

Memory Formation and Removal - A Conjecture

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We are defined by our memories. They are the only things we can call our own. All our experiences, ego, I, and our existence is sum and substance of our memories. They also guide us on our future journey in life and till the end of our existence those memories are with us.

Most of the memories we have can be divided into pleasant and unpleasant ones. These memories give rise to a whole range of emotions – love, hatred, jealousy, fear, happiness etc. To live a good and happy life we should strive to have mostly pleasant memories and see how the unpleasant ones are reduced or removed. One of the main focus of Indian *Yogic* system is complete removal of our memories at the time of final exit so that we are liberated from the cycle of birth and death.

But what are memories; where in the brain do they reside; how are they formed; and what is the possible mechanism of their removal? These are the issues that we will try to explore and explain in this article.

Previous research

Memory, its origin, and spatial location in the brain has been researched for hundreds of years. Extensive literature on it exists and hence this article is not a place to write the history of memory research, but we will briefly touch the salient features of previous research. One of the seminal work on memory was done by Eric Kandel who got the [2000 Nobel Prize for his work on this subject](#). Kandel's main discovery was that the synapse plays an important role in memory formation and the consolidation of memory changes the synapse itself. Though this pioneering work on neurobiological basis of memory showed the process of memory formation and consolidation

in few neurons but it did not show [where the memory is located and how is it related to consciousness.](#)

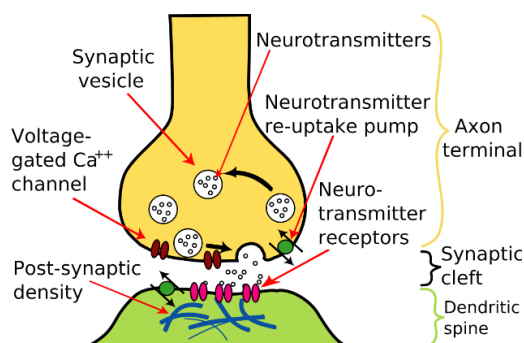
At the same time neurological basis of memory formation also does not explain the pliability and plasticity of neurons and neural networks. Scientists have recently found [that with time the original neural networks shift spatially and yet are able to retain the same memory.](#) How this happens is still a mystery and thus we do not know where the memory exists and exactly what is it.

Possibilities

There are [close to 80-100 billion neurons](#) in the brain (the exact figure is not known). It is an accepted fact that a thought is produced when brain neurons fire. All the neurons are connected to each other by axons and dendrites. These connections are called neural pathways.

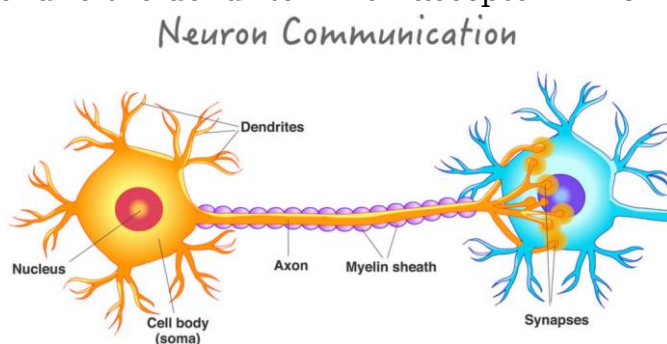
Memories are therefore nothing else but the arrangement of neural pathways and the sequence of their firing. Firing of neurons is triggered either by signals from the sense organs or by stimulation of certain memory space in the brain. These firings produce a thought, and it is the visualization of thought that gives us a sense of memory. Since memory is an outcome of human thought, we will define what is a thought and how and where it is produced in the brain.

The firing of neurons is a process by which they communicate with each other. During this communication electrical signal from a neuron is converted into chemicals (neurotransmitters) and transmitted across the synaptic cleft to another neuron where it is again converted to electrical signal for onward journey.



Synaptic cleft is a tiny space of about 20 nanometers (nm) between two neurons and is the place where the neurons exchange information via neurotransmitters (NT).

A neuron has three parts. At one end is the dendrite which accepts NT from other neurons; the central nucleus which is the heart of the neuron and a long nerve fiber called axon whose end (synapse) releases the NT for transmitting to the other neuron.



Why did nature produce this type of communication system where the electrical signal from the neuron is first converted into chemicals (neurotransmitters), transmitted through the synaptic cleft, and again converted back into an electrical signal?

A possible answer could be that during this conversion in synaptic cleft photons are produced which are the signature of thought. I conjecture that these photons from a large number of neural pathways synchronize to form a **three-dimensional hologram which we can call a thought**. *Arrangement of neural pathways resulting in the production of thought gives rise to memory. Memories therefore do not reside in the brain, but the arrangement of neural pathways does.*

Memory formation

Memory formation starts the moment brain starts forming in the womb. Very rudimentary memory of movement, swallowing, etc. starts in the second and third trimester of pregnancy. Prenatal memory starts forming

around 30 weeks after conception. After this time, the fetus is affected by the food the mother consumes. Fair amount of good data exists on how alcohol and drug use by mothers at this stage affect the children later in life.

The moment a child is born there is an explosion in memory formation. A child's brain is like a sponge for information intake. The neural pathways must be established. So, the sound, smell and other sensory organs start sending the signals to the brain for the formation of neural pathways.

However, the first solid memories are those when eyes start focusing. The input signals from the eyes are coordinated with those from the ears and help stimulate the neural pathways which results in the formation of a random hologram. This hologram is compared with the actual object and, when after many comparisons the exact match takes place, then the memory is etched in the brain.

The “comparer” of reality and hologram in this case is the nascent ego of the child which is still developing but is not strong enough to focus on a particular thing for a long time. This results in memories being formed and forgotten. Though the brain at this age is like a sponge for absorbing the information, the lack of focus does not allow the memories to become strong.

This is the reason why children have very few memories till the age of 2-3 years. With the developing of [ego](#) as we age, longer focus results and hence a stronger memory. The memory is further strengthened when the child repeatedly performs the process of seeing, validating, and memorizing. This also helps in making neural pathways stronger when the child repeatedly produces the hologram of a given object.

Children are therefore particularly good at doing mundane things repeatedly because this is how they set up and consolidate their memories. Since the brain in childhood is virgin, those repeated early neural pathways are strong and thus some of the childhood memories are very powerful.

Many times, the parents get exasperated with a child repeatedly performing these mundane actions and scold the child. This should not be done because scolding starts a process by which new learning is retarded and fear complex takes over the brain.

As we grow older this process of memory formation and consolidation is repeated and a whole network of neural pathways is formed building upon the existing ones, and this is [the genesis of ego](#) and of experience which is nothing else but sum and substance of our memories.

If the hologram of a certain memory is not strengthened by repeated experiences, then those neural pathways are used for something else and hence the memory becomes weak and maybe lost as happens in children till the age of 2-3 years. Thus, memory is strengthened by repeatedly thinking about the subject in focus.

Therefore chanting, associating the images with signposts, etc. are ways of strengthening the memory. However, there are some people who possess photographic memory. They can immediately remember most of the details the moment they become aware of it. This happens because their brain possesses superior processing power. This is mostly inborn and may also have a genetic element to it.

Our memory formation is based on a sequence of events and hence the time is embedded in the memories. They are replayed as a movie and thus the sequence of events tells us about the passage of time. This is the [genesis of time perception](#).

Since the neural pathways are formed sequentially, during recall one set of neural pathways triggers another set and thus the sequence of events is established. It is therefore quite possible that the *neural pathways of such events reside close to each other in the brain otherwise sequencing maybe difficult*. This triggering of sets of neural pathways is probably facilitated by

the [ego](#). When ego becomes weak the triggering is reduced and the sequencing is lost. This happens temporarily during dreaming; and permanently in dementia, Alzheimer's disease, and [other brain maladies](#).

Memory Removal

In everybody's life there are both painful and happy memories. It will be wonderful if somehow, we can get the ability to remove those painful memories. Then we all can have better and happier life with pleasant memories. Most people think that if we do not think about the painful memories then they are gone. But painful memories produce strong psychological knots which remain buried in the brain. By some trigger they get reactivated, and the pain comes back again. To remove the pain a mechanism of actively removing such memories is necessary.

A possible mechanism of memory removal is to focus on a single thought for an exceptionally long time. It is called [Sanyam](#) in *Patanjali Yoga*. This process requires large number of neural pathways. As the focus and concentration on a single thought becomes stronger even more neural pathways are needed for processing it thereby helping in removal of the other memories. Only with tremendous will power to think about a single thought for a long time can those neural pathways for other memories be weakened and reorganized for a new thought.

This process has also been corroborated by recent work in memory formation where scientists have shown that by thinking deeply on certain object [the synapses are weakened for a short time](#). They can then be modified to form pathways for other memories.

Memory removal is the most important aspect of Indian *Yogic* system which asserts that this leads to liberation. Also, with less memory attached to our soul during the final exit [we can tunnel through the drag of gravity and other souls and reach the other worlds](#). This is the easiest way to get out of the earth's gravity field.

This method of memory removal is also mentioned in ancient Indian philosophical texts. Thus, Patanjali says in his *yoga darshan*; “*When a brain becomes powerful and nimble it is like a pure crystal which takes the color and shape of the object which comes in its view*”. Such a brain is therefore able to focus like a laser on anything that occupies its vision field. This state is also called *Samadhi*.

Memory removal also helps in unraveling of memory knots, mostly made of emotional incidents, and helps in resolving emotional conflicts. There are many instances where the [resolution of such conflicts helped people die peacefully](#). Another way to remove unpleasant memories is to [cultivate the habit of continuously thinking about the pleasant incidences](#) that have happened in our lives. This could help in resolving unhappy memories.

This resolution also allows most of the brain’s processing capability to be made available for the single thought. That is the whole basis of [Sanyam](#) of Patanjali where concentration, contemplation and *Samadhi* is carried out on a single subject so that complete knowledge of the subject results. Such a brain can remove all its memories before the final exit and thus can make us free.

External memory

Many times, it happens that our PC’s, laptops, and other computing devices become slow since they are cluttered with folders and other materials which take up memory space. After downloading most of the information on an external hard disk, the memory of the PC is restored, and it functions faster and smoothly.

In the same way uncluttering the brain of memories will allow it to function properly and faster. The uncluttering is needed since the psychological memory knots take up a good portion of the memory space. This uncluttering of brain through the memory removal process has been outlined in the previous section.

This process may however remove the resident memories (rewire the neural pathways) from our brain and is akin to deleting unwanted files in the computer. But there are other powerful and intense memories which are the result of emotional and painful episodes. These episodes when they happen take over the whole brain functioning, and it seems that during this time the focus of the brain is single pointed. This is similar to producing a very [deep thought which can form a stable soliton](#) and can exist for a long time. I conjecture that such stable memories may reside in Knowledge Space (KS). Knowledge space could be equivalent to hard disk where our strong memories get stored automatically.

[Knowledge space \(KS\)](#) is defined as a space which may contain information structures or memories which are very stable and will remain there forever. It is possible that KS, which is filled with memories of very deep thought and intense emotions. This space may also contain fundamental knowledge produced in the past and is continuously fed by the ever-increasing knowledge from various civilizations. A prepared and focused human mind can access knowledge from this space, and I feel that [great discoveries of mankind](#) have come from such access.

These strong emotional memories also exist in inanimate objects. There is a good amount of data from all over the world where the mediums have been able to access the memories from objects and it has resulted in new finds of buried ancient structures (almost 15-20,000 years old); ability to tell sequence of events about unnatural deaths; and [timelines of civilizations long gone and lost](#). It seems that the physical objects (like a stone, bone or any other object used by the people long dead) are somehow attached to the memories of those persons in KS and the mediums are able to access them. In scientific language this ability is called [“Intuitive Archeology”](#).

Such ability to recall the memories or past events of people by simply touching them was shown by [Swami Vivekananda](#) – the Indian spiritual leader. This ability is also mentioned in Patanjali Yoga Darshan; “By doing

Sanyam on other person's mind, a Yogi gets the knowledge of that person's thought waves but not the contents of his mind".

It is possible that KS may also have templates of various life forms. The memories of life forms remain in K.S. because these forms existed for an exceedingly long time (couple of million years). Thus, either a deep thought for a long time or "nearly constant" life forms for a long time produce these stable memories in KS. Even if the physical form disintegrates the ghost or memories remain in KS. This memory of forms or templates maybe the basis (besides the regular evolutionary forces) of new life forms for a young life-sustaining planet as it comes across KS in its journey through space.

We can also conjecture that the transfer of memories to KS from our brain is via a filter. Thus only [deep emotional memories get transferred](#) and mundane memories remain behind in the brain. This process helps to reduce the loading of KS. The mundane memories however need to be removed via the memory removal process outlined in the previous section.

In the modern internet and world wide web if we want to completely remove our trace then not only we need to format our PCs, but also remove all the information from the net. This is not easy since the deep web contains the archived material with which we have been associated and it is exceedingly difficult to remove all of it. Thus somehow and somewhere the past can catch up!

Just like the hard disk can be formatted or cleaned when it is attached to the PC or a similar device, similarly we need to clean the memory from KS in this life or any other incarnation. The cleaning of memories in KS can only be done by intense thinking via the human brain. In case the reincarnation is in other life forms then this memory stays in KS without modification.

The traces of our memories in KS force our rebirth either here on this planet or other planets. This could probably be the genesis of [Karma concept](#) so often mentioned in Indian philosophy.

So, for [true liberation from the cycle of birth and death](#), not only do we have to remove the memories from the physical brain but also clear them from K.S. This is what Patanjali says in his *Yoga Darshan*, “As the mutations of gunas cease to function Kaivalya (Nirvana) results”.

Article published in truncated form in [South Asia Monitor](#), [Thrive Global](#) and [Boloji](#).

Suggested Reading

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5. Gustav Pagenstecher, “Past Events Seership: A Study in Psychometry”. American Society for Psychical Research, Vol. XVI, Part I, Jan. 1922.
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9. Anil K Rajvanshi, “Neurobiological Basis of Ego and Anger” (2012)
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[HOME](#)