



“A Study of Human Happiness, Health, Hormones, Brain and Body Related to Green-Psycho-Chemistry”

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Abstract:

This paper surveys the scientific evidence regarding the nature of human happiness, health, hormones, brain and body related to green-psycho-chemistry by drawing upon numerous studies in social science domains: namely psychology, but also related fields of biology, and chemistry. Happiness is an emotional state characterized by feeling of joy, satisfaction, contentment, and fulfillment. Happiness underlying factors are considerable from two dimensions: endogenic factors (biological, cognitive, personality and ethical sub-factors). Almost all the endogenous determinants, the role of neurochemicals tends to be the most dependent predictor of happiness. Exogenic factors (behavioral, sociocultural, economical, geographical, life events and aesthetics sub-factors). Happiness encompasses several constructs, including affective well-being (feelings of joy and pleasure), eudemonic well-being (sense of meaning and purpose in life), and evaluative well-being (life-satisfaction). Research into the relationship between happiness and health is developing rapidly, exploring the possibility that impaired happiness is not only a consequence several of ill-health but also a potential contributor to disease risk. Hormones are biochemical substances that regulate and control physiological functions in the body, it affects emotions, feelings and mental health.

The main purpose of this research is to study the hormones of happiness and its role in mood, emotions and mental health. The findings of this study show that serotonin, oxytocin, dopamine, melatonin, endorphins, estrogen, progesterone, and testosterone are the important hormones of happiness that play a constructive and important role in happiness and sadness, mood, emotions, health, through green-psycho-chemistry.

Keywords: Happiness, Health, Hormones, Brain, Body, Green-psycho-chemistry, Physical health, biological health, Mental health, Neurochemicals, Neurotransmitter.

Introduction:

Happiness:

In general, happiness is understood as the positive emotions we have in regards to the pleasurable activities we take part in through our daily lives. Pleasure, comfort, gratitude, hope, and inspiration are examples of positive emotions that increase our happiness and move us to flourish. In scientific literature, happiness is referred to as hedonia (Ryan & Daci, 2001), the presence of positive emotions and the absence of negative emotions. Any serious discussion about happiness must first begin by attempting to define what we mean by the term happiness. Happiness can be thought of as an emotional state that reflects a high level of mental or emotional well-being. Current scientific perspectives typically frame happiness as a complex binary construct that encompasses subjective elements of both affect and cognition that contribute to well-being. Subjective well-being (SWB), according to Lyubomirsky and Dickerhoof (2006) “represents people’s beliefs and feelings about whether they are leading a rewarding and desirable life (p.167).” Diener, Oishi and Lucas (2009), define SWB as “a person’s cognitive and affective evaluation of his or her life as a whole (p.187).” including about satisfaction and fulfillment, and especially in important life domains, such as marriage and work (Diener, 2012). Much of the research conducted on happiness comes under the heading of subjective well-being (Diener, 2000,2012). Psychology theories of happiness build upon philosophical concepts such as hedonia, eudaimonia, and meaning in life as well as philosophical traditions of utilitarianism or moral philosophy (Tatakiewicz 1976). Scholars within the field of psychology have attempted to translate these philosophical concepts into empirical measurable construct (e.g., Waterman et al. 2010).

Types of happiness:

There are many different ways of thinking about happiness. For example, the ancient Greek philosopher Aristotle made a distinction between two different kinds of happiness: hedonia and eudaimonia.

1. **Hedonia:** Hedonia happiness is derived from pleasure. It is most often associated with doing what feels good, self-care, fulfilling desires, experiencing enjoyment, and feeling a sense of satisfaction.
2. **Eudaimonia:** This type of happiness is derived from seeking virtue and meaning. Important components of eudemonic well-being including feeling that your life has meaning, value, and purpose. It is associate more with fulfilling responsibilities,

investing in long-term goals, concern for the welfare of other people, and living up to personal ideals.

The Psychology of Happiness:

According to psychology, happiness is about more than simply the experience of a positive mood than simply the experience of a positive mood. In order to describe happiness, psychologist commonly refer to subjective well-being (Kesebir & Diener, 2008). In other words, happiness is “people evaluations of their lives and encompasses both cognitive judgements of satisfaction and affective appraisals of moods and emotions” (Kesebir & Diener, 2008, p. 118).

The psychological inquiry into happiness is important because happiness is not only associated with improved physical health and even longevity, but it is also a priority for people- across the world, happiness has been rated as being more important than other desirable outcomes including living a meaningful life or making a lot of money (psychology Today, 2019).

There are three ways that psychologist study happiness:

1. Need and Goals Satisfaction theories:

These theories suggest that happiness results from striving to achieve appropriate goals and meeting one's fundamental human needs (Nelson, Kurtz & Lyubomirsky, in press). Deci and Ryan (2000) for example, proposed self-determination Theory, which stipulates that wellbeing is achieved when one meets their wellbeing is achieved when one meets their basic human needs including autonomy, competence, and relatedness.

2. Genetic and Personality Predisposition Theories:

These propose that wellbeing is influenced by genes, and is associated with the personality traits of extraversion and neuroticism (Nelson et al., in press). This, in turn, implies that wellbeing does not change much over time.

3. Process/activity theories:

Process/activity theories argue that well-being may be improved by participating in activities that are engaging and require effort (Nelson et al., on press). Psychologist ask the question, ‘is it possible to increase one's happiness?’. Some psychologists claim that making an attempt to enhance happiness is pointless because happiness levels are predetermined and stable over the time (Norrish & Vella-Brodrick, 2008).

Happiness and Positive Psychology:

As a science, positive psychology is the scientific study of positive experiences and positive individual traits. It is a field concerned with well-being and optimal functioning, and aims to broaden the focus of clinical psychology beyond suffering. Positive psychology denotes that troubled people want more satisfaction, contentment, and joy not just less sadness and

worry. The belief is that those who suffer want to build the strengths and not just correct their weaknesses (Duckworth, Steen, & Seligman, 2005).

Positive psychology can be described as a psychology of potential, and what ‘could be’ as compared to what ‘is’ (Seligman & Csikszentmihalyi, 2000). It aims to shift what has historically been the predominant focus of psychology-pathology- to examining the development of positive qualities in individuals and communities (Seligman & Csikszentmihalyi, 2000). In other words, positive psychology is aims to understand and cultivate the factors that put individuals, communities, and societies in a position where they are able to ‘flourish’ (Fredrickson, 2001). Happiness exists when positive emotions are dominants, with the experience of negative emotion minimal. The so-called ‘pleasant life’ is one which involves enjoyable and positive experience.

Neurobiology of Happiness:

All human emotions are functions that are produced in the brain. Any state in the mind including pleasure or happiness, are produced by the synergistic functions of certain brain sites. Communication between nerve cells (neurons) are mediate by certain neurochemical messengers called neurotransmitters. This view purports that individuals are born with the genetic makeup to be either “very” happy, reasonably content, or chronically dissatisfied. Positive emotion has been shown to coincide with higher levels of activity on the left side of the brain’s prefrontal lobes. A key player seems to be the neurotransmitter dopamine, which carries “feel good” messages between brain cells.

High levels of dopamine have been implicated in feeling of happiness while low levels may result in feeling of depression. Lykken and Tellegen (1996) conducted from their study of twins that most people have an average level of happiness or a “set point” that is innate in them and therefore independent of environmental factors.

Neurochemistry of Happiness:

Many neurotransmitters are involved in the process of manufacturing happiness. Beyond neurotransmitters, many hormones contribute directly or indirectly to the process as well. This section will only focus on the major neurotransmitters.

The four main happiness chemicals are serotonin, dopamine, endorphins and oxytocin. Each one has an impact on happiness, with effects ranging from boosting pleasure and satisfaction to controlling stress and anxiety.

1. **Serotonin:** serotonin is one of the key hormones linked to our emotions and mood, says Michela. It’s associated with satisfaction and optimism, and also has a role in our physical health. The presence of serotonin in the body influences everything from the quality of our sleep to our appetite, says, Michela. “Low serotonin has

been linked to reduced immune system function as well as wide range of mental illness such as depression, anxiety, and obsessive-compulsive disorder (OCD)."

2. **Dopamine:** The chemical messenger, Dopamine, is linked to the reward, motivation, memory and attention functions of the body and plays a role in regulating body movement, Healthline reports. "When dopamine released in large amounts, it creates feelings of pleasure and reward, which motivates you to repeat a specific behavior. In contrast, low level of dopamine is linked to reduced motivation and decreased enthusiasm for things that would excite most people."
3. **Endorphin:** The word "Endorphin" combines two words: "endogenous" (meaning "inside the body") and "morphine" (a medication that relieves pain). This powerful chemical is your body's natural pain killer. They inhibit the transmission of pain signals in the central nervous system by binding to opioid receptors (the body's natural morphine).
4. **Oxytocin:** The happiness chemical that helps us feel loved and connected to others is oxytocin. "Oxytocin is known as the love chemical as it's released during human-to-human contact such as hugging, and kissing;" explains Michela. Oxytocin also plays an essential role in reproduction. Studies have found it can trigger labor contractions and the flow of breast milk in women, and the movement of sperm in men.

Physical Health:

Medicine and psychological findings showed that positive emotion reactions against life events can influence in various ways on physiologic characteristics. Therefore, several studies investigate the association between physical health and happiness. A group of researchers studied the general association between physical health and others investigate the relation between physical illness (hypertension, bulimia...) and happiness.

Recently, several studies concluded that positive mood in individuals is a strong predictor of physical health and there is a significant correlation between positive mood and physical health. Researchers stated that people with happiness experience a long life. People with happiness behave healthier (weight control and practice) than others. Moreover, the people of happiness inhibited the risky behaviors. Having positive mood and happiness correlated with decreasing some illness such as hypertension, cardiovascular disease and fatness. Researchers find a strong relation between local of brain that manage weight and metabolism and areas that control cognition and emotions. Fatness is likely a risk factor for depression and then significantly decrease the quality of life.

Researchers indicate that rate of hypertension is low among happy societies. In addition, researchers concluded that special emotions like fear, anger, and happy, play a clear and important role in psychopathology and treatment of cardiovascular disease. Recent studies showed that people with happiness can more fight with cancer and more survive. Some researchers used music therapy to increased positive emotions in individual with cancer; they conclude that music therapy has a

significant effect on dealing with cancer. Van Dom 1989 described that positive attitude can stop the serious disease and happiness is the best means against cancer. In addition, some researchers indicated hypothesis of long life among happy cancers is invalid and some studies reported short life among cancers.

Hormones:

Hormones are biochemical substances that regulate and control physiological functions in the body; it affects, emotions, feelings, and mental health. Hormones are important chemicals substances in the body that are secreted by the endocrine glands and transported through the blood to various organs. These substances are responsible for transmitting messages from the brain and control the health and functions of various organs. Klein and Rosmanit (2016) write in the book Hormones and the Endocrine system that: Hormones are involved in various functions of the body such as eating, sleeping, sexual desire, birth as well as emotions and feelings. Emotions such as happiness, sadness, irritability, anger, etc. are often associated with hormones. Mansouri (2019) wrote that different organ of the body work together to provide the desired function. However, some things can be done to help with this process. Serotonin, dopamine, and endorphins are three hormones that play a role in human happiness and well-being. Dfarhud, Malmir & Khanahmadi (2014) found that: Research in neuroscience and psychiatry shows that happiness is associated with changes in the human brain and nervous system.

Types of happiness hormones:

1. Oxytocin:

Oxytocin is a hormone directly linked to human bonding and increasing trust and loyalty. The happiness chemical that helps us feel loved and connected to others in oxytocin. Oxytocin is known as the love chemical as it's released during human-to-human contact such as hugging and kissing. Oxytocin also play an essential role in reproduction. Studies have found it can trigger labour contractions and the flow of breast milk in women, and the movement of sperm in men.

Role in happiness:

Oxytocin is referred to as the “bonding molecule” or “hug hormone” because its levels go high during feeding the baby, skin-skin contact, intercourse, orgasm, and hugging. In the other words, it is known to facilitate social interaction and is also linked with positive social behavior. Such a significant correlation between social bonding and satisfaction, then indeed brought about by the effects of oxytocin can in turn lead to a happier life. Oxytocin a huge scale of physiological and behavioral effects controlled via certain receptors in the brain, social, sexual, and maternal behaviors. Being associated with positive social behaviors and known to increase

the relationship or bonding with others, it's assumed that the hormone brings about happiness. Low levels of oxytocin are associated with depression, poor communication, increased fear and anxiety, sleep disturbances, irritability and craving for sugar.

2. Serotonin:

Also known as 5-hydroxytryptamine (5-HT), serotonin is a complex neurotransmitter. It is distributed in various body tissues link CNS, GI tract etc. Salamat news, 2017 wrote that: Serotonin, also known as the happiness hormone, this hormone is secreted from the hypothalamus of the brain. Serotonin is responsible for transmitting information to the brain, improve sleep quality, and has a calming effect. Serotonin regulates mood, prevents depression, regulates blood pressure, plays an important role in regulating the menstrual cycle in women, and makes you feel happy. Serotonin is one of the most effective neurotransmitters in the human mood. The deficiency of this hormone cause insomnia, mood disorder, and feeling of sadness, depression, aggressive behavior, and eating disorders.

Role in happiness:

Serotonin is also known as the 'confidence molecule' as it brings about confidence and self-esteem and there is a positive feedback loop that causes further release of the chemical though building up self-esteem. It controls an immense spectrum of physiological and biological actions like arousal, aggression, mood, memory, and abilities of thinking. Raised levels of serotonin are identified during state of self-confidence, feeling of a self-significance and causes relaxation from which it's clear that absence of serotonin imparts feeling of being depressed or lonely. Excess levels of serotonin induce sadness and apathy, while lower levels of serotonin are attributes to less mood, depression, por control of appetite, anxiety disorders, lack of will, social and sexual behavior problems.

3. Dopamine: Dopamine (DA) is a catecholamine neurotransmitter, biogenic amine and an adreno-medullary hormone. It is the principal neurotransmitter of several pathways in the central Nervous System (CNS) starting in the midbrain and significantly involved in motivation, learning and motor activity, any disturbances of which have been associated with several disorders, including Parkinson's disease and Schizophrenia. Dopamine is catecholamine secreted from the medulla and adrenal glands. It belongs to the phenethylamine family and functions as both a hormone and neurotransmitter in several parts of the body. Normal plasma dopamine levels are very low, i.e., 0.13nmol/L. its effect catecholamine includes renal and mesenteric vasodilation, vasoconstriction of other parts of the body. Dopamine has positive inotropic effects on the heart meditate via B1 receptors. It causes an increase in systolic Blood Pressure and do not affect Diastolic Blood

Pressure significantly. In the proximal tubules, it inhibits the sodium-potassium pump and causes natriuresis. Also, highly intervened for the treatment of traumatic and cardiogenic shock.

Role in Happiness:

Dopamine is also known to be a ‘reward molecule’ and is normally thought to be involved with anticipation. In the brain, it feeds the reward pathways, and is concerned with addiction, drive, motivation and pleasure, ovulation and muscle control. It is also known to be associated with vigilance, alertness, cognition, memory and happiness. High levels of dopamine are associated with, loss of consciousness with reality, lack of emotion, additive behavior, suspicious personality, possible paranoia and delusions, while significantly low levels are linked to depression, mood swings, attention deficit, cognitive issues, compulsive behavior, cravings, apathy, loss of satisfaction in life activities risk taking and additive behavior.

4. Estrogens:

The major action of estrogens includes, promotion of growth of all components of female reproductive system including ovary and ovarian follicles, stimulation of smooth muscles contraction in fallopian tube, increases uterine size, its blood flow, causes proliferation of uterine endometrium etc. Estrogens are certain ovarian steroid hormones secreted from the granulosa cells of follicles of ovary, corpus luteum and placenta. It is also indirectly released from adrenal glands as the androgens are converted to estrogen by the enzyme aromatase.

Role in happiness:

Estrogens is known to be a happy hormone due to its indirect effects in stimulating the formation of serotonin. This can protect the body from conditions of irritability and anxiety, thereby keeping the mood constant. It is also known to cause increase serotonin of endorphins both of each are chemical messenger linked with positive state of mood. Estrogens can cause mood disruptions in women, failure of synthesis, or low levels of which can result in mood swings, anxiety, and depression.

5. Progesterone:

Progesterone is known as our calming, mood, sleep, libido and bone-enhancing hormone. Progesterone levels start dropping in your late 20’s, falling dramatically after age 30 and are almost nonexistent at the age of menopause, which can begin as early as age 35 in some women. Progesterone is a C-21 steroid hormones secreted by corpus luteum and placenta during pregnancy period. A small amount also released from adrenal cortex and testes. The normal plasma levels of the

hormone vary with different phases of the female cycle, although reaches its peak in the luteal phase, that is, 18ng/ml.

Role in happiness:

Progesterone alters the secretion of several neurotransmitters in the brain affecting appetite and sleep. It causes the effect of somnolence, that is help to sleep well and thereby prevents anxiety, feeling of irritability and mood swings. This can help in maintenance of a peaceful or calm state of mind. Progesterone also seems to activate the activity of amygdala, the chief alert system of the brain. It promotes the calming hormone GABA which helps reduces stress and induce sleep.

Brain and Neurotransmitters:

The human brain contains an estimated 86 billion neurons. Those billions of the brain cells communicated by passing chemical messages at the synapse, the small gap between cells, in a process called neurotransmitter. Those chemical messages are unique molecules called neurotransmitters. There are many types of neurotransmitters in the brain, but they do have a few things in common. Neurotransmitters are endogenous-produced inside the neuron itself. When a cell is activated, these neurochemicals are released into the synapse from specialized pouches clustered near the cell membrane called synaptic vesicles. Specific receptors on neighboring cells can then take up the neurotransmitters, which can increase or decrease the signal being passed along a particular circuit.

All of the activities managed by brain. Thoughts, feelings, activities, learning and love, all conducted by brain. Mood and emotions are not except for this role. Davidson and his colleagues have reported large individual difference in baseline levels of asymmetric activation in prefrontal cortex, related to a person's typical emotional style. Individuals with a positive emotional style show higher level of left than right prefrontal activation at rest (using EEG or fMRI), while those with a negative emotional style tend to show higher levels of right than prefrontal activation at rest. Davidson and his colleagues have also reported that, independent of emotional style; induced negative mood, increases relative right-sided activation, whereas induced positive mood increases relative left-sided activation.

Types of neurotransmitters:

1. Acetylcholine:

Acetylcholine was the first neurotransmitter discovered. It is a direct action small-molecule that works primarily in muscles-helping to translate our intentions to move into actual actions as signals are passed from the neurons into the muscle fiber. But it also has other roles in the brain, including helping direct attention and playing a key role in facilitating neuroplasticity across the cortex.

2. Dopamine:

Dopamine is often referred to as the “pleasure chemical”, because it is released when mammals receive a reward in response to their behavior – that reward could be food, drugs, or sex. It is one of the most extensively studied neurochemicals, mainly because it plays such diverse roles in human behavior and cognition. Dopamine is involved with motivation, decision-making, movement, reward processing, attention, working memory and learning. But isn’t just a pleasure chemical. New work suggests dopamine also plays an important role in Parkinson’s disease, addiction, schizophrenia and other neuropsychiatric disorders.

3. Glutamate:

Glutamate is the most excitatory neurotransmitter in the cortex. Too much glutamate results in excitotoxicity- or the death of neurons due to stroke, traumatic brain injury, or amyotrophic lateral sclerosis, the debilitating neurodegenerative disorder better known as Lou Gehrig’s disease. Yet, it’s not all bad news. The excitement GLU brings is important to learning and memory-long term potentiation (LTP), the molecular process believed to help form memories, occurs in glutamatergic neurons in the hippocampus and cortex.

4. Serotonin:

Serotonin is a neurotransmitter that mediates satisfaction, happiness and optimism. Serotonin levels are reduced in depression and most modern antidepressant drugs, known as serotonin reuptake inhibitors (SSRIs), act by increasing the amount of serotonin available to brain cells. However, what is the relationship between serotonin and positive mood? Researcher indicated that increased of serotonin level was related to positive mood.

Serotonin (5HT), sometimes called the “calming chemical,” is best known for its mood modulating effects. A lack of 5HT has been linked to depression and related neuropsychiatric disorders. But 5 HT is father reaching, and also has been implicated in helping to manage appetite, sleep, memory and most recently, decision-making behaviors.

5. Norepinephrine:

Norepinephrine is another neurotransmitter that associated with the level of happiness. Antidepressant such as the selective norepinephrine reuptake inhibitor (Reboxetine) also induce a positive emotional perceptual bias in healthy subjects suggesting that norepinephrine positively colors the emotional perception of facial expressions in humans. “Recognition that norepinephrine

regulates neuronal excitability in the basolateral amygdala by facilitation of GABA release, demonstrates a potential neuroanatomical locus for this effect".

Norepinephrine (NE) is both a hormone and a neurotransmitter. Some refer to it as noradrenalin. It has been linked to mood, arousal, vigilance, memory, and the stress. Newer research has focused on its role in both post-traumatic stress disorder (PTSD) and Parkinson's disease.

Discussion:

Happiness, physical health, hormones, brain and body they all are related to green-psycho-chemistry. Happiness hormones play a constructive role and graceful role in regulating and controlling our mood and mental health. Hormones affect emotions and factors related to the human lifestyle, and paying attention to them can significantly contribute to a healthy lifestyle in humans. The harmonious activity of all parts of the body and its relationship with the environment is ensured by the nervous system. The hormonal communication system improves the nervous communication activity inside the body, the endocrine system being an elegant mechanism of "checks and balances" that act through feedback that facilitate the normal functioning of the body. Another factors that affected happiness in general is hormones and glands. Studies suggested that some released hormones (Cortisol, Adrenaline, Oxytocin) have a fundamental role in happiness and mood regulation. Physical health and attractiveness also influence on happiness and they seem to be significant factors in comprising happiness.

Conclusion:

Hormones play an essential role for the human body, care for sleep regulation, influence growth and development, and responsible for our mental state. Happiness is a new concept of positive psychology. Although, uses this concept commonly as a clear concept, it has a complex meaning and composed of several factors. Happiness is a new concept in positive psychology. Happiness hormones play a constructive and graceful role in regulating and controlling our mood and mental health. Hormones affect emotions and factors related to the human lifestyle, and paying attention to them can significantly contribute to a healthy lifestyle in humans. Dopamine is a hormone that is related to the reward and pleasure centers of the brain and is related to motivation, memory, attention, thought process and concentration and is released when a person moves towards a goal. Serotonin, also known as the happiness hormones, is responsible for transmitting information in the brain, improving sleep quality, and having a calming effect. Oxytocin is one of the most important happiness hormones, also known as the love hormone, which reduce stress and increases social interactions.

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