

Entry

Role of Happiness When Evaluating Society

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Definition: Happiness, or life satisfaction, has become an important factor when considering what should be the objective of a society. Understanding the nature of happiness is thus important. The text offers a biological—specifically evolutionary—framework, which suggests that happiness can be described as the net impact of positive and negative feelings. It follows that a key issue is to explain what these feelings are about. The present situation and options for improving the score of happiness are discussed.

Keywords: happiness; quality of life; evolutionary perspective; feelings; rewards; punishments; neurobiology; brain modules

1. Introduction

When assessing the progress of society, there has been a tendency to move from easily quantifiable features—such as economy, education, and general health—toward an emphasis on mental issues [1,2]. The idea was made famous by the fourth King of Bhutan when he, in 1972, declared that, in Bhutan, gross national happiness (GNH) is more important than gross national product. Today, it has become customary to include items probing happiness in surveys on how various nations are doing, as exemplified by the World Happiness Reports regularly published by the Sustainable Development Solutions Network (an initiative of the United Nations).

In order to aim for enhancing happiness, it is important to understand the nature of happiness. As our brains are a product of evolution, one heuristic approach is to consider the various functions, or modules, that evolution has incorporated into the human brain. Included in this list are modules responsible for positive and negative feelings. These modules can be construed as the features responsible for our capacity for happiness; that is, the effect these modules have on conscious experiences decides how good or how bad you feel. In other words, happiness is a question of the net output of the brain's modules responsible for feelings. I shall present a model that suggests when these modules first evolved, what function they were meant to perform, and what is presently known about their neurobiology.

After presenting this evolutionary model of happiness, I shall briefly discuss the role of happiness as a target when attempting to improve society. Finally, I add some words as to why the level of happiness may not be optimal today and suggest a strategy aimed at enhancing mental health and happiness.

The term *happiness* as used here covers the mental part of the quality of life. *Life satisfaction* and *subjective well-being* are, in the present context, closely related terms. It should be pointed out that notions such as contentment and hedonic and eudemonic pleasure are covered by the present concept of happiness.

Mental health and happiness are correlated insofar as the more common mental disorders imply activation of negative feelings—as exemplified by anxiety (here understood as hyperactivity in the fear module) and depression (hyperactivity of the low mood function). The diagnosable disorders of anxiety and depression are presumably only the ‘tip of the iceberg’, in that many more suffer from disproportional, but subclinical, levels of fear or low mood. While it is possible to have mental issues without experiencing any reduction



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of happiness, as exemplified by people with Down syndrome [3], in most cases, the two are intertwined.

2. An Understanding of Happiness Based on Biology

Evolution has installed a range of functions in the human brain; I shall refer to them as *modules* [4,5]. The concept of modules is a convenient simplification when describing the evolutionary history, and the present inventory, of the brain. Modules consist of widespread nerve circuits, but are often associated with particular anatomical regions. Several modules can use the same nerve circuits.

The term *feelings*, as used here, comprises, for one, *sensations*, which reflect pleasant or unpleasant experiences due to signals from external or internal sensing systems; and two, *emotions*, which encompass all other forms of feelings, but typically concern interpersonal relations. The present, feelings-based model of happiness is explained in more detail elsewhere [6]. Feelings include an element of something positive or negative; that is, the brain offers rewards or punishment in the form of pleasure or pain, respectively. The term *pain* will be used for all unpleasant experiences.

The *mood modules* are responsible for the positive or negative element of feelings; that is, the pleasure or pain. These modules can be activated by various *type modules*, which add the specific quality of a particular feeling. For example, a physical injury activates the pain module, as does being rejected by a friend [7], while the taste of sugar or the pleasure of sex both activate reward modules [8].

The evolutionary function of pleasure and pain is to help an individual evaluate behavioral options [9,10]. A behavioral option generally means to move toward what is good for the genes, such as food or a partner, and away from whatever may be harmful, such as predators or adverse temperatures. The duality of choice explains why we have respective positive and negative feelings. Together, they comprise a form of a ‘common currency’ to help the individual make decisions [11].

Evolution has invented a number of different strategies for instigating optimal behavior; in addition to feelings, the list includes reflexes and instincts. Feelings were introduced at an advanced stage of nervous system evolution. They offer a particularly flexible, but neurologically demanding, strategy. The relevant nerve circuits can be used in very different situations, and they are modulated by environmental feedback. The organisms learn how to obtain pleasure and avoid pain. One should keep in mind that the human brain retains several of the more ancient strategies, as exemplified by reflexes and instincts, and the different strategies can be active concurrently.

Various lines of evidence suggest that the mood modules, and thus the capacity to have feelings, first evolved in the early amniotes—the common ancestors of present reptiles, birds, and mammals—some 300 million years ago [10,12]. In fact, the ‘invention’ of feelings may have triggered the evolution of consciousness, as feelings appear to be the one feature of the brain that definitely requires an ability to actually experience something [10]. If this scenario is correct, it suggests that only the above three orders of vertebrates have the capacity for experiencing happiness. One should, however, keep in mind that the human vocabulary is generally designed to describe human features—feelings and consciousness are likely to appear very different for a crocodile, or a dog, compared with us. The point is reflected in the rhetorical question of whether these animals have a nose. In the case of the dog, some people will say ‘no, it has a snout’. The question of whether the human vocabulary fits features in other species is, in principle, a question of how broadly one defines the relevant terms.

3. The Neurobiology of Happiness

There are three different mood modules [6,13,14]. The reward system is divided into a *seeking* (or wanting/motivating) module and a *liking* (or consuming) module. The former is meant to stimulate the individual to seek opportunities and motivate for action, while the latter make sure the opportunities are utilized. The two reward modules are exemplified

by the pleasant smell of a bakery, which induces you to enter the shop, and the subsequent delight in eating a cake once inside. Only a single *pain* module is required for all sorts of negative experiences. That is, more or less the same neurological circuits deliver the unpleasant component whether it is a question of social situations, such as shame, or an injury. The above classification reflects both present knowledge as to the neurological circuits responsible and present evolutionary understanding of the brain. As to the latter, it makes sense that the reward part needs to be split into seeking and liking, as these two forms of behavior are distinctly different and should be activated sequentially, while it suffices, and is energetically prudent, to use the same pain circuits for any situation where avoidance behavior is required.

All three mood modules rely heavily on deeper structures in the brain, particularly nerve circuits associated with the limbic system such as the amygdala and hypothalamus [14]. As a rule of thumb, the seeking module is based primarily on the neurotransmitters dopamine and serotonin, and can consequently be hijacked by substances mimicking these neurotransmitters, which is why amphetamine and cocaine offer a positive experience. The liking module and the pain module both utilize endorphins (natural opioids) and are thus affected by substances such as heroin. That is, opioid drugs have the capacity to both stimulate the positive feelings associated with the liking module and to inhibit pain. The capacity to activate the reward modules explains why the above-mentioned drugs are so addictive, as the intention of the system is to teach the individual to repeat actions that lead to positive feelings.

4. A More Detailed Account of Happiness

The above description explains why humans have the capacity to be happy. It also allows for a definition of happiness. The term can be construed as the net activity of the mood modules; that is, the pleasures minus the pains [6]. This definition needs some additional elaboration.

One salient point is that all forms of positive feelings reflect activity in the reward modules. The list includes obvious pleasures, such as those you obtain when eating, but also companionship and the sense of living a ‘meaningful life’. The definition thus embraces what some refer to as eudemonic happiness. The above description makes sense in that more or less the same neurological circuits create the positive or negative part of an experience regardless of the situation [14–16].

As pointed out above, many brain modules can activate the mood modules, and thus cause an experience to be regarded as pleasant or unpleasant. It is important to note that many of these type modules actually may activate both rewards and punishment. Fear is a typical example, in that fear is normally associated with something negative, but in the case of a mountain climber, the adrenalin kick can turn it into an enjoyable experience. The active mood module can shift rapidly; if, for example, the climber suddenly slips, the joy gives way to disagreeable panic. Similarly, grief can be either a negative experience or, in certain situations, considered pleasant—as reflected in the nerve circuits active while reporting grief [17].

The mammalian brain is most likely designed with a positive feeling as a default state of mind [6]. That is, in the absence of trouble, activity in the reward modules dominates, which means that the individual is content. It is the interest of the genes to reside in an individual with a positive and optimistic attitude. It follows that, for the sake of lifetime happiness, it is more important to avoid inappropriate negative emotions than to engage in short-term delights. While sensual stimuli are typically temporary, emotional experiences tend to be more lasting. This means that seeking sensual pleasures tends to be a less fruitful strategy compared with avoiding emotional pain. In other words, as has been well substantiated empirically, how we interact with fellow humans appears to be the most important factor determining our level of happiness [18–21].

The individual pursuit of happiness ought to consider both the present and the future. Certain ventures, such as unhealthy food, may activate immediate rewards, but decrease

the lifetime measure of happiness. Similarly, one should not avoid all sorts of pain. Being afraid while standing on the edge of a cliff, or to avoid breaking a leg, can both help secure the individual a prospect for future happiness. It is the disproportional and debilitating negative feelings one wishes to avoid.

5. Happiness as an Aim for Society

Most nations have a more or less clearly formulated objective as to how they want society to develop. Traditionally, the key ambition has been toward economic expansion. More recently, many countries have realized that this may not be the optimal aim; for one, because the economic success does not necessarily enhance the well-being of the citizens; and two, because an increase in production generally leads to an increase in pollution and depletion of non-renewable resources. Consequently, there has been a tendency to incorporate other indicators as to what constitutes a successful nation.

One might argue that happiness, or well-being, should be the sole target—that all other factors are desired only to the extent that they contribute to well-being. There are two reasons why this approach is not an obvious choice. One of them is that happiness is difficult to measure. The typical method is to ask people to answer a small battery of questions such as “On a scale of 0–10 how happy are you with your life today?” Although the more popular instruments are well documented [22], the answers may be skewed for various reasons. Factors that are likely to contribute to well-being indirectly tend to be easier to measure. The other reason is that these other factors are also easier to work toward improving. It is relevant to point out that well-being seems to promote productivity [23].

Bhutan, the country that initiated the interest in happiness, has, for example, decided to set up a gross national happiness index consisting of nine domains [24]:

1. Psychological well-being;
2. Health;
3. Education;
4. Time use;
5. Cultural diversity and resilience;
6. Good governance;
7. Community vitality;
8. Ecological diversity and resilience;
9. Living standards.

The index is meant to guide development. Although the questions concerning happiness are only included in the first domain, the idea is that the other factors will help promote the general well-being of the population. Moreover, they offer guidelines that are more tangible when making political decisions.

I believe that happiness/well-being should be the primary purpose, but that indirect measures are useful. By understanding the human capacity for good and bad feelings, it is easier to see why the various factors included in indexes, such as the one described above, may promote happiness. This insight should be helpful when deciding on both how to best collect index data and how to define, refine, and explicate the methodological parameters of the index.

6. Problems with the Present Human Environment

Even in the nations that today score highest on happiness, such as the Scandinavian countries typically scoring between seven and eight on a 0–10 scale [25], the situation does not appear to be ideal. Mental suffering is a major burden. It appears that some 31–50% of the population experiences a mental disorder at some point in life, while 17–33% had a condition sufficiently severe to warrant diagnosis during the last 12 months [26,27]. As the majority of these cases reflect problems related to anxiety or depression, the level of happiness is unlikely to be optimal. There is an obvious need for strategies aimed at improving the situation.

Although individuals differ significantly in respect to various mental features, the human species is genetically homogenous compared with other present-day mammals [28]. That is, we start life with shared innate predispositions. The inherited differences between individuals are mostly quantitative in nature; that is, certain individuals have a stronger predisposition for certain functions—for example, a tendency for aggressive behavior or the threshold for feeling pain—but the list of functions is shared. Humans are formed by interactions between genes and environmental factors; consequently, we may differ considerably as adults.

The human brain is, arguably, the most adaptive organ on Earth; yet, certain environments are less productive in terms of enhancing happiness. A key issue, which applies to all organisms, is that, if the environment differs compared with the environment the organism is genetically tuned to experience, there is a risk for a suboptimal result. Industrialized societies tend to offer living conditions that differ considerably compared with what has been referred to as our Environment of Evolutionary Adaptation (EEA) [29]. The consequences are what has been referred to as the *diseases of modernity*; in fact, these maladies are arguably one of the greatest threats to public health [30]. The typical diseases of modernity are somatic—such as cardiovascular problems and asthma—but the present burden of mental disorders, particularly those related to anxiety and depression, should presumably be included in the list [31–33].

One possible strategy for improving the situation is consequently to consider the present environment in comparison with the EEA. As a reasonable simplification, the EEA can be described as a ‘Stone Age’, hunter-gatherer, tribal lifestyle. Environmental factors that differ between the present way of living and the EEA have been referred to as mismatches [34]. Most mismatches are likely to be beneficial; the important point is thus to identify the differences that contribute to morbidity. These can be referred to as discords [31].

One approach to the quest of enhancing the quality of life in modern society is to look for discords that may be responsible for the high level of mental disorders. For example, the way we handle babies may contribute to anxiety [35]. That is, for the youngster to feel safe, it needs to know that a caretaker is at hand. If the baby is put in a separate crib, or in a stroller instead of being carried, the situation may activate the fear function. A function that is regularly activated will tend to expand and thus deliver a more substantial contribution to conscious experiences. An enhanced fear function is likely to result in anxiety.

7. Conclusions and Prospects

There are several ways to explain the nature of happiness. The topic can be outlined in terms of psychology or philosophy [36]; I describe a biological explanation for why we have this quality of mind [4,6]. The present outlook focuses on the evolutionary history and the neurobiology of the brain modules constructed for the purpose.

Most brain modules are designed to be modulated by experience. The quest for happiness can be described as how to increase the impact of positive feelings and decrease unwarranted negative feelings. The task is twofold: for one, to set up a suitable environment; and two, to find relevant ways to improve the brain’s capacity to deliver happiness.

The prevalence of mental disorders in present society suggests that there are discords at play. However, to pinpoint which mismatches actually contribute—the ones that should be labeled as discords—requires further research. As the brain is most formative in the first years of life, one might focus on the conditions we offer our children. Then again, the brain can be modulated at any age, thus whatever the effect of upbringing has been, it is possible to improve conditions for adults. In the case of adults, there is an additional option in that one may try to design pertinent brain ‘exercises’ aimed at enhancing happiness.

The mood modules are meant to sway you rather than you controlling them, which is why it is so difficult to turn off pain or anxiety solely by willpower. The point is particularly relevant in the case of the pain module, as your life may depend on whether you respond

to danger or not. Yet, it is possible to impact on these modules; more specifically, on the ‘switches’ that turn them on or off. In the case of pain, it seems difficult to avoid the somewhat reflex-like activation of, for example, fear; but it is possible to exercise the capacity to turn the fear off at an early stage if it seems to be undue, rather than letting the fear linger on endlessly as in the case of anxiety disorders.

Based on the idea of a default state of good mood, a fruitful approach to enhance happiness is to exercise the capacity to turn off inappropriate negative feelings. Cognitive therapy, as in the treatment of phobias, is perhaps the most successful form of psychological treatment. In the present vocabulary, it can be described as a strategy for exercising the capacity to turn off fear.

The ideal way to exercise brain functions may be by means of neurofeedback. As a proof of principle, it has proven feasible to decrease the burden of negative mood by measuring (fMRI) activity related to anxiety and depression and serving the information to the individual in a feedback setup [37]. However, this strategy is currently not practical. A more simple, but convenient, strategy is based on the observation that the mood modules can respond to words [38,39], or even to the use of certain muscles such as when smiling [40]. Thus, an alternative to neurofeedback is to take a meditative approach where the practitioner repeats words or short sentences such as ‘life is good’ or ‘there is no reason to worry’.

If we are to increase the level of happiness in society, strategies such as those described above seem appropriate. Including happiness as a measure when evaluating society is a first, but an important, step. As they say “What you measure is what you get”.

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