HPS203

THE HUMAN MIND EXAM NOTES

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TOPIC 3: WORKING MEMORY

Acquisition, Storage and Retrieval

Acquisition - The process of placing new information into long-term memory.

Storage - The state in which a memory, once acquired, remains until it is retrieved. Many people understand storage to be a "dormant" process, so that the memory remains unchanged while it is in storage. Modern theories, however, describe a more dynamic form of storage, in which older memories are integrated with (and sometimes replaced by) newer knowledge.

Retrieval - The process of locating information in memory and activating that information for use.

Working Memory

Modal Model

A nickname for a specific conception of the "architecture" of memory. In this model, working memory serves both as the storage site for material now being contemplated and as the "loading dock" for long-term memory. Information can reach working memory through the processes of perception, or it can be drawn from long-term memory. Once in working memory, material can be further processed or can simply be recycled for subsequent use. This model prompted a large quantity of valuable research, but it has now largely been set aside, with modern theorizing offering a very different conception of working memory.

This is the Modal of Memory form the 1960's. It has 3 stages:

1. Encoding – we receive information from our environment
2. Store – we hold the information in storage
3. Retrieval Phase – where we can access it from storage and bring it back to active use

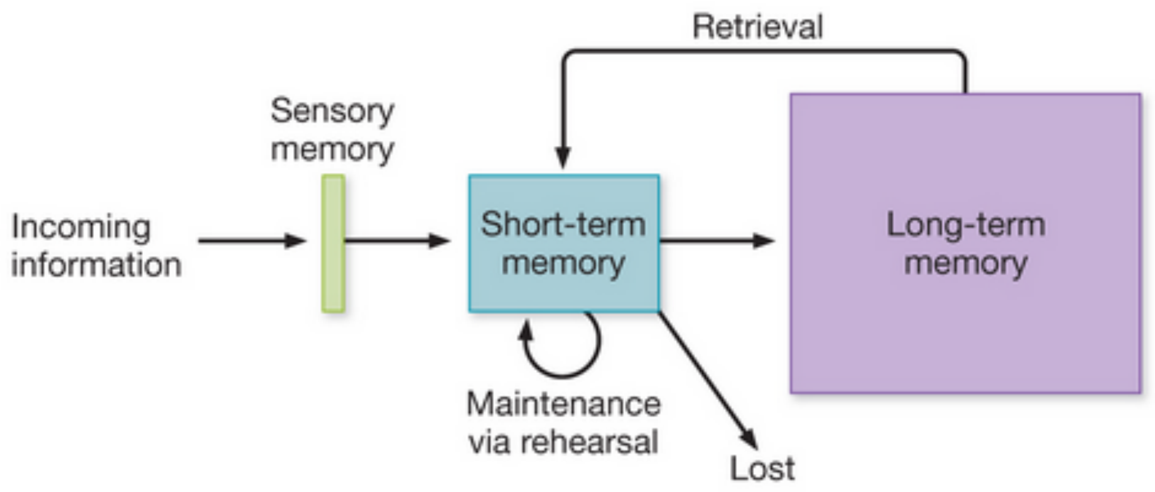
The first memory receptacle we have is called **Sensory Memory** – it holds information very briefly, stored as visual input, auditory input. It is about retaining sensory events as an impression in your sensory information.

According to the modal model, when information first arrives, it is stored briefly in sensory memory. This form of memory holds on to the input in "raw" sensory form—an iconic memory for visual inputs and an echoic memory for auditory inputs. A process of selection and interpretation then moves the information into short-term memory—the place where you hold information while you're working on it. Some of the information is then transferred into long-term memory, a much larger and more permanent storage place.

Short Term Memory (working memory)

We now call it working memory. We do this to emphasise the active nature of it, this memory holds information that we are currently working on. If you're trying to solve an equation, you can hold information in your working memory while you work on a longer equation. If you want to hold on to that information you need to rehearse it.

We can transfer this information to our long-term memory – this holds all of our knowledge and beliefs. Studies show that you can retain information for 40/50 years.



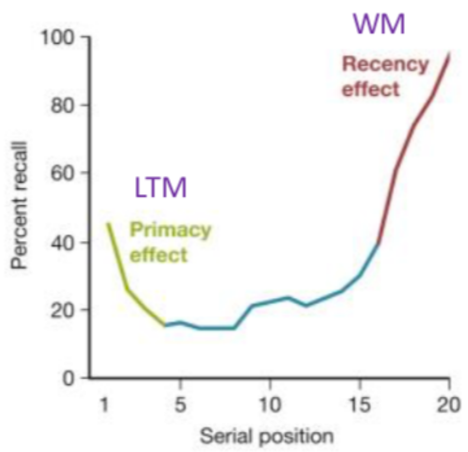
There are 4 main difference regarding Working Memory and Long Term Memory:

1. The size – Working memory is a lot more limited, compared to the enormity of Long term memory
2. Getting info into WM is quite easy compared to LTM
3. Getting information out of WM is much easier than Long term memory – you need the right retrieval queues to access the information in LTM
4. Contents of WM is quite fragile, if someone disrupts your maintained rehearsal you will forget what you are holding onto. The contents of LTM is strong and robust.

Serial Position Effect

Working memory and Long Term Memory are two different stores, we know this because of serial position effect.

If you are read a list of words, what we see is that people can usually remember 12-15 words from a 20-word list. People are likely to remember the first few words on the list (primacy effect) we remember them because they enter working memory and to try to remember the words they are often repeated over and over, paying attention and rehearsing words as they are said. After a while there are too many to pay attention to. This attention and focus for the first few words means they are more likely to be transferred into LTM. So, primacy effect enters LTM.



The words in the middle of the list are often forgotten.

People usually remember the words at the end of the list are often remembered very well, this is the recency effect, you heard the words more recently. You remember these words well because they are the one that you are currently working on in your WM 5-7 words are able to be remembered at once, so words are bumped out as they go.

The U shaped curve is known as the serial position effect.

Recency Effect

This memory contains whatever the person is currently thinking about; and during the list presentation, the participants are thinking about the words they're hearing. Therefore, it's these words that are in working memory. This memory, however, is limited in size, capable of holding only five or six words. Consequently, as participants try to keep up with the list presentation, they'll be placing the words just heard into working memory, and this action will bump the previous words out of working memory. As a result, as participants proceed through the list, their working memories will, at each moment, contain only the half dozen words that arrived most recently. Any words that arrived earlier than these will have been pushed out by later arrivals.

The key idea, then, is that the list's last few words are still in working memory when the list ends (because nothing has arrived to push out these items), and we know that working memory's contents are easy to retrieve. This is the source of the recency effect.

Primacy Effect

Words arriving later in the list receive even less attention. Once six or seven words have been presented, the participants need to divide their attention among all these words, which means that each one receives only a small fraction of the participants' focus. As a result, words later in the list are rehearsed fewer times than words early in the list—a fact that can be confirmed simply by asking participants to rehearse out loud (Rundus, 1971).

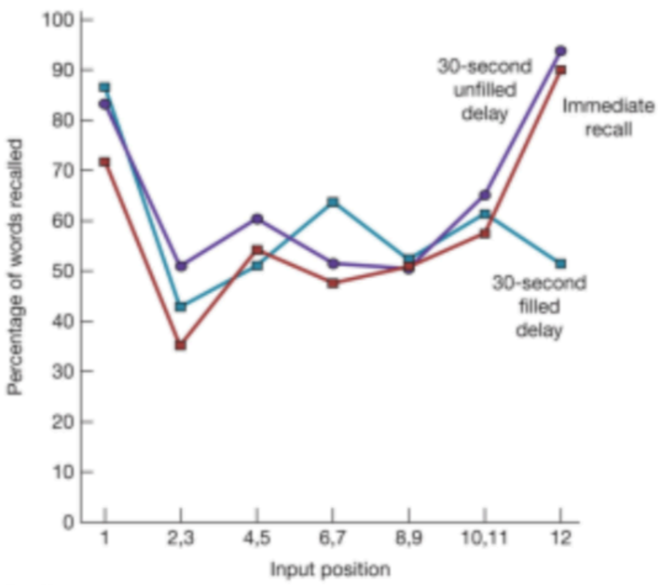
This view of things leads immediately to our explanation of the primacy effect—that is, the observed memory advantage for the early list items. These early words didn't have to share attention with other words (because the other words hadn't arrived yet), so more time and more rehearsal were devoted to them than to any others. This means that the early words have a greater chance of being transferred into LTM—and so a greater chance of being recalled after a delay. That's what shows up in these classic data as the primacy effect.

Delay Affect

By manipulating what happens during the delay from after the word list is stated until they have to recall the words.

The Red Line – shows immediate recall and the serial position effect.

The Purple Line - when we ask people to recall the words after a delay of 30 seconds (unfilled delay), this shows the same pattern. It shouldn't affect primacy cause all the same things will happen a delay will not effect this. An unfilled delay shouldn't affect recency effect either because you don't need to fill your working memory with anything else.



The Blue Line – a filled delay, a task such as counting backwards from 201 by 3's, if you have to think about the task you have to keep the number in your working memory and keep going backward. This task takes over our working memory. The new task will disrupt the contents of working memory as it is fragile. There will not be a recency effect because you have disrupted WM.

Presentation Speed

Fast presentation of words means less words are remembered slower words means there is more time to transfer from WM to LTM, people are remembering more words from the start and middle of the list because people have more time to process those words. This does not affect recency

TOPIC 5: REMEMBERING COMPLEX EVENTS

Memory Errors

Those that think they have seen footage of the car chase and death of Princess Diana are experiencing memory errors, because no such footage exists. These are known as **crashing memories**, they are usually when people are asked about crashes that did not exist.

Crombag et al. (1996) asked if people had asked about the moment people had seen a certain airplane crash into a building, there was no footage of this, yet half of the participants said they had seen it and some even gave great detail about the 'crash'.

Ost et al. (2002) British participants were asked about the footage of Princess Diana, 44% said they had seen it.

This is because our memory is not like a video recorder, and if it would be difficult to do anything in your life. A Russian memory expert (known as 'S') had a near perfect memory, the problem was he had trouble forgetting, the things he remembered on stage for his memory performances, he would hold onto forever, unable to forget it.

Our system is not designed to remember every single detail, instead it is designed to selectively remember important things. It can sometimes be hard for us to remember specific details, for example if we have seen a piece of footage.

Memory Errors – Hypothesis

Connections tie together similar episodes, so that a trip to the beach ends up connected in memory to your recollection of other trips. Sometimes the connections tie an episode to certain ideas—ideas, perhaps, that were part of your understanding of the episode, or ideas that were triggered by some element within the episode.

With all these connections in place—element to element, episode to episode, episode to related ideas—information ends up stored in memory in a system that resembles a vast spider web, with each bit of information connected by many threads to other bits elsewhere in the web. This is the concept of **nodes.**

However, within this network there are no boundaries keeping the elements of one episode separate from elements of other episodes. The episodes, in other words, aren't stored in separate "files," each distinct from the others. What is it, therefore, that holds together the various bits within each episode? To a large extent, it's simply the density of connections. There are many connections linking the various aspects of your "trip to the beach" to one another; there are fewer connections linking this event to other events.

Connections play a crucial role in memory retrieval. Imagine that you're trying to recall the restaurant you ate at during your beach trip. You'll start by activating nodes in memory that represent some aspect of the trip—perhaps your memory of the rainy weather. Activation will then flow outward from there, through the connections you've established, and this will energize nodes representing other aspects of the trip. The flow of activation can then continue from there, eventually reaching the nodes you seek. In this way, the connections serve as retrieval paths, guiding your search through memory.

Obviously, then, memory connections are a good thing; without them, you might never locate the information you're seeking. But the connections can also create problems. As you add more and more links between the bits of this episode and the bits of that episode, you're gradually knitting these two episodes together. As a result, you may lose track of the "boundary" between the episodes. More precisely, you're likely to lose track of which bits of information were contained within which event. In this way, you become vulnerable to what we might think of as "transplant" errors, in which a bit of information encountered in one context is transplanted into another context.