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Memory in Embodiment: Neural Attunement and the Neuro-Aesthetic Life of Rasa in Mohiniyattam

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***Abstract*— Indian aesthetic philosophy has long viewed rasa as a transformative experience shaped by the sahṛdaya, or cultured spectator. This paper studies rasa through the framework of Embodied Cognition, using Mohiniyattam as a living Indian Knowledge System. It offers an indigenous perspective on relational and distributed meaning-making in relation to contemporary neuroscience and Neuroaesthetics. The study also engages with Eurocentric ideas that place aesthetic experience solely within individual cognition, asserting that rasa arises from dynamic interactions among body, movement, rhythm, breath, and the audience.**

This paper discusses how Mohiniyattam's lasya-based movement, circular spatiality, controlled breathing, and subtle abhinaya create shared emotional resonance and neural attunement between the performer and the audience. It does this by drawing on theories of embodied cognition and enactive cognition, affective synchronization, predictive processing, neural attunement, and the somatic marker hypothesis.

As active co-creators of the experience of sight, viewers participate in meaning-making through anticipatory gestures and rhythmic flow. This paper defines Indian performance traditions as embodied modes of knowing within Indian Knowledge Systems by highlighting Mohiniyattam, which conveys ethical, emotional, and cognitive understanding. It advocates Indian Knowledge Systems as trustworthy and perceptive frameworks for investigating embodied, relational, and collective cognition by situating rasa within the field of neuroaesthetics.

***Keywords*— Mohiniyattam, Rasa, Embodied Cognition, Neural Attunement, Indian Knowledge Systems, Neuroaesthetics, Somatic Marker Hypothesis**

I. Introduction

Indian aesthetic philosophy frames aesthetic experience as a shared, embodied, and relational process rather than a solitary mental response. The theory of rasa, first articulated in the Nāṭyaśāstra by Bharata Muni and later refined by Abhinavagupta, is central to this tradition. In this context, aesthetic experience arises through the interplay of vibhāva, anubhāva, and vyabhicāribhāva, culminating in the sahṛdaya's aesthetic enjoyment.

The idea of sādhāraṇīkaraṇa, as proposed by Abhinavagupta, emphasizes how rasa can universalize emotions, enabling the audience to transcend their own self-centered feelings and experience in a shared aesthetic experience.

Scholars like Gupta and Misra have pointed out that the sahṛdaya actively interacts between ideal aesthetic consciousness and sensory experience rather than only receiving meaning passively. These relational models of experience are becoming more and more reinforced by recent findings in cognitive and neuroscience research.

Furthermore, Vittorio Gallese's idea of embodied simulation describes how shared sensorimotor activation enhances emotional understanding between individuals, while Antonio Damasio's somatic marker hypothesis highlights how bodily states impact emotional judgments and decisions. In addition, this study establishes Mohiniyattam as an evolving Indian Knowledge System (IKS) by emphasizing that rasa is best understood as an emergent phenomenon arising from embodied memory, rhythmic anticipation, and brain attunement between the dancer and the observer.

Additionally, the study views rasa as more than just an emotion that the audience "felt"; rather, it views it as a dynamic process influenced by breath control, bodily movement, spatial design, and culturally guided perception. A prime example of participatory sense-making, Mohiniyattam performances form a rhythmic and emotional continuum between the dancer, music, and audience. The slow motions, when coupled with cyclical rhythmic structures, enable viewers in concentrating and empathizing with the developing emotional arc. Importantly, prolonged emotional and neural synchronization co-creates rasa, resulting in a prolonged experience.

Consequently, in addition to being an art form, Mohiniyattam serves as an embodied mode of knowing that transmits ethical, emotional, and cognitive information. By combining classical Indian aesthetic theory with modern neuroscience, specifically, enactive cognition, predictive processing, neural mirroring, and the somatic marker hypothesis, this paper focuses on how Indian performance traditions foreshadow and broaden contemporary scientific perspectives on mind-body harmony Mohiniyattam is an excellent instance for studying how memory, embodiment, and shared emotion work together to produce collective aesthetic meaning because of its lasya-based movement and emphasis on subtle impact.

In conclusion, by blending modern neuroscience with Indian aesthetic philosophy, this study highlights the comprehension of rasa as a growing body of neuro-aesthetic knowledge. Rasa doesn't just exist in the thoughts of the audience or come before a performance. It emerges when affective synchronisation, neuronal mirroring, predictive anticipation, and embodied memory align. Mohiniyattam's emphasis on relational presence, breath, and continuity clearly illustrates this process.

II. Rasa, Embodied Cognition, And Indian Knowledge Systems

The Nāṭyaśāstra's classical definition of rasa places aesthetic experience inside a meticulously planned combination between vibhāva (determinants), anubhāva (consequents), and vyabhicāribhāva (transitory states), which culminates in the sahṛdaya's aesthetic delight. Later philosophical elaborations, like Abhinavagupta's rasa-dhvani theory, highlight the relational and transformative aspects of rasa theory, but early readings have frequently been interpreted through an emotional or psychological perspective.

Significantly, the universalised influence of rasa, according to Abhinavagupta, transcends individual subjectivity through aesthetic distance (sādhāraṇīkaraṇa). More [17] stated that, according to Abhinavagupta, art extends beyond merely evoking particular emotions; a true work of art, while possessing an emotive essence, must also embody a profound sense of suggestion and the ability to evoke multiple layers of meaning. Rasa appears as an early expression of embodied and enactive cognition when observed through the prism of modern cognitive theory.

Also, enactive approaches to cognition emphasise that active interaction between an organism and its environment, rather than static mental representation, is the source of perception and meaning. This idea is demonstrated by Mohiniyattam's focus on constant movement, circular spatial patterns, and controlled breathing, all of which highlight the body as the primary site of knowledge.

By emphasising that aesthetic experience is co-created rather than received, the sahṛdaya notion further complicates the spectator–performer dichotomy. According to Gupta [10], from its very aesthetic sense, *natya* is intended to evoke *rasa*, which serves as both its purpose and its ultimate end.

Through emotive memory and physical resonance, the cultured spectator actively contributes to the unfolding of rasa rather than just decoding meaning.

Furthermore, this is in line with recent theories of neural mirroring and emotional synchronisation, which show how observers use shared brain pathways to internally mimic the behaviours and feelings of others. Such embodied emulation is encouraged by the dancer's delicate abhinaya and restricted expressivity in Mohiniyattam, which allows viewers to "feel with" the performer. Furthermore, the neuroscientific interpretation of predictive processing is similar to the rasa theory's emphasis on cultural training and aesthetic competency.

Misra [15] stated that the tradition of poetics does not perceive *sahṛdaya* merely as an enjoyer of literature, rather, it views him as an individual placed in a situation of tension between two selves, one responding to the sensory world and the other to an idealized realm of aesthetic constructs, collective wisdom, and self-transcendence, ultimately merging into a Universal being.

According to predictive processing models, expectations, learned patterns, and past experiences all influence perception. In Mohiniyattam, the sahṛdaya's ability to predict gestural meaning, rhythmic cycles, and emotional trajectories is essential to the aesthetic experience.

III. Mohiniyattam As A Living Neuro-Aesthetic Embodiment

Mohiniyattam's aesthetic language offers a particularly rich setting for researching embodied cognition. It stresses circular movement trajectories, soft lateral movements of the body, and a controlled tempo that emphasises breath and muscular memory. Antonio Damasio's explanation of the Somatic Marker Hypothesis, which maintains that physiological conditions influence emotional judgment, valuation, and reasoning, is consistent with these traits. In Mohiniyattam, the dancer's bodily reactions reveal emotive awareness, which guides both performance choices and audience perception.

Damasio [8] asserted that he introduced the phenomenon as the technical term *somatic state* and referred to it as a *marker* because it “marks” an image. He further noted that the term is employed in its broadest sense to encompass both visceral and non-visceral sensations.

Most importantly, the way this function is further clarified by contemporary neuroaesthetic theory, especially Vittorio Gallese's work. According to Gallese's theory of embodied simulation, the activation of common sensorimotor pathways between the artist and the audience is the foundation of aesthetic experience.

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Gallese [12] stated that the bodily structure of mental representations determines the scope of what they can represent, as these representations are influenced by the inherent limitations of the human body. Such constraints govern the representations of one's own actions, emotions, and sensations, as well as those of others.

Consequently, embodied simulation involves the reactivation of mental states and processes grounded in bodily representations. Sensory–motor systems, which initially evolved to facilitate interactions with the external world, can, upon being detached from direct motor pathways and dynamically integrated with other cortical regions, contribute to advanced cognitive abilities such as understanding others.

Also, neural mirroring is facilitated by Mohiniyattam's restrained abhinaya, which leads viewers into a zone of affective intimacy rather than theatrical excess through delicate eye movements, regulated facial musculature, and micro-expressions. To create a shared affective environment in which rasa may arise, the audience does more than just understand gesture symbolically; they also practice it internally through physical simulation Significantly, these neuroscientific frameworks depict how Indian performance traditions work as integrative systems where body, memory, and culture intersect rather than reducing Mohiniyattam to biological processes.

IV. Embodied Memory, Emotions, And The Transmission Of Aesthetic Knowledge

In Indian performance traditions, memory is viewed as an embodied, emotive, and culturally embedded activity rather than an abstract cognitive possession. Through consistent practice, rhythmic entrainment, and controlled breath and gesture modulation, Mohiniyattam engraves memory into the body. Multiple temporal registers are used by this embodied memory: collective memory engaged during performance through shared affective awareness, cultural memory passed down through repertoire and lineage, and personal memory developed through years of practice. Batson [5] emphasized that in a quiet and reflective state of open attention, active thoughts gradually subside, allowing a deeper receptivity to new sensations and experiences to emerge. Repeated physical actions create long-lasting brain networks that function subconsciously, as evidenced by studies on procedural memory and motor cognition.

Basso et al. [4] highlighted that dancers progressively refine their movement sequences by modifying their actions through feedback from instructors, self-observation through mirrors, and the mental visualization of accurate movement patterns. They further hypothesized that dance training enhances a range of neurobehavioural processes, which consequently contribute to improved interpersonal coordination skills.

In addition, the Indian educational emphasis on anusandhāna (attentive practice) and abhyāsa is highly aligned with these outcomes. The alignment of physiological and emotional states among individuals interacting is known as affective synchronisation, according to research in social cognition and neuroscience.

Elst et al. [10] noted that prior to the commencement of dance, the nervous system processes auditory and other external stimuli and initiates the necessary preparatory mechanisms. During the performance, it generates, regulates, and coordinates dancers' movements while continuously processing relevant environmental inputs. Consequently, the nervous system serves as the fundamental basis of dance, making the study of its neuroscience indispensable for a comprehensive understanding of the art form.

Also, interpersonal brain synchronisation research indicates that shared rhythms, coordinated movement, and prolonged attention can all result in observable neural connections. This synchronicity has important ethical implications. Indian aesthetic theory holds that rasa is a transformative experience because it suspends ego-driven emotion and replaces it with a universalised effect. According to the neurohumanities perspective, this process can be understood as a recalibration of affective orientation: spectators briefly align their brain and emotional states with the performance, which fosters empathy without appropriation.

To add to this, empathic involvement is made possible by Mohiniyattam's restrained expressivity, which alleviates emotional excess and maintains aesthetic detachment. The ability to stay in ambiguity, identify subtle emotional shifts, and stay focused without demanding closure is all made possible by embodied attunement. This challenges dominant cognitive paradigms, which attribute meaning to immediacy and climax. Instead, Mohiniyattam cultivates an ethics of patience, attunement, and relational awareness, qualities that are vital in the face of today's sensory overflow.

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Furthermore, even while contemporary cognitive research has progressively acknowledged the relevance of embodiment in perception and action, Indian performance traditions such as Mohiniyattam require a further conceptual shift from embodied cognition to scattered embodied cognition. This approach emphasises that memory and meaning are not limited to specific brain systems but are instead dispersed throughout bodies, rhythms, spatial arrangements, musical patterns, and culturally held expectations. By emphasising relational emergence, Indian aesthetic philosophy subtly acknowledges this dispersal of cognition. Rasa is never solely ascribed to the dancer or the audience; rather, it results from the two coming together in a shared aesthetic space.

Importantly, this anticipates contemporary theories of distributed cognition, which argue that cognitive processes extend beyond the brain into tools, environments, and social interactions. In Mohiniyattam, the rhythmic cycles of the percussion, the melodic contours of the rāga, and the dancer's corporeal modulation collectively scaffold aesthetic experience. Memory, therefore, is not recalled but enacted, reconstituted anew in each performance through distributed participation.

Additionally, this foreshadows current ideas of distributed cognition, which contend that social interactions, technologies, and environments all perform a role in cognitive processes that transcend the brain. In Mohiniyattam, the dancer's body modulation, the rāga's melodic contours, and the percussion's rhythmic cycles all work together to create an artistic experience. Srivastava et al. [20] stated that this profound connection between the mind and body enables Indian dances to transcend linguistic boundaries and serve as a medium for expressing profound human emotions.

As a result, memory is not recalled but rather enacted and recreated in every performance through shared involvement. This perspective is further supported by neuroscientific research on interpersonal synchronisation and temporal coordination.

Significantly, neural oscillations tend to synchronise when people are performing rhythmically aligned activities, creating similar temporal frames for affect and perception. This coordination is made possible by Mohiniyattam's consistent rhythmic continuity, which allows viewers to focus their attention and emotional reactions on the movement as it unfolds.

V. The Temporality Of Rasa

The emphasis on anticipation that both Indian aesthetic theory and modern neuroscience share is one of their most fruitful points of convergence. According to models of predictive processing, the brain continuously creates expectations about incoming sensory data and then uses feedback to improve these predictions. According to this concept, perception is essentially anticipatory as opposed to reactive.

Sundararajan and Raina [19] highlighted that the *rasa* tradition is centred on two forms of virtual realities: the realm of ideal emotions and the ideal creator–audience relationship. They further explained that, according to Abhinavagupta (10th century), a prominent commentator of *rasa* theory, Indian aesthetics primarily engages with idealized emotional experiences rather than ordinary everyday emotions. The second dimension of this virtual reality concerns the ideal relationship established between the creator and the critic.

Moreover, through anticipatory attunement, the sahṛdaya, or spectator, interacts with Mohiniyattam. Understanding narrative patterns, gestural grammar, and rhythmic cycles allows the audience to project emotional pathways before they completely emerge. Thus, the emphasis on aesthetic training in classical rasa theory is consistent with neuroscientific observations that perceptual experience is neurally shaped by prior knowledge.

Additionally, predictive bodily states that correspond with the performance are created by the spectator's body subtly mirroring the dancer's tempo and spatial positioning. With its focus on circularity and movement, Mohiniyattam is the perfect medium for nurturing and disseminating this horizon.

VI. Neural Mirroring, Movement, And Embodied Attunement

This paper emphasises that Mohiniyattam goes beyond primitive ideas of brain imitation, although mirror neuron theory has frequently been used to explain spectatorship in performances. In a condition of neural attunement, the spectator's sensory, motor, and affective systems align with the performer's dynamics without precisely replicating them.

In contrast to just internally replicating observed movement, this distinction is important because Mohiniyattam's restricted expressivity promotes subtle resonance rather than overt mimicry.

According to the neuroaesthetics theory of embodied simulation, seeing movement causes the observer's sensorimotor pathways to fire in tandem.

Gallese [12] highlighted that mirror mechanisms represent one manifestation of embodied simulation, wherein the process of simulation is initiated through perception, such as observing another individual performing an action, expressing an emotion, or experiencing a somatosensory stimulus. He further noted that embodied simulation can also occur through imagination, wherein the mental visualization of perceptions or actions activates the same cortical regions involved in actual sensory experiences, such as the visual areas engaged during the perception of a visual scene.

However, Mohiniyattam uses minimalism to hone this activation. Therefore, culturally informed inference co-constructs neural activation rather than being solely driven by signals. Through the facilitation of shared affect without emotional appropriation, neural attunement maintains this equilibrium.

Consequently, rather than being a product of identification, rasa arises as a social phenomenon maintained through resonance. It illustrates how discipline, continuity, and focused attention may ultimately result in cognitive depth and shows how knowledge can be replenished without disruption, conveyed without abstraction, and preserved without inscription.

To summerize, the complication to distinguish between ethics and aesthetics or between cognition and embodiment is exactly what makes it so epistemological. When such traditions are included in the study of neurohumanities, it becomes more inclusive and philosophically coherent.

VII. Conclusion

This study highlights the way Mohiniyattam works as a neuro-aesthetic system where memory, culture, the body, and the intellect all come together to create common knowledge. It demonstrates how Indian performance traditions express integrated epistemologies of the mind-body continuum by placing rasa within the frameworks of embodied cognition, predictive processing, and neural attunement.

By using controlled breathing, lasya-based movement, and nuanced abhinaya, Mohiniyattam engages viewers in co-participatory aesthetic meaning-making and activates bodily simulation and affective synchrony. The research proposes a dialogic model wherein modern neuroscience and Indian aesthetic philosophy mutually enlighten each other.

Rasa is thus interpreted as shared, embodied knowledge that arises through brain attunement, cultural memory, and ethical relationality as opposed to a personal feeling.

Furthermore, Mohiniyattam is put out as a cohesive neuro-aesthetic epistemology that combines neuronal alignment, emotional synchrony, predictive anticipation, and embodied memory. In a long-term conversation with neuroscience, rasa emerges as dispersed, emergent cognition, contrary to emotional residue. In contrast to fragmentation, Mohiniyattam portrays cognition as relational, temporally prolonged, and ethically inflected, favouring co-presence and continuity. As a result, it contradicts prevalent cognitive models that value individualism, representation, and speed.

To conclude, Mohiniyattam upholds cognition as relational, affective, and embodied, reminding us that knowledge is found in shared rhythms, dancing memory, nurtured attention, and moving bodies in addition to texts and theories. As neurohumanities evolves, such traditions demand recognition as theoretical interlocutors within global cognitive discourse today.

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