This is because it is more difficult to encode them into declarative long-term memory. The primacy effect, depends critically on the ability to effectively and quickly store information in LTM.
  - ➢ **Suffix Effect**

- **Definition** – The recency effect is diminished when extra information is presented at the end of a list. If you are told to "go" after receiving a list of information, the "go" condition is the silence condition. The word "go" interferes with information in STM, causing forgetting.
- The more related the nature of the suffix itself, like items on the list, the greater the interference and the greater effect the suffix effect.
- The suffix effect is heavily influenced by the physical characteristics of the suffix, leading it to be considered to be part of echoic memory.
  
➢ **Memory for Serial Order**
- You're more likely to make an error if the telephone number is 123-4567 as 123-5467 than 163-4527.
- **Three Classes of Theories of Memory for Serial Order**
  - **Chaining Model**
    - ♦ In STM there are a series of associative links. Order information is recovered by moving along the associative chain.
    - ♦ Problem with this view - If people cannot remember an item, then the chain should be broken, so they should not be able to continue further. However, some approximation of the lost item could be used to pick up further along the chain.
  - **Ordinal Models**
    - ♦ Ordinal Models order is captured by information about where a given item occurs along a dimension relative to the other. For example in the perturbation model, information in STM is organized as hierarchy of chunks regulated by control units. For example, with 123-4567 they're more likely to misrepresent either 123 or 4567 as a chunk rather than mess up 4 and 5 as they're in a different chunk.
    - ♦ The ordinal models are inhibition models, which suggests that inhibition, a mechanism of attention, is used to recover serial order.
    - ♦ The inhibition of recently processed STM can be seen in repetition blindness. People are told to study sentences represented in a rapid serial virtual presentation format. Essentially words are presented one at a time in the same location on a computer in a rapid fashion. If the word is repeated in a short time span, people claim to have never seen the second occurrence.
  - **Positional Models**
    - ♦ Serial order is conveyed by associating each item with its position in the sequence. Slot-based models, which assume that STM is a series of ordered slots and that information is dropped into each one as it is encountered. Context-based models that exploit the fact that context is constantly in flux, even if at a very subtle level.

❖ **Working memory**
  ➢ **Definition** – Controlled used of information in STM.
  ➢ **Baddeley's Multicomponent Model**
    ▪ This theory assumes that working memory is made up of several components
      • **Phonological Loop** – Responsible for processing verbal and auditory information
      • **Visuo-spatial Sketchpad** – Responsible for processing visual and spatial knowledge.
      • **Episodic Buffer** – Where multimodal information from different sources is combined or bound together.
      • **Central Executive** – Controls the above three components.
❖ More in depth parts of working memory
  ➢ Phonological Loop
    ▪ The phonological loop is concerned with processing verbal information. Studies of the phonological lloop focus on linguistic materials, which are either read or heard, although other acoustic phenomena have been studied.
      • Two Parts of the Phonological Loop
        ◆ Phonological Store
          ➢ Temporary storehouse. Can be described as if part of the inner ear that listens to what we say to ourselves.
        ◆ Articulatory Loop
          ➢ For active rehearsal. Can be described as if like our inner ear voice that says what we are thinking.
❖ Random Notes from Chapter 5
  ➢ Articulatory Suppression Effect – A reduced verbal span when a person is speaking simultaneously trying to remember a set of items.
  ➢ Irrelevant Speech Effect – The phonological loop is less efficient when there is irrelevant speech in the background, even if it's a language people don't understand.
  ➢ Lexicality Effect – Working memory is influenced by prior knowledge. Memory spans are larger for lists of words than for non words.
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Random notes from chapter 5
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Chapter 7