

The Story of **AUTISM**

PART 20:

REPETITION, LEARNING AND LONG TERM MEMORY



The STORY OF AUTISM: Long Term Memory and Learning

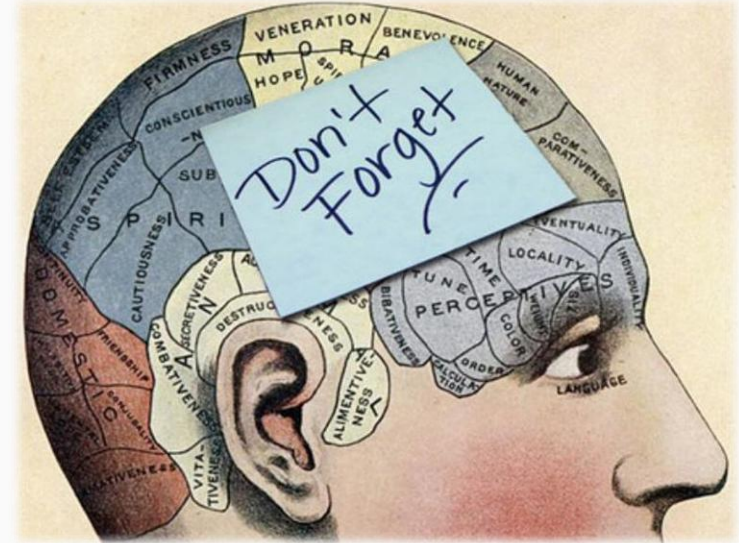
Consider your morning routine. You probably got up, got dressed, drank a cup of coffee and drove to work while listening to the radio. You paid no special attention to your route, sang along to a tune you learned years ago, and mentally tuned out a commercial you have heard too many times.



The STORY OF AUTISM: Long Term Memory and Learning

The day is still young, yet you have already performed thousands of actions without thinking about them. That is **your memory at work.**

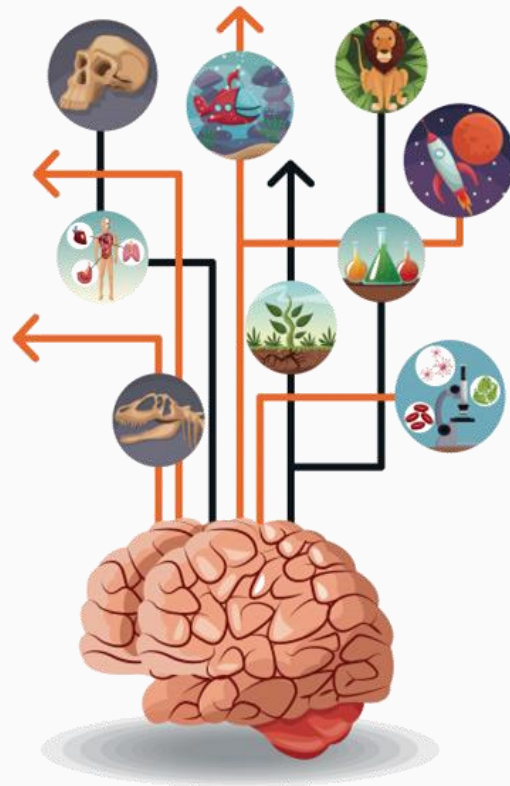
The ability to remember major facts and small details essential for daily life.



The STORY OF AUTISM: Long Term Memory and Learning

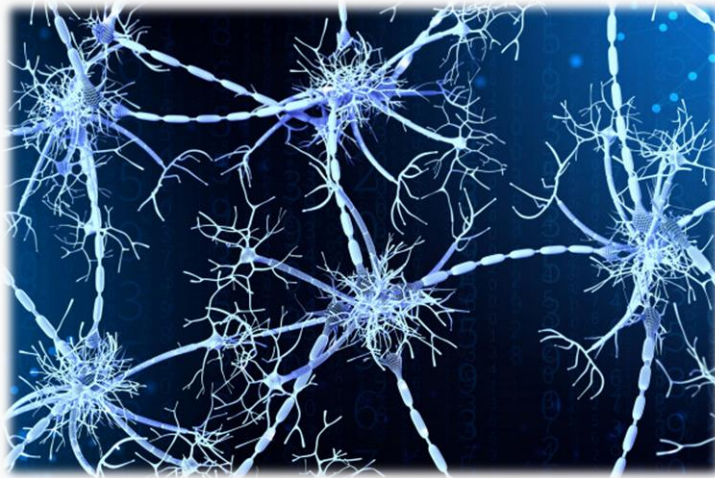
But how does memory work?

Our memories are not stored in our brains like books on library shelves. They are actually on-the-fly reconstructions from elements scattered throughout various areas of our brains.



The STORY OF AUTISM: Long Term Memory and Learning

In simple neurological terms, **memory is a set of encoded neural connections in the brain.** It is the re-creation of past experiences by the synchronous firing of neurons that were involved in the original experience.



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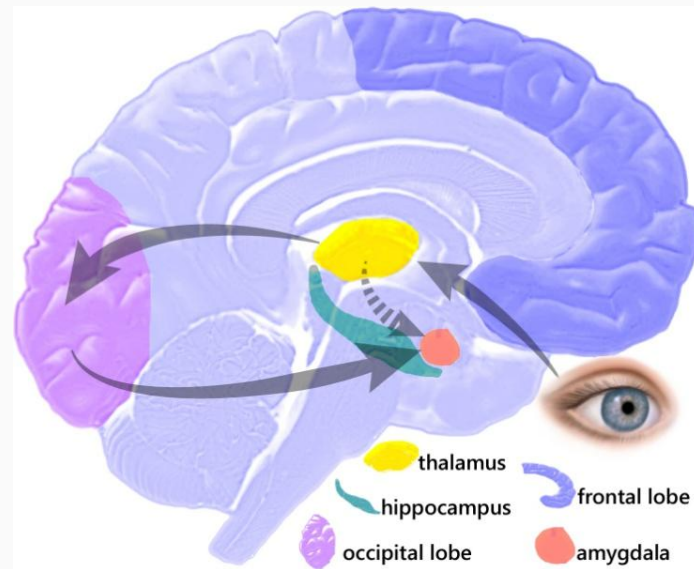
There are **3 main stages of memory - Encoding, Storage, and Retrieval.**



The main operating system for coordinating memory work in the brain is the **hippocampus.**

The STORY OF AUTISM: Long Term Memory and Learning

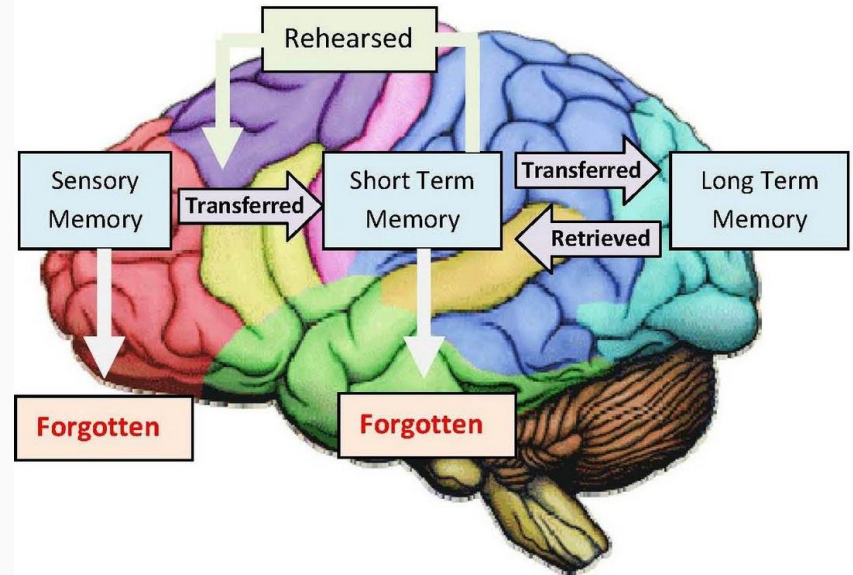
Not only is this the **hippocampus** important for turning short term memories into long term memories, but it also plays an important role in **our vision**.



The STORY OF AUTISM: Long Term Memory and Learning

It determines **what information we pay attention to** – what information actually makes its way into the memory process.

Sensory input is the first stage of memory and it lasts only a few seconds.



The STORY OF AUTISM: Long Term Memory and Learning

If a sensation feels good or a thought pleases us, it passes on to **short term memory**, also known as **working memory**.

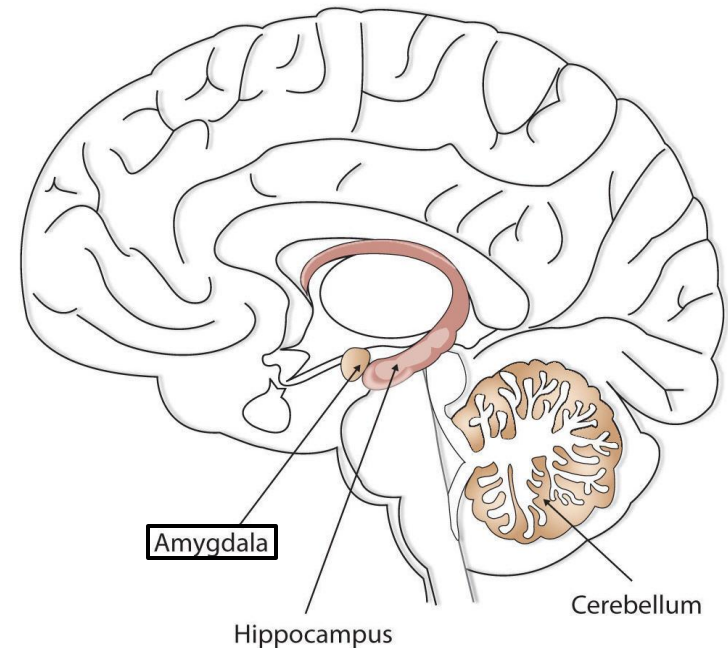
Our short term memory is what we are currently thinking about or feeling and it typically lasts about 20-45 seconds.



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If a short term memory makes its way to a neighboring limbic structure, **the amygdala**, its emotional salience is likely to be enhanced.

This is why things that touch us, or cause us fear and anxiety, often linger in our minds the longest.



The STORY OF AUTISM: Long Term Memory and Learning

It's no different for kids with autism. **This is how they develop obsessions and perseverations.**

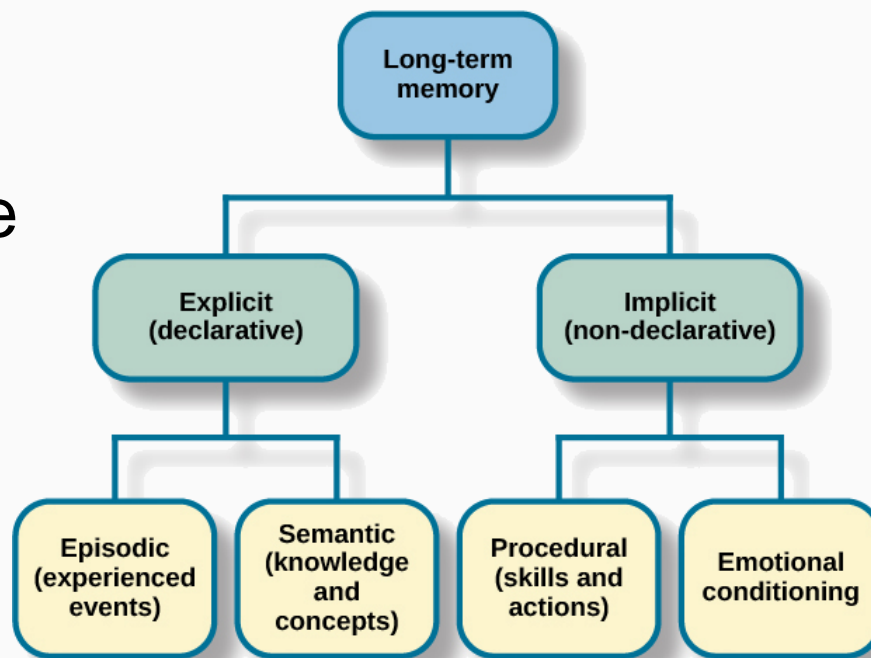
What starts off as a short term sensory sensation or fascination keeps getting repeated until it becomes a long term memory or habit (i.e. self soothing arm rubbing, hand flapping or stimming).



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Long-term memories last for an extended period of time – hours, days, months or even years.

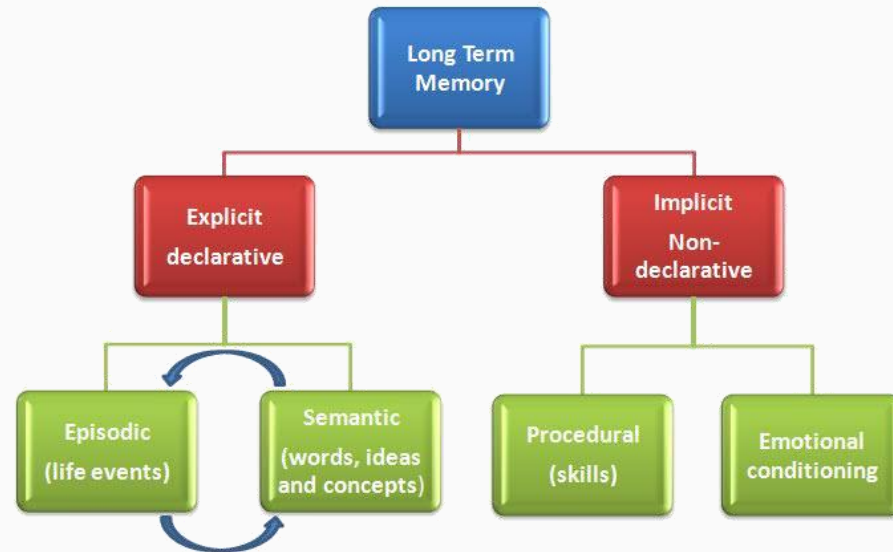
We store different types of information in separate long term memory systems.



The STORY OF AUTISM: Long Term Memory and Learning

Explicit, also known as **Declarative Memory**, involves memory of facts, concepts, and events that require the conscious recall of the information.

There are two types of explicit memory:



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1. Semantic Memory stores knowledge of facts, concepts, names and other general knowledge and information about the world. (Left brain)

Autistic kids have solid semantic memories. They excel in remembering facts and details, the names of favorite people and of the places they have been to.



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2. Episodic memory is the ability to remember meaningful, first-hand experiences in your life. They include sensations and emotions associated with the event.



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One winter my daughter and I were walking in the woods by a lake. She lost her footing and slipped down a sharp incline onto the frozen ice. This event traumatized her so much that until this day she is deadly afraid of slipping on any ice.



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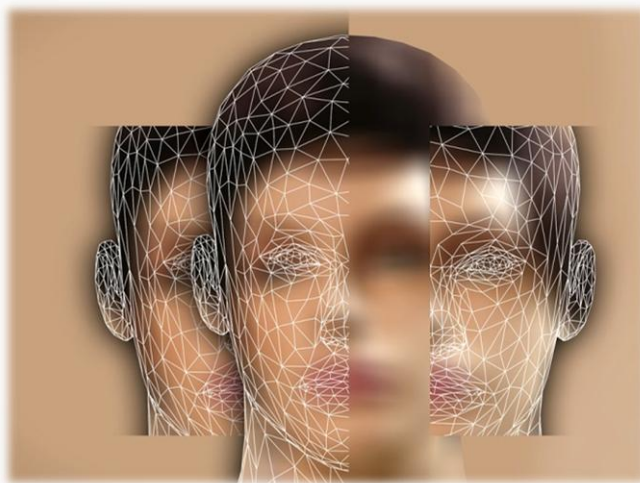
Implicit or non-declarative memory refers to knowledge or actions you remember effortlessly and unconsciously. It is remembering without awareness.

These memories typically operate on autopilot, such as tying your shoes or logging into your iPad.



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Long term memory is interesting is because, **although cerebellar dysmetria interferes with new motor learning in autism, it doesn't appear to impact long term motor memories or learning much.**



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For example, a child with autism may have a lot of difficulty learning to tie his shoes, but once he has mastered the skill, he is able to retain that memory or learning without a problem.



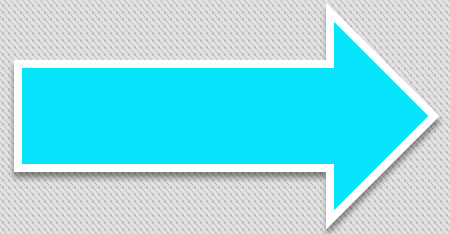
The STORY OF AUTISM: Long Term Memory and Learning

We have all seen this with our kids with autism. They are definitely capable of learning. And they do appear to have an excellent memory.

The problems they have seem to revolve around what they **choose to attend to** and, how their short term memory deals with visual and verbal language.



GO ON TO THE NEXT PRESENTATION



The Story of
AUTISM

PART 21:

**REFLEX
RETENTION
AND THE RETICULAR
ACTIVATING SYSTEM**