

Meditation: Bridging Ancient Wisdom and Modern Advances.

Sutra of Hui-neng:

“Meditation and wisdom are of one essence, not different. Meditation is the essence of wisdom, and wisdom is the function of meditation. At times of wisdom, meditation exists in that wisdom; at times of meditation, wisdom exists in that meditation”.

(McRae 2000:41-42)



Table of contents:

- | | |
|---|--|
| 2. Introduction | 7. Neuroanatomy and Long-term Impact of Meditation |
| 3. Philosophical Background | 8. Concentration |
| 4. Objective | 9. Neurophysiology of Concentration |
| 5. Observable Benefits of Meditation | 10. Personal Insights and Lessons |
| 6. Summary of the Eightfold Path's Impact | |

Introduction

Meditation

Buddhist teachings have evolved over centuries through the practice of meditation, a specific and profound form of concentration. Thorough understanding of Buddhist heritage without the practice of meditation is problematic.

Externally, various forms of meditation can be distinguished. However, in essence, they are similar. Spiritual development requires delving deeply into one's inner self and simultaneously into philosophical teachings, to make the right decisions, actions, and to improve karma.

Chan / Zen

One of the best examples of ancient meditation that has reached us today is the Mahayana Chan/Zen school. The name of this school reflects its roots, deriving from the Sanskrit word 'dhyana' (meaning meditation or meditative state). The school originated and developed in China from the 5th-6th centuries CE (starting with Bodhidharma), but it has been significantly influenced by the ancient Indian Yogacara school (founded by Vasubandhu) and the important works of Nagarjuna and Aryadeva, all of whom are revered as patriarchs of the school.



Philosophical Background:

Zen teachings are often known for their central tenet that phenomena, as conventionally understood, exist only within our own consciousness.

Today's manifestations are based on previous karma and can be conceptualized as arising from "store consciousness." These manifestations are not determined by a single cause but rather by a "field of tension" shaped by multiple causes.

Both Chan/Zen and the earlier Yogacara teachings are based on the concept of *pratītyasamutpāda*, which logically leads to *Śūnyatā*. Although things, including concepts, are inherently empty, for the sake of spiritual progress, it is still possible to use these empty but conventional linguistic "convenience concepts." Thus, even "consciousness" as a concept is inherently just a tool—a compassionate aid (*upaya*) to reach higher understanding.



*“The limits (i.e., realm) of nirvana are the limits of samsara.
Between the two, also, there is not the slightest difference whatsoever.”*
Nagarjuna, Mūlamadhyamakakārikā XXV:20 - (Inada 1993:158)

Objective

The driving force of Buddhism is compassion, through which more enlightened beings, bodhisattvas, offer assistance to others. This assistance is clear and naturally measurable, as illustrated in our next slide.

Our consciousness contains within it karmic seeds of future manifestations ("store consciousness" in Buddhist tradition or "subconscious" in psychoanalytic terms). Karma can only be improved through understanding, which comes from a focused comprehension of the nature of phenomena, leading to an improved worldview and better relationships.

In contemporary academic science, there is discussion of the intrapsychic dimension in the emergence of political conflicts and the etiology of stress. There is also talk of cumulative and intergenerational trauma, observable through an epigenetic lens. Epigenetics is one of the modern ways to explain the accumulation of intergenerational karma through predispositions, experiences, judgments, readiness for reactions, and the triggering of prepared responses. These seeds reach us from the lives of our parents, grandparents, and the sociocultural approaches of significant others.



Observable Benefits of Meditation

During prolonged meditation periods, positive changes are especially observable at the level of brain functional metabolism.

Fayed N, Lopez Del Hoyo Y, Andres E, Serrano-Blanco A, Bellón J, Aguilar K, Cebolla A, Garcia-Campayo J. "Brain changes in long-term zen meditators using proton magnetic resonance spectroscopy and diffusion tensor imaging: a controlled study." PLoS One. 2013;8(3):e58476. doi: 10.1371/journal.pone.0058476. Epub 2013 Mar 25. PMID: 23536796; PMCID: PMC3607604.

Meditation reliably reduces stress and anxiety while also improving attention. These improvements are correspondingly detectable on both behavioral and neuronal levels.

Mora Álvarez MG, Hölzel BK, Bremer B, Wilhelm M, Hell E, Tavacioglu EE, Koch K, Torske A. "Effects of web-based mindfulness training on psychological outcomes, attention, and neuroplasticity" Sci Rep. 2023 Dec 19;13(1):22635. doi: 10.1038/s41598-023-48706-0. PMID: 38114554; PMCID: PMC10730881.

Meditation also helps in coping with age-related neurodegenerative changes.

Leow Y, Rashid NLBA, Klainin-Yobas P, Zhang Z, Wu XV. "Effectiveness of mindfulness-based interventions on mental, cognitive outcomes and neuroplastic changes in older adults with mild cognitive impairment: A systematic review and meta-analysis". J Adv Nurs. 2023 Dec;79(12):4489-4505. doi: 10.1111/jan.15720. Epub 2023 May 29. PMID: 37248564.

It similarly aids in improving coping mechanisms and perceived quality of life among young people.

Dunning DL, Griffiths K, Kuyken W, Crane C, Foulkes L, Parker J, Dalgleish T. "Research Review: The effects of mindfulness-based interventions on cognition and mental health in children and adolescents - a meta-analysis of randomized controlled trials." J Child Psychol Psychiatry. 2019 Mar;60(3):244-258. doi: 10.1111/jcpp.12980. Epub 2018 Oct 22. PMID: 30345511; PMCID: PMC6546608.

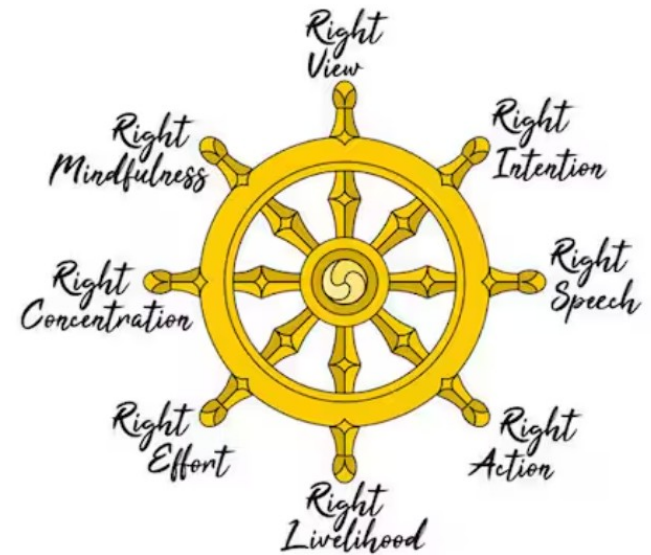
Meditation is helpful in overcoming addictions and improving emotional regulation.

Tang YY, Tang R, Posner MI. Mindfulness meditation improves emotion regulation and reduces drug abuse. Drug Alcohol Depend. 2016 Jun 1;163 Suppl 1:S13-8. doi: 10.1016/j.drugalcdep.2015.11.041. PMID: 27306725.

Summary of the Eightfold Path's Impact

The results presented can be explained by the initial shift where old values and habits are replaced by new ones. At the beginning of the Eightfold Path, the first and most crucial condition is the correct view, which is refined progressively over time. Enhanced understanding and perception underpin better decision-making. Expectations freed from illusions pave the way for more effective strategies and improved karma. All subsequent steps of the Eightfold Path lead to deeper, structural changes.

The application of the Eightfold Path's core principles in setting daily life orientations, choosing role models, and enhancing understanding brings about profound, fundamental changes. The next slide illustrates how the Eightfold Path fosters deep structural transformation in individuals and the mechanisms behind its long-term impact.



Neuroanatomy and Long-term Impact of Meditation

This slide illustrates neuroanatomical changes involved in mitigating the harmful effects of stress, emphasizing the lasting effects of prolonged practice. The red column on the left lists research studies that describe deleterious changes associated with PTSD, while the green column on the right summarizes studies that document the opposite trend. The materials used are derived from PTSD patients, given that this condition has been extensively studied clinically. The focus is on hippocampal studies, though similar research exists for other brain regions. This body of work highlights the concept of neuroplasticity and the enduring impact of long-term practice.

Logue MW, van Rooij SJH, Dennis EL, Davis SL, Hayes JP, Stevens JS, Densmore M, Haswell CC, Ipser J, Koch SBJ, Korgaonkar M, Lebois LAM, Peverill M, Baker JT, Boedhoe PSW, Frijling JL, Gruber SA, Harpaz-Rotem I, Jahanshad N, Koopowitz S, Levy I, Nawijn L, O'Connor L, Olff M, Salat DH, Sheridan MA, Spielberg JM, van Zuiden M, Winternitz SR, Wolff JD, Wolf EJ, Wang X, Wrocklage K, Abdallah CG, Bryant RA, Geuze E, Jovanovic T, Kaufman ML, King AP, Krystal JH, Lagopoulos J, Bennett M, Lanius R, Liberzon I, McGlinchey RE, McLaughlin KA, Milberg WP, Miller MW, Ressler KJ, Veltman DJ, Stein DJ, Thomaes K, Thompson PM, Morey RA. **Smaller Hippocampal Volume in Posttraumatic Stress Disorder: A Multisite ENIGMA-PGC Study: Subcortical Volumetry Results From Posttraumatic Stress Disorder Consortia.** *Biol Psychiatry*. 2018 Feb 1;83(3):244-253. doi: 10.1016/j.biopsych.2017.09.006. Epub 2017 Sep 20. PMID: 29217296; PMCID: PMC5951719. Bremner, J. Douglas, and Eric Vermetten, 'The Hippocampus and Post-Traumatic Disorders', in Thorsten Bartsch (ed.), *The Clinical Neurobiology of the Hippocampus: An integrative view* (Oxford, 2012; online edn, Oxford Academic, 20 Sept. 2012), <https://doi.org/10.1093/acprof:oso/9780199592388.003.0014>

Sigal Zilcha-Mano, Or Duek, Benjamin Suarez-Jimenez, Xi Zhu, Amit Lazarov, Liat Helpman, Nachshon Korem, Michal Malka, Ilan Harpaz-Rotem, Yuval Neria, **Underlying Hippocampal Mechanism of Posttraumatic Stress Disorder Treatment Outcome: Evidence From Two Clinical Trials.** *Biological Psychiatry Global Open Science*, Volume 3, Issue 4, 2023, Pages 867-874, ISSN 2667-1743, <https://doi.org/10.1016/j.bpsgos.2023.01.005>.

Lardone A, Liparoti M, Sorrentino P, Rucco R, Jacini F, Polverino A, Minino R, Pesoli M, Baseli F, Sorriso A, Ferraioli G, Sorrentino G, Mandolesi L. **Mindfulness Meditation Is Related to Long-Lasting Changes in Hippocampal Functional Topology during Resting State: A Magnetoencephalography Study.** *Neural Plast*. 2018 Dec 18. doi: 10.1155/2018/5340717

Wells R. E., Yeh G. Y., Kerr C. E., et al. **Meditation impact on default mode network and hippocampus in mild cognitive impairment: a pilot study.** *Neuroscience Letters*. 2013;556:1519. doi: 10.1016/j.neulet.2013.10.001.

Luders E., Toga A. W., Lepore N., Gaser C. **The underlying anatomical correlates of long-term meditation: larger hippocampal and frontal volumes of gray matter.** *NeuroImage*. 2009;45(3):67278. doi: 10.1016/j.neuroimage.2008.12.061.

Concentration

The most crucial distinction between meditation and mere wandering curiosity or reading various interesting books lies in the focus of concentration. More specifically, meditation involves reaching qualitatively new insights and realizations through the refinement of that concentration.

When translating, it's important to recognize that language usage varies across different target countries and groups. Thus, it is noteworthy that the quotation from the Hui-neng Sutra in the initial slide of our presentation is sometimes translated as "concentration" (BTTS 2001:203) rather than "meditation" (McRae 2000:41-42).

Different schools utilize various methodologies to achieve qualitatively different levels of concentration. A skilled teacher and a foundation of trust are essential components in effective meditation practice.



Neurophysiology of Concentration

The Nobel Prize laureate I. Pavlov is considered one of the most prominent thinkers of the past century in the field of psychology and related disciplines. Pavlov's extensive clinical research led to the identification of distinct phases in brain function (Pavlov 2022).

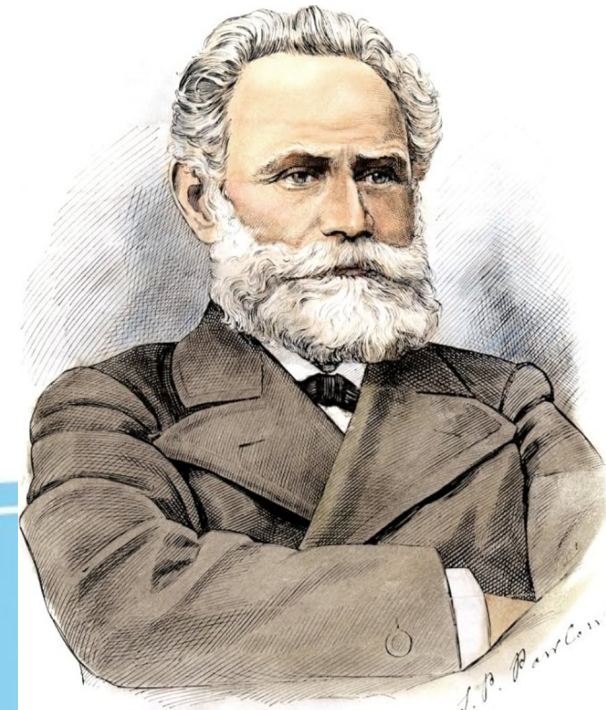
During the paradoxical phase, reflexive behavior and cognitive processes change in such a way that subsequent stimuli affect the individual contrary to what would be experienced under normal conditions. Specifically:

- ✓ Stimuli that typically provoke a strong reaction under normal circumstances only elicit a weak response during the paradoxical phase.
- ✓ Conversely, stimuli that usually provoke a weak reaction in normal conditions produce a strong effect during the paradoxical phase.
- ✓ The degree of difference observed varies depending on the "depth" of the phase.

A simple example is a tracking dog that, despite having its faint trail covered by various animals and passing tractors over several days in the woods and fields, is still able to locate a lost person.

A similar level of concentration is required to capture the nuances and reflections within the depths of the human psyche.

This is the only tool capable of achieving this.



IVAN PETROWITCH PAWLOW.
Professor i fysiologi vid militär-medicinska akademien i St Petersburg. Född 1849.
Af Karolinska Mediko-Kirurgiska Institutet tilldelad Nobelpriset i medicin år 1904.

Personal Insights and Lessons

My personal experience with meditation dates back to my distant youth, associated with an abandoned soccer gate next to the field, which I used as a dry sitting place. Living in a remote rural area and lacking a teacher, I relied on various available literature.

In retrospect, I can affirm the following:

- ✓ Understanding the conditional and dependent nature of phenomena leads to liberation from irrational judgments.
- ✓ Recognizing the futility of fears and attachments results in freedom from unreasonable expectations and discomfort.
- ✓ Abandoning illusions and delusions eliminates inappropriate projections from others.
- ✓ Viewing the surroundings through the prism of compassion, while controlling actions and speech, improves relationships as a foundational element of the psychosocial climate.
- ✓ Improved attitudes and a better psychosocial climate contribute to better health, as the psychosomatic component is more decisive in the etiology of health disorders than other factors.

Breathing in light, I exhaled the same light to other beings, adding care.

The blue sky that was before my eyes remains with me even today, years later.

