

Human Brain: A Powerful Machine

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Have you ever wondered what your brain's memory capacity is and how it works? Don't worry, I will answer your question in detail. Sometimes people memorize so much content or have so much going on in their lives that they feel like their memory capacity is almost full like the storage capacity of hard disks in our computers. In reality, it is not. This article will explain your brain memory, so that next time you face such a hurdle you can say to it, "You are just my emotions getting in my way and I have much more space in my brain to deal with my problems than you can imagine!"

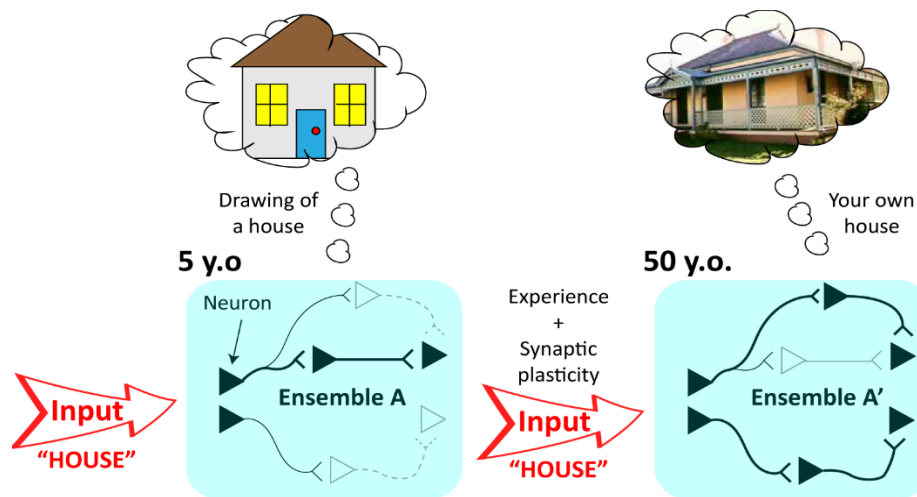
(Mehrotra, 2022) When buying a new phone, you consider its storage capacity as one of the most important factors. A 512 GB storage area probably inclines you towards buying a specific phone. Similarly, owning a 2 TB hard disk makes you feel like a memory king with almost infinite memory space. Coming to the point, an article in the Scientific American reports that a human brain's memory capacity was testified to be equivalent to 2.5 petabytes. Yes, you heard it right! A PB possesses a total of 1024 TBs or a million GBs. Hence, 2.5 PBs would be totaling to 2.5 million GBs. Now, take a moment to digest this unimaginable piece of information.

(Cunff, n.d.) Moving on, let's further understand the memory power of the brain through numbers. The brain holds about 100 billion neurons. So far, scientists report that each neuron is connected to about 7000 neurons. Hence, when a specific neuron fires a signal, 7000 other connected neurons get the information as well. Different parts of the brain fire at different rates, but a report suggests a rate of 0.29 per second based on rough calculations. Doing a little bit of math, your brain receives 200,000,000,000,000 bits of information every second. In words, this number means 200 million million – a number too big that even while writing it, many may lose count in the sea of 0s.

Now, that you understand the brain's memory capacity, let's take a look at how memories are formed. Our brains involve a lot of activity as different groups of neurons constantly drift in and out of action forming thoughts and shaping perspectives. Memory is the reactivation of a specific group of neurons, formed from persistent changes in the strength of connections between neurons. The Stronger the connections between a group of neurons the more likely it is to be reactivated over any other combination of neurons. Active connections tend to get stronger, whereas those that aren't used get weaker and can eventually disappear entirely.

(Anonymous, n.d.) Scientific evidence suggests there is another way of memory formation. Some important memory structures, such as the hippocampus, in the adult brain can produce new neurons through a process called neurogenesis. After studying old mice, scientists have developed that increasing neurogenesis in the hippocampus can improve memory performance. You must be thinking, "How do I

boost neurogenesis?” The answer is simple: exercise regularly. It will increase the volume of your hippocampus and this will create new neurons. Hence, it will help you during memory tasks.



Credit: qbi.uq.edu.au

Changing connections between neurons determine the storage of memories. Imagine you are given the word house at the age of five years. This will activate a certain group of neurons (Ensemble A) and you might think about a drawing of a house. Now, you are given the same word but at fifty years of age. This time you will activate a different group of neurons (Ensemble A') and you might think about your own house. Synaptic plasticity (changes that occur at synapses, the junctions between neurons that allow them to communicate) and experience can change the connection strengths between neurons. This explains the different neuronal responses to the same input.

Presently, you might be thrilled to know a strategy that will help you in your daily tasks and excited to start your exercise routine. I have another surprise information for you that will give you the same benefit! The majority of people do not take proper sleep. Let me tell you that sleep is a significant factor in conserving and consolidating memories. Next time, you are risking your sleep schedule, do think about the consequences it may have on your brain memory.

References

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