

# UC Berkeley

## Berkeley Scientific Journal

**Title**

The Science of Happiness

**Permalink**

<https://escholarship.org/uc/item/9c00q8js>

**Journal**

Berkeley Scientific Journal, 12(2)

**ISSN**

1097-0967

**Author**

Mangels, Daniel

**Publication Date**

2009

**DOI**

10.5070/BS3122007598

**Copyright Information**

Copyright 2009 by the author(s). All rights reserved unless otherwise indicated. Contact the author(s) for any necessary permissions. Learn more at <https://escholarship.org/terms>

Peer reviewed|Undergraduate

# The Science of Happiness

What Makes People Happy and How Can We Become Happier?

by Daniel Mangels



The idea of happiness is largely influenced by culture and is invariably shaped by individual experience. In order to scientifically study happiness, its definition must be reduced to fulfill a more basic and intrinsic set of properties. Until recently, most scientific literature has primarily investigated maladaptive psychology such as depression, anxiety, and stress. The recent emergence of positive psychology has helped to shift attention away from the study of mental illness to the study of mental wellness. Despite the tremendous influx of happiness research that has ensued over the past thirty years, researchers still disagree on a universal and testable definition of happiness. The emergence of positive psychology, and its vast array of scientific research, has nonetheless led to an increasing tendency towards defining happiness as a state of subjective well-being (Easterlin, 2002). This definition encompasses both the biological mechanisms necessary to measure subjective happiness as well as the psychological, cultural, and social factors that may be involved in determining its presence. Ultimately, an understanding of the multifactorial causes and processes of happiness can be used to increase levels of happiness and to potentially unveil one of the more fundamental features of being human.

## What can Biology tell us?

Though it may seem hapless to say that happiness is simply a resultant emotion of our genes, studies have shown that identical twins share more consistent and similar levels of happiness than fraternal twins (Lykken & Tellegen 1996). This finding is crucial to understanding happiness because it indicates that there are certain genetic components to happiness. Such biological consequences may have to do with increased levels of the neurotransmitter associated with

pleasure and motivation, dopamine, which has been tied to greater positive affect scores on self-reported surveys (Ashby, Isen, & Turken 1999). The multifactorial nature of happiness, however, makes it difficult to exclusively target physical predictors, since both physical and non-physical factors may be acting simultaneously. Additionally, since happiness is described as subjective well-being, personal assessments of happiness can be biased and variable depending on an individual's judgment. Despite these obstacles that hinder researchers from identifying precise biological mechanisms, several biological signals have been found that correlate with happiness.

In one study on the relationship between happiness and the body, subjects' blood pressure and heart rates were measured. Levels of blood sugar and salivary cortisol, a stress hormone associated with immunosuppressive behavior, were also measured. These measurements were then compared to monitored levels of plasma fibrinogen, a protein linked to increased chances for developing coronary heart disease (Stephens, Wardle, & Marmot 2005). It was discovered that negative affective states, such as sadness and anxiety, were correlated with an increased risk of coronary heart disease, type II diabetes, and disability. Positive affective states were associated with smaller plasma fibrinogen stress responses, less cortisol output, and lower heart rates.

In another study, individuals with higher levels of "personal growth" and "purpose in life" registered lower and more stable levels of salivary cortisol and urinary adrenaline (Ryff, Singer, & Love 2004). Adrenaline is a hormone and neurotransmitter that produces similar effects to cortisol, such as increased heart rate and immune system suppression. These results indicate that lower stress responses, such as less salivary cortisol, plasma fibrinogen, urinary adrenaline, lower blood pressure, and lower heart rates, are good predic-

tors of happiness. Likewise, higher stress responses are correlated with lower levels of happiness.

A significant amount of research has been conducted that ties positive emotions to good health. Positive emotions can manifest themselves through laughter, the behavioral outcome of humor (Bachorowski & Owren 2001). In addition, laughter has been associated with increased immune system function due to greater levels of immunoglobulin A in saliva, a protein involved in the immune defense against respiratory illnesses (Dillon et al., 1985-1986). But, conclusive results have yet to show whether or not immunoglobulin A is actually induced by happiness, or is rather a precursor to happiness. Laughter has also been linked to decreased levels of various stress hormones, including serum cortisol, growth hormone, and dopac, which all decrease immune system function from its optimal level (Bennett & Lengacher 2007). These findings suggest that laughter may promote better health as well as more positive emotions.

Thus, one of the simplest relationships between happiness and the body seems to be the connection between happiness and health. This point seems to have been postulated within popular thought for quite some time, but these studies confirm this association. The more consistently happy an individual is, the longer his life span seems to be, especially due to the aforementioned effects of a stronger immune system and a lower risk for coronary heart disease.

**What can Economics, Psychology, and Sociology tell us?**

Dr. Lyubromirsky of the University of California, Riverside believes that about half of a person's level of persistent happiness is determined by their genetic makeup. The other determining 50% can be attributed to life circumstances and intentional efforts to become happier (Lyubomirsky, Sheldon, & Schkade 2005). 10% of persistent happiness can be accounted for by circumstantial variables such as: occupational status, job income, major automobile accidents, or deaths in the family. Geography, nationality, age, gender, and ethnicity also fall into this category. The remaining 40% of happiness is attrib-

uted to the individual's intentional efforts to make happiness a priority.

Dr. Lyubromirsky divides intentional activity into behavioral, cognitive, and volitional categories, though the three divisions are sometimes indistinguishable. Behavioral activity consists of happiness-promoting actions, such as engaging in more physical exercise, and has been shown to boost

one's mood. Cognitive activity concerns the perception of certain events, a feature of thought that can be manipulated. For instance, striving to understand situations using a more optimistic mindset has been known to cause positive effects. Lastly, volitional activity involves pursuing certain fulfilling courses of action. Working to achieve self-concordant life goals can also lead to higher levels of emotional well-being.

Similarly, some researchers divide happiness into eudaimonic and hedonic well-being. Eudaimonic well-being can be further broken down into six basic components: self-acceptance, purpose in life, personal growth, positive relationships with others, environmental mastery, and autonomy (Ryff 1989). Hedonic well-being can be measured by "pleasant" or "unpleasant"

life experiences. Such hedonic pursuits might include wealth, material possessions, sex, and drugs. However, pursuing happiness through hedonistic means is not conducive to sustaining long-term happiness since it necessitates that happiness is contingent on certain unpredictable, outside forces. This can help to explain why it is only eudaimonic well-being that has been linked to lower salivary cortisol, lower levels of inflammation, lower cardiovascular risk, and longer duration of REM sleep (Ryff, Singer, & Love 2004). Eudaimonic strategies, because they create an internal, solid foundation for happiness to flourish, have proven to be much more effective in promoting health and lasting happiness.

The theory of the hedonic treadmill may help to explain the elusive and sometimes misleading nature of hedonic happiness. As hedonic events

cause an increase in levels of happiness, there is a tendency for happiness levels to drop back down to a basal level due to adjustment and to the wearing off of novelty. An example of the hedonic treadmill is illustrated by one study in which lottery winners returned to prior levels of happiness despite



There seems to be a U-shaped age curve with happiness levels. Younger and older people are happier than those in their forties and fifties. This trend may be due to unfulfilled expectations followed by acceptance in later years.

---

Money and other material possessions may provide some initial happiness, but states of happiness will inevitably retreat back to prior levels..

---

initial surges in happiness levels (Brickman, Coates, & Janoff-Bulmann 1978). In Brickman's study, twenty-two lottery winners' happiness levels were assessed and compared to the happiness levels of twenty-two control subjects who had not won the lottery. The results indicated that the winners were no happier and took no more pleasure out of ordinary events than the controls, despite having won large sums of money. Money and other material possessions may provide some initial happiness, but states of happiness will inevitably retreat back to prior levels, according to this theory.

Studies concerning economic status have revealed several key findings that relate happiness to fiscal circumstances.

Because unemployment can interfere with hedonic pleasures such as benefits of personal wealth, unemployed people are very unhappy (MacCulloch et al. 2001). More importantly, unemployment can inhibit such eudaimonic pursuits as personal growth, purpose in life, environ-

mental mastery, and autonomy. Studies in economics also reveal that happiness is highest among women, people with many friends, married and cohabiting couples, the highly educated, those in good health, and those with high incomes (Oswald 1997). Although higher income earners are generally happier than lower income individuals, after a certain threshold of earnings, the differences in happiness become negligible. Interestingly, due to recent rates of inflation, many high-income earners have become less wealthy in the absolute sense, but relative rates of affluence between individuals have remained constant (Pew Research Center 2006). This finding suggests that the relationship between happiness and income has more to do with relative income (who is wealthier than whom) than how much money one actually possesses. Income-derived happiness can therefore be attributed to greater appreciation when one is able to compare his status to another's.

expectations. While people are young, they pursue lifelong goals and have unrealistic expectations about the future. When they reach middle age, the disappointment, or perhaps simply the disconnect between the expected and the actual, leads to low levels of happiness. The probability of depression by age also seems to peak around the same time happiness dips.

In *Stumbling on Happiness*, Harvard professor Daniel Gilbert attributes this disconnect between expectations and reality to affective forecasting, the tendency to overestimate the magnitude of an emotional outcome based upon an impact bias. An impact bias is one that preferences individuals to perceive the aftermath of a given circumstance as more

exaggerated than the reality, especially if the impact is perceived as monstrous. For example, in one study, college students were asked to predict their level of happiness two months after ending a romantic relationship (Gilbert 2006).

The levels of happiness predicted by the students at the time were

much lower than the actual levels of happiness of the students two months later. This study reveals that the impact bias of the students who were in relationships led them to inaccurately predict the actual impact of ending that relationship on their levels of happiness.

Personality traits also play a role in determining happiness. Research in the "Big Five" factors of personality (openness, conscientiousness, extroversion, agreeableness and neuroticism) has confirmed a correlation between certain personality traits and levels of happiness. People who demonstrate more extroverted behaviors are happier, and people who exhibit more neuroticism are unhappier. Researchers believe that extroversion promotes stronger social relationships and positive emotions, two prominent determining features of happiness (McCrae and Costa 1987).

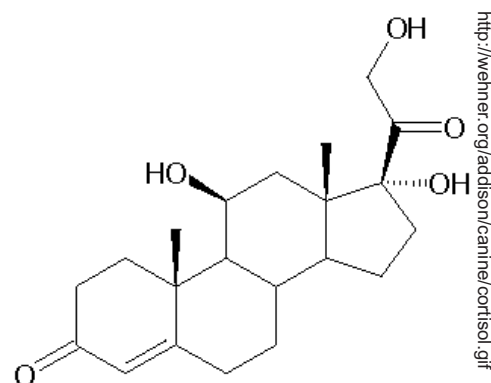
An additional example of the relationship between social contexts and happiness is Denmark. Over the past thirty years, Denmark has consistently been the happiest country in the world according to surveys (University of Leicester 2006). Several features about Danish society stand out as potential contributors to the Danes' high levels of happiness: frequent exercise and physical activity, high marriage and fertility rates, and large consumption of comfort foods high in carbohydrates. Most importantly, however, studies reveal that the Danes have fewer unrealistic expectations, and that their source of happiness may come from receiving more than what they expect.

Part of this trend of satisfied expectations can be explained by Denmark's social welfare programs which offer free health coverage, free education, subsidized child and elderly care, and considerable social safety, all at the expense of a high tax rate (Christensen, Herskind, & Vaupel 2006).

---

The more consistently happy an individual is, the longer his life span seems to be, especially due to the aforementioned effects of a stronger immune system and a lower risk for coronary heart disease.

---



High levels of the stress hormone cortisol is linked with lower levels of happiness. Lower stress responses are characteristic of people with high levels of happiness.

There also seems to be a parabolic relationship between age and happiness (Branchflower & Oswald 2008). Younger people and older people tend to be happier than people in their 30s and 40s (Gilbert 2006). Social scientists speculate that this phenomenon may have to do with

<http://wehner.org/addison/canine/cortisol.gif>

Denmark's high tax rate reinforces the notion that perceptions of income are relative, and not solely measured by absolute earnings. Because a significant portion of income is forfeited to the government, the possibilities of living luxurious lives may be reserved only for the extremely wealthy, yet Denmark as a whole remains happy. As previously mentioned, researchers have theorized that high levels of relative income can cause greater happiness, but the Danes also illustrate that social equality, created through their system of high taxes and distribution of social services, can create happiness as well. Despite their modest incomes, a generous yield of social services makes for a more-than-expected standard of living with more social and economic security.

### How can you become Happier?

The field of positive psychology offers tremendous insight into the study of happiness. The consensus of biological, psychological, and sociological studies is that although happiness may be partly predetermined either genetically or by some other biological precursor, it is nonetheless influenced by both intentional and unintentional life events. Statistically speaking, people would be the happiest if they lived in Denmark, were married, were healthy, made a considerable amount of money, were either young or old, had many friends, and had a considerable sense of job security. However, the usefulness of studying happiness comes from achieving a method of how to be happier, not who to emulate. Expressing gratitude, such as practicing appreciation or counting life's "blessings", has been shown to increase positive emotions. Visualizing one's best possible self, which includes writing positively about life, can also lead to significant improvements in subjective well-being (Lyubomirsky & Sheldon 2006). Committing random acts of kindness, such as donating blood or helping a friend with homework, has also been shown to increase well-being since it has been suggested that random acts of kindness instill a greater sense of control, social optimism, and confidence. Therefore, because subjective well-being is not only controlled by genes, but is also largely determined by individual choices, making happiness a priority must be regularly practiced in order to sustain long-term happiness (Sheldon & Lyubomirsky 2004).

Upon further advances in happiness research, it is likely that new cognitive and behavioral interventions will become tools to bring more people happiness. Despite a general lack of understanding of the biological components of happiness, it is rather comforting to know that social scientists can at least identify certain traits and practices of people who are happy. Perhaps science may go so far as to involve genetic manipulation or health interventions to control stress responses. Or, perhaps the path to a happier life simply rests in the individual's willingness to endeavor in its pursuit. Knowing that certain behaviors lead to increases in happiness provides hope for a better future with happier people

and happier lives.

### References

- Ashby, F. G., Isen, Alice M., and Turken U. 1999. A Neuropsychological Theory of Positive Affect and Its Influence on Cognition, *Psychological Review*, 106 (3), 529-550.
- Bachorowski, J.A., & Owren, M.J. 2001. Not all laughs are alike: Voiced but not unvoiced laughter readily elicits positive affect. *Psychological Science*, 12, 252-257.
- Barrett, L.F., Fredrickson, B.L., & Tugade, M.M.. 2004. Psychological Resilience and Positive Emotional Granularity: Examining the Benefits of Positive Emotions on Coping and Health. *J Pers.* 72(6): 1161-1190.
- Bennett, M. and Lengacher, C. (2007). Humor and Laughter may influence Health: III Laughter and Health Outcomes. *Evidence-based Complementary and Alternative Medicine* 4 (2).
- Branchflower, D., & Oswald, A.J.. 2008. *Social Science & Medicine*.
- Brickman, P., Coates, D., & Janoff-Bulman, R. 1978. Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology*, 36, 917-927.
- Christensen, K., Herskind, A.M., & Vaupel, J.W. 2006. Why Danes are smug: comparative study of life satisfaction in the European Union. *BMJ* 333: 1289-1291.
- Costa, P. T., McCrae, R. R., & Zonderman, A. B. 1987. Environmental and dispositional influences on well-being: Longitudinal follow-up of an American national sample. *British Journal of Psychology*, 78, 299-306.
- Dillon K, Minchoff B, Baker KH. (86). Positive emotional states and enhancement of the immune system. *International Journal of Psychiatry in Medicine* 1985;15:13-18.
- Easterlin, A Richard. 2003. Explaining happiness. *Proceedings of the National Academy of Sciences* 100(19): 11176-11183.
- Gilbert, Daniel. 2007. *Stumbling on Happiness*. Knopf Publishing Group.
- Lykken, D, Tellegen, A. 1996. Happiness Is a Stochastic Phenomenon. *Psychological Sciences* 7(3): 186-189.
- Lyubomirsky, S. & Sheldon, M.K.. 2006. Achieving Sustainable Gains In Happiness: Change Your Actions, Not Your Circumstances. *Journal of Happiness Studies* 7: 55-86.
- Lyubomirsky, S., Sheldon, K.M., and Schkade, David. 2005. Pursuing Happiness: The Architecture of Sustainable Change. *Review of General Psychology* 9(2): 111-131.
- MacCulloch, R., Oswald, A., & Tella R.D. 2001. Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness. *American Economic Review*, 91, 335-341.
- Marmot, M, Steptoe, A, & Wardle, J. 2005. Positive affect and health-related neuroendocrine, cardiovascular, and inflammatory processes. *Proceedings of the National Academy of Science* 102(18): 6508-6512.
- Oswald, Andrew. 1997. Happiness and Economic Performance. *Economic Journal*, 107, 1815-1831.
- Pew Research Center. 2006. *Are We Happy Yet?*
- Ryff, C.D. 1989 Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Person. Soc. Psychol.* 57, 1069-1081.
- Ryff, C.D., Singer, B.H., & Love, G.D. (2004). Positive health: Connecting well-being with biology. *Philosophical Transactions of the Royal Society of London B*, 359, 1383-1394.
- Sheldon, K. M., & Lyubomirsky, S. 2004. Achieving sustainable new happiness: Prospects, practices, and prescriptions. In A. Linley & S. Joseph (Eds.), *Positive psychology in practice* (pp. 127-145). Hoboken, NJ: John Wiley & Sons.