

A COGNITIVE APPROACH TO CARNATIC PEDAGOGY: PATTERN STRUCTURES IN SARAḶI VARISAI

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Abstract

Abhyāsa Gāna forms the foundational stage of Carnatic music pedagogy, where saraḶi varisai serves as the primary exercise for beginners. Traditionally taught through repetitive practice, these exercises are often perceived as mechanical, leading to reduced engagement among learners. This study proposes a pattern-oriented approach to teaching saraḶi varisai by examining its inherent structural logic and cognitive implications. Using selected exercises from Gānamṛtha Bōdhini, the research analyses sequential, repetitive, and shifting swarā patterns and interprets them through cognitive frameworks such as pattern recognition, chunking and memory reinforcement. The study aims to argue that saraḶi varisai is not merely a vocal drill but a systematically designed structure that facilitates cognitive processing and internalization of musical concepts. By introducing pattern-based pedagogical model, the paper demonstrates how learners can achieve improved retention, faster comprehension, and enhanced engagement. The findings suggest that integrating cognitive awareness into traditional teaching methods can significantly improve the effectiveness of beginner-level Carnatic music training.

Keywords: SaraḶi varisai, Abhyāsa Gāna, Cognitive Learning, Pattern recognition, Carnatic pedagogy, Music Education

Introduction

Carnatic music pedagogy begins with Abhyāsa Gāna, a structured set of foundational exercises that have been designed to establish swarā knowledge, layā control, and voice culture. Among these, SaraḶi Varisai represents the first systematic introduction to swarā patterns, typically taught in *Māyāmālavagowla* rāga and *Ādi* tāla.

Despite its importance, the teaching of SaraḶi Varisai often relies on heavily repetitive practice without explicit emphasis on structural logic. This leads to a perception of monotony among learners, particularly beginners, who may fail to recognize the underlying patterns embedded within these exercises.

This study seeks to re-examine SaraḶi Varisai from a cognitive perspective by proposing a pattern-oriented approach to teaching. It aims to demonstrate that these exercises are inherently structured to facilitate cognitive processes such as pattern recognition, memory organization, and sequential learning.

This study proposes that SaraḶi Varisai may be reinterpreted as a structured cognitive training system rather than a purely repetition-based vocal exercise. By analysing the pattern structures embedded within these exercises, the paper aims to demonstrate their role in facilitating cognitive processing and enhancing pedagogical effectiveness in Carnatic music training.

Materials and Methods

The primary source for this study is Gānamṛtha Bōdhini, a widely used pedagogical text designed for structured beginner-level Carnatic music training. The text presents SaraḶi Varisai exercises in a graded and systematic manner, making it suitable for analytical study.

A purposive selection of 14 SaraḶi Varisai in Gānamṛtha Bōdhini was undertaken based on the following criteria:

- Representation of distinct structural patterns
- Gradation in complexity
- Relevance to beginner-level pedagogy

The selected exercises were analysed using a qualitative framework focusing on:

- Pattern classification (Musical Structure)
- Pattern Progression (Pedagogical Design)
- Cognitive Interpretation

Research Methodology:

This study adopts an analytical and interpretative methodology combining musicological analysis with cognitive theory.

Step 1: Pattern classification

This selected Saraḷi Varisai exercises were categorized into:

- Sequential patterns
- Repetitive patterns
- Shift (sliding) patterns
- Composite patterns

Step 2: Structural Analysis

Each exercise was examined for:

- Linear progression of swarās
- Recurring motifs
- Symmetry and grouping
- Step 3: Cognitive Mapping

The identified patterns were interpreted using cognitive concepts such as:

- Chunking - grouping swarās into meaningful units
- Pattern recognition - identifying recurring structures
- Memory reinforcement - repetition aiding retention

Step 4: Pedagogical Interpretation

A pattern-oriented teaching model was proposed based on the findings.

Step 5: Observational validation

A preliminary observational exercise was conducted to examine the pedagogical effectiveness of the pattern-oriented approach. A small-scale observational study was conducted involving ten beginner-level students with no prior formal training in Carnatic music. These students were introduced to selected Saraḷi Varisai exercises. Each group consisted of five beginner-level students. One group was taught using the conventional repetition-based method, while the other was guided through a pattern-oriented approach, where structural groupings and swarā relationships were explicitly explained.

It was observed that the learners exposed to pattern-based instruction demonstrated quicker recall of swarā sequences, reduced dependence on repetition, and greater ease in identifying similar patterns across exercises. In contrast, the learners trained through repetition required more iterations to achieve comparable accuracy and showed limited transfer of learning between exercises. (Figure 1)

Although limited in scope, this observation suggests that a pattern-oriented approach may enhance cognitive engagement and learning efficiency in beginner-level Carnatic music pedagogy.

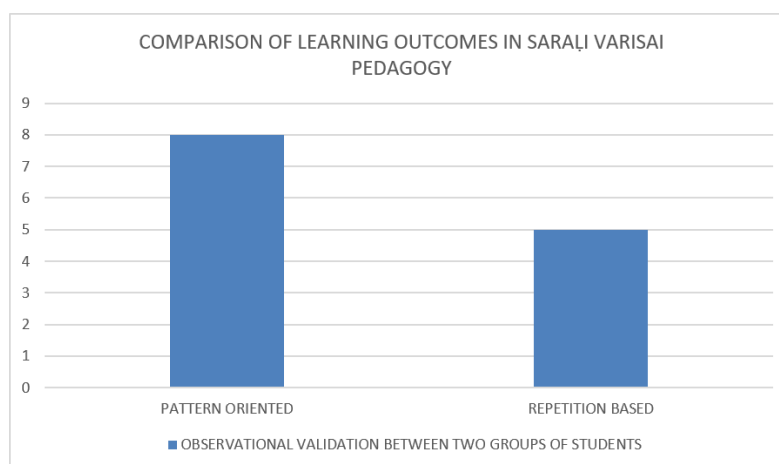


Figure 1: Comparative learning outcomes between pattern-based and repetition-based instruction

Study Area

The study is situated within the domain of beginner-level Carnatic music pedagogy, specifically focusing on vocal training practices involving Abhyāsa Gāna. The analysis is limited to Saraḷi Varisai as presented in Gānamṛtha Bōdhini, which reflects widely adopted contemporary teaching practices.

Analysis

Pattern Bracket Of All 14 Varisais:

- PURE SEQUENTIAL FRAME

s r g m | p d | n ś ||

ś n d p | m g | r s ||

Pattern type: Linear progression

Structural Insight:

Strict thrusting-descending symmetry

No divagation or variation

- REPETITIVE UNDERPINNING PATTERNS

s r s r | s r | g m ||

s r g m | p d | n ś ||

ś n ś n | ś n | d p ||

ś n d p | m g | r s ||

Structural Insight:

The structure demonstrates repetition of swarās in paired cycles, forming micro-pattern loops that reinforce auditory memory.

Introduces micro-pattern looping

Cognitive Role:

Strengthens memory connection

Builds auditory reinforcement

This introduces chunking through repetition.

- OSCILLATING PATTERNS

s r g s | r g | s r ||

s r g m | p d | n ś ||

ś n d ś | n d | ś n ||

ś n d p | m g | r s ||

Structural Insight:

Back-and-forth motion

Breaks linear expectation

Cognitive Role:

Develops pattern discrimination

Avoids passive learning

Brain must actively track deviation.

- SEGMENTED REPETITION PATTERNS

s r g m | s r | g m ||

s r g m | p d | n ś ||

ś n d p | ś n | d p ||

ś n d p | m g | r s ||

Structural Insight:

Larger phrase broken into smaller repeating units

Cognitive Role:

Encourages chunking

Reduces cognitive load

Important for efficient learning.

- INSERTION / PAUSE-GROUNDED PATTERNS:

s r g m | p , | s r ||

s r g m | p d | n ś ||

ś n d p | m , | ś n ||

ś n d p | m g | r s ||

s r g m | p , | g m ||

p ; , | p , | ; ||

g m p d | n d | p m ||

g m p g | m g | r s ||

ś , n d | n , | d p ||

d , p m | p , | p , ||

g m p d | n d | p m ||

g m p g | m g | r s ||

ś ś n d | n n | d p ||

d d p m | p , | p , ||

g m p d | n d | p m ||

g m p g | m g | r s ||

s r g m | p , | p , ||

d d p , | m m | p , ||

d n ś | ś n | d p ||

ś n d p | m g | r s ||

From the 5th, 10th, 11th, 12th and 14th varisai's mentioned,

Structural Insight:

Introduction of kārvai (rests)

Temporal gaps

Cognitive Role:

Enhances timing awareness

Introduces temporal cognition

Moves from pitch → laya integration

- DIRECTIONAL SHIFT PATTERNS:

s r g m | p d | s r ||

s r g m | p d | n ś ||

ś n d p | m g | ś n ||

ś n d p | m g | r s ||

s r g m | p d | n , ||

s r g m | p d | n ś ||

ś n d p | m g | r , ||

ś n d p | m g | r s ||

From the 6th and 7th varisai,

Structural Insight:

Sudden directional jumps

Partial phrase resets

Cognitive Role:

Builds predictive correction ability

Prevents rigid memorization

- MIRROR / SYMMETRY PATTERNS:

s r g m | p m | g r ||

s r g m | p d | n ś ||

ś n d p | m p | d n ||

ś n d p | m g | r s ||

s r g m | p m | d p ||

s r g m | p d | n ś ||

ś n d p | m p | g m ||

ś n d p | m g | r s ||

From the 8th and 9th varisais,

Structural Insight:

Reflection-like movement

Symmetrical phrasing

Cognitive Role:

Enhances pattern recognition efficiency

Brain detects balance structures

• **COMPLEX COMPOSITE PATTERNS:**

- s r g r | g , | g m ||
- p m p , | d p | d , ||
- m p d p | d n | d p ||
- m p d p | m g | r s ||

- s r g m | p , | p , ||
- d d p , | m m | p , ||
- d n ś , | ś n | d p ||
- ś n d p | m g | r s ||

Structural Insight:

A combination of:

- Repetition
- Jumps
- Pauses
- Direction changes

Cognitive Role:

- Highest cognitive load
- Integrates all prior learning

This is the advanced stage of beginner cognition.

Pattern Progression

From the analysis done we can find that all these 14 varisais are actually not random. They follow a cognitive progression model.

- Stage 1: Linear Encoding (Varisai 1)
- Stage 2: Reinforcement or Underpinning (Varisai 2)
- Stage 3: Deviation Introduction (Varisai 3 & 4)
- Stage 4: Temporal awareness (Varisai 5)
- Stage 5: Directional complexity (Varisai 6 to 9)
- Stage 6: Cognitive Integration (Varisai 10 to 14)

Cognitive Interpretation

The Saraḷi Varisai system in Gānamṛtha Bōdhini demonstrates a graded cognitive design, progressing from simple sequential encoding to complex pattern integration, thereby functioning as a structured cognitive training model rather than a set of mechanical exercises.

VARISAI	PATTERN TYPE	COGNITIVE FUNCTION
1	Sequential	Encoding
2	Repetition	Memory reinforcement
3	Oscillation	Pattern detection
4	Segmentation	Chunking
5	Pause-based	Timing cognition
6-7	Directional	Prediction
8-9	Symmetry	Pattern efficiency
10-14	Composite	Integration

Results And Discussion:

The analysis of the fourteen Saraḷi Varisai exercises from Gānamṛtha Bōdhini reveals a highly systematic and graded structural organization, demonstrating that these exercises function not merely as vocal drills but as a structured framework for progressive learning.

The Saraḷi Varisais can be broadly classified into distinct pattern categories, including sequential, repetitive, oscillatory, segmented, pause-based, directional, symmetrical, and composite structures. Each of these reflects a specific mode of swarā arrangement, contributing to varied levels of cognitive engagement.

The initial exercises establish a linear ascending-descending framework, enabling learners to internalize swarā order and pitch relationships. Subsequent varisais introduce repetition, reinforcing pitch stability and strengthening memory through cyclic structures. As the progression continues, oscillatory and segmented patterns introduce controlled deviations from linearity, requiring active cognitive engagement and facilitating chunking of musical material into manageable units.

The incorporation of pauses (kārvai) introduces a temporal dimension, enabling learners to integrate rhythm with pitch, while directional shifts and symmetrical patterns enhance predictive processing and pattern recognition. The later exercises combine multiple structural elements, forming composite patterns that demand higher levels of cognitive integration.

The structural organization of Saraḷi Varisai aligns with established principles in cognitive psychology, particularly in relation to chunking and memory processing (Miller, 1956). The reduction of cognitive load through structured patterning further supports efficient learning (Sweller, 1988). Additionally, the recognition of recurring swarā groupings reflects broader principles of pattern recognition in skill acquisition (Simon, 1974).

From a cognitive perspective, these structures engage key learning mechanisms. Pattern recognition enables learners to identify recurring swarā groupings, reducing reliance on rote memorization. Chunking allows multiple swarās to be processed as unified units, thereby lowering cognitive load and improving efficiency. Repetitive structures support memory consolidation, while oscillatory and directional patterns stimulate predictive processing. Pause-based elements further contribute to temporal cognition by integrating rhythmic awareness into melodic learning.

Taken together, these findings demonstrate that Saraḷi Varisai embodies a structured cognitive learning system, progressing from simple sequential processing to complex integrative pattern recognition.

Pedagogical Implication: A Pattern-Oriented Model

Based on the above findings, a pattern-oriented approach to teaching Saraḷi Varisai is proposed as an effective alternative to purely repetition-based methods.

Instead of presenting exercises as continuous sequences, the teacher may first identify and highlight the underlying structural patterns within each varisai. This is followed by an explanation of the swarā logic, enabling learners to understand the internal organization of the exercise. Practice can then be carried out in segmented units, allowing learners to internalize patterns through chunking rather than memorizing isolated notes.

Further reinforcement may be achieved by drawing connections between similar patterns across different varisai's, thereby strengthening recognition and recall. The integration of layā elements, particularly in exercises involving pauses, ensures that learners develop both melodic and rhythmic awareness simultaneously.

This approach transforms the learning process from mechanical repetition to cognitively informed engagement, leading to improved retention, faster comprehension, and enhanced learner involvement.

Visual Model: Pattern-Cognition Mapping

Saraḷi Varisai Structures



Pattern Types

(Sequential / Repetitive / Shift / Pause / Composite)



Cognitive Processes

(Chunking / Memory / Prediction / Timing)



Learning Outcomes

(Improved Retention / Faster Learning / Engagement)

The findings of this study align with established principles in cognitive psychology. The concept of chunking, as proposed by George A. Miller (1956), suggests that individuals process information more efficiently when information is grouped into meaningful units. Similarly, cognitive load theory introduced by John Sweller (1988) emphasizes that structured information reduces the burden on working memory, thereby facilitating learning. The recurring and symmetrical patterns observed in Saraḷi Varisai also reflect principles of pattern recognition in skill acquisition, as discussed by Herbert A. Simon (1974). These perspectives reinforce the interpretation that Saraḷi Varisai, as presented in Gānamṛtha Bōdhini, inherently embodies cognitively structured learning principles.

Conclusion

This study establishes that Saraḷi Varisai, as presented in Gānamṛtha Bōdhini, embodies a structured pattern system that aligns closely with cognitive learning principles. By shifting from a repetition-based to a pattern-oriented teaching approach, educators can significantly enhance learner engagement, comprehension, and retention.

The findings suggest that integrating cognitive awareness into Carnatic pedagogy can transform the learning experience, particularly at the foundational level. This also opens avenues for further research into integrating of psychological, scientific and mathematical approach towards pedagogy in Abhyāsa Gāna. This perspective opens scope for further interdisciplinary research integrating cognitive science and Carnatic music pedagogy.

References

- Panchapakesa Iyer, A. S. (2015). *Ganamrutha Bodhini*. Chennai.
- Sambamoorthy, P. (1998). *South Indian music* (Vol. 1). Chennai: The Indian Music Publishing House.
- Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63(2), 81–97. <https://psychclassics.yorku.ca/Miller/>
- Schmidt, R. A., & Lee, T. D. (2011). *Motor control and learning: A behavioral emphasis* (5th ed.). Champaign, IL: Human Kinetics.
- Simon, H. A. (1974). How big is a chunk? *Science*, 183(4124), 482–488. <https://doi.org/10.1126/science.183.4124.482>
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4