Independent research & further reading

Guest: Joe Dizpensa

Disclaimer 1: The literature presented here directly (or as closely as possible) looks at statements made by the guest. In order to fully understand each topic mentioned, an extensive literature review (beyond the scope of this document) would be required.

Disclaimer 2: The information provided in this podcast and any associated materials is not intended to replace professional medical advice. For any medical concerns, it is essential to consult a qualified health professional.

Contents

List of guest's publications

Throughout the episode, the guest references their data and studies. However, many of these results have not been published in scientific journals. To the best of our knowledge, the following is a complete list of the guest's publications:

- Meditation-induced bloodborne factors as an adjuvant treatment to COVID-19 disease.
- The Mathematical Characterization of the Complexity Matching during a Healing Circle Meditation.
- One-Minute Deep Breathing Assessment and its Relationship to 24-Hour HRV Measurements
- One-Minute Deep Breathing Assessment and its Relationship to 24-Hour HRV Measurements
- "Let's keep calm and breathe"—A mindfulness meditation program in school and its effects on children's behavior and emotional awareness: An Australian pilot study

Reliving negative past experiences

"when a person analyzes, uh, their problems, Uh, within the emotions of the past, uh, they make their brain worse"

Cultural differences in thinking styles can shape how revisiting negative experiences affects individuals, with non-Western cultures experiencing weaker negative effects. While reflecting on negative experiences and finding meaning in them can be beneficial, excessive rumination may lead to harmful outcomes, such as depression. Personality traits and sex-related differences also play a role in recalling and experiencing emotional autobiographical memories—extraversion is linked to positive memories, while neuroticism is associated with negative ones. Despite its challenges, reliving past events as part of trauma-focused cognitive-behavioural therapy can promote positive change in individuals with PTSD.

References 1-4.

“When the heart begins to open and it begins to become coherent. In other words, when you're fearing, feeling, uh, frustration or impatience or judgement, your heart is beating very incoherently. When you're feeling love and gratitude, kindness, and care, there's a rhythm. There's a cadence that the heart has that's very coherent.”

Research indicates a strong connection between positive emotions and increased coherence in heart rhythm patterns, reflecting greater synchronisation between the parasympathetic and sympathetic branches of the autonomic nervous system.

Positive emotions trigger a distinct shift in heart rhythm, known as psychophysiological coherence, which enhances alignment and harmony across physiological, cognitive, and emotional processes. This state is marked by higher heart rate variability (HRV), which supports cardiovascular health and aids in emotional regulation.

Higher HRV is linked to improved emotional regulation and overall well-being, highlighting the influence of physiological states on emotional experiences. This connection is particularly evident in the relationship between HRV and feelings of safeness and contentment. Other studies demonstrated that heart rate asymmetry (HRA) differentiates between positive and negative emotions, with positive emotions producing more short-term decelerations.

References 5-12.

“50 percent of the story we tell in our past isn't even the truth. That means that people are reliving a miserable life they never even had. Just to excuse themselves from changing”

A study (13) found that people often modify their retellings of personal experiences, with 61% including exaggerations, omissions, or additions. Research also showed that false memories can be induced in 20–50% of participants using techniques such as imagination inflation, false feedback, and memory implantation.

References 13-16.

“Various types of therapy that make you kind of recount the events and then they ask you questions about it You're saying that you don't feel like those approaches are optimal because they just keep you in that circuit of reliving the emotion”

Some therapeutic approaches involve revisiting traumatic memories, but their effectiveness and potential risks vary. Trauma-focused cognitive-behavioral therapy (CBT) that includes reliving has shown effectiveness, with clients reporting positive changes despite the emotional difficulty involved. Research on recalling negative memories presents mixed findings—while revisiting distressing events can be upsetting, it is not always harmful. Personality traits and emotion regulation strategies influence these experiences, with extraversion linked to positive memory recall and neuroticism associated with negative memories. Additionally, warnings about distressing content may unintentionally prolong the negative aspects of memories rather than help individuals prepare for them. However, adaptive emotion regulation can improve the integration of negative memories, enhancing well-being and future emotional regulation.

References 17-22.

Brain waves in children

“So as a child, your brainwaves are, um, very slow.”

Studies have shown that children typically exhibit higher spectral power across all frequency bands compared to young adults, with greater power in the lower frequencies, such as delta and theta.

Reference 23.

Low heart rate and creativity

“the more relaxed you get in your heart, we've discovered, really relaxing into your heart, the more the heart informs the brain to get creative.”

Research suggests a strong connection between psychophysiological coherence and enhanced creativity and intuition. Characterised by the synchronisation of physiological systems and heart rhythm coherence, psychophysiological coherence is linked to sustained positive emotions and improved cognitive performance. This state fosters creativity, intuitive insight, and spiritual experiences.

References 24-27.

“You'll become so conscious of those unconscious habits that more than likely you won't want to do them again.”

Meditation and mindfulness practices have been shown to enhance self-awareness and access unconscious aspects of the mind. Like psychoanalysis, meditation can facilitate the emergence of unconscious material, allowing it to be integrated at higher levels of awareness. Habits are automatic behaviours that occur outside of conscious

awareness, making up nearly half of our daily actions. While willpower alone often fails to change habits, increasing awareness can be an effective strategy.

References 28-31.

Reynard’s syndrome

“if the person has Renard syndrome, we've had. events where four other people with Reynard's syndrome healed at the end of the event, like no longer have any symptoms at all.”

Raynaud's syndrome manifests as temporary colour changes in the skin, particularly fingers and toes. These shifts occur due to changes in blood circulation. During these episodes, patients often feel pain or discomfort, with attacks commonly triggered by cold temperatures or emotional stress.

References 32-24.

Strong emotions and memories

“And the stronger emotion, the stronger the emotion you feel when you make that choice, the more you remember the choice.”

Emotional arousal has been shown to strengthen long-term memory and the feeling of recollection, though it doesn't always improve accuracy. Negative emotions, in particular, can enhance memory for specific event details. However, the relationship between emotion and memory is complex—while negative emotions typically improve recall of central aspects, positive emotions may enhance memory for peripheral details.

References 35-38.

Oxytocin, vasodilation

“Then we, when we feel angry, or we feel victimised, or when we feel sexual, it's just a different chemical elixir, and oxytocin is released, and oxytocin signals nitric oxide. That's it. Nitric oxide signals another chemical that causes the arteries in your heart to literally dilate.”

Oxytocin is released in response to stress, either simultaneously with or shortly after a stressor, and may help modulate the stress response. Both oxytocin and nitric oxide play key roles in artery dilation, with nitric oxide serving as the primary mediator of this process. While high oxytocin levels can aid in conflict resolution, their effects depend on the context and individual factors.

References 39-42.

Stress hormones and brainwaves

“arousal that's created from the stress hormones causes us uh, to move into these higher brainwave states called beta brainwave states”

Multiple studies have shown that stress, whether psychosocial or induced by tasks like the Stroop test, leads to an increase in beta brainwave activity. This increase is typically linked to heightened alertness and increased cognitive processing demands under stress.

References 43-45.

Stress and disease

“when you turn on that emergency system, the fight or flight nervous system, because of the hormones of stress, and you move your body out of balance, and it has no time to recover and turn back to balance, now you're headed for disease, because no organism can live in emergency mode for that extended period of time.”

“if you can turn on that stress response just by thought alone, that means your thoughts can make you sick”

Stress is a complex factor in disease, impacting both mental and physical health. Effective stress management is essential for disease prevention and better health outcomes.

References 46-52.

Healthcare walk-ins due to psychological stress

“75 to 90 percent of every person that walks into a healthcare facility in the Western world walks in because of emotional or psychological stress”

A significant proportion of medical visits are attributed to stress-related symptoms, with stress identified as a primary cause of healthcare visits in the United States. In Denmark, a study found that 2.1% of the working-age population contacted general practitioners (GPs) for psychological stress over a six-month period. The prevalence was higher among women, particularly those aged 35-54, and was linked to higher education levels and areas with lower population density. In a primary care-seeking working-age population, 59% reported moderate to high levels of perceived stress, with women more likely to report higher stress levels than men.

References 53-55.

Types of stress

“there's three types of stress, physical, chemical, and emotional”

In the literature, there are different stress classifications. One divides stress into eustress (positive stress) and distress (negative stress). Another classification proposes seven types of stress personalities, highlighting the individual nature of stress responses. A third divides stress into physical, psychological, psychosocial, and psychospiritual.

References 56-58.

Stress and the immune system

“And, and so a lot of the work that we do, especially during this time in history, where everybody's feeling the, the, um, the pressure, the environmental pressure of stress. Uh, is to give people the tools to be able to self regulate. And when I mean self regulate, that means move from one emotional state to another emotional state. And it's not bad that we react, we all react, I react. But the question is, how long? How [01:14:00] long are you going to react for? Because, um, if you keep doing it, uh, for months or years, it ultimately becomes your personality, right? And it has a big impact on your immune system.”

Stress has a significant impact on the immune system, with acute and chronic stress affecting immune function in different ways. Acute stress can temporarily boost immunity, while chronic stress tends to suppress immune responses. Additionally, age plays a role, with older adults often experiencing greater immunological impairment due to stress. The effect of stress on immunity varies based on the duration and type of stressor, with chronic stressors suppressing both cellular and humoral immunity.

References 59-62.

Immunoglobulin A (IgA) and emotional states

“We measured a chemical called IGA, immunoglobulin A. It's your body's natural flu shot. It's actually better than a flu shot. And, uh, and so we measured people's IgA levels at the beginning of this time and then we measured them at the end. At the end of three days, by trading those limited emotions for more elevated emotions, their IgA levels went up 50%. 50 percent. So, so the, when you're feeling an elevated emotion, the body's so objective that it's believing it's living in a nurturing and loving environment. And if the environment signals the gene, and it does, and the end product of an experience in the environment is an [01:16:00] emotion. That person is signaling genes ahead of the environment, and that's, and now the body is going to make globulins, which are proteins that are going to create more internal defense and, uh, uh, and less, and less, uh, attention on external defense.”

Studies examining the connection between emotions and salivary immunoglobulin A (IgA) have produced inconsistent findings. Some research links lower IgA levels to emotional crying and stress, while others associate positive experiences, such as laughter, with increased IgA concentrations. Recent longitudinal studies suggest that negative emotions might actually elevate salivary IgA levels, with this effect influenced by individual emotion regulation abilities. Differences in methodology and uncontrolled variables may contribute to these mixed results. Notably, most IgA fluctuations occur within individuals rather than between them, emphasising the role of personal factors. Additionally, circadian rhythms impact IgA levels, with concentrations declining throughout the day. Further research is needed to better understand the complex relationship between emotions and mucosal immunity.

References 63-67.

Slowing down brain waves

“when we started looking at, um, training people how to broaden their awareness to sense space, when you're sensing space. The act of sensing and feeling causes you to stop analyzing and thinking. And if you're not analyzing and thinking, you start suppressing neocortical activity. Your brainwaves start to slow down.”

Slow and deep breathing practices in yoga can significantly increase theta, alpha, and beta wave percentages while reducing delta waves, promoting deep relaxation and enhanced focus.

Reference 68.

Beta brain waves

“beta is a conscious awareness now in beta. The brain is trying to create meaning between what's going on in the outer world and what's going on in the inner world. And it's processing all the sensory information. So a lot of data. So beta is like conscious and awake. And so there's low level beta, there's mid range beta, it's not on this chart. But high level beta is when you're fearful, when you're anxious, when you're angry, when you're in pain, when you're frustrated, when you're jealous, whatever. Uh,”

High beta waves are also linked to states of anxiety and excitement, reflecting heightened cognitive and emotional activity.

References 69, 70.

“In beta, there's a voice talking to you in the back of your head all the time, saying, this is right and this is wrong.”

Beta oscillations are crucial for decision-making, supporting neural ensemble formation, evidence accumulation, and cognitive processing. Their role goes beyond traditional sensorimotor functions, encompassing a wide range of cognitive activities. By facilitating communication within and between brain regions, beta waves help the brain adapt to task demands and integrate information from multiple sources, ultimately influencing decision outcomes.

References 71-73.

Alpha brain waves

“That's just when you're moving into an imaginary state and people do this, but, but a lot of people move into alpha, but it's not coherent. So we're looking for a coherent alpha.”

Alpha rhythms are most prominent during states of quiet wakefulness and relaxation, often dominating the electroencephalogram (EEG) during these periods.

References 74-75.

Theta brain waves

“And they can feel so safe that their body moves into a light rest or a light sleep while they're still awake. So it's relaxed and awake. In that realm, you're in a hypnotic state. You're in theta brainwaves. And in theta now, Lights are shut out in the thinking neocortex that plugs us into three dimensional reality. The identity's gone. The character is gone. There's no activity there. Now the door between the conscious mind and the subconscious mind is wide open to information, and now we're suggestible to information.”

“And that field is carrying an enormous amount of information. So when a person moves into Theta, and I ask them to open their awareness, if they're in a certain range of Theta, we can just about predict 100 percent of the time that that person is going to connect to information.”

Theta brain waves, oscillating between 3-12 Hz, are linked to various cognitive and behavioural functions, including memory, spatial navigation, and meditative states. Specifically, frontal midline theta activity is associated with mindfulness meditation, playing a key role in maintaining meditative states. This activity is also connected to brain plasticity and may enhance control and focus during meditation.

Theta rhythms are vital for learning and memory, particularly in organising related information for efficient processing. They are involved in memory encoding and retrieval, often interacting with gamma oscillations. These waves are also observed during REM sleep and the transition to wakefulness, contributing to memory consolidation. Theta oscillations occur in short bursts and are not always coherent across brain regions, suggesting the presence of multiple theta generators in the brain.

Research indicates that individuals with high hypnotic susceptibility tend to generate more theta power compared to those with low susceptibility. This increase in theta activity is observed across various brain regions, including frontal, central, and occipital areas, during both waking and hypnotic states. The enhancement of theta waves in

highly hypnotisable individuals suggest a link between theta activity and heightened attentional processes, as well as improved imagery during hypnosis.

References 76-80.

“many of the people that are meditating really well, they can relax their bodies so well. And they can feel so safe that their body moves into a light rest or a light sleep while they're still awake. So it's relaxed and awake. In that realm, you're in a hypnotic state. You're in theta brainwaves. And in theta now, Lights are shut out in the thinking neocortex that plugs us into three dimensional reality. The identity's gone. The character is gone. There's no activity there. Now the door between the conscious mind and the subconscious mind is wide open to information, and now we're suggestible to information.”

The relationship between theta waves and hypnosis remains debated, with studies showing varying results. Future research should focus on clarifying the role of theta oscillations in hypnosis, considering individual differences in hypnotisability. Additionally, exploring the potential of interventions that enhance theta activity could offer valuable insights into improving hypnotic outcomes.

References 81-85.

Delta brain waves

“Now, go too far past theta and you fall into delta and now lights are out. You're in a catatonic state and you're unconscious, right?”

Delta brain waves, typically oscillating in the 1-4 Hz range, have traditionally been associated with unconscious states, such as slow-wave sleep and anesthesia. However, they also appear to play a role in decision-making.

References 86, 87.

Relaxation and creativity

“when you're living in survival, you have different hormonal systems switching on. It's not a time to create, your heart doesn't open up. Okay, get a person in that relaxed state, get their heart beginning to change, and energy starts moving into the heart, we can actually measure this. And there's a very low frequency when a person puts their attention on their heart that starts to feed the heart energy. I studied this and it's like filling a gas tank. It just starts to elevate the energy that the heart needs to beat. You're giving it more life force, right? So we can measure that. So when the person is relaxed in their heart and their heart's starting to open up, the heart tells the brain. It's time to imagine, it's time to fall in love with the future. Now the heart is the creative center, right? It's the, it's the part of the, uh, uh, our biology that, that allows the brain to begin, the frontal lobe to begin to create.”

While relaxation has been shown to enhance creativity, the mechanisms behind this relationship are complex and multifaceted. Future research could explore how different relaxation techniques specifically impact various aspects of creativity and how individual differences, such as personality and mood, influence these effects. Additionally, examining the neural correlates of relaxation-induced creativity could provide deeper insights into the cognitive processes involved.

References 88, 89.

Gamma brain waves

“And then high beta ultimately into gamma. And now the person is relaxed and very awake because gamma is superconsciousness.”

Gamma brain waves, characterised by high-frequency oscillations between 30 and 100 Hz, are a crucial component of brain activity, linked to various cognitive functions and processes. These oscillations occur across different brain regions and states, including both waking and sleep, and are associated with a range of neurological and psychiatric conditions.

References 90-95.

Psylocibin and brain waves

"Psilocybin significantly alters brain dynamics and functional connectivity. Functional Magnetic Resonance Imaging (fMRI) studies have shown that psilocybin increases signal variability in brain regions such as the hippocampi and anterior cingulate cortex, influencing higher brain systems like the default mode, executive control, and dorsal attention networks. This leads to a broader range of connectivity states, suggesting a more dynamic brain state during the psychedelic experience."

Psilocybin significantly alters brain dynamics and functional connectivity. Functional Magnetic Resonance Imaging (fMRI) studies have shown that psilocybin increases signal variability in brain regions such as the hippocampi and anterior cingulate cortex, influencing higher brain systems like the default mode, executive control, and dorsal attention networks. This leads to a broader range of connectivity states, suggesting a more dynamic brain state during the psychedelic experience.

References 96, 97.

Gamma brain waves and autonomic regulation

“Now if stress is autonomic dysregulation and they're functioning in a very, very high energetic state in their autonomic nervous system, coherent gamma brainwaves, then there's an enormous amount of autonomic regulation.”

Gamma-band EEGs have been found to predict and modulate autonomic responses during mental tasks, with increased gamma activity preceding autonomic fluctuations (98).

COVID-19

“There's information in the blood that we've discovered that stops the COVID virus. From entering the cell, we've isolated the protein that inhibits the virus from entering the cell. In other words, we've done this studies called adoptive transfer. We've taken advanced meditator's blood, and we've put it in, uh, a culture with ACE two receptor cells that have ACE two receptors and then exposed the ACE two receptor to the, to a pseudo virus like a Covid virus. And in advanced meditators, we noticed that the virus couldn't enter the cell. It was stuck to the outside of the cell and we isolated a protein in the advanced meditator's blood that inhibits the virus from entering the cell.”

Reference 99.

Microbiome and the brain

“And at the end of a seven day event, the microbiome of a person was dramatically different. Dramatically different at the end of seven days”

The brain can influence the gut microbiota through the autonomic nervous system, affecting gut motility, intestinal transit, secretion, and permeability, which in turn alters the structure and function of the microbial community. Additionally, the brain affects the microbiome by secreting hormones into the gut lumen, directly modulating

microbial gene expression. Psychological and physical stressors further contribute to these changes, altering both the composition and metabolic activity of the gut microbiota.

References 100-102.

“If you have diabetes, there's microbiomes in the gut that are gonna influence the way you think”

The microbiota-gut-brain axis plays a crucial role in modulating cognitive functions in diabetes. Research has shown that changes in gut microbiota composition can significantly affect cognitive behaviour. For example, intermittent fasting has been found to improve cognitive deficits in diabetic mice by reshaping the gut microbiota and boosting mitochondrial biogenesis and energy metabolism in the hippocampus.

References 103, 104.

Chronic health conditions and lifestyle

“the majority of chronic health conditions are created by lifestyle”

The evidence strongly supports the idea that lifestyle choices are essential in the development and management of chronic health conditions. By encouraging healthy behaviours and environments, it is possible to prevent, treat, and even reverse many chronic diseases, ultimately improving overall public health outcomes.

References 105-108.

Autonomic nervous system

“Our data shows that the autonomic nervous system can manufacture a pharmacy of chemicals that works better than any drug.”

Imbalances in the autonomic nervous system are associated with various diseases by impacting functions such as immune responses, cardiovascular health, and metabolic processes. These imbalances often exacerbate disease symptoms and progression. Larger clinical trials are needed to confirm the safety and effectiveness of autonomic nervous system-targeted therapies across different conditions.

References 109-115.

Microbiome in PTSD and cancer

“And because we have so much information with anxiety or say, PTSD or cancer. Cancer. When we look at a particular microbiome, we can, we are, are, our machine learning can predict more than 80 percent margin that the person has cancer, has PTSD, uh, or has anxiety, but that's at the beginning of the study. At the end of seven days, when we look at their microbiome, the machine learning can no longer, the algorithm can no longer predict that the person has cancer any longer, cannot predict that they have PTSD.”

The gut microbiome plays a significant role in the development and manifestation of PTSD. Specific microbial profiles and reduced diversity have been linked to PTSD, but further research is needed to fully understand the causal relationships and explore potential therapeutic approaches. Addressing these microbial factors could lead to innovative strategies for managing PTSD and improving mental health outcomes.

References 116, 117.

While preclinical evidence supports the role of the microbiome in cancer therapy, translating these findings into effective clinical interventions is challenging. Large-scale clinical trials and advanced sequencing technologies are needed to validate these approaches and develop microbiome-based diagnostics and therapeutics.

References 118-123.

References

1. Choi, J. H. (Steph), & Miyamoto, Y. (2024). Revisiting negative experiences: A sociocultural cognitive framework. Social and Personality Psychology Compass, 18(1), e12811.
2. Choi, J. H. (Steph), & Miyamoto, Y. (2024). Revisiting negative experiences: A sociocultural cognitive framework. Social and Personality Psychology Compass, 18(1), e12811.
3. Denkova, E., Dolcos, S., & Dolcos, F. (2012). Reliving emotional personal memories: affective biases linked to personality and sex-related differences. Emotion, 12 3, 515-28 .
4. Shearing, V., Lee, D., & Clohessy, S. (2011). How do clients experience reliving as part of trauma-focused cognitive behavioural therapy for posttraumatic stress disorder? Psychology and psychotherapy, 84 4, 458-75 .
5. McCraty, R., & Tomasino, D. (2003). MODULATION OF DNA CONFORMATION BY HEART-FOCUSED INTENTION.
6. Elbers, J., & McCraty, R. (2020). HeartMath approach to self-regulation and psychosocial well-being. Journal of Psychology in Africa, 30, 69 - 79.
7. McCraty, R., & Rees, R. (2009). The Central Role of the Heart in Generating and Sustaining Positive Emotions. .
8. Mather, M., & Thayer, J. (2018). How heart rate variability affects emotion regulation brain networks. Current Opinion in Behavioral Sciences, 19, 98-104.
9. McCraty, R., & Zayas, M. (2014). Cardiac coherence, self-regulation, autonomic stability, and psychosocial well-being. Frontiers in Psychology, 5.
10. Tiller, W., McCraty, R., & Atkinson, M. (1996). Cardiac coherence: a new, noninvasive measure of autonomic nervous system order.. Alternative therapies in health and medicine, 2 1, 52-65 .

11. Kaczmarek, L.D., Behnke, M., Enko, J., Kosakowski, M., Hughes, B.M., Piskorski, J., & Guzik, P. (2019). Effects of emotions on heart rate asymmetry. Psychophysiology, 56 4, e13318 .

12. Kaczmarek, L.D., Behnke, M., Enko, J., Kosakowski, M., Mickiewicz, A., Hughes, B.M., & Piskorski, J. (2021). RUNNING HEAD: Emotions and heart rate asymmetry Effects of emotions on heart rate asymmetry.

13. Marsh, E.J., & Tversky, B. (2004). Spinning the Stories of our Lives. Applied Cognitive Psychology, 18, 491-503.

14. Scoboria, A., Wade, K., Lindsay, D., Azad, T., Strange, D., Ost, J., & Hyman, I. (2017). A mega-analysis of memory reports from eight peer-reviewed false memory implantation studies. Memory, 25, 146 - 163.

15. Muschalla, B., & Schönborn, F. (2021). Induction of False Beliefs and False Memories in Laboratory Studies - A Systematic Review.. Clinical psychology & psychotherapy.

16. Lindsay, D., Hagen, L., Read, J., Wade, K., Garry, M., & Lindsay, S. (2004). True Photographs and False Memories. Psychological Science, 15, 149 - 154.

17. Ehlers, A., Hackmann, A., & Michael, T. (2004). Intrusive re-experiencing in post-traumatic stress disorder: Phenomenology, theory, and therapy. Memory, 12, 403 - 415.

18. Shearing, V., Lee, D., & Clohessy, S. (2011). How do clients experience reliving as part of trauma-focused cognitive behavioural therapy for posttraumatic stress disorder? Psychology and psychotherapy, 84 4, 458-75 .

19. Brewin, C.R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. Psychological review, 103 4, 670-86 .

20. Denkova, E., Dolcos, S., & Dolcos, F. (2012). Reliving emotional personal memories: affective biases linked to personality and sex-related differences. Emotion, 12 3, 515-28 .

21. Bridgland, V.M., & Takarangi, M.K. (2021). Danger! Negative memories ahead: the effect of warnings on reactions to and recall of negative memories. Memory, 29, 319 - 329.

22. Houle, I., & Philippe, F.L. (2020). Is the negative always that bad? Or how emotion regulation and integration of negative memories can positively affect well-being. Journal of personality.

23. Barriga-Paulino, C. I., Flores, A. B., & Gómez, C. M. (2011). Developmental changes in the EEG rhythms of children and young adults: Analyzed by means of correlational, brain topography and principal component analysis. Journal of Psychophysiology, 25(3), 143–158.

24. Mindfulness meditation, which can increase heart rate variability and lower overall heart rate, has been linked to improved divergent thinking performance

25. Creative processes are associated with increased heart rate signal entropy, indicating greater complexity and irregularity in cardiac dynamics

26. Tomasino, D. (2007). The psychophysiological basis of creativity and intuition: Accessing 'the zone' of entrepreneurship. International Journal of Entrepreneurship and Small Business, 4(5), 528–542.

27. Childre, D.L., & McCraty, R. (2002). Psychophysiological Correlates of Spiritual Experience.

28. Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: a review of empirical studies. Clinical psychology review, 31(6), 1041–1056.

29. Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: a review of empirical studies. Clinical psychology review, 31(6), 1041–1056.

30. Delmonte, M. M. (1989). Meditation, the unconscious, and psychosomatic disorders. International Journal of Psychosomatics, 36(1–4), 45–52.

31. Duhigg, C. (2012). The power of habit: Why we do what we do in life and business. Random House.

32. Prete, M., Fatone, M., Favoino, E., & Perosa, F. (2014). Raynaud's phenomenon: from molecular pathogenesis to therapy.. Autoimmunity reviews, 13 6, 655-67 .

33. Pauling, J., Hughes, M., & Pope, J. (2019). Raynaud's phenomenon—an update on diagnosis, classification and management. Clinical Rheumatology, 38, 3317 - 3330.

34. Goundry, B., Bell, L., Langtree, M., & Moorthy, A. (2012). Diagnosis and management of Raynaud's phenomenon. BMJ : British Medical Journal, 344.

35. Cahill, L., & McGaugh, J. L. (1995). A novel demonstration of enhanced memory associated with emotional arousal. Consciousness and cognition, 4(4), 410–421.

36. Phelps, E. A., & Sharot, T. (2008). How (and Why) Emotion Enhances the Subjective Sense of Recollection. Current directions in psychological science, 17(2), 147–152.

37. Kensinger, E. A. (2007). Negative Emotion Enhances Memory Accuracy: Behavioral and Neuroimaging Evidence. Current Directions in Psychological Science, 16(4), 213-218.

38. Talarico, J. M., Berntsen, D., & Rubin, D. C. (2009). POSITIVE EMOTIONS ENHANCE RECALL OF PERIPHERAL DETAILS. Cognition & emotion, 23(2), 380–398.

39. Winter, J., & Jurek, B. (2018). The interplay between oxytocin and the CRF system: regulation of the stress response. Cell and Tissue Research, 375, 85 - 91..

40. Neumann, I. (2007). Stimuli and consequences of dendritic release of oxytocin within the brain.. Biochemical Society transactions, 35 Pt 5, 1252-7 .

41. Oyama, H., Suzuki, Y., Satoh, S., Kajita, Y., Takayasu, M., Shibuya, M., & Sugita, K. (1993). Role of Nitric Oxide in the Cerebral Vasodilatory Responses to Vasopressin and Oxytocin in Dogs. Journal of Cerebral Blood Flow & Metabolism, 13, 285 - 290.

42. Rassaf, T., Preik, M., Kleinbongard, P., Lauer, T., Heiss, C., Strauer, B., Feelisch, M., & Kelm, M. (2002). Evidence for in vivo transport of bioactive nitric oxide in human plasma.. The Journal of clinical investigation, 109 9, 1241-8 .

43. Palacios-García, I., Silva, J., Villena-González, M., Campos-Arteaga, G., Artigas-Vergara, C., Luarte, N., Rodriguez, E., & Bosman, C. (2021). Increase in Beta Power Reflects Attentional Top-Down Modulation After Psychosocial Stress Induction. Frontiers in Human Neuroscience, 15.

44. Alonso, J., Alonso, J., Romero, S., Romero, S., Ballester, M., Antonijoan, R., Mañanas, M., & Mañanas, M. (2015). Stress assessment based on EEG univariate features and functional connectivity measures. Physiological Measurement, 36, 1351 - 1365.

45. Noushad, S., Ahmed, S., Ansari, B., Saleem, Y., Batool, S., & Batool, S. (2021). A review of the literature on the impact of acute and chronic stress upon brain waves. Annals of Psychophysiology.

46. Thoits, P. (2010). Stress and Health: Major Findings and Policy Implications. Journal of Health and Social Behavior, 51, S41 - S53.

47. Crosswell, A. (2020). Is Being Stressed Really that Bad? Mechanistic Pathways and Interventions for the Stress-health Relationship. The FASEB Journal, 34.

48. Turner, A., Smyth, N., Hall, S., Torres, S., Hussein, M., Jayasinghe, S., Ball, K., & Clow, A. (2020). Psychological stress reactivity and future health and disease outcomes: A systematic review of prospective evidence. Psychoneuroendocrinology, 114.

49. O'Connor, D., Thayer, J., & Vedhara, K. (2020). Stress and Health: A Review of Psychobiological Processes.. Annual review of psychology..

50. Schneiderman, N., Ironson, G., & Siegel, S. (2005). Stress and health: psychological, behavioral, and biological determinants.. Annual review of clinical psychology, 1, 607-28 .

51. Pickering, T. (2001). Mental stress as a causal factor in the development of hypertension and cardiovascular disease. Current Hypertension Reports, 3, 249-254.

52. Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T., & Sahebkar, A. (2017). The impact of stress on body function: A review. EXCLI Journal, 16, 1057 - 1072.

53. Aguzzoli, C., & Santi, A.M. (2019). Stress: How to Help Patients? Clinical Management Issues.

54. Lykkegaard, J., Rosendal, M., Brask, K., Brandt, L., & Prior, A. (2018). Prevalence of persons contacting general practice for psychological stress in Denmark. Scandinavian Journal of Primary Health Care, 36, 272 - 280.

55. Wiegner, L., Hange, D., Björkelund, C., & Ahlborg, G. (2015). Prevalence of perceived stress and associations to symptoms of exhaustion, depression and anxiety in a working age population seeking primary care - an observational study. BMC Family Practice, 16.

56. Lu, S., Wei, F., & Li, G. (2021). The evolution of the concept of stress and the framework of the stress system. Cell Stress, 5, 76 - 85.

57. Kumar, V., Mittal, A., Sharma, A. K., & Ahmad, R. (2022). The role of stress personalities: A comparative study between Indian Academia and industry. The Journal of Mental Health Training, Education and Practice, 17(6), 506–525.

58. Marinova, I., & Radeva, N. (2019). The basics of stress. Factors and symptoms. , 8, 45-50.

59. Alotiby, A. (2024). Immunology of Stress: A Review Article. Journal of Clinical Medicine, 13.

60. Khanam, S. (2017). Impact of Stress on Physiology of Endocrine System and on Immune System: A Review.

61. Graham, J.E., Christian, L.M., & Kiecolt-Glaser, J.K. (2006). Stress, Age, and Immune Function: Toward a Lifespan Approach. Journal of Behavioral Medicine, 29, 389-400.

62. Segerstrom, S. C., & Miller, G. E. (2004). Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. Psychological bulletin, 130(4), 601–630.

63. Martin, R.B., Guthrie, C.A., & Pitts, C.G. (1993). Emotional crying, depressed mood, and secretory immunoglobulin A. Behavioral medicine, 19 3, 111-4 .

64. Kugler, J. (1991). [Emotional status and immunoglobulin A in saliva--review of the literature]. Psychotherapie, Psychosomatik, medizinische Psychologie, 41 6, 232-42 .

65. Dillon, K.M., Minchoff, B., & Baker, K.H. (1986). Positive Emotional States and Enhancement of the Immune System. The International Journal of Psychiatry in Medicine, 15, 13 - 18.

66. Seizer, L., & Löchner, J. (2024). The influence of everyday emotions on mucosal immunity: An intensive longitudinal modeling approach. Psychophysiology, 61(8), e14577.

67. Beck, R., Cesario, T., Yousefi, A., & Enamoto, H. (2000). Choral Singing, Performance Perception, and Immune System Changes in Salivary Immunoglobulin A and Cortisol. Music Perception, 18, 87-106.

68. Malhotra, V., Hulke, S.M., Bharshankar, R., Chouhan, S., Ravi, N., & Patrick, K.P. (2021). Effect of Slow and Deep Breathing on Brain Waves in Regular Yoga Practitioners. Mymensingh medical journal : MMJ, 30 4, 1163-1167 .

69. Leaf, C., Turner, R., Wasserman, C., Paulson, R., Kopooshian, N., Lynch, G., & Leaf, A. (2023). Psycho-neuro-biological Correlates of Beta Activity. NeuroRegulation, 10(1), Article 1.

70. Radi, N., & Nasaruddin, N. (2022). Brainwaves Activities during Resting State: A Neurofeedback Case Study. Journal of Cognitive Sciences and Human Development.

71. Spitzer, B., & Haegens, S. (2017). Beyond the Status Quo: A Role for Beta Oscillations in Endogenous Content (Re)Activation. eNeuro, 4.

72. Haegens, S., Nácher, V., Hernández, A., Luna, R., Jensen, O., & Romo, R. (2011). Beta oscillations in the monkey sensorimotor network reflect somatosensory decision making. Proceedings of the National Academy of Sciences, 108, 10708 - 10713.

73. Gould, I., Nobre, A., Wyart, V., & Rushworth, M. (2012). Effects of Decision Variables and Intraparietal Stimulation on Sensorimotor Oscillatory Activity in the Human Brain. The Journal of Neuroscience, 32, 13805 - 13818.

74. Halgren, M., Ulbert, I., Bastuji, H., Fabó, D., Erőss, L., Rey, M., Devinsky, O., Doyle, W., Mak-McCully, R., Halgren, E., Wittner, L., Chauvel, P., Heit, G., Eskandar, E., Mandell, A., & Cash, S. (2017). The generation and propagation of the human alpha rhythm. Proceedings of the National Academy of Sciences, 116, 23772 - 23782.

75. Basar, E. (2012). A review of alpha activity in integrative brain function: fundamental physiology, sensory coding, cognition and pathology.. International journal of psychophysiology : official journal of the International Organization of Psychophysiology, 86 1, 1-24 .

76. Tang, Y., Tang, R., Rothbart, M., & Posner, M. (2019). Frontal theta activity and white matter plasticity following mindfulness meditation.. Current opinion in psychology, 28, 294-297 .

77. Nuñez, A., & Buño, W. (2021). The Theta Rhythm of the Hippocampus: From Neuronal and Circuit Mechanisms to Behavior. Frontiers in Cellular Neuroscience, 15.

78. Colgin, L. (2013). Mechanisms and functions of theta rhythms.. Annual review of neuroscience, 36, 295-312 .

79. Cantero, J., Atienza, M., Stickgold, R., Kahana, M., Madsen, J., & Kocsis, B. (2003). Sleep-dependent theta oscillations in the human hippocampus and neocortex.. The Journal of neuroscience : the official journal of the Society for Neuroscience, 23 34, 10897-903 .

80. Sabourin, M., Cutcomb, S., Crawford, H., Pribram, K., & Pribram, K. (1990). EEG correlates of hypnotic susceptibility and hypnotic trance: spectral analysis and coherence.. International journal of psychophysiology : official journal of the International Organization of Psychophysiology, 10 2, 125-42 .

81. Jensen, M., Adachi, T., & Hakimian, S. (2015). Brain Oscillations, Hypnosis, and Hypnotizability. American Journal of Clinical Hypnosis, 57, 230 - 253.

82. Lankton, S. (2015). In the Room with Milton H. Erickson, M.D. Volume 1 (October 3rd–5th, 1979), by Milton Erickson. American Journal of Clinical Hypnosis, 57, 355 - 358.

83. Ak, T., Ka, P., Rw, F., & Pentony, P. (1975). Hypnosis and the EEG. A quantitative investigation.. The Journal of nervous and mental disease, 161 1, 1-17 .

84. Baghdadi, G., & Nasrabadi, A. (2010). An Investigation of Changes in Brain Wave Energy during Hypnosis with Respect to Normal EEG. .

85. Hiltunen, S., Karevaara, M., Virta, M., Makkonen, T., Kallio, S., & Paavilainen, P. (2021). No evidence for theta power as a marker of hypnotic state in highly hypnotizable subjects. Heliyon, 7.

86. Frohlich, J., Toker, D., & Monti, M. (2021). Consciousness among delta waves: a paradox?. Brain : a journal of neurology.

87. Nácher, V., Ledberg, A., Deco, G., & Romo, R. (2013). Coherent delta-band oscillations between cortical areas correlate with decision making. Proceedings of the National Academy of Sciences of the United States of America, 110(37), 15085–15090.

88. Ding, X., Tang, Y., Cao, C., Deng, Y., Wang, Y., Xin, X., & Posner, M. (2015). Short-term meditation modulates brain activity of insight evoked with solution cue.. Social cognitive and affective neuroscience, 10 1, 43-9 .

89. Ding, X., Tang, Y., Tang, R., & Posner, M. (2014). Improving creativity performance by short-term meditation. Behavioral and Brain Functions : BBF, 10, 9 - 9.

90. Valderrama, M., Crepon, B., Botella-Soler, V., Martinerie, J., Hasboun, D., Alvarado-Rojas, C., Baulac, M., Adam, C., Navarro, V., & Van Quyen, L. (2012). Human Gamma Oscillations during Slow Wave Sleep. PLoS ONE, 7.

91. Buzsáki, G., & Wang, X. (2012). Mechanisms of gamma oscillations.. Annual review of neuroscience, 35, 203-25 .

92. Lisman, J., & Jensen, O. (2013). The Theta-Gamma Neural Code. Neuron, 77, 1002-1016.

93. Bragin, A., Jandó, G., Nadasdy, Z., Hetke, J., Wise, K., & Buzsáki, G. (1995). Gamma (40-100 Hz) oscillation in the hippocampus of the behaving rat. , 15, 47 - 60.

94. Herrmann, C., & Demiralp, T. (2005). Human EEG gamma oscillations in neuropsychiatric disorders. Clinical Neurophysiology, 116, 2719-2733.

95. Csicsvari, J., Jamieson, B., Wise, K., & Buzsáki, G. (2003). Mechanisms of Gamma Oscillations in the Hippocampus of the Behaving Rat. Neuron, 37, 311-322.

96. Tagliazucchi, E., Carhart-Harris, R., Leech, R., Nutt, D., & Chialvo, D. (2014). Enhanced repertoire of brain dynamical states during the psychedelic experience. Human Brain Mapping, 35.

97. Lord, L., Expert, P., Atasoy, S., Roseman, L., Rapuano, K., Lambiotte, R., Nutt, D., Deco, G., Carhart-Harris, R., Kringelbach, M., & Cabral, J. (2019). Dynamical exploration of the repertoire of brain networks at rest is modulated by psilocybin. NeuroImage, 199, 127-142.

98. Umeno, K., Hori, E., Tabuchi, E., Takakura, H., Miyamoto, K., Ono, T., & Nishijo, H. (2003). Gamma-band EEGs predict autonomic responses during mental arithmetic. Neuroreport, 14(3), 477–480.

99. Zuniga-Hertz, J. P., Chitteti, R., Dispenza, J., Cuomo, R., Bonds, J. A., Kopp, E. L., Simpson, S., Okerblom, J., Maurya, S., Rana, B. K., Miyonahara, A., Niesman, I. R., Maree, J., Belza, G., Hamilton, H. D., Stanton, C., Gonzalez, D. J., Poirier, M. A., Moeller-Bertram, T., & Patel, H. H. (2023). Meditation-induced bloodborne factors as an adjuvant treatment to COVID-19 disease. Brain, behavior, & immunity - health, 32, 100675.

100. Martin, C., Osadchiy, V., Kalani, A., & Mayer, E. (2018). The Brain-Gut-Microbiome Axis. Cellular and Molecular Gastroenterology and Hepatology, 6, 133 - 148.

101. Mayer, E., Knight, R., Mazmanian, S., Cryan, J., & Tillisch, K. (2014). Gut Microbes and the Brain: Paradigm Shift in Neuroscience. The Journal of Neuroscience, 34, 15490 - 15496.

102. Rogers, G., Keating, D., Young, R., Wong, M., Licinio, J., & Wesselingh, S. (2016). From gut dysbiosis to altered brain function and mental illness: mechanisms and pathways. Molecular Psychiatry, 21, 738 - 748.

103. Liu, Z., Dai, X., Zhang, H., Shi, R., Hui, Y., Jin, X., Zhang, W., Wang, L., Wang, Q., Wang, D., Wang, J., Tan, X., Ren, B., Liu, X., Zhao, T., Wang, J., Pan, J., Yuan, T., Chu, C., Lan, L., Yin, F., Cadenas, E., Shi, L., Zhao, S., & Liu, X. (2020). Gut

microbiota mediates intermittent-fasting alleviation of diabetes-induced cognitive impairment. Nature Communications, 11.

104. Liu, Z., Yuan, T., Dai, X., Shi, L., & Liu, X. (2019). Intermittent Fasting Alleviates Diabetes-induced Cognitive Decline via Gut Microbiota-metabolites-brain Axis (OR32-04-19).. Current developments in nutrition, 3 Suppl 1.

105. Katz, D., Frates, E., Bonnet, J., Gupta, S., Vartiainen, E., & Carmona, R. (2018). Lifestyle as Medicine: The Case for a True Health Initiative. American Journal of Health Promotion, 32, 1452 - 1458.

106. Vodovotz, Y., Barnard, N., Hu, F., Jakicic, J., Lianov, L., Loveland, D., Buysse, D., Szigethy, E., Finkel, T., Sowa, G., Verschure, P., Williams, K., Sanchez, E., Dysinger, W., Maizes, V., Junker, C., Phillips, E., Katz, D., Drant, S., Jackson, R., Trasande, L., Woolf, S., Salive, M., South-Paul, J., States, S., Roth, L., Fraser, G., Stout, R., & Parkinson, M. (2020). Prioritized Research for the Prevention, Treatment, and Reversal of Chronic Disease: Recommendations From the Lifestyle Medicine Research Summit. Frontiers in Medicine, 7.

107. Nyberg, S., Singh-Manoux, A., Singh-Manoux, A., Pentti, J., Pentti, J., Madsen, I., Sabia, S., Sabia, S., Alfredsson, L., Alfredsson, L., Bjorner, J., Borritz, M., Burr, H., Goldberg, M., Goldberg, M., Heikkilä, K., Jokela, M., Knutsson, A., Lallukka, T., Lallukka, T., Lindbohm, J., Nielsen, M., Nordin, M., Nordin, M., Oksanen, T., Pejtersen, J., Rahkonen, O., Rugulies, R., Shipley, M., Sipilä, P., Stenholm, S., Suominen, S., Suominen, S., Vahtera, J., Virtanen, M., Virtanen, M., Westerlund, H., Zins, M., Zins, M., Hamer, M., Batty, G., Batty, G., Kivimäki, M., & Kivimäki, M. (2020). Association of Healthy Lifestyle With Years Lived Without Major Chronic Diseases. JAMA Internal Medicine, 180, 1 - 10.

108. Li, Y., Schoufour, J., Wang, D., Dhana, K., Pan, A., Liu, X., Song, M., Liu, G., Shin, H., Sun, Q., Al-Shaar, L., Wang, M., Rimm, E., Hertzmark, E., Stampfer, M., Willett, W., Franco, O., & Hu, F. (2020). Healthy lifestyle and life expectancy free of cancer, cardiovascular disease, and type 2 diabetes: prospective cohort study. The BMJ, 368.

109. Bellocchi, C., Carandina, A., Montinaro, B., Targetti, E., Furlan, L., Rodrigues, G., Tobaldini, E., & Montano, N. (2022). The Interplay between Autonomic Nervous System and Inflammation across Systemic Autoimmune Diseases. International Journal of Molecular Sciences, 23.

110. Carod-Artal, F. (2018). Infectious diseases causing autonomic dysfunction. Clinical Autonomic Research, 28, 67-81.

111. Koopman, F., Maanen, M., Vervoordeldonk, M., & Tak, P. (2017). Balancing the autonomic nervous system to reduce inflammation in rheumatoid arthritis. Journal of Internal Medicine, 282, 64 - 75.

112. Fujiu, K., & Manabe, I. (2021). Nerve-macrophage interactions in cardiovascular disease.. International immunology.

113. Thayer, J., & Brosschot, J. (2005). Psychosomatics and psychopathology: looking up and down from the brain. Psychoneuroendocrinology, 30, 1050-1058.

114. Thayer, J., Yamamoto, S., & Brosschot, J. (2010). The relationship of autonomic imbalance, heart rate variability and cardiovascular disease risk factors.. International journal of cardiology, 141 2, 122-31.

115. Curtis, B., & O'Keefe, J. (2002). Autonomic tone as a cardiovascular risk factor: the dangers of chronic fight or flight.. Mayo Clinic proceedings, 77 1, 45-54 .

116. Hemmings, S., Malan-Müller, S., Van Den Heuvel, L., Demmitt, B., Stanislawski, M., Smith, D., Bohr, A., Stamper, C., Hyde, E., Morton, J., Marotz, C., Siebler, P., Braspenning, M., Van Criekinge, W., Hoisington, A., Brenner, L., Postolache, T., McQueen, M., Krauter, K., Knight, R., Seedat, S., & Lowry, C. (2017). The Microbiome in Posttraumatic Stress Disorder and Trauma-Exposed Controls: An Exploratory Study. Psychosomatic Medicine, 79, 936–946..

117. Petakh, P., Oksenych, V., Kamyshna, I., Boisak, I., Lyubomirskaya, K., & Kamyshnyi, O. (2024). Exploring the interplay between posttraumatic stress disorder, gut microbiota, and inflammatory biomarkers: a comprehensive meta-analysis. Frontiers in Immunology, 15.

118. Sepich-Poore, G., Zitvogel, L., Straussman, R., Hasty, J., Wargo, J., & Knight, R. (2021). The microbiome and human cancer. Science, 371.

119. Helmink, B., Khan, M., Hermann, A., Gopalakrishnan, V., & Wargo, J. (2019). The microbiome, cancer, and cancer therapy. Nature Medicine, 25, 377 - 388.

120. Cullin, N., Antunes, C., Straussman, R., Stein-Thoeringer, C., & Elinav, E. (2021). Microbiome and cancer.. Cancer cell.

121. Goodman, B., & Gardner, H. (2018). The microbiome and cancer. The Journal of Pathology, 244.

122. Rajagopala, S., Vashee, S., Lm, O., Suzuki, Y., Jc, V., Telenti, A., & Nelson, K. (2017). The Human Microbiome and Cancer. Cancer Prevention Research, 10, 226 - 234.

123. Matson, V., Chervin, C., & Gajewski, T. (2020). Cancer and the Microbiome: Influence of the commensal microbiota on cancer, immune responses, and immunotherapy.. Gastroenterology.