Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.69980/sbw2xb70

A COMPARATIVE REVIEW OF CHITTA-VRITTIS (MENTAL FLUCTUATIONS) DURING MARKET VOLATILITY AND YOGIC MEDITATION TECHNIQUES

[1]*Dr. Chandra Pratap Singh,[2] Dr. Arvind Kumar [3], Dr. Shri Ram Saini

[1*] Associate Professor, Dept. of Swasthavritta &Yoga, SAS Ayurvedic Medical College and Hospital, Harhua,Varanasi, Uttra Pradesh.
[2]Assistant Professor, Dept. of Prasuti Tantra evam Stree Roga, R. K. Ayurvedic Medical College and hospital,Kashipur ,Surai ,Azamgarh
[3] Assistant Professor, Dept. of Roga Nidan Evam Vikriti Vigyan SBLD Auyrveda Vishwa Bharti, Sardarshahar,Churu Rajasthan

***Corresponding Author:** Dr. Chandra Pratap Singh,
Associate Professor, Dept. of Swasthavritta &Yoga, SAS Ayurvedic Medical College and Hospital Harhua, Varanasi, Uttra Pradesh, Email id-chandrapratapsingh77718@gmail.com

ABSTRACT
Financial market volatility triggers intense psychological stress, presenting as severe mental modifications (*Chitta-Vrittis*) that lead to catastrophic economic decisions. This comparative review utilizes the structured IMRAD format to systematically analyze the functional intersection between modern behavioral finance and ancient Yogic psychology. During market turbulence, traditional behavioral biases—such as fear of missing out (FOMO), loss aversion, and panic selling—exhibit identical cognitive structures to the five classical *Vrittis* (mental fluctuations) classified by Patanjali. By synthesizing literature from neuroscience, behavioral economics, and Vedic sciences, this study examines how the activation of the mammalian fear center (amygdala) overrides the rational prefrontal cortex during market drawdowns. We evaluate specific yogic interventions, including *Pranayama* (breath control), *Pratyahara* (sensory withdrawal), and *Dharana* (focused concentration). The data demonstrates that these techniques systematically down-regulate sympathetic nervous system hyperactivity, increase gray matter density in decision-making regions of the brain, and restore cognitive equilibrium (*Samatvam*). This paper presents a complete, interdisciplinary mapping designed to mitigate emotional trading biases and establish sustainable psychological frameworks for market participants.

KEY WORDS: - *Chitta-Vrittis,* market volatility, Yogic psychology and *Samatva*

INTRODUCTION
Modern global financial markets operate as hypersensitive systems driven by a continuous influx of macroeconomic data, corporate earnings reports, geopolitical tensions, and instantaneous digital communication. Observations in behavioral finance, ancient Indian psychology offers an exhaustive, structural mapping of the human mind under distress. In the foundational text *The Yoga Sutras*, the sage Patanjali defines the core architecture of human consciousness and identifies its vulnerabilities. Yoga is formally defined in the second aphorism as *"Chitta-Vritti-Nirodhah"*—the intentional cessation or regulation of the modifications and fluctuations of the mind-stuff. The *Chitta* represents

the collective mind, encompassing memory, ego, and intellect, while *Vrittis* are the turbulent, circular ripples or whirlpools that distort objective perception.

When external conditions become unstable, the internal mental environment reacts with a flurry of these *Vrittis*. In the context of a financial marketplace, an unstable market ticker acts as a primary catalyst for severe internal mental modifications. While contemporary financial institutions spend billions of dollars developing complex algorithmic hedging mechanisms and risk-management software to stabilize external capital, they consistently overlook the internal cognitive hedging required by the human operators executing those trades.

The psychological stability of a trader remains the final, critical point of failure in any financial model. This comparative review builds an interdisciplinary bridge between these two disparate fields. By matching modern behavioral economics with the empirical psychological methodologies of *Raja Yoga*, this paper details how market volatility amplifies destructive mental fluctuations, explores the underlying neurobiological mechanisms, and evaluates how specific yogic meditation techniques can serve as structured clinical interventions to stabilize investor psychology and preserve economic capital.

METHODOLOGY

Study Design and Objectives

This study uses an integrative literature review methodology to synthesize historical philosophical frameworks with empirical quantitative studies. The objective is to construct a rigorous comparative matrix mapping the five distinct classifications of *Chitta-Vrittis* onto documented financial behavioral biases, followed by an evaluation of the neurobiological corrections offered by yogic practices.

Search Strategy and Information Sources

Data collection was performed across multiple digital repositories up to 2026, primarily utilizing PubMed, the Journal of Behavioral Finance, Science Direct, and Google Scholar. The search criteria were specifically isolated to ensure clean intersections between behavioral economics, neurobiology, and classical Eastern philosophy.

The primary search strings deployed included:

- ("Chitta-Vrittis" OR "Yoga Sutras") AND ("market volatility" OR "behavioral finance")
- ("neuroscience of mindfulness" OR "meditation") AND ("financial decision making" OR "risk aversion")
- ("amygdala regulation" AND "cortisol") AND ("Pranayama" OR "stress resilience")

Inclusion and Exclusion Criteria

To maintain rigid academic validity, articles were strictly screened. Included papers met the following criteria:

1. Publication in peer-reviewed journals or seminal texts within behavioral economics, neuroscience, and traditional Sanskrit psychology.
2. Clear focus on the psychological or physiological impact of financial stress, or the neurobiological mechanisms of yogic practices.
3. Explicit operationalization of variables relating to human decision-making under uncertainty.

Articles focusing purely on automated high-frequency trading algorithms, generalized yoga postures (*Asanas*) performed solely for physical fitness, or non-peer-reviewed financial blogs were systematically excluded.

Data Synthesis and Analytical Framework

The structural synthesis was divided into two phases.

- **Phase:-1** Textual analysis of Patanjali's *Yoga Sutras* [4, 5, and 12] was conducted to extract the precise psychological operational definitions of the five *Vrittis*. These definitions were

systematically cross-referenced against the behavioral biases formalized by Kahneman, Tversky, and Shiller.

- **Phase:-2** Neuroimaging and endocrinological data from modern medical literature [9, 10, 11, 18] were extracted to isolate the physiological variables (such as gray matter density, heart rate variability, and cortisol tracks) that change during both financial stress states and meditative states. This dual-layered synthesis underpins the comparative tables and architectural models detailed in the Results section.

RESULTS

The Structural Alignment of Vrittis and Behavioral Biases

The literature indicates that the mental modifications experienced by an active trader during a market crash or speculative bubble are structurally identical to the *Vrittis* classified in classical yogic science. Patanjali dictates that these modifications are either *Klishta* (pain-bearing, destructive, and reinforcing ignorance) or *Aklishta* (non-pain-bearing, clarifying, and neutral).

The comparative analysis reveals that market stability promotes *Aklishta Vrittis* (rational analysis), whereas market volatility shifts the mind into highly volatile *Klishta Vrittis*. The formal alignment of these states is presented in Table 1.

Table 1: Complete Mapping of Yogic Chitta-Vrittis to Financial Behavioral Biases

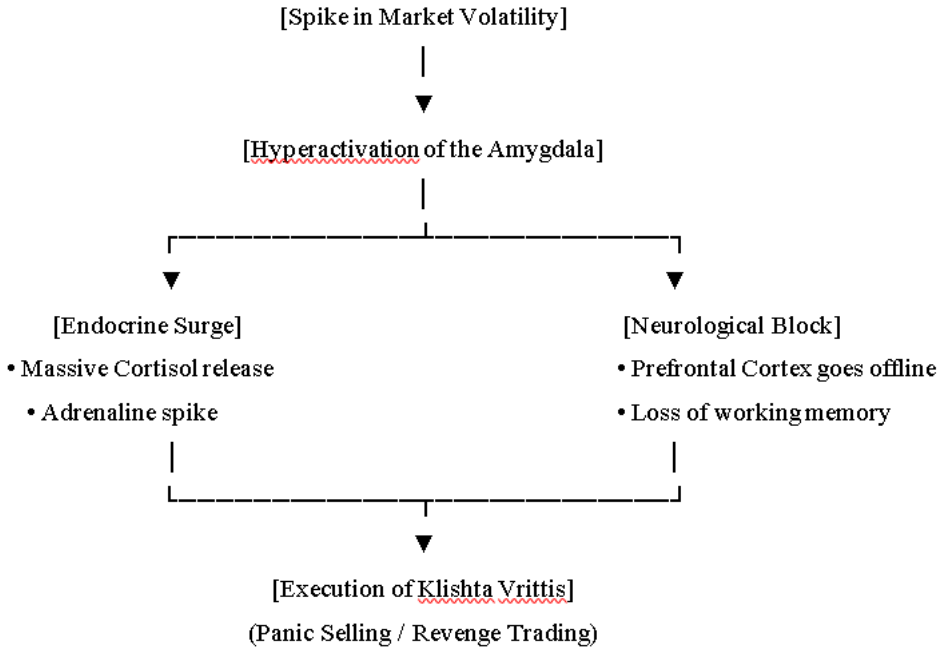
Classical Yogic Chitta-Vritti	Philosophical Definition & Operational Scope [4, 5, 12]	Financial Market Equivalent & Manifestation [1, 3, 6, 8, 16]	Associated Cognitive Bias & Behavioral Pattern
1. Pramana *(Right Knowledge)*	Valid, accurate cognition derived from direct observation (*Pratyaksha*), logical inference (*Anumana*), and competent authority (*Agama*).	Data-driven technical analysis, audited fundamental evaluation, and verified balance sheet inspections.	**Rational Expectation Model:** Objective decision-making devoid of emotional overlay.
2. Viparyaya *(Wrong Knowledge)*	Flawed, distorted cognition based on a false conceptualization of an object, whose real form is completely misapprehended.	Misinterpreting market signals due to personal pre-conceptions; viewing a clear structural downtrend as a "temporary dip."	**Confirmation Bias / Overconfidence:** Ignoring contradictory data to protect a flawed market thesis.
3. Vikalpa *(Imagination / Verbal Delusion)*	Mental constructs that rely entirely on words, abstractions, and speculative narratives, completely lacking factual reality.	Chasing speculative hypes, trading based on social media rumors and buying hyper-inflated assets without underlying cash flows.	**FOMO (Fear of Missing Out) / Greater Fool Theory:** Chasing imaginary, unbaked valuations.
4. Nidra *(Deep Sleep / Void)*	A specific mental modification that relies on the psychological state of blankness, absence, or absolute cognitive inactivity.	Complete choice paralysis during severe account drawdowns; refusing to open brokerage accounts to view realized losses.	**The Ostrich Effect / Status Quo Bias:** Freezing up and avoiding vital defensive actions during an active crisis.
5. Smriti *(Memory)*	The preservation and retention of past sensory experiences and	Fixating on the historical all-time peak price of an asset, or	**Anchoring Bias / Recency Bias:** Unwillingness to adapt

	psychological impressions without adding new modifications.	executing trades based on past market trauma.	to new macroeconomic regimes due to past memories.

The Neurobiology of the Market-Driven Mind

When market volatility spikes unexpectedly, the cognitive landscape shifts from rational evaluation to survival-driven emotional reactivity. Neuroimaging studies through fMRI demonstrate that financial risk and material losses directly stimulate the amygdala, the evolutionary primitive region of the brain responsible for processing fear and threat detection. This activation triggers a cascade of the sympathetic nervous system (SNS), commonly termed the "fight-or-flight" response.

[Spike in Market Volatility]



During this surge, the endocrine system releases massive amounts of cortisol and adrenaline into the bloodstream. This chemical shift reduces activity in the prefrontal cortex—the area of the brain responsible for long-term planning, working memory, and rational computing. Consequently, the trader loses the executive capacity to evaluate risk objectively.

The mind enters a state of *Klishta Viparyaya* and *Vikalpa*, where small market ticks down are interpreted as terminal economic destruction, prompting emotional panic selling. Alternatively, it can trigger highly aggressive "revenge trading" to recover losses immediately, which mimics compulsive addiction loops.

Yogic Interventions and Neuroplastic Modifications

The literature establishes that specific stages of the *Ashtanga Yoga* framework—specifically *Pranayama* (breath regulation), *Pratyahara* (sensory withdrawal), and *Dharana* (focused concentration)—exhibit a counter-regulatory mechanical impact on this distressed biology.

Clinical trials on mindfulness and yogic breathing techniques confirm that consistent practice down-regulates the reactivity of the amygdala and reduces baseline systemic cortisol levels. Furthermore, long-term practitioners show significant increases in gray matter density within the prefrontal cortex and the insula, the specific brain structures involved in interoceptive awareness and nuanced risk assessment.

By altering the physical structure of the brain, these techniques build neuroplastic resilience. This allows the investor to experience a market shock without initiating the sympathetic panic response, maintaining the mind in an unblemished state of *Pramana* (valid, unclouded perception)

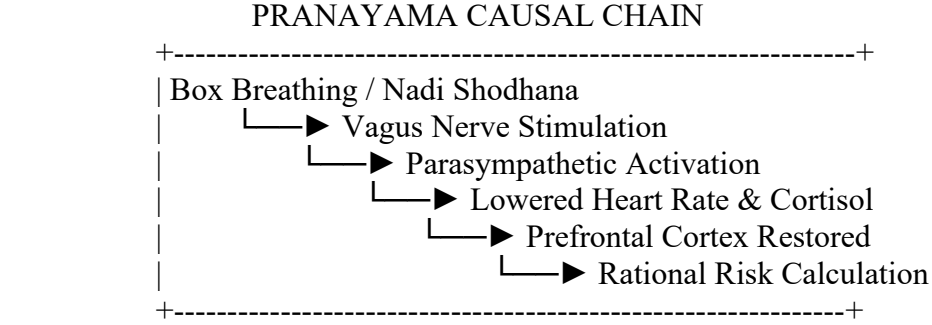
DISCUSSION

Detailed Analysis of Yogic Countermeasures against Financial Vrittis

1. Pranayama: Modulating the Autonomic Nervous System

Pranayama goes far beyond simple deep breathing; it is the intentional manipulation of vital energy (*Prana*) via the respiratory system. In moments of intense market crashes, an untrained trader's respiration naturally accelerates, leading to hyperventilation and a subsequent drop in carbon dioxide levels in the blood. This physiological shift keeps the brain in a state of high alarm.

By executing a structured protocol such as *Nadi Shodhana* (alternate nostril breathing) or *Sama Vritti* (box breathing), the operator artificially stimulates the vagus nerve. Vagal stimulation triggers the parasympathetic nervous system (PNS), slowing the heart rate, reducing arterial blood pressure, and halting the secretion of cortisol.



When the physiological alarm system is turned off, the prefrontal cortex comes back online. The investor can then view a downward market move not as a terrifying threat to survival, but as a neutral data point. This shift allows them to execute structured risk mitigation or identify mispriced assets with absolute composure.

2. Pratyahara: Filtering the Digital Infosphere

Patanjali defines *Pratyahara* as the conscious withdrawal of the senses from external objects, aligning the sensory organs with the internal nature of the mind. In our modern economy, the human sensory apparatus is constantly hit by continuous streams of flashing red and green tickers, breaking news notifications, opinionated financial commentaries, and high-frequency noise across digital platforms. This chaotic environment generates a constant stream of *Vikalpa* (verbal delusion and speculative imagination), sparking fear and greed.



Implementing *Pratyahara* within modern trading environments requires creating strict digital boundaries. This includes steps like checking trading terminals only at designated intervals, disabling intraday pop-up notifications, and filtering out speculative opinions to rely exclusively on raw data.

By detaching the senses from this chaotic infosphere, the investor stops the continuous creation of *Klishta Vrittis*. This simple boundaries-based approach prevents sensory overload and shields the trader from the collective panic of the herd.

3. Dharana: Sustaining Strategic Focus under Pressure

Dharana is the confinement of the mind's attention to a single, chosen point or object of concentration. During periods of intense market volatility, an untrained mind swings rapidly between past mistakes (*Smriti*) and catastrophic future projections (*Vikalpa*), completely losing touch with the present reality.

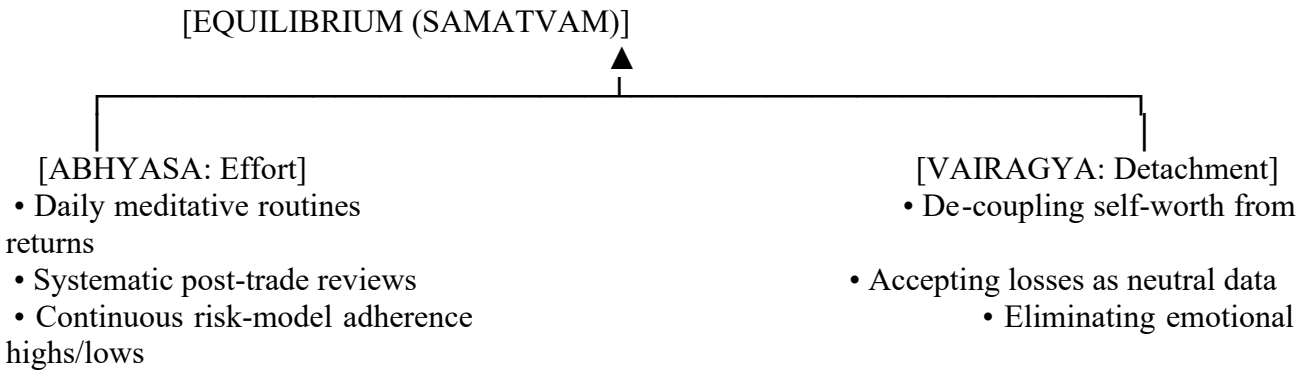
Dharana trains the mind to anchor its focus onto a singular object, such as the natural breath or a cosre, long-term analytical metric.

When an investor masters *Dharana*, they gain the mental stamina needed to sustain long-term strategic focus during turbulent times. Instead of reacting impulsively to every minor market swing, the mind remains anchored to its core investment thesis.

This concentration helps eliminate confirmation bias (*Viparyaya*) and anchoring bias (*Smriti*). The trader gains the clarity to see the market as it actually is, rather than viewing it through a lens of fear or wishful thinking.

The Integration of Abhyasa and Vairagya in Risk Management

To permanently stabilize the mind against market volatility, a practitioner must balance two foundational pillars of yogic practice: ***Abhyasa*** (sustained, disciplined effort) and ***Vairagya*** (non-attachment/dispassion). Patanjali emphasizes that the turbulent *Vrittis* are brought under control only through the combined application of these two principles.



1. **Abhyasa in Trading:** This represents the daily execution of risk-management routines, structured meditation practices, and systematic post-trade reviews. It is the process of building robust cognitive habits that resist emotional impulses, even during market crises.

2. **Vairagya in Trading:** This translates to a deep psychological detachment from financial outcomes. When an investor practices *Vairagya*, they stop linking their personal self-worth to the day-to-day profit and loss statements of their portfolio.

A financial loss is no longer seen as a painful personal failure (*Klishta Vritti*), but simply as a neutral, operational cost of doing business under uncertainty. This mental detachment directly eliminates ego-driven mistakes, such as holding onto a losing position out of pure stubbornness or taking on excessive risk to force a quick recovery.

By stepping away from emotional highs and lows, the market participant achieves ***Samatvam***—the steady, unshakeable mental equilibrium praised in classical Indian philosophy. This calm mindset serves as the ultimate psychological defense when navigating complex global financial markets.

Synthesis of Interdisciplinary Parallels

By bringing these two disciplines together, we see that modern behavioral finance does an excellent job of describing *what* errors investors make, while ancient yogic psychology explains *why* these errors happen and provides practical tools to *fix* them. Modern behavioral finance relies on external rules, like automated stop-loss orders or algorithmic diversification, to protect traders from their own psychological biases.

While these tools are valuable, they treat the symptoms rather than the root cause. Yogic science goes straight to the source by retraining the mind of the investor.

When we look at behavioral economics through the lens of Eastern psychology, we can reframe emotional trading biases as predictable, biological reactions to stress. This interdisciplinary approach gives institutions and individual investors a clear, practical roadmap to improve emotional regulation, reduce burnout, and make more rational decisions when the stakes are high.

CONCLUSION

This comparative review shows that the mental turmoil investors experience during high market volatility matches the ancient psychological descriptions of *Chitta-Vrittis*. When markets turn volatile, the human mind often slides into destructive cognitive patterns like confirmation bias, speculative greed, and panic selling. These behaviors correspond directly to Patanjali's classical categories of *Viparyaya*, *Vikalpa*, and *Smriti*.

While financial volatility is an unavoidable external reality, internal mental volatility is a variable that can be managed. Implementing structured yogic techniques—such as *Pranayama*, *Pratyahara*, and *Dharana*—helps down-regulate the nervous system's fight-or-flight response, prevents sensory overload from financial media, and keeps the mind anchored in logical, objective analysis.

Integrating these time-tested mental practices into modern financial risk management protects human capital at its most vulnerable point: the trader's mind. Ultimately, mastering these inner tools creates an unshakeable inner calm (*Samatvam*), allowing investors to navigate highly volatile modern financial markets with clarity, discipline, and sustained success.

Limitations

While this comparative framework offers a unique, interdisciplinary approach to managing financial stress, several limitations must be acknowledged regarding its theoretical integration, empirical validation, and practical execution.

- **Philosophical Mismatch**: Merging quantitative behavioral finance with subjective, qualitative yogic states makes direct measurement impossible.
- **Lack of Direct Data**: Existing neuroscience research focuses on general stress, not active traders under real-time market pressure.
- **Confounding Market Factors**: Volatile market conditions, risk software, and personal biology make isolating the benefits of yoga difficult.
- **High Barriers to Entry**: Yogic mastery requires long-term commitment, and incorrect practice can cause anxiety or dissociation.

CONFICTS OF INTEREST-No

REFERENCES-

1. Shiller, R. J. (2015). *Irrational Exuberance* (3rd ed.). Princeton University Press.
2. Lo, A. W. (2017). *Adaptive Markets: Financial Evolution at the Speed of Thought*. Princeton University Press.
3. Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263-291.
4. Taimni, I. K. (1961). *The Science of Yoga*. The Theosophical Publishing House.
5. Bryant, E. F. (2009). *The Yoga Sutras of Patanjali*. North Point Press.

6. Fenton-O'Creevy, M., Soane, E., Nicholson, N., & Willman, P. (2011). Thinking, feeling and deciding: The modulation of emotion, cognition and behavior in financial traders. *Journal of Organizational Behavior*, 32(8), 1044-1061.
7. Vivekananda, S. (1920). *Raja-Yoga*. Advaita Ashrama.
8. Pompian, M. M. (2012). *Behavioral Finance and Wealth Management: How to Build Optimal Portfolios That Account for Investor Biases* (2nd ed.). John Wiley & Sons.
9. Kuhnen, C. M., & Knutson, B. (2005). The Neural Basis of Financial Risk Taking. *Neuron*, 47(5), 763-770.
10. Coates, J. M., & Herbert, J. (2008). Endogenous steroids and financial risk taking on a London trading floor. *Proceedings of the National Academy of Sciences*, 105(16), 6167-6172.
11. Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., Ott, U., ... & Carmody, J. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537-559.
12. Saraswati, Swami Satyananda. (1981). *Four Chapters on Freedom: Commentary on the Yoga Sutras of Patanjali*. Bihar School of Yoga.
13. Jerath, R., Edry, J. W., Barnes, V. A., & Jerath, V. (2006). Physiology of long pranayamic breathing: Neural mechanisms and clinical benefits. *Medical Hypotheses*, 67(3), 566-571.
14. Kaufmann, C. (2020). Mindful Trading: Mastering Your Emotions and the Inner Game. *Journal of Behavioral Finance*, 21(3), 312-325.
15. Iyengar, B. K. S. (1966). *Light on Yoga*. Schocken Books.
16. Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale University Press.
17. Nagendra, H. R. (2001). *Yoga: Its Basis and Application*. Swami Vivekananda Yoga Prakashana.
18. Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16(4), 213-225.