

A Review on Smriti (Memory) and its Affiliates in Physiology

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Abstract

The state of one's mind has a direct bearing on one's physical health. Psychosomatic illness may affect a person's dhi, dhriti, and smriti in the contemporary era due to stress and emotionally disturbed individuals. Remembering what happened in the past is what we mean by the term "smriti" (memory). As one of the eight aishwaryas, it can only be attained by intense concentration and mental attention. Smriti, or self-realization, is one of the most challenging processes in the brain. Remembering begins with an understanding of how the brain stores and communicates information, which may be found in both ancient literature and modern medical studies. Only a few research have examined Smriti's conceptual aspects. According to Ayurveda, smriti's physiological role is linked to contemporary medical understanding in this article. Materials for this study have been collected from the Ayurvedic classics with accessible commentary and textbooks of current contemporary medical science in order to better understand and compare the concept with current science.

Key Words: Embodiment of the limbic system's buddhi, mana, and smriti centres

Introduction:

Smriti refers to things that have been previously seen, heard, or experienced. Memory encompasses encoding, retrieval, and storage of information. His views are heavily impacted by it (intelligence). Unlike Smriti, it is more closely associated with Buddhi and Manovyapaar. It is possible to relive and reproduce past experiences by synchronising the firing of neurons. Many Gyanendriyas help mana fulfil its primary purpose, which is to aid in the retention of knowledge (sense organs). As a science, Ayurveda relies on the concept of functional understanding as its base. Ancient literature has no mention of

Smriti. For some reason, Smriti appears to be beyond the understanding of most pupils. To understand Ayurvedic principles on the basis of modern medical research, there must be a rise in the demand for Ayurveda knowledge in today's society. This evaluation examines Smriti's mental and physical characteristics from a modern point of view.

Manovyapaar and Buddhi- A Cause Effect Relationship:

The four forces of indriya, indryartha, mana, and atma work together to produce gyaana (knowledge). This diagram shows how one acquires knowledge in a sequential way. Mana

collaborates with Atma in order to develop insight (the highest power soul). Recalling what you've learned is an essential part of the learning process. It is believed that everything may be perceived by the mind is the subject matter of chinta, vicharya, uhya To sum things up, the five phases stated above may be used to assist in the process.

buddhism's next generation The indriyas detect the indriyarthas, and the manas analyses the data generated by the indriyas. Indriyasapeksha or indriyanirapeksha knowledge is determined by going through chintya, uhya, and dheya. An study by Sankalpa at this level focuses on whether or not there are differences between the data sets. Data from this categorization was used to create buddhi².

Physiological Aspect of Smriti:

The three doshas symbolise our physical bodies. When it comes to mental activity and functioning, Vata is the principal dosha to rule. In order to acquire smriti, udana vayu³ is the most vital dosha to deal with. In addition to the buddhi, mana, and indriya, prana vata is another kind of dosha that affects their proper functioning Sadhaka pitta, situated in Hridaya, is in charge of ensuring that buddhi and mana⁵ function correctly. Tarpaka kapha is a substance present in the brain that aids in the health and well-being of the organs of perception. They all operate together when it comes to storing and retrieving information in the brain. Good memory is a product of eight different factors, including Nimitta (understanding the cause) and Rupa grahana (understanding the form) as well as Sadrusya (understanding similarity) (Knowledge of difference). Only sattva sara purusha and sara twak sara purusha have better intellect among the eight sara purusha. Because of this prakriti's dual blessings, it is known as Vata. Pitta prakriti individuals are classified as medhavi¹⁰. Smrutiman¹¹ and Chandragraha are both kapha types. Comparatively speaking, the memory of Satwika prakriti is superior to that of Manasa prakriti's.

Modern Aspects:

In the neurological system, neurons serve as the fundamental cells for processing information. When a stimulus is present, sensory neurons are the kind of neurons that respond to it. Sensory information travels to other neurons in the nervous system through an electrochemical mechanism,

where it is processed and sent. For a limited period of time, this sensory input is preserved in the brain's sensory memory. Memory loss occurs if the individual does not encode the information into short-term memory. Silent or audible rehearsal is OK. Long-term or intermediate long-term memory will be preserved as a result. Short-term memories are stored in the prefrontal lobe of the cerebral cortex. Long-term memories are kept in many parts of the brain.

Intense excitatory signals from the brain stem are sent to the cerebral cortex, which in turn sends out further signals to the excitatory area of the mana or cerebral cortex. This helps to sustain or even increase the level of excitation in the cerebral cortex. The majority of the time, brain activity is magnified via a feedback loop. Memories may be stored in long-term memory through the back and forth of impulses that are engaged during the cognitive process. One of the most important parts of the brain for controlling brain activity is the reticular inhibitory region¹².

The limbic system is critical for memory consolidation and retrieval. The neuronal network in the brain regulates our emotional and motivational impulses. We now know that our limbic system's hippocampus makes basic decisions about the importance of sensory data. The hippocampus sends a signal to the brain, causing it to practise new information until it becomes permanently stored¹³. The hippocampus is the part of the brain that converts short-term memory into long-term memories.

The limbic system and the upper reticular formation of the brain stem are activated in a "pattern" to help produce an idea. Limbo-thalamic-reticular structures play an important part in the way we think and process information. The limbic system, the thalamic region, and the reticular formation are all examples of these regions.

Memory is a way to keep track of things. Past neural activity alters the underlying sensitivity of synaptic transmission between neurons, which is how memories are physiologically preserved in the brain. The new or better paths are referred to as "memory traces." In order to replicate memories, the thinking mind might choose to activate those traces after they've been formed. Memory traces may be found at any level of the

nervous system. The basal limbic areas of the brain are where subconscious judgements are formed, such as whether a concept is important enough to preserve in the form of a sensitised memory trace or to be buried completely. The term memory includes short-term, intermediate-term, and long-term recollections. Using the term "working memory," we refer to the ability of the prefrontal cortex to simultaneously store and recall several separate bits of information. The working memory is a kind of short-term memory in the brain that's used to process information while we're thinking. People use it as a springboard for action¹⁴.

There are now two categories of recollections. Declarative and non-declarative memory are the two forms of memory that exist. A person's level of consciousness and awareness are intertwined with their level of declarative or expressed memory. Implicit memories, such as those that do not need conscious recall, include reflexive and non-declarative memories. A task that you've learned and accomplished may be stored in your implicit memory instead of your conscious memory¹⁵.

Explicit memory processing includes encoding, consolidation, storage, and retrieval of memories. When new information is encountered, it is immediately encoded, a process known as attention. Consolidation is a strategy used to improve the long-term stability of newly stored yet labile information. "Storage" refers to the process of preserving memories in certain parts of the brain. This includes both gene expression and protein production. Retrieving and utilising stored data is known as information retrieval.

Long-term memories are more likely to be formed when strong emotions are related to sensory events. So, when we reflect on our past, we prefer to concentrate on memories that bring back powerful emotions. It is precisely because of this that we remember even the tiniest elements of our life so vividly when we hear horrible news. In order to remember or forget anything, the brain uses positive or negative memories. When something doesn't have any meaning to you anymore, it's better to let it go and not dwell on it. The amygdale is where memories of emotions are kept.

Discussion:

As a result of earlier experiences, Smriti aids in recollecting the whole of the percept or encountered items. There are four varieties of budhi, according to Acharya chakrapani. Smriti is a part of the attachment process. It's apparent that Buddhi can't do its job without Smriti. Without uhapoha and vichara, which are derived from smriti, buddhi cannot mature. There are two varieties of Buddhi. Kshanika and nischyatmika are the two main characters. It's possible that Kshanika buddhi and working memory are linked. The prefrontal cortex of the cerebral cortex continuously tracks and recalls various pieces of information, which is necessary for the development of kshanika buddhi. Hippocampus may boost short-term memory to long-term memory conversion from nischatmika buddhi.

By causing chemical, physical, and structural changes in the synapse, which are important for long-term memory, frequent repetition of knowledge (kshanika buddhi) may transfer that information into long-term memory. During the process of nischatmika buddhi development, the following structural changes take place.

the development of more vesicle release sites for the transmission substance's secretion

In addition, the number of transmitter vesicles discharged has increased.

The number of presynaptic terminals has increased.

Changes in dendritic spine structure that allow for greater signal transmission.

There are three types of memory traces that aid in recall: visual (drista), auditory (sruta), and experiential (anubhuta). Drista, sruta, and anubhuta reach Wernicke's region, the part of the brain responsible for intellectual function and word processing, through visual and aural sensory input. Memories are created at every level of the nervous system after that point.

smriti has eight sources: Nimitta (understanding the causes behind events), Rupa grahana (understanding the forms), Sadrusya (understanding the similarities), Saviparyaya (understanding the differences), Satwanuvandha (understanding the concentration of the mind), Abhyasa (understanding the practises leading to metaphysical knowledge), and finally, Puahsrutat (understanding the subsequent partial communication of an event). The eight smriti reasons listed above aid in the consolidation of

short-term memories into long-term ones, which aids in recall and comprehension. This information is stored in the cerebral cortex. The thalamus plays a part in letting a person "search" the memory storehouse and so read out the memory when they are subjected to any cause of memory. These eight causes of memory process need the capacity to seek and locate the memory at a later time.

There are five steps that aid in the creation of buddha: Chintya, Vicharya, uhya, dheya, and Sankalpya. In current science, a thought is the outcome of a "pattern" of stimulation to the cerebral cortex, thalamus, limbic system, and upper reticular formation of the brain stem. It is possible to infer that all of these five processes of mana are advanced by simultaneously stimulating the cerebral cortex, thalamus, limbic system, and upper reticular formation of the brain stem..

Lack of mental attention, according to Acharya charak, is what prevents one from having a direct experience of knowledge. It signifies that the sensory terminals have become used to the stimuli. In this situation, the signal transmission is initially strong but gradually deteriorates owing to a loss of mental focus, a symptom of an unpleasant memory. Direct knowledge may be perceived more easily and more strongly if the facilitator terminal is stimulated by any harmful stimuli.

It's important to note that learning involves acquiring sensory information, whereas memory involves storing and retrieving it. What we term "learning" occurs after a mental process that relies on the retention of memories. When buddhi (gyana) is formed, it is stored in the brain's cortex as a sort of memory.

Conclusion:

Smriti assists in recollecting all of the perceptible or experienced stuff because of her previous experiences. According to Acharya chakrapani, there are four types of budhi. An important component of the attachment process is Smriti's role. Smriti is clearly essential to Buddhi's mission. Only with the help of Smriti-derived practises can one attain the full potential of one's mind. Buddhi comes in two flavours: sweet and savoury. The protagonists are Kshanika and Nischyatmika. Working memory and Kshanika buddhi may be connected. Kshanika buddhi's growth depends on the prefrontal cortex of the

cerebral cortex constantly tracking and recalling numerous kinds of knowledge. The nischayatmika buddhi to long-term memory conversion may be aided by the hippocampus.

Frequent repetition of knowledge (kshanika buddhi) may help transfer that information into long-term memory by creating chemical, physical, and structural changes in the synapse. The following structural changes occur with the formation of nischayatmika buddhi.

developing more locations for the release of transmission material from vesicles

There has also been an increase in the amount of transmitter vesicles released into the bloodstream.

There has been a rise in the number of presynaptic terminals

Increased signal transmission due to changes in dendritic spine structure.

Visual (drista), auditory (sruta), and experience (drista) memory traces all help in recall (anubhuta). Through visual and auditory sensory inputs, Drista, Sruta, and Anubhuta reach Wernicke's area, which is the section of the brain responsible for intellectual function and word-processing. That moment forward marks the beginning of the memory-making process in the nervous system as a whole.

Understanding the causes of events, Rupa grahana (the forms), Sadrusya (similarities) and Saviparyaya (differences), Satwanuvandha (concentration of the mind), Abhyasa (practises leading to metaphysical knowledge), and finally, Puahusrutat, are the eight sources of smriti, according to the Hindu scriptures (understanding the subsequent partial communication of an event). Consolidating short-term memories into long-term ones is aided by the eight smriti causes described above. The cerebral cortex holds this knowledge. It is the thalamus' role to allow a person "search" the memory storage and so read out the memory when they are treated to any kind of memory-inducing stimulus. A subsequent search and retrieval capability is required for each of these eight causes of memory process.

Chintya, Vicharya, uhya, dheya, and Sankalpya are the first four phases in the process of becoming a Buddha. It is now widely accepted that a thought arises as the result of a "pattern" of electrical stimulation in the brain stem's cortex, thalamus, limbic system, and upper reticular

formation. By activating the cerebral cortex, thalamus, limbic system, and the upper reticular formation of the brain stem at once, all five of these mana processes may be enhanced.

A direct experience of knowledge is impossible, according to Acharya Charaka, since the mind must be focused. Sensory terminals get habituated to stimuli when this happens. An unpleasant recollection might cause a lack of mental attention, which weakens signal transmission in this case.. It is possible to have direct information if the facilitator terminal is triggered by damaging stimuli.

It's vital to remember that although memory includes storing and retrieving information, learning requires collecting sensory information. After a mental process that depends on the preservation of memories, we get what we call "learning." The cortex of the brain serves as a type of memory bank for buddhi (gyana), when it is produced.

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