

Productivity and Sustainability at Workplace: A Study on Happiness-Generating Hormones

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Abstract

Organizations crave for an effective work-force. Happiness is a prime component of Effectiveness. Happiness associated with materialistic-objects brings temporary delight and collaborated with mental-happiness leads to Euphoria. Thus this entire emotional-play is controlled by the "brain".

This paper addresses the basic insight on Emotional-system and its effects on work-place by knowing about the various neurotransmitters and their controlling activities. The paper also reflects about "Happiness-hormones", the diet/activities which help to enhance those and ultimately generating Happiness - Positivity - Team Behaviour - Productivity at work-place. The topics covered in this paper may act like a miniature guiding-note for both managers and employees and pave way for a developmental fusion.

Keywords

Productivity, Happiness at work, Emotional system (Limbic system), Neurotransmitters, Happy hormones.

1. Introduction

Organizations urge for productivity, fertility and happiness at work-place. Organisational accomplishments crave for conglomerating individual achievements. Scientists and researchers have made innumerable studies and findings in the field of Management and Human Resource. Apart from various empirical outcomes and theories, researchers should also find health-environment oriented ways to infuse productivity and happiness at work as models/frameworks and theories are sometimes difficult to implement practically in an organizational set-

up. The paper aims at a deviant way from the traditional methods to bring happiness at work-place. The paper puts light on the emotional system (Limbic system) of brain, so as to educate managers and other employees about various systems and hormones that deal with multiple situations (like anger/happiness) in day-to-day life. Thus "Brain" is the master organ which control the foresaid activities/emotions/hormones and a focus on this organ can internally help the policymakers to spread forth productivity among the employees.

Human brain is the central hub of complicated neural network. Series of reactions take place in fraction of seconds where brain is the primary remote control of how an individual reacts. For instance when boss praises an employee in front of the entire office crew, the hormones released further motivate them to work better, and also it creates positivity in mind and health. On the other hand, an insult by the boss for not completing an assignment creates completely opposite hormones leading to anger, anxiety, stress and de-motivation. To understand them, a narrow light is focused on the emotional system of the brain (Limbic system), which is actually responsible for producing those. Homosapiens have two different types of brain systems – the limbic system and the cortex. The Limbic system is responsible for emotional processes and produces the neuro-chemicals that entails the body as to what's good or bad for them. The Neurotransmitters remain in constant flux throughout human brain. They are manufactured and released by billions of neurons which a human brain possesses, they control the actions like how humans feel and react to any particular situation. The Special cells called "neurons" are liable for information transportation through the brain to the body. To pass this information, they utilize small chemicals known as neurotransmitters. Neurotransmitters are connected stem to stem, i.e. they are released from one neuron and received by another neuron, using special receptors – which recognises the neurotransmitter and passes on the information further to the cell body. Thus, in the light of something good, the brain releases four main 'feel-good' chemicals namely – endorphin, oxytocin, serotonin, and dopamine these hormones are the happy hormones which may actually help managers to build a strong work-force; on the other hand in the presence of danger and other related situations it releases, the 'bad-feeling' chemical – cortisol – comes into picture, thus managers should discover ways , as to how can the feel bad

hormones which leads to anxiety, tiredness, stress and other mental disorders that adversely affect physical health. Thus, in order to know and understand about various brain hormones, the focus shall be laid on the system which generates them" The Limbic system".

2. Work and Function of the Emotional System: Limbic System and Work-place

The role of emotions are essentially unavoidable in life of human beings. A book by Daniel Goleman (1995): *Emotional Intelligence: Why It Can Matter More Than IQ*, discussed the importance of emotions. Owing to the principle of evolution, it is believed that emotional part of human brain (limbic system) existed long-before rational brain (cortical system). This idea has been supplemented with the fact that all living creatures dealt with the challenges and threats of survival first. The emotional system of the brain helped to make decision regarding the approaching challenge or danger like to accept, run, fight or ignore any dangers. The seat for assessment, analysis and rational thoughts were added to human personality later. Thus it is necessary to keep the limbic system healthy as it is the seat of action and reactions of almost all day-to-day activities, one utilises their limbic brain for almost everything whereas rational brain is mostly utilised during problem solving. The structures compositions and interacting areas of limbic system are primarily involved in the process of motivation, emotional stages, learning, and also memory. The limbic system functions by impacting the endocrine system and the autonomic nervous system. Suppose, in an organizational set-up when a task is assigned in a team, or an accident happens or a festival is celebrated, the parts of the limbic system gets activated and starts working according to previous experiences and the hormones are released at those instances.

The limbic system is also tightly connected to the prefrontal cortex. Some scientists revealed that this connection is related to the satisfaction which one obtains from solving problems. The functional relevance of this system has directed to serve many different activities such as emotions, memory related activities, sensory organ processing, time of perception, alertness, consciousness, instincts, autonomic controls, and motor behaviour. The happiness, satisfaction and motivation of completing a task is attained from this section of brain. When an individual is satisfied

after problem solving and task completion, they feel motivated to work more. The feelings like anger, anxiety, frustration, stress and burnout are also the outcomes of this emotional system. This is the area where mental aggression and work-load may sometimes lead to mental disorders, thus an alertness among individuals and managers is necessary to understand the system of our body and derive basic solutions so as to maintain a productive and competitive workforce.

Out of the hundreds of chemicals that brain release during different activities/emotional stages, few important one's are listed below in the table and also the examples of situations when these hormones are generated in common to have a better understanding about their functions.

Table 1: Chemicals produced by Brain and their Related Activities/Functions with Situational Examples based in an Organizational set-up.

Chemical	Discovery	Activity
DOPAMINE (Happy -hormone)	Dr. Carlsson, 1950's	Dopamine effect makes one 'want' to do things (that are related with happiness/pleasure). Its inadequacy causes slower reaction time and also anhedonia (unwillingness to do a task) and even depression. Dopamine is released when the doing action is connected with pleasure. It influences the level of motivation and plays a crucial role in how an individual perceives reality. Inefficiency in dopamine transmission is associated with a state called psychosis, a severely distorted form of thinking which is characterized by hallucinations and also sometimes delusions. It also plays a major role in the brain's reward system. Example: Feeling of an employee when rewarded for good performance.

Chemical	Discovery	Activity
SEROTONIN (Happy-hormone)	Vittorio Ersplamer,1940	Serotonin causes the feelings related to safety, calmness, joy and also self-confidence. Its scarcity leads to lowered self-esteem, high obsessive thoughts, quick compulsive behaviour, impulsiveness and aggression. Serotonin is released when carbohydrates are consumed (example: sweets and chocolate). Serotonin gives a feeling of calmness and confidence. Not just happiness but it is calmness. Precisely is relaxed happiness. Serotonin also helps in regulating sleep, appetite/hunger, moods and also inhibits pain. Certain research supports the idea that depressed people tend to have a reduced level of serotonin transmission. Thus lower levels of a serotonin by-products have been associated to a higher risk for suicide. Example :When employees celebrate festivals and success together.
ENDORPHINS (Happy-hormone)	Choh Hao Li,1960	Endorphins leads to really good/happy mood (also euphoric) and gives the surplus energy to “go an extra mile”, with decreased feeling of tiredness. This chemical is considered very vital since stone age, as endorphins saved the life of nomads which kept them going in spite of hunger and tiredness. The lack of endorphins can cause mood swings and also extremely, contrasting emotions. It is also released during physical exercises and movement and tends to decrease the perception of pain. Example: An employee is given an extra task at the end of the day.

Chemical	Discovery	Activity
CORTISOL	Edward Kendall, Tadeus Reichstein and Philip Hench,1930	This hormone is released during the time of stress hence called the "stress hormone". It increases heartbeat, blood glucose, blood pressure, muscle tension and respiration. It also temporarily shuts down the functions that are not in need during the crisis/alertness time i.e. digestion. Example: Feelings created in employees during insult and chiding by the boss.
ACETYLCHLOIN	Henery Dale,1936	Acetylcholine is the chemical present between the nerve synapses, or the gaps, in between nerve cells. When activated, it contracts the skeletal muscles and activates the glandular functions of the endocrine system enhancing the power of learning and recalling. Acetylcholine has a vital role in the enhancement of alertness when humans wake up from sleep, and also in sustaining attention and in learning and memory . Damage to this cholinergic (acetylcholine -producing) system in the brain has revealed to be associated with major memory related with Alzheimer's disease. Example: Employee giving a presentation on an important topic.
GLUTAMATE	Kikunae Ikeda,1908	Glutamate is an amino acid. It is found to be an excitatory neurotransmitter, i.e. it tends to increase the likelihood of a nerve cell to fire an action potential. Its main function is to pass information that maintains brain development and also determines cellular survival. Glutamate though is present throughout the brain in good level of-concentrations, but excessive glutamate, as well as scarce

Chemical	Discovery	Activity
		glutamate, can be dangerous either. It must be present in accurate concentration at correct location of the brain and for the regulated length of time for functions to be carried out without damaging the cells. Example: Employee during the beginning of a new project which has a near deadline.
GABA (Gamma-aminobutyric acid)	Eugene Roberts,1950	Researchers believe GABA as an inhibitory neurotransmitter. GABA is also an amino acid which behaves as a neurotransmitter and its natural function is to slow the activity of the neurons to which it is connected. It facilitates nerve transmission in the brain, which acts as calming nervous activity. This makes a person feeling of tranquility and give a sense of wellbeing . GABA also makes the body and mind relax to fall asleep, soundly throughout the night. Low GABA levels are is interlinked to insomnia and also disrupted sleep . In a study, it was revealed that, the GABA levels in people with insomnia were found almost 30 percent lower than in people without any sleep disorder. <i>Example: Mid-tea breaks, relax time of employee in between work.</i>

The idea on various activities and the root chemicals can steer clear the way for team building and nurturing happy workforce (Table 2). The term happy is derived from the old Norse term happ implying “luck” or “chance”. The treaties An Enquiry into the Original of Our Ideas of Beauty and Virtue by Francis Hutcheson (1725) highlighted the concept that action is best which accomplishes the greatest happiness for the greatest numbers. So here is a shift from individual happiness to collective happiness. The organisations can sense the neural roots of their organisations.

Table 2: Activities and Root Chemicals Related to Them

Activity	Root Chemicals
Insomnia	Dopamine, Norepinephrin, Serotonin, Orexin
Sleep	GABA, Melatonin
Anger	Adrenalin, Dopamine
Mood swings	Dopamine, Norepinephrin, Adrenalin
Love	Oxytocin, Dopamine, Serotonin
Hunger	Glutamate, Ghrelin, GABA
Music	Dopamine, Opioids,
Alertness	Norepinephrin
Exercise	Dopamine, Norepinephrin
Excited	Dopamine
Death	DMT-dimethyltryptamine

3. Hormones and Productivity at Workplace

The figure above shows Casey Moore's Productivity chain for increasing organizational effectiveness. The chain include twelve factors that contribute to make an effective work-force: Communication & relationship among each other, Decision making in the organization, Delegation of duties, Drive to work, Goal setting , Health, Organization of data, Planning, Re-invention, Resources available, Task management and finally boundary setting. Each of them plays an equal role in productivity where, the concern picked for this paper is Health.

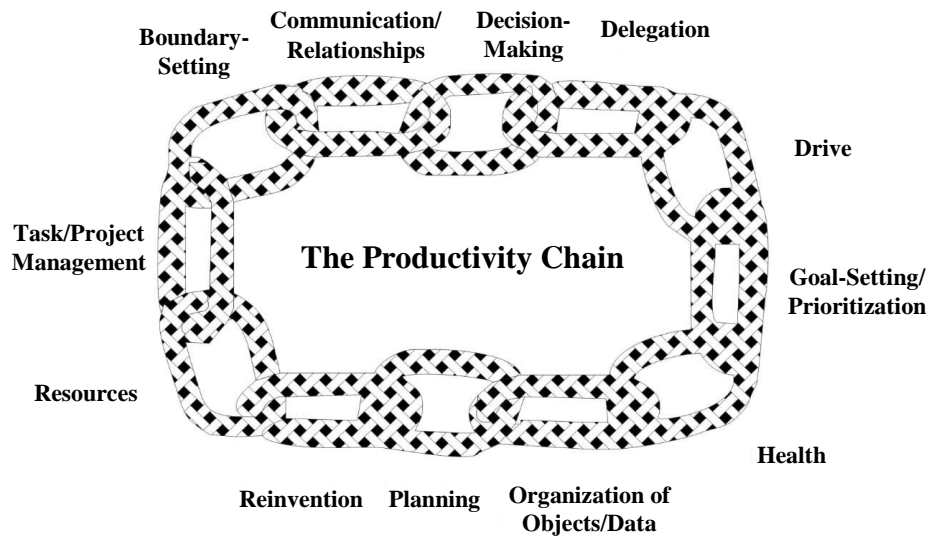


Figure 1. Casey Moore's Productivity Chain Model for Increasing Effectiveness

Source: caseymooreinc.com

An old saying 'Health is wealth', is to be taken as statutory warning by today's organizations to reach at a competitive stage for organizational success. Thus, a new dimension to health i.e. keeping the neurotransmitters/ chemical messengers positive can help to attain balance, health and well-being at large. As mentioned earlier, there are hundreds of neurotransmitters that are produced in human body out of which four are considered to be the happy hormones or DOPE hormones, and organizations must consider them in order to being productivity among employees. The neurotransmitters are Dopamine, Oxytocin, Serotonin and Endorphins. The people in general are unaware of how can these neurotransmitters be enhanced by daily activities and foods thus, a quick guide is given below, which can be a guide for self-development, productivity, happiness and sustainability at workplace which are the essential point of a growing organisation.

4. Ways to Enhance Happy Hormones for Productivity and Positivity at Workplace: A Guide for Self-development and Team Building:

Dopamine: (Food and Activities)

- Rich in protein
- Consuming low saturated fat food

- Consuming Velvet beans
- Regular exercise
- Consuming Almonds, Avocados, Bananas, Green Tea, Milk , water melon
- Eggs, Fish, meat, nuts
- Avoid sweeteners
- Getting the right sleep hours
- Having friend
- Exposing to morning sun
- Meditating
- Listening music
- Listing down to-do tasks

Oxytocin: (Food and Activities)

- Vitamin C & D
- Acupuncture therapy
- Consuming caffeine content
- Keeping pets
- Listening soothing music
- Eating dark chocolate
- Using scent of jasmine and Lavender
- Massage
- Yoga
- Exposing oneself to both cool and warm temperature
- Positive social encounters

Serotonin: (Food and Activities)

- Consuming Soy products in good quantity.
- Taking a quality probiotic,
- Properly hydrating oneself
- Consuming a brain-healthy diet.
- Spending time with nature
- Gratitude: Research show that the feeling of gratitude affects the brain's reward system directly. Since it is associated with the release of dopamine and serotonin it has been directly linked to increased well-being and happiness.
- Essential Oils: possess medicinal properties which reveal that bergamot, lavender, and lemon essential oils are rich in therapeutic properties. Utilizing them calms brain and releases serotonin.

- Happy Memories: Creating and remembering happy memories promotes production of serotonin.
- Psychotherapy helps in elevating mood and serotonin level.
- Exposing oneself to bright light
- Consuming vitamins of B6, B12 (green leafy vegetables and whole grains.)
- Increasing magnesium intake(dark greens, bananas, and fish)
- Less sugar consumption
- Staying calm and positive

Endorphins: Food and Activities

- Consuming Chocolate which contains substances such as phenethylamine and theobromine, these are chemicals that suppress pain and makes a person feel serene and pleasant by elevating endorphins.
- Eating favorite food make the brain satisfied which releases endorphins to boosts mood.
- Exercise - As working out stresses the entire body, thus brain has to pumps out endorphins to cope with the strain and pain.
- Laughter as a medicine.
- Listening and making music
- Activities like charity, volunteering, donating, as well as helping others make a person feel good which activates the pleasure centre of their brain which ultimately improves endorphins.
- Dancing to music reveals endorphins.
- Getting some walk and morning sun-rays
- Breathing exercises, yoga and meditation.

Apart from keeping all the above things in note, Ergonomics at the working-place (arrangement of things in simple ways) as well as colour of the work place, the temperature maintained, moments of Laughter, Music, providing short-breaks are all key factor in promoting happy hormones at work-place.

Research Implications:

- The study helps to guide managers/ employees to relate productivity with internal factors like health and well-being, rather than the traditional ways of following models and theories.
- It tries to educate management individuals about the master organ "Brain", its role in transmission/communication/decision making.
- It addresses the path making to spot the inner engineering similarities and nurturing teams rather than just individuals.

5. Conclusion

Happiness is not just a feeling, it is a choice which every individual must make, it is a gift which one individual must present their fellow beings by bringing a modulation in everyday activities and actions. In this light, neural balance is essential for keeping brain's functional equilibrium. Promoting happy hormones through neural-knowledge, not only makes an individual healthy in physical and mental ways, but also spread a soothing wind of positivity, which makes the entire environment pacified and ultimately enhances productivity. Mirror neurons can be ignited through team building and spiralling satisfaction effects. Thus to create a culture of harmony-happiness in the organizational set-up, management studies should also render focus to neural-knowledge as it may adhere countless benefits through managing the flow of collective happiness in the people component for the growth-stability-productivity of the organization.

6. References

1. Aashish Nanda, (Dec, 2016). Hormones and Chemicals that influence emotions. Retrieved from <https://www.mokshamantra.com/hormones-chemicals-influence-emotions/>
2. Deane Alban, (November 15, 2018). How to increase Endorphins naturally. Retrieved from <https://bebrainfit.com/increase-endorphins>
3. Dolores Garcia, (May 2, 2017). Happy-or-Sad-the-Chemistry-behind-Depression. *The Jackson Laboratory* Retrieved from <https://www.jax.org/news-and-insights/jax-blog/2015/december/happy-or-sad-the-chemistry-behind-depression>
4. Danial Goleman (1997). Emotional Intelligence "Why it can Matter more Than IQ", Boston, United States of America: Bantam Books
5. Dominika Kuczyńska, (Dec 23, 2016). Short story about the Brain Chemicals and How they Affect Players. Retrieved from <https://blog.daftmobile.com/short-story-about-the-brain-chemicals-and-how-they-affect-players-d078792139ec>
6. Erica Julson, (May 10, 2018.). 10 Best ways to Increase Dopamine Levels Naturally. Retrieved from <https://www.healthline.com/nutrition/how-to-increase-dopamine#section4>

7. ET Bureau, (Dec 10, 2018). Boost these hormones to succeed as a leader at work. *The Economic Times Wealth*. Retrieved from https://economictimes.indiatimes.com/articleshow/66988190.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
8. Genevieve Rayner, (September 26, 2016). The emotion centre is the, oldest part of the human brain: why is mood so important? *The Conversation* Retrieved from <https://theconversation.com/theemotion-centre-is-the-oldest-part-of-the-human-brain-why-is-mood-so-important-63324>
9. Gibb, B. J, A. (November, 2017). A Quick Guide to Brain Chemistry. Retrieved from <https://bigpictureeducation.com/chemicals-brain>
10. Glenn Santos, (March 15, 2018). #3 ways to Increase Dopamine to Boost your Productivity. Retrieved from <https://helloendless.com/10-ways-to-increase-dopamine-to-boost-your-productivity>.
11. Glutamate. (May 24, 2017) *Good Therapy*. Retrieved from <https://www.goodtherapy.org/blog/psychpedia/glutamate>
12. Harvard health Publishing. (Updated: June 24, 2019, Published: June, 2009). What causes depression? Retrieved from <https://www.health.harvard.edu/mind-and-mood/what-causes-depression>
13. Jennifer Berry, (February 6, 2018). Endorphins: Effects and How to Increase Levels. *Medical News Today* Retrieved from <https://www.medicalnewstoday.com/articles/320839.php>
14. Joanna Smykowski, (January 2, 2019). Aristotle & Plato-How their Views on Happiness Help us Today. *Better Help*. Retrieved from <https://www.betterhelp.com/advice/happiness/aristotle-and-plato-how-their-views-on-happiness-can-help-us-today/>
15. Joe Cohen, (July 25, 2019). BS, Beneficial Effects of Oxytocin + 34 Ways to Increase it. *SELFHACKED*. Retrieved from <https://selfhacked.com/blog/the-social-chilled-out-and-empathetic-genes-oxytocin-receptor-snps/>
16. Jordan Fallis, (March 30, 2019). 25 Effective Ways to Increase Oxytocin Levels in the Brain. *Practical Brain and Mental Health Solutions*. Retrieved from <https://www.optimallivingdynamics.com/blog/25-effective-ways-to-increase-oxytocin-levels-in-the-brain>

17. Katherine Wu, (Feb 14, 2017). Actually: The Science behind Lust, Attraction, and Companionship. *Science In The News (SITN)*. Retrieved from <http://sitn.hms.harvard.edu/flash/2017/love-actually-science-behind-lust-attraction-companionship/>
18. Lachlan Brown, (March 13, 2019). 11 Ways to Increase the Serotonin in your Brain (Naturally). *Hack Spirit*. Retrieved from <https://hackspirit.com/11-increase-serotonin-brain-naturally>
19. Marie Miguel, (Jan 2, 2019). Happiness Article. *Better Help*. Retrieved from <https://www.betterhelp.com/advice/happiness/>
20. Medical University of Vienna, (August 31, 2016). Dopamine: Far more than just the 'happy hormone'. ScienceDaily. Retrieved from <https://www.sciencedaily.com/releases/2016/08/160831085320.htm>
21. Psychologies. (April 14, 2018). Boost your Natural “Feel Good” Chemicals. Retrieved from <https://www.psychologies.co.uk/self/how-to-boost-your-natural-feelgood-chemicals.html>
22. R.L. Isaacson, (2001). Limbic System. *Science Direct*. Retrieved from <https://www.sciencedirect.com/topics/neuroscience/limbicsystem>
23. Sawaram Suthar, (May 23, 2016). 6 Scientific Ways to Increase Productivity. *VISME*. Retrieved from <https://visme.co/blog/how-to-increase-productivity-at-work/>
24. Seana, (2014). Happy Hormones: How Training makes you Happy. [Blog Post]. <https://www.freeletics.com> Retrieved from <https://www.freeletics.com/en/blog/posts/happiness-hormones-training-makes-happy>
25. Swaim, Emily. (December 12, 2017). 10 Ways to Boost Dopamine and Serotonin Naturally. Good Therapy. Retrieved from <https://www.goodtherapy.org/blog/10-ways-to-boost-dopamine-and-serotonin-naturally-1212177>
26. Timothy J. Legg, (May 25, 2018). What are the benefits of Sunlight? *Healthline*. Retrieved from <https://www.healthline.com/health/depression/benefits-sunlight#benefits>
27. Wikipedia, (April 23, 2020). Limbic System. Retrieved from https://en.wikipedia.org/wiki/Limbic_system