

Memory and Concentration

The role of memory.

Memory plays a vital role when it comes to who we are as individuals and as a collective whole. We are constantly reliant on our ability to retrieve information so we can address any given situation we face, interaction with our fellow human beings or apply our learned trade by retrieving the information..

Perception.

From an age where we begin to perceive and take stock of our surroundings we start to gather and store a plethora of images, communicative tools in the form of body language facial expressions, emotions and knowledge. Your mothers homemade christmas cookies, the smell of a perfume all these fragments come together creating you and a sense of self. These become a part of who we are leading our reactions based on what we have stored and learned before.

Animals for example will bare their teeth if they feel threatened and if we take Darwin's theory to heart the animal in us co-opted this, though instead of a threat we turned it into a form of greeting or peace offering to quickly disarm both parties and relieve us of the fight or flight mode.

As you are reading this, memory is aiding your capacity to understand the words on the page by associating them with visuals drawn from previous experience.

What is is memory?

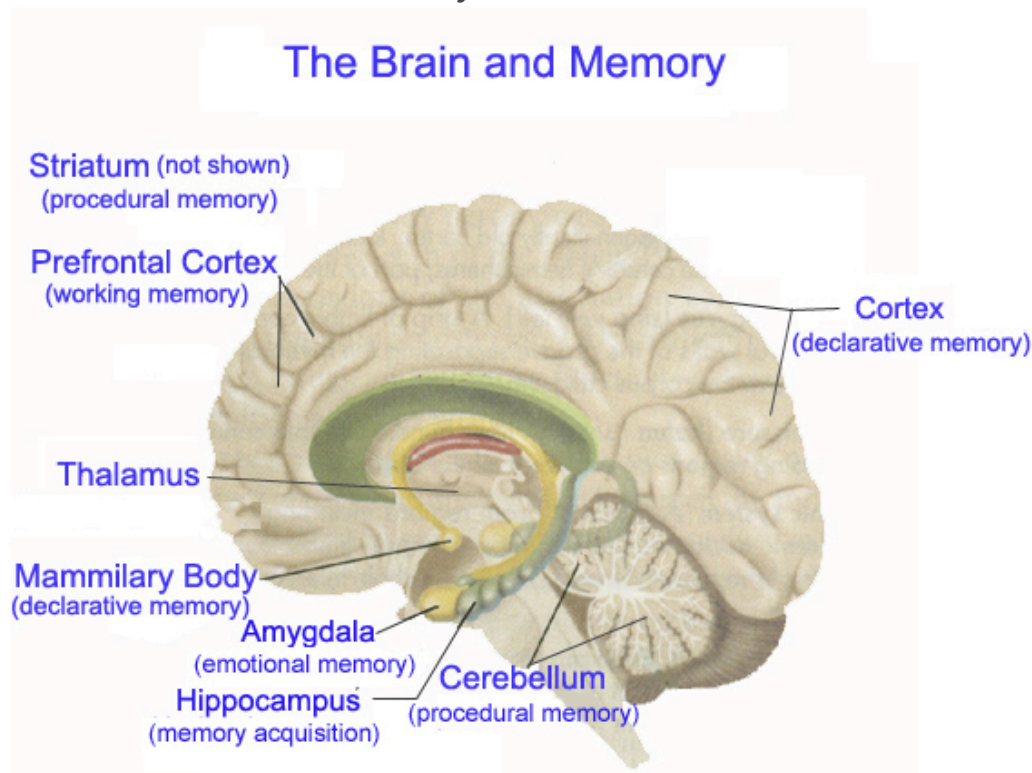
As the science of memory continues different descriptions have tried to give us an idea of what memories are. But the brain and its functions are vast. Previously it was implied that we had a large file cabinet from which we could pull out individual files as needed. The word super computer has also been and is still used as a description for the cluster of cognizant grey matter.

Further research had been done and had our memory bank located in one area of the brain. Though scientists have come to find it might be slightly more elusive than that.

Is there a location for memory.

What seems to be a single memory is actually a complex construction. If you think of an object -- say, a guitar -- your brain retrieves the object's name, its shape, its function, the sound that is played along with the emotions that are evoked. Each part of the memory of what a "guitar" is comes from a different region of the brain. Thereby the entire image of guitar is actively reconstructed.

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Scratching the surface.

Neurologists are only beginning to understand how the parts are reassembled into this coherent whole.

The ability to remember and forget these things happen to be on of the most complex functions of the brain.

Memory is well known to be selective and often illogical. In order to understand what happens when creating a memory we have to look at **encoding, storage and retrieval**. Failure at any one of these stages will result in poor remembering of an experience.

Encoding

When the brain is put to work, which it almost always is, the nerves cells (**neurons**) are connected to each other through the well trodden or newly trodden paths, called **synapses**. The means of communication for between point A and B is electricity and chemical reactions. These **chemical messages** that are sent back and forth to cells are called **neurotransmitters**. Neurotransmitters spread across the space and thereby attach themselves to other neighboring cells. Every brain cell has the capacity to form a thousands of these links giving the typical brain about a trillion synapses. What receives these signal are dendrites. Branch like structures that in turn reach out to surrounding cells.

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The rules yet to be determined.

The rules for how this whole process works are not defined to the point of certainty as the brain is a malleable thing. It keeps on changing as do our experiences and the mind acts appropriately. When a signal is sent from one cell to the other it gets stronger and stronger if said signal is triggered often.

So as our surroundings change and our way to approach a situation, action feelings are met with demands for a response so will our brain continue to organize itself for the purpose of using the brain optimally.

This flexibility is what scientists call **plasticity**. The ability to rewire itself through training.

For a memory to be successful you must first be paying **attention**.

Sensory Stage.

All the sights, sounds smells, tastes and touch and feelings start filtering through the first stage of sensory perception. By identifying and categorizing in milliseconds we allow ourselves a visual pattern that lingers for a brief second.

We filter as since we cannot pay attention to everything or our memory capacity would be shot before we left the house. This stage is the sensory stage.

Short term memory.

That flicker created in the sensory stage then moves on to the short term memory.

As indicated short term memory has a limited capacity to store. The time frame we are taking about here is just 20 -30 seconds.

Long term Memory.

Taking your first driving lesson there are lot of things to be aware of sitting in the car, hand on the wheel, your pedals, gear shift, indicators. While the instructor is explaining all this your senses are wide awake, knowing that you will be attempting to drive in just a few seconds concentration and awareness is at it height allowing all this information to move on to short term memory. As you slowly start to drive you repeat the various actions constantly and this allows the information to pass on to long term memory.

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Successful memory by association.

If we are to learning something new a person with an average memory will find it easier to retain information that has similarities to a something one already has knowledge of. This mentally connects the new information with the old one that is already stored in the long term memory.

For these memories to be of any use to us we have to be able to retrieve them.

Retrieval.

Recall:

This type of memory retrieval involves being able to access the information without being cued. Answering a question on a fill-in-the-blank test is a good example of recall.

Recollection:

This type of memory retrieval involves reconstructing memory, often utilizing logical structures, partial memories, narratives or clues. For example, writing an answer on an essay exam often involves remembering bits on information, and then restructuring the remaining information based on these partial memories.

Recognition:

This type of memory retrieval involves identifying information after experiencing it again. For example, taking a multiple-choice quiz requires that you recognize the correct answer out of a group of available answers.

Relearning:

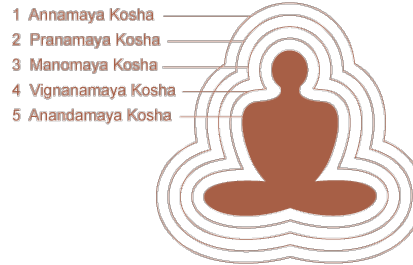
This type of memory retrieval involves relearning information that has been previously learned. This often makes it easier to remember and retrieve information in the future and can improve the strength of memories.

Aging.

As we get older our memory will inadvertently start to fail you in small ways. This is totally natural and what happens up top is the break down of the assembly process. Synapses having not been used for a long time will fade. The once trodden trail regrown. This can start to happen at an early stage as 20 and can gradually get worse as we reach 50. The good new is that we can keep our mind and memory strong.

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Yoga and memory



The Koshas.

According to the Kosha system in Yogic philosophy, the nature of being human encompasses physical and psychological aspects that functions as one holistic system.

The Kosha system refers to these different aspects as layers of subjective experience. Layers range from the dense physical body to the more subtle levels of emotions, mind and spirit. Anamaya kosha, Pranamaya Kosha, **Manomaya kosha**, **Vinamaya kosha**, Anandamayakosha. We will focus on the two following koshas that has mostly to do with memory.

Manomaya kosha

Manomaya means composed of **manas** or mind. Thinking, feeling and willing. The mind along with the five sensory organs (taste (tongue),smell (nose), vision (eyes), hearing (ear), and touch (skin), is said to constitute the manomaya kosa or “mind-sheath”. It is the cause of diversity. Man’s bondage is caused by the mind, and liberation, too, is caused by that alone.

The Manomaya Kosha is the mental faculty that receives all the sensory inputs, interprets them as good or bad and desires. **Chitta**, the subconscious stores these memories. This Kosha is much more powerful than the preceding two Koshas and governs them and is, in turn, governed by the two Koshas superior to it. It is thus central to human existence.

Vijnanamaya Kosha.

Vijnanamaya means composed of vijnana, or intellect, **buddhi** , the faculty which discriminates, determines or wills. It is the sheath composed of more intellection, associated with the organs of perception. This knowledge sheath cannot be the supreme

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self for the following reasons; It is subject to change, It is insentient, It is a limited thing, It is not constantly present.

A large part of this Kosh is in the realm, of the unconscious and is a major repository of information. The feeling of 'me' and 'mine', **ahmakara** (ego) and the faculty of intelligence and reasoning constitute the fourth or Vigyanmaya Kosh. The feeling of freshness that 'I had had a deep sleep' is said to arise from this Kosh. When one closes the eyes and relaxes during meditation, the functioning of the Manomaya Kosh becomes minimum. The Vigyanmaya Kosh comes in the front and gets active. In the final stages of meditation, the intellect becomes stable and mind becomes still and this with practice goes towards the state of samadhi if "mastered".

Causes for memory loss.

Chronic stress:

In this situation the flight or flight mode that is only intended to work briefly becomes the norm. Over time the brain loses cells and has trouble creating neurons

Sleep deprivation: Is your sleep disrupted, or are you getting less of it? Sleep deprivation compounds the effects of stress on the brain, because memories are sorted and organized during normal sleep.

Depression: is usually linked with the lack of serotonin, a neurotransmitter connected to the arousal system. Concentration and focus are affected impairing the ability to properly store new memories.

Nutritional deficiency. Good nutrition- including high-quality proteins and fats - is important to proper brain function. Deficiencies in vitamin B1 and B12 specifically can affect memory.

Alcohol, tobacco, or drug use. Excessive alcohol use has long been recognized as a cause of memory loss.

Stroke. A stroke occurs when the blood supply to the brain is stopped due to the blockage of a blood vessel to the brain or leakage of a vessel into the brain. Strokes often cause short-term memory loss. A person who has had a stroke may have vivid memories of childhood events but be unable to recall what he or she had for lunch.

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Head injury. A severe hit to the head -- from a fall or automobile accident, for example -- can injure the brain and cause both short- and long-term memory loss. Memory may gradually improve over time.

Improving and strengthening memory and concentration from the science of yoga.

Improving concentration and memory power through yoga is very simple. Yoga works on both your mind and body and thus helps to improve your overall condition. It works on a very deep level on your body and that has a powerful impact on your system. The practice of **concentration** is also called as **Dharana** and it helps to focus the mind in one place instead of thinking about different things and wandering here and there. This effectively helps to reduce the stress on your mind and body and boosts your mental functions.

Pranayama:

In seated position there are four pranayama exercises that will stimulate the brain cells , energizes the mind on the whole, provide unifying the body mind and breath causing calm and facilitate clear thinking.

- Bramari
- Ujjayi
- Nadi Shuddi
- Kapalabati
- Full yogic breathing

Pranayama or the breathing exercises help to focus your mind on your breathing pattern as you breathe in and out and thus helps to increase the oxygen flow to your body and also improves the concentration and focus. It also helps to correct your breathing pattern that helps in improving the oxygen flow to your brain and thus nourishes it. It also clears any blockages in the system and also helps to correct the energy flow so the prana or the life energy flows unobstructed. This deeply nourishes the brain and thus helps you to improve the concentration and memory.

Suryanamaskara.

In the asanas or postures you can safely practice the **Surya Namaskar** or the sun salutation daily. This is an intense series of 12 different postures that help to work out

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the entire body. You can also practice the Shavasana for the purpose of observing the breath or creating awareness of the body.

Other asanas that can be practiced are **Sarvangasana** as it **Shoulder-stand** works on the sympathetic and parasympathetic nervous systems, and creates health in the brain and spine by increasing blood flow to the scalp and brain. This pose has been clinically observed to promote vitality and increase memory and IQ.

It is to be held up to three minutes.

From the **Therapy Series:** ankle stretching as it involves balance, **Shalabasana** improves the nervous system that will in turn affect your brain. **Dhanurasana** as it increases circulation to the head region. It also helps the respiratory system that if working properly will allow the mind to be clear and light instead of drowsy and heavy.

Urdhva prasarita padasana is good for circulation of blood for heart to head and is good preparation for Sarvangasana.

Following are the standing/balancing postures that all build concentration and awareness, quietens the mind as well as activates it, improves memory power makes the body lighter and fresher, cleansing and mentally challenging as well as preparation for other asanas like Parighasana for backbends.

Program 1

PROGRAM 1	Focus: BREATH	PROGRAM 2	
Full yogic breathing		Naddi Shuddi	10 round
Kapalabati	10 x 3	Bramari	25 rounds
Bastrika	15 x 3	Shanmukhimudra	10 round
Ankle streching	5 times	Trataka	5-10 minutes + with practice.
Hands in and out breating	5 times	So Hum meditation	5minutes
Front and back bending/ Hands stretching	5 times	Nasikagra Drishti	3 x 1 minute
Tiger Breathing	8 times	Asanas	

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PROGRAM 1	Focus: BREATH	PROGRAM 2	
Shalabasana basic	x 5	Surya Namaskara	6 Rounds
Setubhandasana	x 5	Vrikshasana	5 breaths to each side.
Pavana Mukhta	5 times	Garudasana	5 breaths to each side.
Savasana	5 minutes +	Virabhadrasana A	5 breaths to each side.
		Chakrasana	8 breaths
		Paschimotannasana	8 breaths
		Purvottanasana	8 breaths
		Ardha Matsyendra Asana	5 breaths to each side.
		Vashishtasana	5 breaths to each side.
		Sarvangasana series	6 minutes
		Savasana	5 minutes

Diet

Lastly we have to consider our diet. If this is in tune with what we actually need at any given point we maintain balance in mind and body.

Following the Ayurvedic lifestyle we can glean a lot by eating in accordance with the three gunas being: Satvik, Rajasik and Tamasik.

Eating 2/3 of ones normal portion will also allow the digestive system to work at it's best. This space also leave the mind alert and active instead of sluggish.

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A few things to keep in mind when having to do with memory as well is having a proper diet is to moderate caffeine intake as that inhibits the levels of serotonin and therefore our neurotransmitters.

As a vegetarian one has to make sure that our B12 level is sufficient allowing the brain to work as B12 plays a key role in the normal functioning of the brain.

We can get these from eggs, cheese, milk and yoghurt and marmite.

Data supports eating foods that are high in vitamin E and this includes healthy vegetable oil-based salad dressings, seeds and nuts, peanut butter, and whole grains.

Dark greens like broccoli, collard greens, spinach kale as well as avocados.

Berries helps get rid of toxic proteins associated with age-related memory loss.

Lastly in this technological driven world a number of brain training games available out there to jog ones memory and keep those synapses well oiled for the neurotransmitters.

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