



## CHEMICAL BASIS OF HAPPINESS: A DISCUSSION

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### **Abstract:**

Our brains are the result of over two million years of evolution. Scientists have found out that certain chemicals and connections between neurons correspond to the feelings of pleasure and happiness. These feelings were meant for our survival. This paper discusses various facets of happiness, transmission between neurons and role of certain chemicals.

**Keywords:** neurotransmission, happiness, evolution, neurotransmitters

### **1. Happiness**

Happiness is a feeling. Like all feelings, it belongs to a person. It is subjective. Any one's claim to happiness is from that person's point of view. The experiences that one has had in life influence what will cause one to be happy. They make the context for one's happiness.

Science deals with measurable things. Subjective experiences are not measurable accurately. However when large number of people report the same state, it can be trusted. However, science has made some strides towards gaining knowledge about happiness. This is towards isolating and measuring different chemicals that are produced and influence human happiness.

In his book *Stumbling on Happiness*, Daniel Gilbert writes that the word happiness can mean 3 related things: emotional, moral or judgmental happiness. Emotional happiness is subjective feeling or experience. For example, color yellow is subjective experience which is produced by light of wavelength 580 nanometers. Getting a new car, a child's smile, touching soft objects, smelling a flower are all forms of feelings. These give different happiness.

Sigmund Freud wrote that the purpose of human life is not clear. What men show by behavior is that they want to be, and remain happy. Philosopher and

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mathematician Blaise Pascal wrote that motive of all human action is to be happy. The actions however; can be very varied. For example both the persons; one going to war and the other avoiding it, are seeking happiness. Emotional peppiness is usually, not something to be proud of. It is considered cheap and base; not a worthy goal. Serious pursuit leads to anxiety and depression.

The philosopher John Stuart Mill confirmed it by saying that it is better to be a dissatisfied human than a satisfied pig. Another philosopher Robert Nozick goes further to bring home the same idea. He says that a virtual reality machine which can give one any experience, cannot be a source of true happiness. However, people want to be happy. Everything they do is towards this.

From the above we learn that people do want a feeling of happiness, not only do they want, they actually spend their lives pursuing it. And further that, this happiness is not true happiness and not a worthy goal. That means there is more to happiness than a good feeling. Our experiences of the world, like awe of nature, taste of wine, seeing a loved one; are very complex. As our language is rather limited, we use the word happiness for all these. It seems that, the way the feeling is produced, decides the value of happiness. Although some philosophers attempt to identify virtue with happiness, but happiness refers to feelings and virtue to action. Virtuous actions may or may not cause the feeling of happiness. Still another view is that happiness is not just a matter of feeling good. If so, drug abusers would be happiest. In his book *Memoirs of an Addicted Brain* Marc Lewis takes us through a journey of seeking happiness through drug abuse.

## 2. A little background

Russ Harris writes in *Happiness Trap* that our minds evolved for our survival and reproduction. There are 4 essential needs; food, water, shelter and sex. Foremost is survival, because if you get killed, nothing else is important. Mind became skilled at predicting and avoiding danger. In the modern life, these include: losing source of income, getting rejected, embarrassment, getting scorned by our loved ones and many more. We worry about some of the things that may never happen.

Another essential for the early man was to belong to a group. Acceptance by others was necessary. This was achieved by comparing self with others. The criteria included: am I fitting in, doing the right thing, contributing enough, avoiding friction, being good to others etc. The early man had a few members to compare with; those in the immediate group. Modern man has a much more difficult task. Every day the newspapers, magazines, TV and social media show us taller, sexier, cleverer, richer smarter and so on beings. This is enough to make people depressed. It does not stop here. Our minds are sophisticated; they imagine and visualize a person, we would like to be. The real "me" is compared with that idealized picture. The result is that we end up feeling that we are not good enough.

For the Stone Age man, simple rule was: more is better. It applied to weapons or food or shelter. Today it is translated into more money, younger looking body and

partner, bigger house and so on. All these things give happiness for a while; sooner we want more. This cycle of wanting more and getting it cannot go on indefinitely.

Fulfillment of our biological and social needs is somehow related to our happiness. The same can become the reason for our unhappiness and many psychological disorders. Experts tell us that in any year almost 30% of population will suffer from recognized psychiatric disorders. WHO estimates, depression is currently 4<sup>th</sup> biggest, costliest and debilitating disease in the world. By 2020, it will be 2<sup>nd</sup> biggest.

### **2.1 The chemical basis**

For over two million years, our brain evolved to optimize our capabilities to achieve, what was essential for our survival. Our brain is mostly made up of the special cells called neurons and the connections between them. It is the signaling between neurons that gives rise to different feelings, including that of happiness. The process is called neurotransmission and is conducted through neurotransmitters.

### **2.2 “Neurotransmission”**

Mental activity is conducted through communication between neurons in the brain. Neurons are cells, with an axon on one end and many dendrites on the other. A neuron receives information from another neuron, through one of its dendrites and transmits through its axon. The information is not transmitted by actual contact. The space between an axon and dendrite is called the synaptic cleft. During neurotransmission, signaling molecules, called the neurotransmitter, are released from the axon terminal of a neuron and bind to receptor of the dendrite of another neuron.

Neurotransmission, therefore, depends on the availability of the neurotransmitter, its release from the axon and its binding by the receiving dendrite. Synthesis of the neurotransmitter takes place in the neuron, which is a cell, or in the axon. It is stored in the axon terminal. Neurons form large networks through which information travels. A neuron can have as many as fifteen thousand connections with other neurons.

### **2.3 “Brain chemicals”**

Following are some of the brain chemicals and their function.

- Norepinephrine: optimizes brain performance, provides accurate assessment of danger or stressful situations.
- Dopamine: has both inhibitory and excitatory action. It affects behavior, learning, sleep, mood, focus, attention, immune health and pleasurable reward.
- GABA: has inhibitory action, and is a mood modulator. Low level leads to restlessness, anxiety and irritability.
- Glutamate: is exciter and affects cognition, learning and memory.
- Serotonin: is inhibitory and affects mood, depression, anxiety, sleep, emotions, appetite and temperature. It also regulates social behavior and sexual desire and function.

- Acetylcholine: is exciter. It triggers voluntary muscle contraction, controls heartbeat, stimulates certain hormones, effects sexuality and sleep.
- Epinephrine or adrelin: it influences attention, focus, stress, fear, anger, panic and excitement.
- Oxytocin: it is a hormone which is sometimes known as “cuddle” or “love” hormone. It is released when people snuggle up or bond socially.

### 3. Chemicals and happiness

Neuroscientists and behavioral psychologists have identified many chemicals in the brain and their relations to various bodily functions, feelings and other mental activities.

Karim Elsheikh, writing for *QUORA* says that human happiness is caused by 4 basic chemicals: Dopamine, Endorphins, Serotonin and Oxytocin. Endorphins are the hormones released within the brain causing an analgesic or painkilling effect. Body releases endorphins to cope with pain of physical exercises. The Stone Age man struggled physically to follow food or to escape becoming food. Endorphins helped in reducing pain so that he could continue the struggle of life. However, to the modern man, it is a ‘high’ after a good physical exercise. It is a feeling of well-being or happiness albeit for a short time.

Dopamine is released in the brain as a reward for some achievement. We set goals for ourselves or goals are set for us. These include examination pass marks or possessing material things. Again, these feelings of happiness do not last long.

Oxytocin is released when we become close to another human being. When we hug a friend or shake some ones hand. It is about becoming more social. The original purpose was to assure social acceptability and therefore survival. Today, it manifests itself as “drinking buddies” or fighting together for a common cause etc.

Serotonin is released when we act in a way that benefits others. It inhibits our tendencies towards self-interest. When we give to causes beyond ourselves and our own benefit. This is when we connect with people on a deep human level. This explains why billionaires often turn to charity when they have bought everything that wanted to, and experienced everything they wanted in life. They have had enough dopamine from material pleasures. Now they need serotonin.

### 4. Conclusion

Happiness is personal and it is a feeling. In the absence of a better purpose of life, on which everyone could concur, many philosophers and psychologists see it as an aim for most. The dilemma is that the happiness which is pursued and achieved is not lasting. Neuroscience has identified various chemicals in the brain which relate to different brain states. Some of these states are associated with the feelings of happiness. Our brains evolved in the last two million years to help us optimize our abilities to achieve,

what nature wants us to do: survive. Happiness and survival are correlated. We use the word 'happiness' to describe or express various but related states of mind.

Drugs or artificial stimulation do provide pleasure albeit short-lived and with depressing after-effects. Material goods give happiness but temporary. Closeness to people or belonging to groups brings longer term happiness. Drugs mimic or manipulate the chemicals in the brain, so, the feeling they impart is not grounded in reality. That means our happiness has to be derived from the real world around. Food and material things help us survive; more the better. The release of 'happy' chemicals associated with achievement, confirm that physical survival brings happiness.

However, their temporality indicates that the physical things are necessary but not sufficient. Social acceptability helped and assured long term survival; so, 'chemically' oxytocin and serotonin etc. are nature's ways to 'bribe' us towards sociability.

Science attempts to justify or account for the happenings in the physical world. The discussion above; is an attempt to explain human happiness in terms of the theory of evolution and the chemical phenomena in the brain. The feeling of happiness, it seems, transcends the physicality of the brain. Every one seeks a rich and meaningful life. We are happy when we work towards what we consider valuable and worthy and it is not fleeting feeling. However, one still gets uncomfortable and sad feelings, like fear and anger. These reflect our mortality; awareness of the impending death; the end of survival game, at least for the individual. We can conclude that a full life provides a full range of human emotions. Goal should be a fulfilling life, a life well lived; happiness is a chemical cocktail; a welcome byproduct.

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