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Concept of Consciousness in Patañjali Yoga Sūtra and Its Correlation with Modern Neuroscience

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Abstract

Consciousness remains one of the most complex and least understood phenomena in both philosophy and science. While modern neuroscience attempts to explain consciousness through neural processes and brain networks, Indian philosophical traditions—especially the Yoga system of Patañjali—approach consciousness as an independent, self-luminous principle (*Puruṣa*). The *Yoga Sūtra* offers a systematic and experiential framework for understanding consciousness through the restraint of mental modifications (*citta-vṛtti-nirodha*). In recent decades, neuroscience has increasingly engaged with contemplative practices such as meditation and yoga, revealing measurable changes in brain structure, function, attention, emotional regulation, and self-awareness. This paper aims to critically analyze the concept of consciousness as expounded in the *Patañjali Yoga Sūtra* and explore its correlations with contemporary neuroscientific findings. Through textual analysis of original sūtras and an integrative review of neuroscientific literature on consciousness, meditation, neuroplasticity, and neural correlates of awareness, this study proposes a Neuro-Yogic model that bridges classical yogic wisdom with modern empirical science.

Keywords: Consciousness, Yoga Sūtra, Patañjali, Puruṣa, Citta, Meditation, Neuroscience, Neuro-Yoga

1. Introduction

The question of consciousness has occupied philosophers, mystics, and scientists for millennia. Despite remarkable advances in neuroscience, consciousness remains what many scholars describe as the “hard problem” of science. Neuroscience has succeeded in identifying neural correlates of conscious experience, yet it struggles to explain subjective awareness, selfhood, and the witnessing aspect of experience.

Indian philosophical systems, particularly Yoga and Sāṃkhya, offer a radically different approach. Consciousness is not viewed as a byproduct of matter but as an eternal, independent reality. The *Yoga Sūtra* of Patañjali presents one of the most systematic expositions of consciousness, outlining its nature, its obscuration by mental processes, and the means for its realization through disciplined practice.

In recent decades, there has been growing scientific interest in meditation, mindfulness, and yoga-based interventions. Functional neuroimaging, electroencephalography (EEG), and longitudinal studies have demonstrated that contemplative practices can alter brain structure, enhance cognitive functions, regulate emotions, and transform self-perception. This convergence between ancient yogic insights and modern neuroscience provides a strong foundation for interdisciplinary inquiry.

The present paper explores consciousness as conceptualized in the *Yoga Sūtra* and examines its correlation with modern neuroscientific understanding, aiming to contribute to the emerging field of Neuro-Yoga and Consciousness Studies.

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2. Consciousness in Indian Philosophical Thought

Indian philosophy consistently places consciousness (*cit* or *caitanya*) at the center of existence. Unlike Western dualism or materialism, Indian systems generally regard consciousness as self-revealing (*svayaṃ-prakāśa*).

Among the six orthodox (*āstika*) systems, Yoga closely follows Sāṃkhya metaphysics. According to Sāṃkhya-Yoga, reality consists of two eternal principles:

- **Puruṣa** – Pure consciousness, passive, unchanging, witnessing
- **Prakṛti** – Material nature, dynamic and evolute, including mind and matter

Yoga differs from Sāṃkhya in emphasizing practical methods (*sādhana*) to disentangle consciousness from matter and realize liberation (*kaivalya*).

3. Definition of Yoga and Consciousness Control

योगश्चित्तवृत्तिनिरोधः॥ (Yoga Sūtra 1.2)

Yoga is defined as the cessation or regulation of the fluctuations of the mind (*citta*).

This sūtra implies that ordinary consciousness is fragmented, restless, and distorted due to continuous mental activity. Pure consciousness is obscured by *vṛttis* such as perception, imagination, memory, and emotion.

Modern neuroscience identifies a similar phenomenon in the **Default Mode Network (DMN)**, a network associated with mind-wandering, self-referential thinking, and rumination. Excessive DMN activity is linked with anxiety, depression, and reduced attentional control. Meditation practices have been shown to reduce DMN activation, supporting the yogic principle of *vṛtti-nirodha*.

4. The Seer and Pure Consciousness

तदा द्रष्टुः स्वरूपेऽवस्थानम्॥ (Yoga Sūtra 1.3)

When mental fluctuations cease, the seer abides in its own true nature.

Here, Patañjali introduces the **draṣṭā** (seer) as distinct from the mind. Consciousness is not an object but the subject of experience.

Although neuroscience does not accept an entity beyond the brain, recent research on **meta-awareness**, **observer consciousness**, and **non-dual awareness** suggests functional correlates of witnessing awareness. Advanced meditators demonstrate heightened awareness without active cognitive processing, indicating a neural basis for the yogic concept of the seer.

5. Misidentification and the Problem of Suffering

वृत्तिसारूप्यमितरत्र॥ (Yoga Sūtra 1.4)

At other times, consciousness identifies with mental modifications.

This misidentification (*avidyā*) leads to suffering (*duḥkha*). The seer mistakenly assumes the qualities of the mind.

Cognitive neuroscience associates suffering with **over-identification with thoughts and emotions**. Studies on mindfulness show that decentering—observing thoughts without identification—reduces emotional reactivity and stress. This directly parallels the yogic distinction between the seer and the mind.

6. Structure of Mind (*Citta*) and Its Functions

Yoga defines *citta* as a functional instrument composed of:

- **Manas** – sensory processing and doubt
- **Buddhi** – discrimination and decision-making
- **Ahaṃkāra** – ego-sense and identity

Consciousness reflects in *citta* much like light reflects in a mirror. The purity of the mind determines the clarity of reflection.

Neuroscience identifies distributed neural systems for perception, cognition, emotion, and self-processing. The ego function correlates with midline cortical structures, particularly the medial prefrontal cortex, involved in self-referential processing.

7. Mental Modifications (*Vṛttis*) and States of Consciousness

वृत्तयः पञ्चतयः क्लिष्टाक्लिष्टाः॥ (Yoga Sūtra 1.5)

The mental modifications are fivefold and may be painful or painless.

The five *vṛttis* are:

1. **Pramāṇa** – valid cognition
2. **Viparyaya** – erroneous cognition
3. **Vikalpa** – imagination
4. **Nidrā** – sleep
5. **Smṛti** – memory

Neuroscientific Interpretation

These categories correspond to cognitive states studied in neuroscience:

- Perception and cognition
- Cognitive distortions
- Imagination and simulation
- Sleep consciousness
- Memory systems

Sleep research confirms that *nidrā* is not absence of consciousness but a modified state of awareness.

8. Meditation (*Dhyāna*) and Attentional Consciousness

तत्र प्रत्ययैकतानता ध्यानम्॥ (Yoga Sūtra 3.2)

Meditation is the uninterrupted flow of awareness toward a single object.

Meditation enhances:

- Sustained attention
- Emotional regulation

- Cognitive flexibility

EEG studies show increased **theta and gamma oscillations**, associated with attention and integrative awareness. Long-term meditators demonstrate cortical thickening in attention-related areas, supporting neuroplasticity.

9. Samādhi and Non-Dual Consciousness

क्षीणवृत्तेरभिजातस्येव मणेर्ग्रहीतृग्रहणग्राह्येषु तत्स्थतदञ्जनता समाधिः॥. (Yoga Sūtra 1.41)

Samādhi is a state of total absorption where the mind becomes transparent.

Studies on non-dual awareness report:

- Reduced activity in orientation networks
- Altered parietal lobe functioning
- Enhanced global neural integration

These findings align with yogic descriptions of ego dissolution and pure awareness.

10. Kaivalya: Liberation of Consciousness

पुरुषार्थशून्यानां गुणानां प्रतिप्रसवः कैवल्यं स्वरूपप्रतिष्ठा वा चित्तिशक्तिरिति॥ (Yoga Sūtra 4.34)

Kaivalya is the complete establishment of consciousness in its own nature.

Neuroscience does not address liberation metaphysically, but long-term meditation studies show enduring changes in identity, compassion, and well-being—suggesting functional parallels.

11. Neuroplasticity and Yogic Transformation

Modern neuroscience confirms that sustained mental training reshapes the brain. Yoga and meditation influence:

- Grey matter density
- Functional connectivity
- Stress-response systems

This supports Patañjali's assertion that consciousness can be systematically refined through practice (*abhyāsa*) and detachment (*vairāgya*).

12. Discussion: Integration of Yoga and Neuroscience

Despite ontological differences, both systems converge on **training awareness, regulating attention, and reducing suffering**.

13. Conclusion

The *Yoga Sūtra* of Patañjali presents a profound, experiential model of consciousness that transcends cognitive activity and situates awareness as the fundamental reality. Modern neuroscience, though grounded in materialism, increasingly validates yogic insights through empirical research on meditation, attention, and neuroplasticity. Integrating these perspectives through Neuro-Yoga offers a holistic framework for understanding consciousness, mental health, and human potential.

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Yogic Perspective	Neuroscientific Perspective
Consciousness transcends mind	Consciousness arises from neural activity
Liberation as ultimate goal	Optimization of mental functioning
Experiential validation	Empirical verification