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Theoretical exploration of yogic and parapsychological correlations: A Neuropsychological perspective based on teachings of the *Haṭha Yoga Pradīpikā*

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Abstract

The study of consciousness has been a key focus in both Eastern contemplative traditions and modern science. Yogic texts such as the *Haṭha Yoga Pradīpikā* (HYP) describe psychophysiological states and experiential phenomena that resemble concepts in parapsychology and neuropsychology. This review aimed to develop a theoretical framework explaining how yogic practices influence consciousness, cognitive processes, and altered states of awareness by integrating yogic, parapsychological, and neuroscientific perspectives. A conceptual review approach was used, systematically examining classical yogic literature, parapsychological studies, and contemporary neuroscientific findings to identify shared principles and mechanisms. Findings indicate that the HYP outlines a structured psychophysiological model where practices such as *Prāṇāyāma, Mudrā*, *Bandha*, and Meditation enhance attentional control, autonomic regulation, and neural integration. These practices parallel neuroscientific observations, including vagal modulation through breathing, reduced default mode network activity, and increased gamma synchrony during Meditation. Yogic descriptions of heightened intuition and expanded cognition show similarities with phenomena discussed in parapsychology, though these remain debated. Emerging models like predictive processing provide tentative explanations for such experiences. The review highlights significant conceptual overlaps across traditions, suggesting that improved attention and autonomic stability underlie altered states of consciousness. However, methodological and epistemological differences require cautious interpretation, emphasizing the need for further interdisciplinary research.

Keywords: Consciousness; *Haṭha Yoga Pradīpikā*; Yogic Practices; Neuropsychology; Altered States of Awareness

1. Introduction

The nature of consciousness remains one of the most profound and unresolved questions across multiple disciplines, including philosophy, neuroscience, psychology, and spiritual traditions. Contemporary scientific inquiry often conceptualizes consciousness in terms of neural correlates, cognitive processes, and computational frameworks. In contrast, traditional yogic systems approach consciousness as a dynamic and trainable phenomenon that can be refined through disciplined psychophysical practices. Throughout history, people have reported events that seem to violate the common-sense view of space and time. Some psychologists have been at the forefront of investigating these phenomena with sophisticated research protocols and theory, while others have devoted much of their careers to criticizing the field (Cardeña, 2018).[1]

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Among classical yogic texts, the *Haṭha Yoga Pradīpikā* (HYP) occupies a central position as a comprehensive manual outlining techniques aimed at regulating the body, breath, and mind. Unlike purely philosophical texts, the HYP provides practical instructions that lead to observable experiential transformations, including heightened awareness, emotional regulation, and altered perceptual states. These descriptions suggest a sophisticated understanding of mind–body interaction long before the emergence of modern neuroscience. Parallel to these traditions, parapsychology has explored phenomena that appear to extend beyond conventional sensory and cognitive boundaries. Experiences such as telepathy, clairvoyance, precognition, and intuitive cognition challenge reductionist models of the mind and raise questions about the limits of human perception (Kullok, 2025).[2] Although often met with skepticism, these phenomena continue to be investigated within controlled experimental frameworks and theoretical models.

Modern neuropsychology provides an additional perspective by examining how brain networks, neural oscillations, and physiological regulation contribute to conscious experience. Advances in neuroimaging and electrophysiology have revealed that states of attention, Meditation, and emotional regulation are associated with measurable changes in brain activity and connectivity. Bringing these three domains together offers a unique opportunity to explore whether seemingly disparate frameworks share underlying mechanisms (Ding *et al*., 2023).[3] While yogic traditions describe experiential states using symbolic and energetic language, and parapsychology focuses on anomalous cognition, neuroscience provides measurable correlates that may help bridge these interpretations.

The present review aims to explore these intersections in a systematic and integrative manner. By analyzing the teachings of the HYP, correlating them with parapsychological constructs, and interpreting both through neuropsychological models, this study seeks to develop a unified theoretical perspective on consciousness modulation. Importantly, the goal is not to validate supernatural claims, but rather to identify plausible mechanisms that may explain how such experiences arise within the human cognitive and physiological system.

2. Materials and Methods

This study employed a conceptual review methodology to integrate knowledge from three complementary domains: classical yogic literature, parapsychological research, and contemporary neuropsychological science. This approach was chosen due to the theoretical nature of the research, which focuses on identifying conceptual convergence rather than testing a specific empirical hypothesis. Primary sources included classical yogic texts, with particular emphasis on the *Haṭha Yoga Pradīpikā*, along with authoritative commentaries and modern interpretations. These texts were systematically examined to extract key concepts related to *Prāṇāyāma, Mudrā*, *Bandha*, Meditation, and altered states of consciousness.

Parapsychological literature was reviewed to identify recurring themes such as extrasensory perception (ESP), intuitive cognition, anomalous experiences, and mind–matter interactions. Both theoretical perspectives and selected empirical studies were included to ensure a balanced and critical understanding. Neuropsychological and neuroscientific sources were selected based on their relevance to consciousness research. Priority was given to peer-reviewed journal articles, systematic reviews, and meta-analyses addressing autonomic regulation, neural oscillations, attentional networks, Meditation, and predictive processing models, ensuring methodological rigor and scientific reliability.

The collected information was organized into key thematic categories, including mind–body regulatory mechanisms, attentional and cognitive modulation, altered states of consciousness, and neurophysiological correlates of yogic practices. A comparative analytical framework was then applied to identify conceptual overlaps and propose potential explanatory models. Throughout the analysis, epistemological neutrality was maintained, acknowledging the distinct theoretical foundations and methodological limitations inherent to each domain.

3. Results

3.1. Yogic Foundations of Consciousness in the *Haṭha Yoga Pradīpikā*

The HYP presents a comprehensive model of consciousness rooted in the interaction between *Prāṇa* (vital energy) and *manas* (mind). According to this framework, the fluctuations of the mind are directly influenced by the movement of *Prāṇa* within the body. An unstable flow of *Prāṇa* leads to mental agitation, while its regulation results in clarity, focus, and expanded awareness (Sumanan, 2023).[4]

This conceptualization aligns with modern psychophysiological models, which emphasize the bidirectional relationship between physiological states and cognitive processes. For example, autonomic nervous system activity has been shown

to influence emotional regulation, attention, and perception, suggesting that bodily states play a critical role in shaping conscious experience. The HYP further proposes that through systematic practice, individuals can gain voluntary control over processes that are typically considered involuntary, such as respiration and internal sensory awareness. This capacity for self-regulation forms the foundation for deeper states of Meditation and altered consciousness.

3.2. *Prāṇāyāma* and Autonomic Regulation

Prāṇāyāma, or controlled breathing, is one of the central practices described in the HYP. Techniques such as *Nāḍīśodhana* (alternate nostril breathing), *Sūryabhedana*, and *Ujjāyī* are designed to regulate the flow of *Prāṇa* and purify subtle energy channels (*Nāḍīs*). From a modern perspective, these practices can be understood as methods of influencing the autonomic nervous system. Slow, rhythmic breathing has been consistently shown to enhance parasympathetic activity, as indicated by increased vagal tone and heart rate variability. This shift toward parasympathetic dominance is associated with reduced stress, improved emotional regulation, and enhanced cognitive clarity.

Moreover, recent research suggests that respiration is closely linked to neural oscillations and cortical excitability. Breathing patterns can modulate activity in brain regions associated with attention, memory, and emotional processing. This provides a physiological basis for the HYP's assertion that the stability of the breath directly influences the stability of the mind. In addition, breath retention practices (*Kumbhaka*) may induce transient changes in carbon dioxide and oxygen levels, which can influence cerebral blood flow and neural activity. These effects may contribute to altered states of awareness and heightened introspective sensitivity reported during advanced yogic practice.

3.3. *Mudrās*, *Bandhas*, and Neuro-energetic Mechanisms

The HYP describes *Mudrās* and *Bandhas* as advanced techniques that regulate the internal flow of *Prāṇa* and facilitate the upward movement of energy through subtle channels (SHWET YOGA, 2025).[5] Practices such as *Mahāmudrā*, *Mūlabandha*, and *Khecarīmudrā* are traditionally understood as methods of conserving and redirecting vital energy, thereby stabilizing the mind and enhancing higher cognitive states. From a neuropsychological standpoint, these practices can be interpreted as sophisticated forms of interoceptive and proprioceptive regulation. The deliberate contraction of pelvic floor muscles in *Mūlabandha*, for instance, may influence autonomic pathways through sacral nerve stimulation, potentially modulating parasympathetic activity. Similarly, *Khecarīmudrā*, involving the positioning of the tongue, may stimulate cranial nerves and influence limbic system activity.

Recent neuroscientific frameworks suggest that interoceptive awareness plays a central role in conscious experience, linking bodily signals with emotional and cognitive processing. Practices that enhance interoceptive sensitivity may therefore contribute to heightened self-awareness and refined perceptual abilities. This aligns with findings indicating that meditative and body-focused practices can alter insular cortex activity, a region associated with internal bodily awareness (Fox *et al*., 2016).[6] Furthermore, these techniques may contribute to sensory gating, a process by which irrelevant sensory information is filtered out, allowing for deeper concentration and reduced cognitive noise. This mechanism may help explain the subjective experiences of clarity, stillness, and inward focus described in yogic literature.

3.4. Meditation, Absorption, and Cognitive Refinement

Meditation in the HYP is presented as a progressive process culminating in *Unmanī avasthā*, a state beyond ordinary mental activity where dualistic perception dissolves (Akar, 2022).[7] This state is characterized by profound stillness, heightened awareness, and the cessation of habitual thought patterns. From a neuropsychological perspective, Meditation involves the systematic training of attention, leading to measurable changes in brain function and structure. Studies have shown that long-term Meditation practitioners exhibit reduced activity in the default mode network (DMN), which is associated with self-referential thinking and mind-wandering (Brewer, 2015).[8] This reduction may correspond to the subjective experience of "mental silence" described in yogic texts.

Additionally, Meditation has been linked to increased gamma-band oscillations, which are associated with integrative cognitive processes, heightened awareness, and conscious perception (Deolindo *et al*., 2020).[9] These neural patterns may underlie the enhanced clarity, insight, and intuitive cognition often reported by advanced practitioners. Yoga-based practices have also been shown to improve cognitive flexibility, emotional regulation, and attentional stability, further supporting the idea that Meditation refines higher-order cognitive functions (Telles *et al*., 2022).[10] These findings provide a scientific basis for the transformative effects described in the HYP.

3.5. Parapsychological Phenomena in Yogic Literature

Classical yogic texts describe siddhis, or extraordinary abilities, as natural by-products of advanced spiritual practice rather than primary goals. These include phenomena such as heightened intuition, clairvoyance, telepathic perception, and expanded sensory awareness (Cardeña, 2018).[1] While these descriptions are often interpreted metaphorically within spiritual traditions, they bear striking resemblance to phenomena studied in parapsychology, a field that investigates anomalous cognitive and perceptual experiences.

3.5.1. *Siddhis* as Cognitive Enhancements

Rather than viewing *siddhis* as supernatural occurrences, some contemporary scholars propose that they may represent extreme forms of cognitive refinement. Enhanced attentional control, improved pattern recognition, and heightened sensitivity to subtle environmental cues may give rise to experiences interpreted as extrasensory. For example, the concept of *Prajñā* (Intuitive wisdom) may correspond to advanced forms of implicit learning and rapid, non-conscious information processing. Research in parapsychology suggests that intuitive cognition may sometimes operate beyond conscious awareness, giving the impression of accessing information without direct sensory input (Cardeña, 2018).[1]

3.5.2. Altered States and Non-ordinary Experiences

Parapsychological research has documented a range of non-ordinary experiences, including telepathic impressions, precognitive dreams, and apparitional encounters. While these phenomena remain controversial, they often occur in altered states of consciousness such as deep relaxation, sensory deprivation, or emotional intensity. Yogic practices provide a systematic and controlled method for inducing such altered states. Techniques such as *Pratyāhāra* (sensory withdrawal), *Dhāraṇā* (focused attention), and *Dhyāna* (Meditation) gradually reduce external sensory input and enhance internal awareness. This controlled environment may increase sensitivity to subtle internal and external signals, potentially explaining the increased frequency of anomalous experiences reported by practitioners.

3.5.3. Mind–Matter Interaction

Some parapsychological studies have explored the possibility of mind–matter interactions, suggesting that intention may exert subtle influences on physical systems (Cardeña, 2018).[1] Although empirical support remains limited and highly debated, such theories resonate conceptually with yogic descriptions of the mind's influence over *Prāṇa* and bodily processes. From a modern scientific perspective, these claims may be reinterpreted through frameworks such as psychophysiological regulation and biofeedback mechanisms, rather than direct physical influence. Nonetheless, the conceptual parallels highlight an intriguing area for future interdisciplinary exploration.

3.6. Neuropsychological and Neuroscientific Correlations

3.6.1. Brain Networks and Attention Regulation

Neuroimaging studies have demonstrated that Meditation practices engage executive control networks while reducing activity in the DMN, leading to decreased self-referential processing and enhanced present-moment awareness (Zagkas *et al*., 2023).[11] This shift corresponds closely with yogic descriptions of *Śūnya* (emptiness) and mental stillness. The ability to sustain attention while minimizing distraction is a key factor in both Meditation and cognitive performance. Enhanced connectivity between prefrontal and parietal regions supports improved attentional control, which may underlie many of the cognitive benefits associated with yoga and Meditation.

3.6.2. Neural Oscillations and Altered States

Meditative states are associated with distinct patterns of neural oscillations, including increased alpha, theta, and gamma activity. These oscillations play a crucial role in coordinating brain activity and facilitating communication between neural networks (Deolindo *et al*., 2020).[9] Gamma synchrony, in particular, has been linked to integrative consciousness and heightened awareness, suggesting a neural basis for the expanded states described in yogic literature. These oscillatory changes may also contribute to enhanced creativity, insight, and intuitive processing.

3.6.3. Predictive Processing and Expanded Awareness

The predictive processing model proposes that the brain continuously generates predictions about sensory input and updates them based on incoming information (Walsh & McGovern, 2020).[12] Meditation may reduce the dominance of top-down predictions, allowing for a more direct and less biased perception of reality. This reduction in predictive filtering may increase sensitivity to subtle stimuli, both internal and external, potentially giving rise to experiences

interpreted as intuitive or extrasensory. Such a framework provides a plausible explanation for certain parapsychological phenomena without invoking supernatural mechanisms.

3.6.4. Autonomic and Interoceptive Pathways

Yogic practices have been shown to enhance parasympathetic activity, improve heart rate variability, and increase interoceptive awareness. These physiological changes contribute to emotional stability, improved focus, and enhanced perceptual clarity (Telles *et al*.,).[10] Interception, the perception of internal bodily states, plays a crucial role in shaping conscious experience. Enhanced interoceptive awareness may lead to a deeper connection between body and mind, facilitating the altered states described in both yogic and parapsychological contexts.

4. Discussion

The present review demonstrated significant conceptual convergence between yogic teachings, parapsychological perspectives, and neuropsychological mechanisms in understanding consciousness and altered states of awareness. Although these domains originate from distinct epistemological traditions, they share a common emphasis on the modulation of consciousness through attentional refinement, physiological regulation, and perceptual sensitivity. The *Haṭha Yoga Pradīpikā* presents a structured framework in which the regulation of *Prāṇa* plays a central role in stabilizing the mind. This traditional concept closely aligns with modern scientific understanding of the autonomic nervous system and its influence on emotional regulation and cognitive processes.

Contemporary neuroscientific findings support these parallels. Practices such as *Prāṇāyāma* and Meditation have been shown to enhance parasympathetic activity, reduce stress responses, and promote mental stability. Additionally, reduced activity in the default mode network (DMN) and increased engagement of attentional control networks during Meditation reflect a shift from habitual, self-referential thinking to present-centered awareness. Increased gamma synchrony observed in experienced meditators further suggests enhanced neural integration and heightened states of consciousness.

Parapsychological phenomena, including heightened intuition and extrasensory-like experiences, may also be interpreted within this integrative framework. Rather than representing supernatural abilities, these experiences may reflect increased sensitivity to subtle internal and external stimuli. Predictive processing models support this interpretation by proposing that reduced top-down cognitive filtering enhances the perception of weak or ambiguous signals, particularly during altered states. Furthermore, the concept of mind–body integration emerges as a unifying principle across all domains. Yogic practices emphasize the interconnectedness of physiological and mental processes, a perspective increasingly supported by research in embodied cognition. However, important methodological and epistemological differences must be acknowledged. Yogic knowledge is largely experiential, while scientific approaches rely on empirical validation, necessitating cautious interpretation of these parallels. Overall, this synthesis highlights the potential for interdisciplinary integration to advance the understanding of consciousness, emphasizing attentional regulation, autonomic balance, and neural integration as core underlying mechanisms.

Limitations - This review is conceptual and lacks primary empirical data, limiting causal inference. Interpretations of yogic and parapsychological concepts remain subjective and symbolic. Differences in methodology, small variability in neuroscientific findings, and weak reproducibility in parapsychology further restrict strong conclusions. Epistemological differences between disciplines also limit precise integration.

Recommendations - Future studies should apply experimental designs using EEG and MRI to examine yogic practices. Standardized Meditation protocols and combined first-person and neurophysiological data are recommended. Interdisciplinary collaboration is essential, along with rigorous evaluation of parapsychological claims, to develop more reliable and integrative models of consciousness and altered states.

5. Conclusion

This review highlights the integrative potential of linking classical yogic philosophy, parapsychological perspectives, and contemporary neuropsychological science in understanding consciousness and altered states of awareness. The synthesis of these three domains suggests that, despite differences in language, methodology, and epistemological foundations, they converge on a shared principle: consciousness can be modulated through systematic regulation of attention, physiological processes, and perceptual sensitivity. The *Haṭha Yoga Pradīpikā* provides a structured experiential framework in which practices such as *Prāṇāyāma*, *Mudrā*, *Bandha*, and Meditation progressively refine both mental stability and physiological balance. These traditional descriptions show strong conceptual alignment with

modern neuroscientific findings, particularly in relation to autonomic nervous system regulation, attentional network engagement, and neural synchronization. Evidence of reduced default mode network activity and increased gamma oscillations during Meditation further supports the possibility that yogic practices can influence brain function in measurable ways.

Parapsychological literature adds an additional dimension by documenting anomalous experiences such as heightened intuition and non-ordinary perceptions. While scientifically debated, these phenomena may be interpreted as variations in cognitive processing under altered states of consciousness rather than supernatural events. Contemporary models such as predictive processing offer plausible explanatory pathways for such experiences. Overall, the findings suggest that enhanced attentional control, autonomic stability, and mind–body integration may represent core mechanisms underlying altered states of consciousness. However, due to methodological limitations and conceptual differences across disciplines, these interpretations should be viewed as theoretical rather than definitive. Future interdisciplinary research combining rigorous neuroscience with contemplative traditions is essential to deepen understanding and validate these integrative models of consciousness.

Compliance with ethical standards

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There is no conflict of interest regarding the publication of this paper.

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