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### Happiness and How Humans Can Alter Their Own Brain Chemistry

Everyday, somewhere in the world, a diligent businessman wakes up, gets dressed, and goes to work. At the same time, a restless teenager is getting high off of the cocktail of drugs he just injected into the inside of his elbow. Although these two people appear to have nothing in common, there is a singular aspect that they share. The former rises to go to work, to make social connections and to earn the money that is needed to live a comfortable life in the current era. The latter chases the short-lived euphoria of drugs until the inevitable end via overdose. They both chase happiness, whether it is long-term economic stability, or quick drug-induced highs. But are these attempts at attaining happiness smart? There is plenty of information about how our brain chemistry affects moods and feelings, chemicals such as dopamine and adrenaline making an appearance in the data multiple times. It can even be said that humans cannot feel uplifting feelings without these chemicals. Isn't happiness something that is only affected by our brain chemistry and therefore, something that we cannot alter on our own actively? However, there is viable evidence that humans are indeed capable of changing their own brain chemistry, and that certain activities and actions we take have an effect on our long-term and short-term happiness. Ultimately, this paper talks about the science of brain chemistry and how the human body is affected by this, how humans are capable of

taking control of their own happiness, and how they are able to control the degree of their happiness, whether it may be short-term happiness or long-term happiness.

Before delving into how humans are capable of changing their own brain chemistry, there must first be an explanation as to how brain chemistry affects the body. Dr. Silvia Cardoso of the Dana Foundation states in her article “Hardwired for Happiness” that “Stimulation of the nucleus accumbens in humans elicits smiling, laughter, pleasurable feelings, happiness, even euphoria” (Cardoso 2). There has also proven to be a “...reward system in the brain...when the cortex has received and process a sensory stimulus indicating a reward, it sends signals to the ventral tegmental area” (Cardoso 2). Basically, there is a system in which our brain chemicals induce the feelings of happiness. External stimuli, such as social interaction and eating something delicious, is processed by the cortex, then it is determined whether or not the stimulus is in need of a “reward”, which then sends a signal to ventral tegmental area. This area then releases dopamine (a chemical in the brain that induced feelings of happiness/euphoria) to the nucleus accumbens, the septum, the amygdala, and the prefrontal cortex, all of which are areas of the brain that have the necessary neural connections that induce happiness (Cardoso 2). The limbic system also is a key part of the human body’s system for happiness. As Chris Woodford, a science writer from Cambridge University, notes in his article about the discoveries of Professor Richard Davidson, Davidson identifies that the “...[among] the key areas of the brain that seem to be implicated in controlling happiness...the limbic system – the brain’s emotional heartland – is among them” (Woodford 4). The amygdala, which is the part of the brain that processes external stimuli, most likely triggers the nerves in the limbic system to determine whether or not

something is a “threat” and then if it is determined that the external stimulus is not a threat, the amygdala moves on to the next stimulus (Woodford 3). Basically, everything in the brain makes connections to make us feel the emotions that are necessary for the situation derived from the information the brain takes in from the external stimuli.

However, as Woodford states, it is still too early to determine what mixture of neural connections, chemical production, and etc. equate to how happiness, or even unhappiness is produced (Woodford 5). Although many things about the brain’s effect on happiness have yet to be discovered, this is currently the basic interaction of neurons and neural connections that create the chain reaction that causes the correct brain chemicals to produce as a response to certain stimuli.

However, because emotional responses have so much to do with chemical reactions in the brain, most people, such as Toru Sato from the Shippensburg University Department of Psychology in his article “Four Theories of Emotion” state that, “...emotion is not directly caused by the perception of an event, but rather by the bodily response caused by the event” (Sato 1). People must first process the external stimuli that go through the brain in order to feel the emotions that the brain chemicals produce in reaction to the external stimuli (Sato 1). In fact, genetics, something that humans generally have no control over, also have a great deal to do with how much happiness someone can feel because, as Cardoso also states, it has been determined that some people are “genetically pre-dispositioned” to be happier than other (Cardoso 3). Daniel Schnitzlein and Christoph Wunder, in their study “Are We Architect of Our Own Happiness? The Importance of Family Backgrounds for Well-Being” also mention the importance of familial background, noting that certain inherited genetics from parents

equate to a happier individual in some cases (Schnitzlein et al 127). Even Dr. Christine Wilson-Mendenhall in her study “Neural Evidence that Human Emotions Share Core Affective Properties” states that there is a general consensus that emotions stem from the body’s physical changes first (i.e. neurological connections, chemicals produced from the brain) instead of these neurological connections being a byproducts of emotional responses (Wilson-Mendenhall et al. 1). Because of the human brain is such a complex organ, there are still more things to discover about it. However, there is still enough scientific fact to support that people are capable of changing their brain chemistry, and actively do it everyday.

Humans can indeed change their own brain chemistry consciously. Actions can lead to certain chemical events happening inside the brain, instead of the other way around. Even the Dalai Lama himself has theorized this in the book *The Art of Happiness*, asking the question, “Is it possible to conceive the reverse sequence, where the thought gives rise to the sequence of chemical events in the brain?” (Bstan-'dzin-rygya-mtsho 5). Unlike how Western theories naturally assume people act certain ways because of their brain chemistry, it can easily be the other way around. While it is more logical to place faith in science, something that must be based on a decent amount of facts, there is no reason why one should naturally assume that the brain is the single source of why humans experience emotions. People are capable of consciously affecting their brain chemistry of their own will to a different state. For example, Dr. Bill Conklin from *Psychology Today* explains, “...exercising in new and different ways has been found to stimulate the release of natural feel-good chemicals” (Conklin 3). It has been proven that when people do certain physical activities, it allows for the production of

dopamine and adrenaline, which are known to be “feel-good chemicals”. There are also negative ways in which people can change their brain chemistry to achieve a similar sense of uplifting feelings. As Sato states, “The pleasure associated with taking an addictive drug makes us feel the painful withdrawal effect of the drug afterwards. To escape this painful withdrawal effect, the addict takes more of the drug right away” (Sato 1). Drugs such as cocaine and methamphetamine alter brain chemistry so that there is an overproduction of dopamine; the brain trains you into thinking that whatever feels good is good for you, and causes the user to chase after that feeling of euphoria taking drugs (Sato 1). However, as Sato also states, the pleasure associated with drugs more often than not are associated with even more painful withdrawal symptoms. Therefore, people take more and more of these harmful substances in order to escape the pain, and at the same time, feel the euphoric pleasure of the high that comes with the drug. This, in turn, leads to the body adapting to the increased dosage of drugs, and the user has no choice but to either quit or keep going until overdose. While humans are capable of changing their brain chemistry, not all of the actions that are taken by the individual affect the brain in a positive way. Still, it must be acknowledged that they are indeed altering their brain chemistry of their own will.

The effects of certain actions are most prevalent in an individual’s short-term happiness. For example, small actions such as laughing, smiling, singing, and more are attributed to the brain’s release of endorphins (Cardoso 3). Even something as small as spending time with friends and having social interaction can stimulate brain chemical activity (Conklin 3). Jong Hyun Jung, of Purdue University, in his study “Religious Attendance, Stress, and Happiness in South Korea: Do Gender and Religious Affiliation

Matter?” even noted that meditative activities, such as religious attendance and prayer “...moderate the effects of stressors on mental health” (Jung 1126). This statement is supported by Michael Lemonick and Dan Cray, senior staff writers at *Climate Central*, in their article “The Biology of JOY”, where he notes how Professor Richard Davidson, a professor of psychology and psychiatry at the University of Wisconsin, performed an experiment where he had a Buddhist monk meditate while checking his brain activity (Lemonick et al 1). The professor noted, “Electrical activity in the left prefrontal lobe of the monk’s brain was shooting up at tremendous rate” (Lemonick 1). This experiment about the activity in the left prefrontal lobe, where our happy emotions lie, proved that activities such as meditation allows for an individual to attain tremendously high levels of happiness in a relaxed state (Lemonick 1). These activities were found to significantly lower stress levels, which boosts the amount of time an individual is in a more positive, relaxed state of being, than stress and irritable state of being. In fact, someone could essentially “train” his or herself to feel pleasure from certain actions, as the repetition of these actions create a shortcut in the brain for the chemicals to travel through even faster than they did before, much like a well-trodden path (Conklin 3). This is part of the reason as to why people who usually run everyday feel agitated when they do not keep up that pattern of running, as well as why people get so easily addicted to drugs and feel painful withdrawal symptoms when they don’t get their fix. Physical exertion stimulates the release of endorphins that trigger a “runner’s high” after exercising (Conklin 3). These endorphins, dopamine in particular, are neurotransmitters that are associated with positive emotions. The reward system of endorphins keep allowing the access of positive emotions to become easier and easier, which leads to addiction and causes

“...uncontrollable urges to engage in a destructive behavior” (Cardoso 2). It would be understandable that going even a day without this would leave someone to become uncomfortable and agitated. However, while physical exertion is a big stimulant for the release of brain chemicals, resting is also important to happiness in brain chemistry. Activities that promote rest and relaxation help to relieve stress in the body and brain (Conklin 3). The decrease in mental and physical stress increases the amount of positive brain chemicals as opposed to the amount of negative brain chemicals, which would allow for feelings of happiness to become more prominent in an individual’s daily life.

Certain actions and activities affect an individual’s long-term happiness more prominently than their short-term happiness. As the economist Ben Bernanke stated in his commencement speech at the University of South Carolina, “[Economists] use “happiness” to mean a short-term state of mind that may depend on a person’s temperament, but also on external factors, such as whether it is a sunny or rainy day” (Bernanke 2). They use “life satisfaction” to refer to a long-term state of contentment and well being to refer to short-term happiness (Bernanke 2). Essentially, one could think of happiness and life satisfaction on a graph with happiness as a spike in positive emotion and life satisfaction as a gradual upward slope. Long-term happiness (life-satisfaction) is what is a more “true” happiness than short-term happiness. Basically, even though some decisions in life do not equal to short-term happiness, they will most likely pay off in the long run and allow you to be happier in general than if you had not made the decision you had. Some of these things might include saving money, denying peer pressure, or not taking on a certain job that you could have earned compensation for, because in the long run, having made the decision to do certain things would have hurt your future happiness.

A notable aspect of long-term happiness is economic stability. There has been no small amount of research that has found that "...both inflation and unemployment detract from happiness" (Bernanke 3). Economic stability is required for someone to live comfortably in today's world of materialism and rising cost of living. Even the economic stability of the family an individual is born into has an input in what kind of opportunities are offered to him or her. Even Schnitzlein et al make a statement about "...[the] importance of family background for children's outcomes" (Schnitzlien et al 127). You could even say that being wealthy satisfies short-term happiness as well, with today's age of materialism and consumerism. Wealth, whether it is how much better off an individual is compared to the average person or how stable their income is, contributes to an enormous part of the individual's happiness. However, Bernanke also makes another statement that "...people's happiness depends less on their absolute wealth than on their wealth compared with others around them," (Bernanke 6). For example, if someone had a luxury car, they would be happy, but if everyone else around them also had luxury cars they would not be happy anymore because that person wouldn't feel special anymore. Money does factor into happiness, but a surplus of wealth (having more wealth than is necessary to live comfortably in society) only leads to happiness if it puts you ahead of others.

Another factor that contributes to long-term happiness would be the relationships and connections an individual has in his or her life. For example, Schnitzlein et al noted that family is one of the most important factors in an individual's happiness (Schnitzlein et al 126). As Conklin also states, spending time with loved ones is also a means of inducing feel good endorphins. Because the parent is usually the person which the child



sees most, it is natural to assume that the parents are the people that the child experiences the most attachment to, and in turn, the relationship where the child experiences the most amount of endorphins as a result of this relationship. The relationship between parent and child factor enormously in childhood happiness, and affect the choices the children make later on in their lives (Schnitzlein et al 126). Relationship between siblings is also very important to an individual's long-term happiness. As Schnitzlein et al state, "...if we observe a high sibling correlation in wellbeing, this means that family and community factors (shared by siblings) have a high influence in determining an individual's wellbeing," (Schnitzlein et al 127). Because siblings are influenced by both parents, much like the individual, the influence of a sibling is like a combination of parents together, instead of either one of the two (or more) individuals. Familial relationships are a big part of an individual's long-term happiness, especially early on in life when there is more exposure to familial relations, because familial influences are experienced even before an infant can express coherent thought for the first time.

The fact that humans are affected by their brain chemistry is obvious. However, the reverse is also true. Human beings can change their brain chemistry and perform activities to further their happiness on their own by increasing the production of certain chemicals in their brain. Small things, such as spending time with friends and family, going for a run, and even taking a nap in the middle of the day all help to increase dopamine levels in the brain (Cardoso 2). For certain people, religion and prayer becomes their daily de-stressor, having shown a significant decrease in stress in churchgoers (Jung 1126). Even things such as the decisions that are made about finance and relationships are known to affect an individual's long-term happiness. There are many things that can

affect someone's happiness, whether they are as small as petting a cat to as big as buying a house, these things affect how much happiness we experience. However, humans are capable of taking their happiness into their own hands and making conscious decisions about the actions that they can take to ensure greater amount of happiness in their life in the long run.

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The Science of Positivity teaches you how cynical thought habits are formed, and how you can rewire yourself to go beyond them. Learn the scientific benefits of positivism! Sometimes it's easiest to look for the worst in every situation--our brains have evolved to scan for problems in order to help avoid them. But you can transcend this natural negativity--if you know how. The Science of Positivity teaches you how cynical thought habits are formed, and how you can rewire yourself to go beyond them. Neurochemical expert Loretta Graziano Breuning, PhD, empowers you to transcend negativity b How we measure 'reads'. A 'read' is counted each time someone views a publication summary (such as the title, abstract, and list of authors), clicks on a figure, or views or downloads the full-text. Learn more.Â Just as there have been philosophical arguments about equating hedonic pleasure with well-being, there has been considerable debate about the degree to which measures of SWB adequately define psychological wellness (e.g. Ryff & Singer.Â happiness to be a vulgar ideal, making humans slavish followers of desires. He posited, instead, that true happiness is found in the expression of virtueâ€”that is