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Ashta Smriti Utpatti Karanas in Ayurveda: A Multidimensional Framework for Memory Enhancement in Children — A Conceptual Review

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ABSTRACT

Background: Memory (*Smriti*) is a central cognitive function in childhood learning. Ayurveda describes *Smriti* within a broader framework of cognition involving *Atma, Manas, Indriya, Indriyartha* and *Buddhi*, and identifies specific factors through which memory may be generated or recalled. *Charaka* describes eight *Smriti Utpatti Karanas—Nimittagrahana, Rupagrahana, Sadrushya, Saviparyaya, Sattvanubandha, Abhyasa, Jnanayoga* and *Punahshruta*.[1] **Objective:** To review the classical Ayurveda concept of *Smriti* and *Ashta Smriti Utpatti Karanas*, examine their conceptual relationship with contemporary understanding of memory, and present a practical framework for translating these principles into child-friendly, non-pharmacological cognitive activities. **Materials and Methods:** A narrative and conceptual review was developed from the classical and contemporary literature compiled in the author's MD thesis literature review. The thesis literature search identified 414 records and 13 core studies relevant to *Smriti, Smritikarana* and pediatric cognitive enhancement. Classical references were examined for definitions, mechanisms and factors related to memory, while contemporary literature was used to contextualize memory encoding, working memory, association, repetition and multimodal learning.[2]Selected contemporary literature was additionally consulted to update conceptual correlations. **Results:** The eight *Smriti Utpatti Karanas* can be interpreted as complementary processes spanning stimulus recognition, form-based encoding, associative similarity, contrast, focused attention, repetition, meaningful understanding and re-exposure. The framework therefore differs from a single-technique memory intervention. Based on the operational model developed in the author's thesis, these principles can be translated into structured activities such as chunking and picture-based narratives, visuospatial manipulation, similarity matching, difference detection, focused-attention practices, repetitive drawing and chanting, and repeated auditory exposure. The framework provides a coherent bridge between classical Ayurveda cognition and contemporary concepts of encoding, attention, association, working memory and retrieval. **Conclusion:** *Ashta Smriti Utpatti Karana* provide a potentially useful multidimensional framework for designing child-centred memory-enhancement programmes. The concept warrants further evaluation through adequately powered controlled studies using validated neuropsychological outcomes and clearly separated intervention components.

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KEYWORDS: *Ayurveda; Smriti; Smritikarana; memory; children; cognition; working memory; Ashta Smriti Utpatti Karanas; Kaumarabhrithya.*

INTRODUCTION

Learning during middle childhood depends on the ability to receive information, attend to it, encode it, retain it and retrieve it when required. Contemporary cognitive science describes memory as a set of interacting processes rather than a single faculty, with working memory playing an important role in the temporary maintenance and manipulation of information. Working-memory capacity is closely related to higher-order intellectual performance and complex cognition.[3]

Ayurveda approaches cognition through a broader psychophysiological model. *Smriti* is discussed in relation to *Buddhi*, *Medha* and *Manas*, and classical descriptions connect cognition with the coordinated participation of *Atma*, *Manas*, *Indriya* and *Indriyartha*. Reviews of Ayurveda literature have identified numerous references to *Smriti* across the *Samhitas*, spanning philosophical, physiological, pathological and therapeutic dimensions[4]

Of particular relevance is the description of eight factors responsible for the generation or activation of *Smriti* in *Charaka Samhita Sharira Sthana* 1/148–149[5] the classical formulation places memory within a process of perception, association, attention, practice, understanding and renewed exposure rather than attributing it to a single anatomical or pharmacological substrate.

This multidimensional character is particularly relevant in children. A child who struggles to remember may not necessarily have a global inability to learn; difficulty may arise at different stages of information processing, including attention, initial encoding, association, retention orretrieval. Consequently, a framework that engages several routes to memory may have greater practical relevance than an intervention focused on a single cognitive exercise.

Ayurveda also contains pharmacological approaches under the broader *Medhya Rasayana* concept. [5] However, an important and comparatively underexplored question is whether classical non-pharmacological principles embedded within *Smritikarana* can be operationalised as structured, repeatable activities suitable for school-age children. The author's thesis was developed around this translational question and created a multicomponent activity-based programme based on the *Ashta Smriti Utpatti Karanas*.

The present review therefore focuses specifically on the conceptual architecture of *Smriti*, the eight *Smritikarana*s, their possible contemporary cognitive correlates, and the practical translation of each principle into child-friendly activities.

REVIEW METHODOLOGY

This was designed as a formal systematic review. The primary source base comprised the classical Ayurveda

literature. The search used the Ayush Research Portal, Cochrane Library, PubMed and Clinical Trials Registry–India, with combinations of the terms *Smriti*, *Smritikarana*, memory, working memory, *Medhya*, chunking, origami, *Gayatri Mantra* and *Mandala* therapy. The documented search identified 414 records, from which 13 core studies were selected for detailed consideration.

For the present review, the classical framework was retained as the primary conceptual source. Contemporary literature was used selectively to explain possible parallels with memory encoding, working memory, associative learning, repetition, visuospatial processing and retrieval. These parallels are presented as conceptual correspondences and not as proof that the classical constructs are anatomically identical to modern neurocognitive mechanisms.

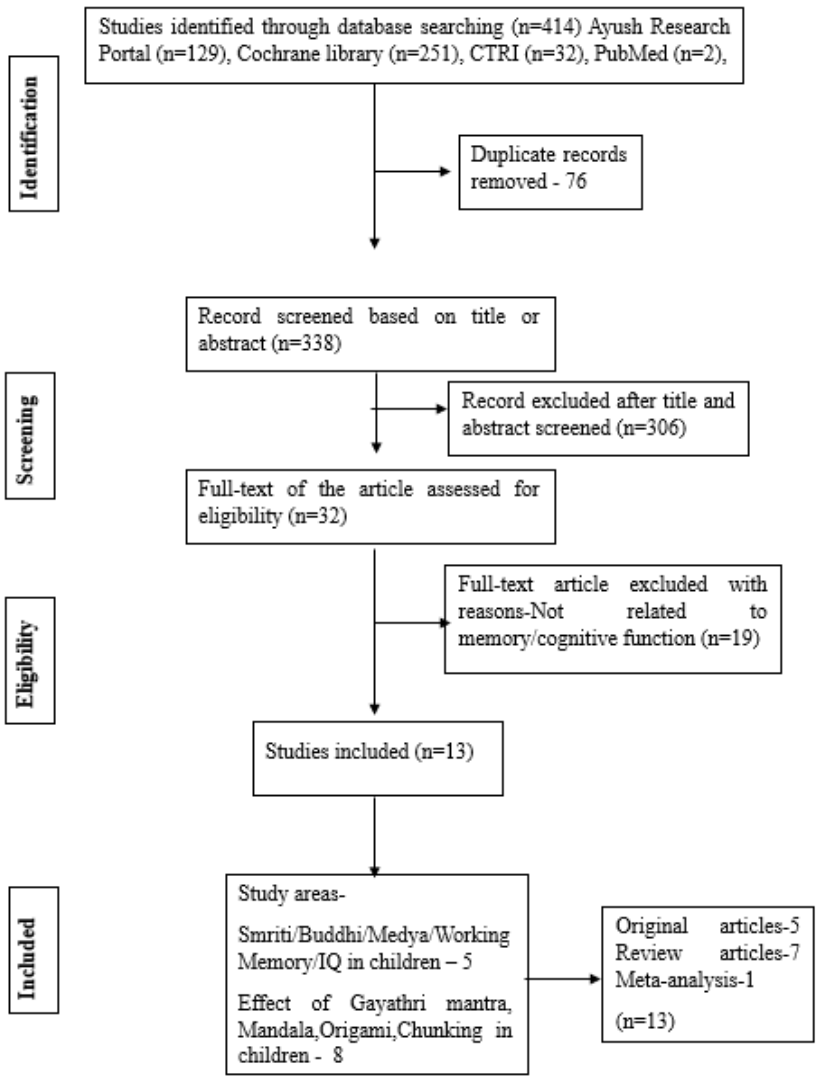
PRISMA S EXTENSIONS:

Prisma-S Extension Checklist

Section/Topic	Item	Check list items
Database Name	1	Ayush Research Portal, Cochrane Library,Pubmed,CTRI
Study Registeries	3	CTRI
Full search strategies	6	The retrieval methodology deployed a matrix of MeSH descriptors, syntax keywords, Boolean operators, and cross-referencing. The primary database execution sequence was structured as follows: (*Smriti* [Title/Abstract]) AND (Memory [Title /Abstract]) AND Children [Title/Abstract]), (*Smriti*[MeSH Terms]) AND (memory[MeSH Terms]),Smriti[Title/Abstract] OR (Memory[Title/Abstract]), (Memory [Title/Abstract]) AND (Chunking [Title/Abstract]), (Memory [Title/Abstract]) AND (Origami [Title/Abstract]), (Memory

		[Title/Abstract]) AND (Gayathri mantra [Title/Abstract]), (Memory [Title/Abstract]) AND (Mandala Therapy [Title/Abstract]).
Limits & Restrictions	7	Articles published in English
Date of Search	9	Last search on 8/5/24
MeSH Terms	10	The thematic search focused on “Smriti", “Smritikarana”, and are systematically paired with parameters like “Memory”, “Working memory”, "Medhya". The following search algorithm was adopted (Smriti [Title/Abstract])) AND (memory[Title/Abstract]), (Smriti[MeSH Terms]) AND (memory[MeSH Terms])
Selection Process	11	Articles having Smriti or Smritikarana and Memory or effect from Gayathri mantra,chunking,mandala art in the title or abstract were shortlisted for full-text review. The articles on clinical trials or meta-analyses assessing the effect on cognitive functions, memory, IQ, or other mental functions were included.
Variables used for Data Extraction	12	Smriti,Smritikarna, memory, working memory, short-term memory, long term memory.
Total Records	13	414
Deduplication	14	Manually done

Prisma Flow Chart



AYURVEDA CONCEPT OF SMRITI

Modern cognitive neuroscience often defines memory as a collection of neurochemical tracks, synaptic updates, and local structural changes in the cerebral cortex[6]. As per these ancient frameworks, ***Smriti*** is the ultimate mental ability of consciousness to actively reshape itself. It acts as an internal guide, connecting the raw data from past sensory experiences to present actions and behaviors. Hence, over time, cultivating this deep awareness transforms memory from a tool of survival into a vehicle for spiritual growth, or the *Karana of Moksha Sadhana.*[7] *Acharya Charaka* anchors memory directly to the timeline of our sensory and emotional existence, dividing deep human experiences into three registers: • *Drishta:* Everything we have seen. • *Shruta:* Everything we have heard.• *Anubhuta:* Everything we have felt and experienced.[8] This reminds us that remembering is an act of reconstruction. *Acharya* has given the fundamental factors responsible for Utpatti of Smriti, collectively considered as *Ashtasmritiutpattikarana.*[1]



Fig. Representation of Charakoktha Ashtasmritiutpattikaranas

1. ***Nimitta Grahana-***

"निमित्तग्रहणं कारणज्ञानं कारणं हि दृष्ट्वा कार्यं स्मरति"

According to *Chakrapani*' s commentary, *Nimitta Grahana* is defined as "*Karana Jnanam*" (Knowledge of the cause or the cue). This implies that memory is triggered when the mind identifies a specific 'cause' or 'signal' that is linked to a past experience.

Ex- By seeing mud, one can remember the pot.

2. ***RoopaGrahana-***

"रूपग्रहणम् आकारग्रहणम् | यथा- वने गवयं दृष्ट्वा गां स्मरति|"

Chakrapani explains *Rupa Grahana* as *"Akara Grahanam"* (grasping or perceiving the shape/form). That is, upon seeing a cattleman in the forest, one remembers the cow.

3. ***Sadrushya-***

"सादृश्याद् यथा- पितुः सदृशं पुरुषं दृष्ट्वा पितरं स्मरति|"

Chakrapani explains this factor using a relatable family example: "Upon seeing a person who resembles one's father, the memory of the father is instantly triggered." This highlights the mind's natural tendency to retrieve stored information when it encounters a current stimulus that shares similar characteristics, features, or "likeness."

4. ***Saviparyaya-***

"सविपर्ययादिति अत्यर्थवैसादृश्यादपि स्मरणं भवति; यथा- अत्यर्थकुरूपं दृष्ट्वा प्रतियोगिनम त्यर्थसुरूपं स्मरति|"

Chakrapani explains this factor by stating: "Memory can also be triggered by extreme dissimilarity (Contrast). Upon seeing an extremely unattractive thing (*Kurupa*), one instantly remembers the opposite, a beautiful thing (*Surupa*).

5. ***Sathvanubandatva-***

"सत्त्वानुबन्धादिति मनसः प्रणिधानात्, स्मर्तव्यस्मरणाय प्रणिहितमनाः स्मर्तव्यं स्मरति।"

Acharya defines this as "*Manasah Pranidhanat*" (the profound application or fixing of the mind). The mind is deeply focused or intent on remembering something, and succeeds in retrieving that memory.

6. ***Abhyasa-***

"अभ्यासादिति अभ्यस्तमर्थमभ्यासबलादेव स्मरति।"

Chakrapani concisely explains this factor as: "Through the power of constant practice (*Abhyasa-bala*), one can remember and retrieve an object or information that has been repeatedly engaged with.

7. ***Jnanayoga-***

"ज्ञानयोगादिति तत्त्वज्ञानयोगात्; उपजाततत्त्वज्ञानो हि तद्बलादेव सर्वं स्मरति"

"Memory arises from the union with *'Tattva-Jnana'* (true or supreme knowledge). This implies that when a concept is understood at its root, the memory becomes effortless and permanent." The knowledge of the supreme soul or the self implies *jnanayoga*. This factor is essential for the processing at the level of *atma* in *jnanotpatti prakriya*.

8. ***Punah shrutha-***

"पुनः श्रुतादिति श्रुतोऽप्यर्थो विस्मृतः पुनरेकदेशं श्रुत्वा स्मर्यते।

"When information that was previously heard is forgotten, hearing even a small part of it again (*Ekadesham*) triggers the complete memory of the entire subject." This highlights the power of sound to "re-awaken" stored knowledge that has become dormant or inaccessible.

The Philosophical Architecture of *Smritikaranas*:

The eight Smritikaranas are not isolated techniques but are grounded in the Epistemological frameworks of the *Darshanas*. While *Nyaya* provides the logic for *Sadrushya* and *Saviparyaya*, *Yoga Darshana* provides the psychological discipline for *Sattva-Anubandha* and *Abhyasa*.

Nyaya Darshana:[9]

The *Smritikaranas* described by *Acharya Charaka*, specifically *Nimitta*, *Roopa, Sadrushya*, and *Saviparyaya*, are the functional manifestations of *Nyaya* principles.

1. ***Upamana*** (The Power of Comparison and Analogy)

In *Nyaya*, *Upamana* is one of the four *Pramanas* (sources of valid knowledge). It is the process of understanding an unknown object by its similarity to a known object.

"प्रसिद्धसाधर्म्यात् साध्यसाधनमुपमानम्॥

Nyaya Sutra (1.1.6)

- ***Prasidda-sadharmyat:*** Based on a similarity (*Sadharmya*) to something already well-known (*Prasidda*).
- ***Sadhya-sadhanam:*** Establishing knowledge of an unperceived object through that similarity.

The mind utilises *Sadrushya* to group objects based on shared attributes, a concept that mirrors the foundational frameworks of modern Schema Theory, where new knowledge is mapped directly onto existing mental models. However, effective information processing requires both categorisation and differentiation; while similarity allows us to cluster concepts together, the principle of *Saviparyaya* provides the necessary contrast to tell them apart. This dual mechanism closely aligns with behavioural psychology's concept of a discriminative stimulus.

2. ***Pratyaksha*** (The Logic of Sharp Perception): *Nyaya* defines *Pratyaksha* as the knowledge that arises from the direct contact of the senses (*Indriyas*) with the object (*Artha*). This is where *Roopa-Grahana* (Perception of Form) and *Nimitta* (Causality) operate.

Yoga Darshana:[10]

The application of *Smritikaranas* is inextricably linked to the psychological and physiological tenets of *Yoga Darshana*. In the context of paediatric cognitive interventions, *Yoga* provides the definitive science of *Abhyasa* (Persistent Practice) and *Sattva-Anubandha* (Focused Attention), which are essential for transforming fleeting perceptions into permanent mental imprints (*Samskaras*).

The Role of Samanya-Vishesha Siddhanta in Cognitive Categorisation

The systematic enhancement of memory through the eight *Smritikaranas* finds its metaphysical and logical grounding in the *Samanya-Vishesha Siddhanta* of the ***Vaisheshika Darshana***.[11] This principle, which governs the relationship between 'Generality' (*Samanya*) and 'Particularity' (*Vishesha*), provides a structural framework for how the human intellect (*Buddhi*) organises and retrieves information.

The classical description of *Smritikarana* is therefore better viewed as a process-oriented model. It includes external cues, visual and conceptual form, similarity and contrast, directed mental attention, repeated practice, deeper understanding and renewed hearing.[1] The framework naturally accommodates multimodal learning and repeated retrieval cues.

ASHTA SMRITI UTPATTI KARANAS

Smritikarana	Classical functional idea	Possible contemporary correlate	Thesis-derived activity example
1. Nimittagrahana	Remembering through recognition of a cause, sign, cue or associated stimulus.	Retrieval cueing; associative encoding; chunking.	Chunked familiar words; picture essays.
2. Rupagrahana	Memory supported by apprehension/recognition of form.	Visual encoding; visuospatial processing.	Rubik's cube; origami.
3. Sadrushya	Recall facilitated by similarity or likeness.	Associative learning; categorisation; analogy.	Shape/size matching; cube-to-flash-card matching.
4. Saviparyaya	Recall facilitated by contrast or marked dissimilarity.	Distinctiveness; attention to salient differences.	Picture-spotting/difference detection.
5. Sattvanubandha	Directed fixation or sustained application of the mind toward the object to be remembered.	Attention; focused engagement.	Jnana Mudra practice; colouring.
6. Abhyasa	Recall strengthened through repeated practice.	Rehearsal; procedural learning; consolidation.	Pattern scribbling; Mandala; Om chanting.
7. Jnanayoga	Memory associated with understanding or union with knowledge at a deeper level.	Meaningful learning; semantic encoding; conceptual integration.	Integrating preceding activities with understanding rather than rote repetition.
8. *Punahshruta*	Previously heard information is recalled when heard again, even partially.	Re-exposure; retrieval cues; auditory repetition.	Gayatri Mantra and Raga Hamsadhwani as repeated auditory exposure.

The table represents a conceptual translation of the classical categories. The modern correlates are explanatory analogies and should not be interpreted as one-to-one equivalences.

RELATIONSHIP WITH CONTEMPORARY MEMORY SCIENCE

Contemporary cognitive science provides several useful conceptual parallels. Working memory is understood as a limited-capacity system involved in temporary storage and manipulation of information, and its relationship with general intellectual ability has been repeatedly discussed.[12]

The *Smritikarana* framework can be viewed as distributing cognitive demand across different forms of representation. Chunking and verbal cues may support manageable encoding; visual form and spatial manipulation provide visuospatial representations; similarity and contrast provide associative and distinctive retrieval cues; focused attention supports selection; repetition provides rehearsal; meaningful understanding supports semantic organisation; and renewed hearing provides additional retrieval cues.

These correspondences should remain hypothesis-generating. Ayurveda and contemporary cognitive neuroscience use different conceptual vocabularies, explanatory assumptions and levels of analysis. The purpose of correlation is therefore not to prove that an Ayurvedic construct is equivalent to a modern brain network, but to identify testable points of intersection.

Recent Ayurveda literature continues to discuss *Smriti* as a multidimensional cognitive construct and has attempted correlations with memory consolidation, hippocampal function and synaptic plasticity.[13] Such work supports continued interdisciplinary investigation while also highlighting the need to distinguish textual interpretation from experimentally established mechanisms.

DISCUSSION:

1. Evidence From Existing Pediatric Cognitive Intervention Literature:

The thesis literature review identified a heterogeneous evidence base comprising clinical trials, reviews and a meta-analysis. Interventions included *Medhya Rasayana*, *Mandala*-based activities, *Mantra*-related practices and other non-pharmacological approaches. The major limitation was methodological isolation: most interventions examined a single herb or a single activity rather than a classical multidomain framework.

The gap is therefore not an absence of interest in memory enhancement; rather, it is the limited evaluation of a standardised, classical, multidimensional non-pharmacological framework. This provides a clear rationale for future controlled studies of *Smritikarana*-based programmes.

2. Proposed Clinical and Educational Application

The reviewed framework may be useful in paediatric counselling, school-health programmes and structured cognitive-support sessions, provided that it is positioned as an adjunctive educational/cognitive intervention rather than a replacement for developmental assessment or evidence-based educational support.

A practical programme can be organised into four stages: (1) assessment of the child's baseline attention, learning and memory profile; (2) selection of age-appropriate activities representing the *Smritikaranas*; (3) graded and repeated practice with monitoring of participation and performance; and (4) objective reassessment using validated outcome measures.

3. Research Gaps and Future Directions

First, the eight components need operational definitions. Each *Smritikarana* should have a reproducible activity protocol, duration and fidelity checklist. Second, future studiesshould separate individual components from the complete multicomponent package to determine whether effects are additive, synergistic or primarily attributable to particular domains. Longer follow-up is necessary to distinguish short-term practice effects from durable changes in memory performance. Finally, future studies should include larger samples, transparent allocation procedures and preregistered protocols where appropriate. These steps would allow the classical framework to move from conceptual plausibility toward reproducible clinical evidence.

4. Limitations Of the Present Review

This review is a new systematic review not a meta-analysis. Much of the pediatric evidence base was derived from the literature search conducted for the author's thesis. The contemporary correlations presented here are interpretive and should not be read as proof of mechanistic equivalence between Ayurveda constructs and modern neurocognitive models. In addition, the practical activity mapping represents an operationalisation developed for the author's thesis and requires independent validation before being considered a standard Smritikarana protocol.

CONCLUSION

Ashta Smriti Utpatti Karanas provide a distinctive, process-oriented Ayurvedic framework for understanding how memory may be acquired, associated, focused, practised and retrieved. Their strength lies in their multidimensionality: *Nimittagrahana, Rupagrahana, Sadrushya, Saviparyaya, Sattvanubandha, Abhyasa, Jnanayoga* and *Punahshruta* can be translated into complementary cognitive, visual, associative, attentional, repetitive and auditory activities. This work provides a practical pathway for operationalizing this classical framework into a structured child-friendly activity programme. The next scientific step is notto assume efficacy from the conceptual model, but to test the model rigorously through controlled, adequately powered studies. *Smritikarana* therefore represents a promising research framework at the interface of Ayurveda, paediatric cognitive care and contemporary learning science.

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