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**The Objective Benefits of Subjective Well-Being**

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## **Abstract**

The aim of this paper is to survey the “hard” evidence on the effects of subjective well-being. In doing so, we complement the evidence on the determinants of well-being by showing that human well-being also affects outcomes of interest such as health, income, and social behaviour. Generally, we observe a dynamic relationship between happiness and other important aspects of our lives, with influence running in both directions.

Keywords: Subjective well-being, health, income, behaviour

JEL Classifications: D6, D03, D31, I1, I31

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## I. Introduction

The aim of this paper is to survey the “hard” evidence on the effects of subjective well-being. In doing so, we complement the evidence on the determinants of well-being by showing that human well-being also affects outcomes of interest such as health, income, and social behavior. Generally, we observe a dynamic relationship between happiness and other important aspects of our lives, with influence running in both directions.

Although happiness is considered here as a *means* — rather than an *end* in itself — we do not imply that normative arguments for raising well-being are insufficient to make the case for well-being. However, a better understanding of the objective benefits of raising happiness may also help to put happiness more center-stage in policy-making and to refine policy evaluation.

In the following sections we review the growing literature on the objective benefits of happiness across the major life domains categorized into (i) health & longevity; (ii) income, productivity, & organizational behavior; and (iii) individual & social behavior. Scientific research increasingly points to specific ways in which happiness generates tangible benefits. The experience of well-being encourages individuals to pursue goals that are capacity-building to meet future challenges. At the physiological level, positive emotions have been found to improve immune, cardiovascular, and endocrine functioning. In contrast, negative emotions are detrimental to these processes. Table 1 below summarizes and categorizes the literature on the effects of subjective well-being.

Although high subjective well-being tends to help people function better, it is of course not a cure-all. Happy people do get sick and do lose friends. Not all happy people are productive workers. Happiness is like any other factor that aids health and functioning; with all other things being equal, it is likely (but not guaranteed) to help. It is important to emphasize that research does not prescribe extreme bliss but, rather, tentative evidence suggests that a moderate degree of happiness tends to be “optimal” for the effects surveyed in this paper.

Before concluding this paper we also discuss *how* happiness may lead to better life outcomes and what its role may be in human evolution. There is initial evidence about the processes that mediate between happiness and its beneficial outcomes. For instance, positive feelings bolster the immune system and lead to fewer cardiovascular problems, whereas anxiety and depression are linked to poorer health behaviors and problematical physiological indicators such as inflammation. Thus, a causal impact of happiness on health and longevity can be understood with the mediating mechanisms that are now being uncovered. Research in the field of neuroscience provides further prospects for new scientific insights on mediating pathways between happiness and traits or outcomes of interest.

It naturally follows from this survey that it is important to balance economic measures of societal progress with measures of subjective well-being and to ensure that economic progress leads to broad improvements across life domains, not just greater economic capacity. Given the tangible benefits to individuals and societies of moderately high well-being, it is ever more urgent that we act to effectively put well-being at the heart of policy and generate the conditions that allow everyone to flourish.

**Table 1: Summary of the objective benefits of subjective wellbeing**

	<i>Benefits</i>	<i>Evidence</i>
<b>Health &amp; Longevity</b>	<ul style="list-style-type: none"> <li>• <b>Reduced inflammation</b></li> <li>• <b>Improved cardiovascular health, immune &amp; endocrine systems</b></li> <li>• <b>Lowered risk of heart disease, stroke &amp; susceptibility to infection</b></li> <li>• <b>Practicing good health behaviors</b></li> <li>• <b>Speed of recovery</b></li> <li>• <b>Survival &amp; longevity</b></li> </ul>	<ul style="list-style-type: none"> <li>• Adversity and stress in childhood is associated with higher inflammation later in life.<sup>1</sup></li> <li>• Positive emotions help cardiovascular, immune and endocrine systems,<sup>2</sup> including heart rate variability.<sup>3</sup> Evidence suggests a causal link between positive feelings and reduced inflammatory, cardiovascular and neuroendocrine problems.<sup>4</sup></li> <li>• Positive affect is associated with lower rates of stroke and heart disease and susceptibility to viral infection.<sup>5</sup></li> <li>• High subjective well-being is linked to healthier eating, likelihood of smoking, exercise, and weight.<sup>6</sup></li> <li>• Positive emotions can undo harmful physiological effects by speeding up recovery.<sup>7</sup></li> <li>• Happier individuals tend to live longer and have a lower risk of mortality, even after controlling for relevant factors.<sup>8</sup></li> </ul>
<b>Income, Productivity &amp; Organizational Behavior</b>	<ul style="list-style-type: none"> <li>• <b>Increased productivity</b></li> <li>• <b>Peer-rated &amp; financial performance</b></li> <li>• <b>Reduced absenteeism</b></li> <li>• <b>Creativity &amp; cognitive flexibility</b></li> <li>• <b>Cooperation &amp; collaboration</b></li> <li>• <b>Higher income</b></li> <li>• <b>Organizational performance</b></li> </ul>	<ul style="list-style-type: none"> <li>• Individuals with induced positive emotions were more productive in an experimental setting.<sup>9</sup></li> <li>• Happy workers were more likely to be rated highly by supervisors and in terms of financial performance.<sup>10</sup></li> <li>• Happiness can increase curiosity, creativity, and motivation among employees.<sup>11</sup></li> <li>• Happy individuals are more likely to engage collaboratively and cooperatively during negotiations.<sup>12</sup></li> <li>• Well-being is positively associated with individual earnings.<sup>13</sup> Longitudinal evidence suggests that happiness at one point in time predicts future earnings, even after controlling for confounding factors.<sup>14</sup></li> <li>• Greater satisfaction among employees tends to predict organization-level productivity and performance, e.g. revenue, sales and profits.<sup>15</sup></li> </ul>
<b>Individual &amp; Social Behavior</b>	<ul style="list-style-type: none"> <li>• <b>Longer-term time preferences and delayed gratification</b></li> </ul>	<ul style="list-style-type: none"> <li>• In experiments, individuals with higher well-being and positive affect are more willing to forego a smaller benefit in the moment in order to obtain a larger</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Reduced consumption &amp; increased savings</b></li> <li>• <b>Employment</b></li> <li>• <b>Reduced risk-taking</b></li> <li>• <b>Pro-social behavior (e.g., donating money and volunteering)</b></li> <li>• <b>Sociability, social relationships &amp; networks</b></li> </ul>	<p>benefit in the future.<sup>16</sup> Happier individuals may be better able to pursue long-term goals despite short-term costs due to a greater ability to delay gratification.<sup>17</sup></p> <ul style="list-style-type: none"> <li>• Longitudinal studies find evidence that happier individuals tend to spend less and save more, take more time when making decisions and have higher perceived life expectancies.<sup>18</sup></li> <li>• Survey evidence shows the probability of re-employment within one year is higher among individuals who are happier.<sup>19</sup></li> <li>• The prevalence of seat-belt usage and the likelihood of being involved in an automobile accident were both linked to life satisfaction in a survey of over 300,000 US households.<sup>20</sup></li> <li>• Individuals who report higher subjective well-being donate more time, money, and blood to others.<sup>21</sup></li> <li>• Well-being increases interest in social activities leading to more and higher quality interactions.<sup>22</sup> Positive moods also lead to more engagement in social activities.<sup>23</sup> The happiness-social interaction link is found across different cultures and can lead to the transmission of happiness across social networks.<sup>24</sup></li> </ul>
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Note: Further detail on each study cited in the table is included in the relevant sections of this paper.

## **II. Benefits of happiness**

### **i. Happiness on health and longevity**

There are many factors that influence health, such as having strong social support, and practicing good health behaviors, such as exercising and not smoking. Although being happy is only one of those factors, it is an important one. This is because higher levels of subjective well-being can both directly and indirectly influence health. Below we review the up-to-date research on whether happy people experience better health.<sup>25</sup>

Happiness and unhappiness have been directly associated with physiological processes underlying health and disease. For example, Kubzansky and colleagues find that adversity and stress in childhood predict elevated markers of inflammation a few years later.<sup>26</sup> And chronic inflammation that occurs over years can harm the cardiovascular system. Cohen et al. (2003) found that positive emotions were associated with stronger immune system responses to infection. Bhattacharyya et al. (2008) found that positive feelings were associated with healthier levels of heart rate variability. Negative emotions harm cardiovascular, immune, and endocrine systems in humans, whereas positive emotions appear to help them.<sup>27</sup> Levels of subjective well-being influence health, with positive levels helping health and negative levels harming it. Through an accumulation of studies, we are beginning to understand not just that subjective well-being influences health, but *how* this occurs.

Because subjective well-being influences physiological processes underlying health and disease, it is predictive of lower rates of cardiovascular disease and quicker recovery. For example, positive affect is associated with lower rates of strokes in senior citizens.<sup>28</sup> Davidson et al. (2010) found in a prospective longitudinal study that those without positive feelings were at a higher risk for heart disease than those with some positive feelings, who in turn had higher levels of heart disease than those with moderate positive feelings. Stress can even hinder wound healing after an injury.<sup>29</sup>

One indirect route from happiness to health is that individuals who are high in subjective well-being are more likely to practice good health behaviors and practices. Blanchflower et al. (2012) found that happier individuals have a healthier diet, eating more fruits and vegetables. Ashton and Stepney (1982) reported that neurotic individuals, people who are prone to more stress, are more likely to smoke. Pettay (2008) found that college students high in life satisfaction were more likely to be a healthy weight, exercise, and eat healthy foods. Schneider et al. (2009) found that happier adolescents, as assessed by brain scans of the left prefrontal area, showed a more positive response to moderate exercise. Garg et al. (2007) found that people put in a sad mood as part of an experiment were more likely to eat tasty but fattening foods, such as buttered popcorn, rather than a healthy fruit.

Using a large sample representative of the USA, Strine and her colleagues (2008a & b) found that depressed individuals are more likely to be obese and twice as likely to smoke, and parallel results were found for those with very high in anxiety. Lack of exercise was associated with depression, and excessive drinking of alcohol was associated with anxiety. Grant et al. (2009) found, in a large sample across 21 nations, that higher life satisfaction was associated across regions with a greater

likelihood of exercising and a lower likelihood of smoking. Kubzansky et al. (2012) found that distressed adolescents are more likely to be overweight. Thus, not only is there a direct biological path from happiness to healthier bodily systems, but unhappiness is also associated with destructive behaviors that can exacerbate health problems.

Another indirect effect of happiness, as will be described more fully in a next section, is that higher happiness can lead to more positive and fulfilling social relationships. And having these relationships promotes health.<sup>30</sup> For instance, the experience of prolonged stress can lead to poor health, but the presence of supportive friends and family can help individuals during this time. In contrast, lonely individuals experience worse health.<sup>31</sup>

An important concern with these research findings is that healthier people may be happier because of their good health, and not the other way around. While this may be true for some reported findings, scientific studies also show support for a *causal* link going from happiness to health. Research findings have established a link from happiness to better physiological functioning. Ong (2010) and Steptoe et al. (2009) review various possible explanations for the effects of positive feelings on health. Steptoe et al. (2005) found among middle-aged men and women that those high in positive feelings had reduced inflammatory, cardiovascular, and neuroendocrine problems. For instance, happiness was associated with a lower ambulatory heart rate and with lower cortisol output across the day. Similarly, Rasmussen et al. (2009) found that optimism predicted future health outcomes such as mortality, immune function, and cancer outcomes, controlling for factors such as demographics, health, and negative feelings. Boehm and her colleagues found that optimism and positive emotions protect against cardiovascular disease and also predict slower disease progression.<sup>32</sup> They discovered that those with positive moods were more often engaged in positive health behaviors, such as exercising and eating a nutritious diet. Furthermore, positive feelings were associated with beneficial biological markers, such as lower blood fat and blood pressure, and a healthier body mass index. These associations held even controlling for level of negative moods.

Another piece of evidence supporting happiness causing good health is that positive emotions can undo the ill-effects of negative emotions on health. Negative emotions generate increased cardiovascular activity and redistribute blood flow to specific skeletal muscles. It has been shown that positive emotions can undo harmful physiological effects by speeding physiological recovery to desirable levels.<sup>33</sup>

Diener and Chan (2011) reviewed eight types of evidence that point to a causal connection going from subjective well-being to health and longevity. They reviewed longitudinal studies with adults, animal experiments, experiments in which participants' moods are manipulated and biomarkers are assessed, natural quasi-experiments, and studies in which moods and biomarkers are tracked together over time in natural settings. Diener and Chan (2011) concluded that the evidence overwhelmingly points to positive feelings being causally related to health.

Happiness on average leads not only to better health, but also to a longer life. Danner et al. (2001) found that happier nuns lived about 10 years longer than their less happy colleagues. Because the nuns all had similar diets, housing, and living

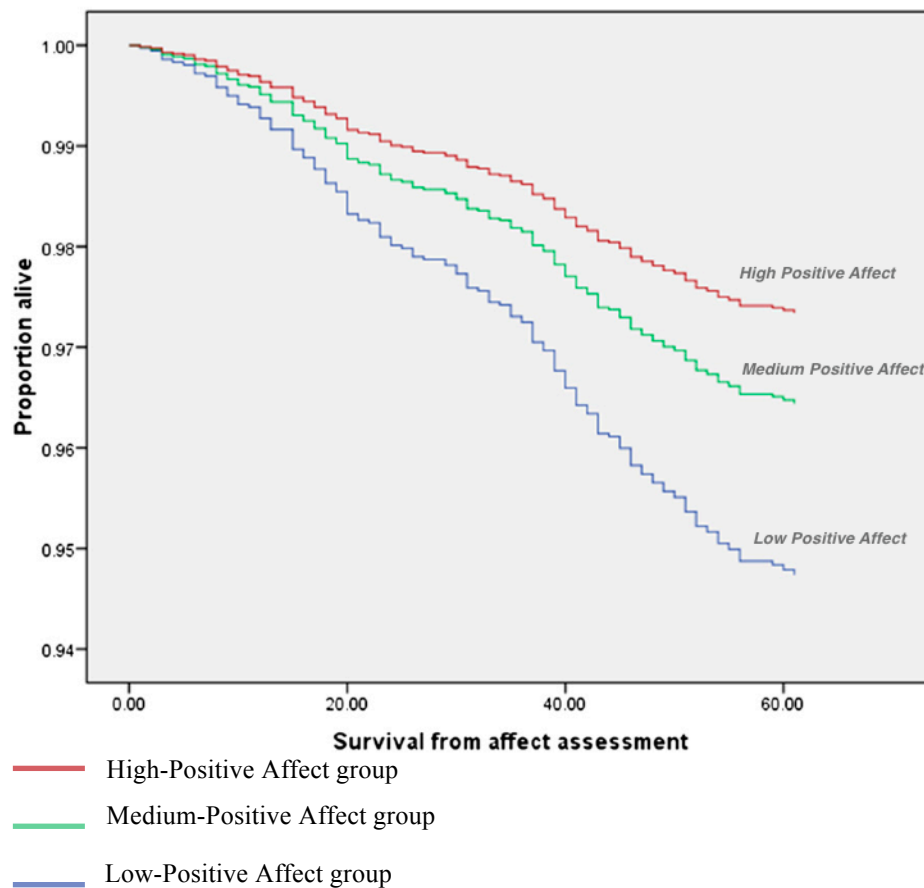
conditions, and the happiness measure was collected at a very early age many decades before death (at age 22 on average), the study suggests a causal relation between positive moods and longevity. In another study, Pressman and Cohen (2012) found that psychologists who used aroused positive words (e.g., lively, vigorous) in their autobiographies lived longer. In a longitudinal study of individuals 40 years old and older, Wiest et al. (2011) found that both life satisfaction and positive feelings predicted mortality, controlling for socio-economic status variables. Conversely, Russ et al. (2012) reviewed 10 cohort studies and found that psychological distress predicted all-cause mortality, as well as cardiovascular and cancer deaths. Russ et al. found that even mild levels of psychological distress led to increased risk of mortality, controlling for a number of possible confounding factors. Whereas risk of death from cardiovascular diseases or external causes, such as accidents, was significant even at lower levels of distress, cancer death was only related to high levels of distress. Bush et al. (2001) found that even mild depression increased the risk of mortality after people had experienced a heart attack.

A systematic review by Chida and Steptoe (2008) on happiness and future mortality in longitudinal studies showed that happiness lowered the risk of mortality in both healthy and diseased populations, even when initial health and other factors were controlled. Moreover, the experience of positive emotions predicted mortality over and above negative emotions, showing that the effects of subjective well-being go beyond the absence of negativity. Therefore, not only do negative emotions predict mortality, but positive emotions predict longevity. One reason this may be so, besides the toll that cardiovascular and immune diseases take on unhappy people, is that stress might lead to more rapid ageing. Epel et al. (2004) found shorter telomeres (the endcaps protecting DNA) in women who had significant stress in their lives. Because DNA must replicate with fidelity for an individual to remain healthy over the decades of life, and because the telomeres protect our DNA during replication, the reduction of telomeres due to stress leads to more rapid aging when a person chronically experiences unhappiness.

In a large representative sample of elderly people in the UK, Steptoe and Wardle (2011) found that higher levels of positive affect were significantly associated with a higher probability of survival in the five years following the survey. The study divided respondents into three groups based on the positive affect they reported over a 24-hour period and then compared their mortality rates over a five-year period following the survey. Mortality rates among respondents in the highest positive affect group were reduced by 35% on average relative to those in the lowest positive affect group. This rate was robust even when controlling for demographic factors as well as health behaviors, self-reported health, and other conditions. Those in the high and medium positive affect groups had death rates of 3.6% and 4.6%, respectively, compared to 7.3% for the low positive affect group. Figure 1 below shows the differences in survival rates among the three groups in the follow-up period.



**Figure 1: Proportion of individuals surviving by level of positive affect in an analysis of the English Longitudinal Study of Ageing**



Notes: Figure from Steptoe and Wardle (2011). “Survival from affect assessment” is measured in months from initial interview where positive affect levels were reported. The English Longitudinal Survey of Ageing is a representative sample of older men and women living in England. Positive affect reported on a single day by individuals between 52 and 79 years old were used. Values are adjusted for age and sex. Respondents with the highest third of reported positive affect were 34% less likely to die over the period studied than those in the lowest positive affect group after controlling for demographic and health factors. Those in the high and medium positive affect groups had death rates of 3.6% and 4.6%, respectively, compared to 7.3% for the low positive affect group.

Primate studies also point to happiness affecting longevity. Weiss et al. (2011) found that orangutans who were rated as happier by their caretakers lived longer. Indeed, the difference between the apes that were one standard-deviation above versus below the mean in happiness was 11 years. Because these apes often live about 50 years in captivity, happiness accounted for a very large increase in longevity.

Research on the role of happiness in human evolution (a topic explored in more depth below) finds a relationship between well-being and successful reproduction. A recent review by Diener et al. (2012) highlighted the evidence linking positive mood to the frequency of sexual intercourse and fertility. For example, Rasmussen et al. (2009) found that pregnant women who were more optimistic tended to miscarry less frequently and have babies of a healthy weight.

The positive benefits of subjective well-being on health at the individual level generalize to more aggregate levels. Lawless and Lucas (2011) found that places with higher life satisfaction had greater life expectancies, with lower levels of mortality from heart disease, homicide, liver disease, diabetes, and cancer. Similarly, Blanchflower and Oswald (2008) found that higher levels of national well-being were related to lower levels of national hypertension in a sample of 16 nations. Blanchflower and Oswald (2008) also found that regions in the United Kingdom reporting more stress also had higher rates of blood pressure. Moum (1996) found that low subjective well-being is both a short- and long-term predictor of suicide, and uncovered similar findings in a 20-year study. Across 32 nations, it was found that experiencing higher life satisfaction and happiness was related to lower suicide rates.<sup>34</sup> These findings suggest that links between happiness and health outcomes are not simply relative in nature as they persist in aggregate and cross-national studies. Happiness can therefore influence health outcomes for both individual citizens and entire societies.

There is also evidence that negative affect can worsen health, even making illness more likely. For example, depressed people are substantially more likely to have cardiovascular problems, such as heart disease and strokes. Rugulies (2000) found in a review of 11 studies that depressed feelings predict coronary heart disease and that clinical levels of depression predict even more strongly. Similarly, when a person is angry and hostile they are more likely to suffer from coronary heart disease.<sup>35</sup> Depression is associated with unhealthy physiological processes, such as inflammation,<sup>36</sup> which is believed to be connected to the development of heart diseases. Antidepressant medications can lower inflammation. A review by Zorrilla et al. (2001) found that stress is related to a weaker immune system. Studies on fertility provide yet more evidence on how negative emotions can be detrimental to healthy functioning. Fertility is lower among depressed women.<sup>37</sup> An unhappy pregnancy is more likely to lead to a premature and low birth weight child.<sup>38</sup> However, as discussed above, the effect of negative affect is not a mirror image of that observed for positive affect. In a study of susceptibility to developing a cold, Cohen et al (2003) found that individuals with positive emotional styles had greater resistance to the virus when controlling for other factors, whereas negative emotions were not associated with resistance. This suggests that positive and negative affect may impact on health through different pathways but further study is needed to understand this interaction.

## **ii. Happiness on income, productivity, and organizational behavior**

The experience of happiness is beneficial to workplace success because it promotes workplace productivity, creativity, and cooperation. There are several reasons why this is the case. The experience of positive feelings motivates people to succeed at work and to persist with efforts to attain their goals. As discussed above, individuals who are happier are more likely to be healthy and will, in turn, tend to be more productive (in part, simply because happier and healthier individuals will take fewer sick days). In addition, individuals who are happier better integrate information leading to new ideas, which leads to creativity and innovation. Finally, individuals who are happier tend to have better social relations. In the context of work this leads to greater cooperation among coworkers and with customers.

Oswald et al. (2012) investigated how positive feelings influence productivity in an experimental setting. In an experiment involving piece-rate pay for research participants across a number of days, the economists found that those who were put in a positive mood had a greater quantity of work output (about 10-12%), but no less quality of output. Those performing the task at low and medium levels of productivity were helped most by being put in a good mood. As part of that same research, Oswald et al. (2012) also found that a bad mood induced by family illness or bereavement had a detrimental impact on productivity.

Employees who are high in subjective well-being are more likely to achieve more while at work. Peterson et al. (2011) found that happy workers – optimistic and hopeful, resilient and high in self-efficacy – were more likely to be high in supervisor-rated performance and in financial performance. Conversely, whereas positive feelings reduce absenteeism from work, negative feelings increase absenteeism as well as turnover.<sup>39</sup>

Happiness has also been shown to enhance curiosity and creativity. Foremost, positive feelings are associated with curiosity and creativity.<sup>40</sup> Leitzel (2001) found that happy people are more likely to feel energetic and interested in doing things, as well as scoring higher on measures of curiosity. Further, there is a large experimental research literature showing that people put in a good mood tend to be more original, creative, and show greater cognitive flexibility.<sup>41</sup> Both Amabile et al (2005) and George and Zhou (2007) found that workers are more creative when they experience positive moods. Indeed, two recent meta-analyses of experimental and non-experimental studies showed that although the strength of effects depend on the context and motivational focus, happiness is related to and generates creativity.<sup>42</sup>

A major reason for the success of happy individuals and organizations is that they experience on average more positive social relationships. Research clearly shows that happy workers are more cooperative and collaborative in negotiations than unhappy ones. In general, positive emotions boost cooperative and collaborative behavior in negotiations rather than withdrawal or competition.<sup>43</sup> Individuals who are in a positive mood are more willing to make concessions during negotiations.<sup>44</sup> Through cooperation, they reach a better joint solution in negotiations.<sup>45</sup> Individuals in a positive mood are more likely to make cooperative choices in a prisoner's dilemma game as well.<sup>46</sup> People in a positive mood are also more likely to show cohesion with their group. Recent experimental studies have shown that positive emotions lead to trust and cooperation when specific conditions are met.<sup>47</sup> Overall, happiness leads to cooperation and collaboration in the workplace, particularly so in situations involving negotiation.

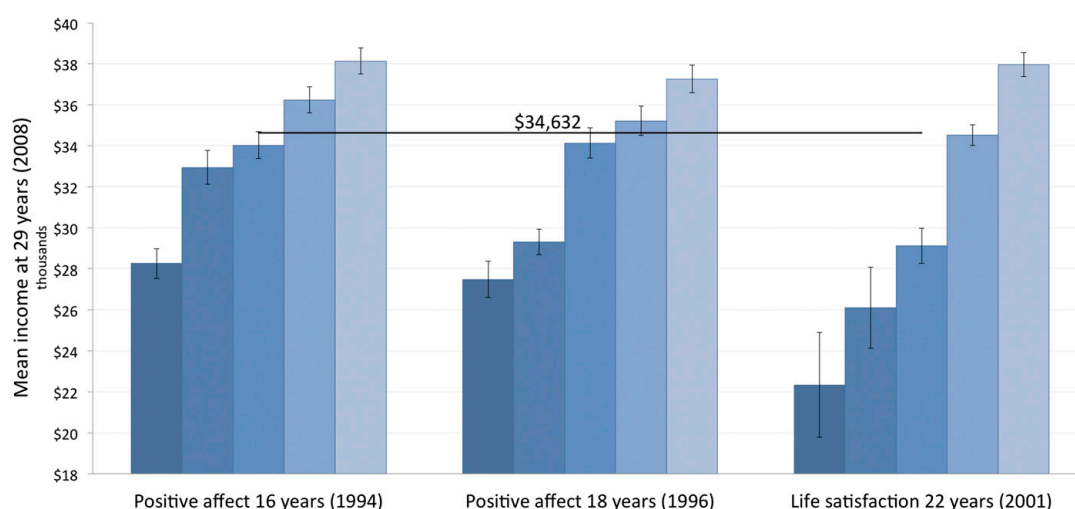
On the other hand, negative emotions in the workplace, especially chronic or intense ones, can be very detrimental to the organization. For example, Felps et al. (2006) found that a single negative individual in a work unit often brings down the morale and functioning of the entire group.

One indicator of the subjective well-being of employees is job satisfaction.<sup>48</sup> A quantitative review found that job satisfaction is a key predictor of job performance, showing that happy employees are better performers in their

workplace.<sup>49</sup> To establish a causal relation, a meta-analysis of panel data demonstrated that job satisfaction predicted future performance, but performance did not predict future job satisfaction.<sup>50</sup> Erdogan et al. (2012) reviewed the research showing that individuals with higher life satisfaction are more likely to have higher levels of career satisfaction, lower turnover intentions, and higher organizational commitment.

In line with the notion that happier workers are better workers, higher well-being is also shown to be associated with higher income<sup>51</sup> and future income.<sup>52</sup> De Neve & Oswald (2012) used a large US representative panel study to show that adolescents and young adults who report higher life satisfaction or positive affect grew up to earn significantly higher levels of income later in life. They used siblings as comparison controls, and also accounted for factors such as intelligence and health, as well as the human capacity to imagine later socioeconomic outcomes and anticipate the resulting feelings in current well-being (see Figure 2 below). Thus, to date, four longitudinal studies have systematically found that happiness at one point in time predicts higher future income, controlling for relevant factors such as intelligence, parental income, and even a sizable part of any genetic predispositions.<sup>53</sup>

**Figure 2: Longitudinal relationship between subjective well-being during adolescence and young adulthood (ages 16, 18 and 22) and later earnings (at age 29)**



Notes: Figure from De Neve & Oswald (2012). The bars represent the response categories for positive affect (at ages 16 and 18) and life satisfaction (at age 22), from lowest to highest levels, and relate this to the mean income for the respondents in each category at age 29. Across the sample, the mean income at age 29 was \$34,632. Large samples were observed for each category (N=14,867 for positive affect at age 16, N=11,253 for positive affect at age 18 and N=12,415 for life satisfaction at age 22). A margin of error (i.e. 2 Standard Errors) is included around each estimate.

Subjective well-being brings about greater success at the organizational level as well. Bockerman and Ilmakunnas (2012) found that job satisfaction predicts the productivity of manufacturing plants. Harter et al. (2010) found in a longitudinal study of 10 large organizations that worker engagement makes a difference to productivity. Work units in which employees were satisfied and otherwise felt highly engaged with their work led to improvements in the bottom line, measured in terms of

revenue, sales, and profit.<sup>54</sup> On the other hand, reverse causality going from company success to employee satisfaction was weaker. An analysis of the “100 Best Companies to Work For in America” revealed that they increased more in equity value compared to the industry benchmarks. The resulting higher returns were about 3% per year.

The study by Harter and his colleagues (2010), based on 2,178 work units in 10 large companies, found that engaged and satisfied workers led to greater revenue, sales, and profits. The two factors that mediated the relation between employee engagement and the performance outcomes were customer loyalty and employee retention. It makes intuitive sense that customers would prefer to interact with positive employees and thus frequent the business. Employee retention is a large challenge for modern companies both because it is expensive to replace employees, especially highly skilled ones, and because more senior employees have more experience on the job. Thus, it is not surprising that employee engagement, resulting in customer loyalty and employee retention, accounted for 10% of the variability in the productivity of the corporations studied.

### **iii. Happiness on individual and social behavior**

Subjective well-being has an impact on individual behavior and decision-making. Happiness and positive affect have been identified as determinants of economic behavior ranging from consumption and savings to time preferences and risk-taking. Research in psychology and economics suggests this may occur through improved integration of information and broadened focus of attention in happier individuals.<sup>55</sup> Thus, happier individuals may be better able to evaluate the implications of decisions with short and long term trade-offs, resulting in decisions that reflect greater self-control and appropriate risk-taking.

Well-being can influence how individuals evaluate outcomes that may occur in the present or future – a concept known in economics as time preference, or discounting. In survey and experimental evidence, Ifcher and Zarghamee (2011a) found that subjective well-being and positive affect were associated with less preference for consumption in the present relative to the future. Using a randomized assignment experiment, they observed that among the group where greater positive affect was induced, participants were less likely to discount future payments, i.e. they were more likely to give up a smaller payment in the current period to receive a larger payment at a later point in time. This implies that individuals with greater positive affect may be more able to exercise self-control or delay gratification (i.e. foregoing smaller short term benefits in order to receive greater benefits in the future or to avoid longer term costs). Happy individuals are motivated to pursue long-term goals despite short-term costs.<sup>56</sup> Fry (1975) found that children placed in a happy mood better resisted temptation. Additionally, Lerner and Weber (2012) found in lab experiments that inducing sadness among participants led to a greater discounting of future rewards than those in a neutral state. Moreover, lack of self-control is also related to over-consumption, obesity, and financial decisions, suggesting that changes in well-being may influence their prevalence.<sup>57</sup>

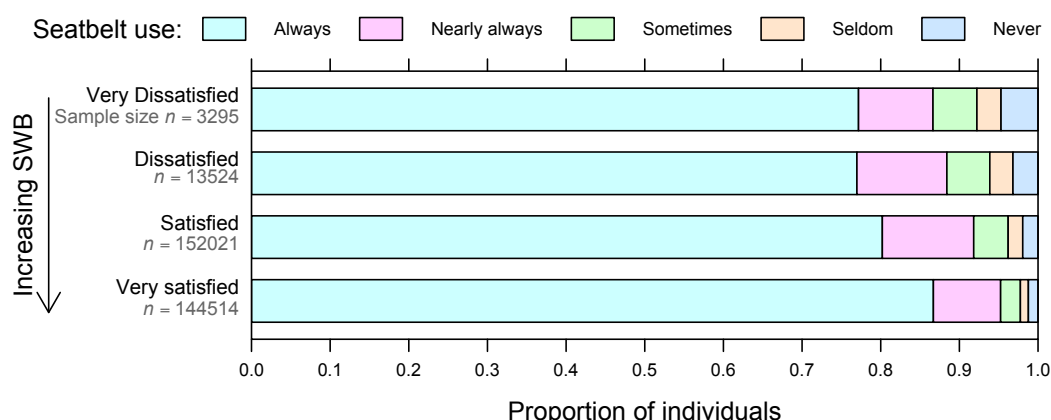
Greater self-control and longer-term time preferences among happier people

have been linked to consumption and saving behavior. Guven (2012) analyzed two representative longitudinal household surveys in the Netherlands and Germany to estimate the causal relationship (if any) between happiness and consumption and saving behaviors. The regression results found that happier people were more likely to save more and consume less than others. Further, happier people had different expectations about the future than those less happy. These individuals were more optimistic about the future, took more time when making decisions, and had higher perceived life expectancies (i.e. moving from “neither happy or unhappy” to “happy” was associated with 1.1 year increase in perceived life expectancy).<sup>58</sup> Thus, happier individuals may be more forward-thinking and willing to consider the long-term implications of decisions taken in the present, leading to “better” decisions for themselves and society.

The probability of being re-employed has also been linked to individual happiness. Among individuals recently entering unemployment in Germany, Krause (2012) found a statistically significant positive relationship between job seekers with higher than average well-being and the probability of re-employment within a year. Additionally, these individuals were more likely to enter into self-employment, suggesting a link between happiness and entrepreneurship. Interestingly, the effect of happiness on re-employment decreased at the extremes, indicating that an “optimal” level of happiness may exist.

Research on individual risk-taking provides evidence of a relationship between happiness and risk-related behavior. According to economic theory, happier individuals have more to lose from engaging in risky behavior that may carry the risk of injury or death. Happier individuals should therefore be more willing to engage in activities that reduce risk. Goudie et al. (forthcoming) found that seatbelt use and not being involved in a motor vehicle accident were both more likely among those with higher subjective well-being (see Figure 3 with respect to seatbelt use). In a representative sample of 313,354 US households, the authors estimated that individuals who reported being “very satisfied” with life were 5.3% more likely to always wear a seatbelt in the survey, even after controlling for potentially confounding factors. When Goudie et al. (forthcoming) looked at the probability of motor vehicle accidents, they found that individuals with higher levels of life satisfaction were less likely to be involved in an accident several years later<sup>59</sup>. While these statistical analyses cannot fully rule out the possibility of reverse causality, the results are robust to including a number of confounding variables and provide strong evidence for a positive relationship between happiness and risk-avoiding behavior.

**Figure 3: Frequency of seatbelt use by subjective well-being in a US representative sample**



Notes: Figure from Goudie et al. (forthcoming). Data is from the Behavioral Risk Factor Surveillance System, a random-digit telephone survey in the US, N=313,354. Pearson's chi-squared statistic = 3,242, p-value <  $2.2 \times 10^{-16}$ . Cross-tabulation figures indicate that subjective well-being and seatbelt use are strongly correlated but this does not account for other factors that may explain this relationship. Goudie et al. (2013) use regression analysis to control for other potentially confounding factors and find the association is robust to these controls. Individuals who report they are "very satisfied" with life are 5.3% more likely to state they always wear a seatbelt. The authors also find that subjective well-being at the time of the survey is statistically significantly associated with a lower probability of having a motor vehicle accident several years later (even after controlling for confounding factors).

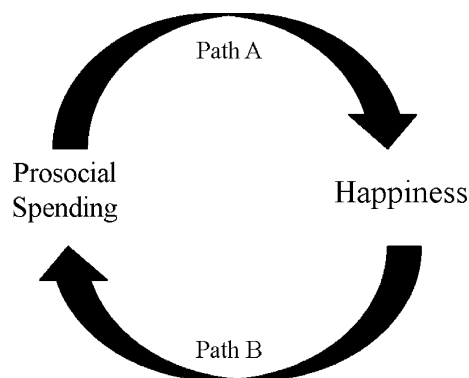
Research studies also indicate a powerful link between high subjective well-being and social behavior, such as being a better friend, colleague, neighbor, and citizen. People who are in a positive mood see others more inclusively and sympathetically. For example, they are less biased against other ethnic groups.<sup>60</sup> Nelson (2009) found that people in a positive mood induction condition, as compared to neutral and negative mood conditions, showed greater compassion, perspective taking, and sympathy for a person experiencing distress.

Individuals who report high subjective well-being give more to their communities — in both time and money. Morrison et al. (2012) found that both life satisfaction and positive feelings predicted reports of donating money to charity, helping a stranger, and volunteering activities. Oishi et al. (2007) found that happier people volunteer more. Aknin et al. (2013) found in a study of 136 countries that prosocial uses of money by happy people generalized across regions of the world. However, further research is underway to clarify the causal relationship between prosocial spending and happiness. Priller and Shupp (2011) found slightly higher rates of blood donation, as well as monetary giving to charity, among happier individuals. They also found that those who were satisfied with their incomes were more likely to donate money to worthy causes.

Do happy moods *cause* the helping behavior and good citizenship? It is a consistent finding in social psychology experiments that when people are induced into a good mood, by various means, they are more likely to help others.<sup>61</sup> These experimental studies in which people who are put into a good mood and compared to those in a neutral mood leave little doubt that happier feelings generally tend to increase helping. The fact that people give both more time and money when they are put into a positive mood in an experiment indicates that being happy raises prosocial

behavior.<sup>62</sup> Aknin et al. (2012) suggest that the relation between mood and helping is circular as shown in Figure 4. When people are in a good mood they tend to help others; helping others in turn fosters a good mood. Thus, friends, family, neighbors, and the society as a whole tend to profit from happy people because these individuals are more likely to be helpful to others.

**Figure 4: Model of positive feedback loop between prosocial spending and happiness**



Notes: Figure from Aknin, Dunn and Norton (2012). The model posits that prosocial spending promotes happiness and, in turn, happiness improves the probability of future prosocial spending.

Having supportive relationships boosts subjective well-being, but having high subjective well-being in turn leads to better social relationships.<sup>63</sup> Thus, good relationships both cause happiness and are caused by it. Two major reasons why happiness benefits social relationships are because happiness increases a person's level of sociability and also improves the quality of social interactions. Happier people have a larger quantity and better quality of friendships and family relationships.<sup>64</sup>

Frequent positive emotions create a tendency in people to be more sociable. In a laboratory experiment people placed in a positive mood expressed greater interest in social and prosocial activities compared to those in a neutral condition, whereas those placed in a negative mood indicated lower interest in social activities.<sup>65</sup> This pattern was replicated in a second study that found an interest in social and prosocial activities among those in a good mood. People who were placed in a good mood expected social activities to be more rewarding than those not placed in a good mood. Similarly, other experimental studies have demonstrated that inducing happiness, in contrast to sadness, makes people more likely to express liking for others they meet for the first time.<sup>66</sup> On the other hand, the absence of positive feelings is accompanied by feeling bored, unsociable, uninterested in things, slowed down, and unenergetic, reflecting a lack of active involvement with the environment and other people.<sup>67</sup> It has also been shown that depressed individuals cause others to react in a negative manner.<sup>68</sup> This can lead to unwillingness to have future interactions with those who have low happiness.

The links between positive moods and sociability are not just in terms of *feeling* sociable, but translate into actual behavior. Cunningham (1988a) discovered that people in an induced positive mood condition compared to a negative mood



condition were more talkative. Mehl et al. (2010) monitored people's everyday conversations for four days and assessed happiness through both self-reports and informant reports. They found that happy participants spent about 25% less time alone and about 70% more time talking when they were with others. Furthermore, the happy participants engaged in less small talk and more substantive conversations compared to their unhappy peers.

Recent evidence shows the happiness-relationship link occurs across cultures. Lucas et al. (2000) found that across the world positive feelings were associated with tendencies for affiliation, dominance, venturesomeness, and social interaction. Similarly, a world survey of 123 nations found that the experience of positive feelings was strongly related to good social relationships across different socio-cultural regions.<sup>69</sup>

Happy people are not just more sociable; they also experience higher-quality social relationships. Kazdin et al. (1982) found that children put in a positive mood showed greater social skills and confidence in social behavior than those not put in a good mood. Boehm and Lyubomirsky (2008) reviewed evidence showing that happy people tend to be more popular and likable. One study showed that reports of better interaction quality were not merely a function of the happy person's perceptions, but that observers similarly rated happier individuals as having better interactions with strangers.<sup>70</sup>

Happiness has the potential to generate positive snowball effects in society. Research has shown that people who are happier are likely to bring happiness to those around them, resulting in networks of happier individuals. It was found that happiness extends up to three degrees of separation, and longitudinal models show that individuals who are surrounded by happy people are likely to become happier in the future.<sup>71</sup>

Happiness can also have effects on the long-term quality of relationships. Luhmann et al. (2013) found that unmarried people high in life satisfaction are more likely to get married in the following years and less likely to get separated or divorced if they get married. Conversely, Stutzer and Frey (2006) found low life satisfaction prior to courtship predicted later dissolution of the marriage.

Depression, which is characterized by low or absent positive feelings, creates problems in social relationships such as divorce, limited social support, and distancing from one's neighbors.<sup>72</sup> Even minor depression results in problems in social relations, such as higher rates of divorce.<sup>73</sup> Even those recovering from depression show impairments in the social and occupational domains.<sup>74</sup> In addition, clinical depression interferes with executive functioning, which is a hallmark of human's special adaptive abilities. For example, Fossati et al. (2002) review evidence indicating that depressed individuals suffer deficits in problem solving and planning. Snyder (2012) reviewed extensive evidence showing that depressed people suffer substantially from broad impairments in executive functions, such as planning, with strong effect sizes varying from 0.32 to 0.97.

In sum, there is substantial evidence connecting positive moods to higher sociability and better quality of social relationships, and the opposite is the case for

negative moods and depression. Happier people enjoy the company of others, and find that interacting with people is more rewarding compared to less happy individuals. Others in turn enjoy interacting with happy individuals. Those high in subjective well-being thus have more rewarding and stable social relationships.

### **III. Moderation, mediation, and the evolutionary role of happiness**

Although happy people and societies have a number of advantages, this does not imply that high subjective well-being is a panacea for everything. To illustrate, happiness can facilitate good health but is not a guarantee of it. Happy individuals may die at a young age. However, on average they will live longer. We can make statements about the effects of average happiness using the notion of *ceteris paribus* (i.e. assuming “all other things being equal”) because in particular cases there will be other factors that override the influence of high subjective well-being.

Not every study has found positive benefits for long-term happiness. A few studies find no differences between happier and less happy individuals, and the rare study has shown opposite effects. This is common in research because of sampling, methodology, and other differences between studies. Nonetheless, reviews that summarize results across studies have virtually always shown benefits for high subjective well-being. One reason for the few null findings is that happiness will not show its value in all samples and contexts. For instance, for young adults there might be no differences in health or longevity due to happiness because young adults very rarely die and mostly have healthy bodies. The results of happiness and unhappiness become more manifest as adults age. Similarly, one would not be surprised if happiness did not reduce divorce in a nation where divorce is virtually nonexistent.

Another caution about the conclusion that happiness is desirable is that people do not need to be constantly euphoric or ecstatic. Happy people most of the time feel merely pleasant – a mild positive state. Only occasionally do happy people feel intensely positive. Oishi et al. (2007) found that although the happiest individuals did very well in social relationships, the moderately happy – not 100% satisfied – often did the best in achievement domains. There is evidence that frequent high-arousal emotions could be harmful to health.<sup>75</sup> Krause (2012) shows that re-employment prospects actually decreased for those with extreme levels of happiness. Furthermore, in a randomized lab experiment, Ifcher and Zarghamee (2011b) found that positive affect increased overconfidence among participants in the treatment group. Thus, extremely high happiness is not a recipe for extremely effective functioning, and in fact, moderate happiness can be more helpful.

It is important to note that happy people also occasionally feel unhappy, and this is not necessarily undesirable. Gruber et al. (2011) and Forgas (2007), as well as others, have shown that in some situations negative emotions can help people to respond more effectively. Thus, happiness does not mean a complete absence of negative feelings. The happy person, however, does not feel chronic negative feelings; he or she experiences negative feelings only occasionally, not frequently, and in appropriate situations.

An important question that is receiving increasing attention is *how* well-being and positive emotions may influence life outcomes. This is an emerging area of research with important contributions from psychology and neuroscience. The pathways leading from happiness to the life outcomes discussed in this paper can either be direct or be subject to moderation and/or mediation by other variables that influence the effect that subjective well-being may have on a trait or outcome of interest. Our discussion here is mostly on mediating pathways that may carry some part of the influence of happiness onto the outcome of interest and thus help explain the relationship. One branch of thinking in psychology posits that positive emotions broaden cognitive capacity and attention, allowing individuals to engage in the behaviors and build the skills associated with better health, productivity, and social interaction.<sup>76</sup> Evidence from lab experiments provides initial backing for this theory. For example, Fredrickson and Branigan (2005) found that participants where positive emotions were induced showed greater scope of cognition and attention in psychological tests.

Studies focusing on neurological processes also support this approach and provide evidence for a connection between well-being and brain structure. Experiments using brain imaging to monitor participants' neurological processes have reported that positive affect is associated with activity in a part of the brain that is associated with "exploratory modes of thought and behavior."<sup>77</sup> Further, Schmitz et al. (2009) found that affect can also alter neurological processing of visual stimuli – specifically, positive affect led to a widening of individuals' field of vision. Small-scale trials of the effect of mindfulness training, a type of meditation that has been linked to improved well-being in psychological studies, have also been shown to increase grey matter in parts of the brain that are believed to regulate cognition and emotion.<sup>78</sup> Happiness may therefore be linked to neurological and cognitive processes that influence human behavior and particularly to behaviors that require broader and more integrative thinking (e.g. considering benefits over a longer time period or helping others).

In a promising new development in the study of mediating pathways between subjective well-being and health outcomes, Fredrickson and colleagues (2013) provide preliminary evidence for different epigenetic dynamics as a result of varying levels and types of happiness. The authors find that varied states of well-being influence gene expression with particular relevance to genotypes underlying the immune system. Although the study is small-scale and is mostly interested in the epigenetic effects of different types of well-being (hedonic and eudaimonic well-being) it opens a promising new direction in the study of how happiness may influence health outcomes.

In their study of happiness in young adulthood and earnings later in life, De Neve & Oswald (2012) shed light on the potential pathways between happiness and income in a longitudinal survey. Their mediation tests reveal a direct effect as well as indirect effects that carry the influence from happiness to income. Significant mediating pathways include obtaining a college degree and a job, higher degrees of optimism and extraversion, and less neuroticism.<sup>79</sup>

Given the increasing evidence for a strong connection between happiness and behavior, a handful of studies have started to investigate the role of well-being in

human evolution. Happiness is argued to play a role in promoting evolutionary success in two possible ways: (1) the experience of happiness acts as a reward for behaviors that increase the likelihood of evolutionary success (e.g. survival, reproduction, resource accumulation, etc.); or, alternatively, (2) given that happiness is beneficial to survival and other important life outcomes (such as those discussed throughout this paper), it has persisted as an evolutionary characteristic.

Happiness as a reward mechanism for evolutionarily-advantageous behaviors has been explored in psychological and neurological research. A review of laboratory experiments by Wise (2004) highlighted the critical role dopamine plays in the neurological learning processes that embed how the brain anticipates reward and prompts action to obtain this reward. For example, Wise (2004) discusses a study where mice whose dopamine production is impaired are less able to undertake previously learned tasks to receive a reward (e.g. pressing a certain lever to receive food). Psychologists have argued elsewhere that positive affect and dopamine levels are connected.<sup>80</sup> They hypothesize that the positive affect feedback from goal-directed behavior and the associated dopamine production are crucial to understanding how humans “learn” what behaviors and habits promote evolutionary success. This fits with other evolutionary theories that suggest the pursuit and experience of happiness incentivizes and increases the probability of successfully engaging in behaviors that improve health, productivity, and reproduction.<sup>81</sup>

Diener et al. (forthcoming) find that in a globally representative sample, 70% of respondents reported enjoying much of the previous day.<sup>82</sup> The fact that happiness is a relatively common human trait can be considered indicative of its important role in evolutionary fitness. The authors also review the evidence that “positive mood offset,” or the presence of positive mood in a neutral state, is associated with characteristics, such as longevity, material and social resource accumulation, and fertility, that have allowed humans to propagate successfully.

#### **IV. Conclusion**

Existing scientific evidence indicates that subjective well-being has an objective impact across a broad range of behavioral traits and life outcomes, and does not simply follow from them. In fact, we observe the existence of a *dynamic* relationship between happiness and other important aspects of our lives with effects running in both directions. Experimental research in which moods and emotions are induced in some participants and their actions are compared to a control group show that positive moods lead to creativity, sociability, altruism, and beneficial physiological patterns. Levels of subjective well-being are found to predict future health, mortality, productivity, and income, controlling statistically for other possible determinants. For example, young people who are less happy many years before they meet their future spouse later show higher rates of divorce compared to their happier peers. Furthermore, predictions in the other direction, from conditions to subjective well-being (that is, conditions influencing happiness) are also positive, helping to create feedback loops that may raise the longer-term happiness effects.

Although high subjective well-being tends to help people function better, it is of course not magic or a cure-all. Happy people do get sick and do lose friends. Not all happy people are productive workers. Happiness is like any other factor that aids

health and functioning—all other things being equal it is likely (but not guaranteed) to help. Needless to say that many other factors such as personality, intelligence, and social capital are also important for good functioning.

It is important to emphasize that research does not prescribe extreme bliss but, rather, tentative evidence suggests that a moderate degree of happiness tends to be “optimal” for the effects surveyed in this paper. Thus, a desirable level of happiness would imply feeling mildly to moderately positive most of the time, with occasional negative emotions in appropriate situations.

There is initial evidence about the processes that mediate between happiness and beneficial outcomes. For instance, happiness is associated with greater cooperation, motivation, and creativity, which in turn are instrumental to success in business, and in life as a whole. Conversely, depression creates problems, such as illness and quitting one’s job more frequently, that all lead to less success in the workplace. Similarly, positive feelings harness the immune system and lead to fewer cardiovascular problems, whereas anxiety and depression are linked to poorer health behaviors and problematical physiological indicators, such as inflammation. Thus, a causal mechanism of happiness on health and longevity can be understood with the mediating mechanisms that are now being uncovered. Research in the field of neuroscience provides further prospects for new scientific insights on mediating pathways between happiness to behavioral traits and socio-economic outcomes of interest.

It naturally follows from this survey that it is important to balance economic measures of societal progress with measures of subjective well-being, to ensure that economic progress leads to broad improvements across life domains, not just greater economic capacity. By assessing subjective well-being as well as economic variables, a society can gauge whether overall net progress is positive in terms of raising human well-being. Diener et al. (2009) detail the case for national accounts of well-being. Most arguments for putting happiness more center-stage in policy-making have been normative in nature; happiness is what would appear to matter most to most people. The aim of this paper is to complement and inform the normative reasoning with a survey of the “hard” evidence on the benefits of subjective well-being across outcomes of importance, such as health, income, and social behavior. A better understanding of the objective benefits of raising happiness may help in estimating the potential impact of making happiness more central in policy-making and in enhancing policy evaluation by informing cost-benefit analyses. Indeed, an argument could be constructed that raising subjective well-being leads to positive externalities or spillover effects across a number of policy domains, ranging from health to traffic safety. Given the tangible benefits to individuals and societies of moderately high well-being, it is imperative that we act to effectively put well-being at the heart of policy and generate the conditions that allow everyone to flourish.

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<sup>1</sup> Appleton et al. (2011); Slopen et al. (2012).

<sup>2</sup> Edwards & Cooper (1988); Kiecolt-Glaser, McGuire, Robles, & Glaser (2002); Cohen, Doyle, Turner, Alper, & Skoner (2003).

<sup>3</sup> Bhattacharyya, Whitehead, Rakhit, & Steptoe (2008).

<sup>4</sup> Ong (2010); Steptoe, Wardle, & Marmot (2005); Steptoe, Dockray, & Wardle (2009).

<sup>5</sup> Ostir, Markides, Peek, & Goodwin (2001); Davidson, Mostofsky, & Whang (2010); Cohen et al. (2003).

<sup>6</sup> Blanchflower, Oswald, & Stewart-Brown (2012); Stepney (1982); Pettay (2008); Schneider, Graham, Grant, King, & Cooper (2009); Garg, Wansink, & Inman (2007); Strine et al. (2008a, 2008b); Grant, Wardle, & Steptoe (2009); Kubzansky, Gilthorpe, & Goodman (2012).

<sup>7</sup> Fredrickson (2001); Fredrickson & Levenson (1998); Fredrickson, Mancuso, Branigan, & Tugade (2000).

<sup>8</sup> Danner, Snowdon, & Friesen (2001); Pressman & Cohen (2012); Wiest, Schuz, Webster, & Wurm (2011); Russ et al. (2012); Bush et al. (2001); Chida & Steptoe (2008); Epel et al. (2004); Steptoe & Wardle (2011).

<sup>9</sup> Oswald, Proto, & Sgroi (2012).

<sup>10</sup> Peterson, Luthans, Avolio, Walumbwa, & Zhang (2011).

<sup>11</sup> Ashby, Valentin, & Turken (2002); Jovanovic & Brdaric (2012); Leitzel (2001); Isen, Daubman, & Nowicki (1987); Amabile, Barsade, Mueller, & Staw (2005); George & Zhou (2007); Baas, De Dreu, & Nijstad (2008); Davis (2009).

<sup>12</sup> Baron, Fortin, Frei, Hauver, & Shack (1990); Barsade (2002); Carnevale (2008); Forgas (1998); Baron (1990); Baron, Rea, & Daniels (1992); Carnevale & Isen (1986); Lawler, Thye, & Yoon (2000); Hertel, Neuhof, Theuer, & Kerr (2000); Lount (2010).

<sup>13</sup> Judge, Piccolo, Podsakoff, Shaw, & Rich (2010); Diener, Nickerson, Lucas, & Sandvik (2002); Graham, Eggers, & Sandip (2004); Marks & Fleming (1999).

<sup>14</sup> De Neve & Oswald (2012).

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- <sup>15</sup> Bockerman & Ilmakunnas (2012); Harter, Schmidt, Asplund, Killham, & Agrawal (2010); Edmans (2011, 2012).
- <sup>16</sup> Ifcher & Zarghamee (2011a).
- <sup>17</sup> Aspinwall (1998); Fry (1975).
- <sup>18</sup> Guven (2009).
- <sup>19</sup> Krause (2012).
- <sup>20</sup> Goudie, Mukherjee, De Neve, Oswald, & Wu (forthcoming).
- <sup>21</sup> Morrison, Tay, & Diener (2012); Oishi, Diener, & Lucas (2007); Aknin et al. (2013).
- <sup>22</sup> Lyubomirsky, King, & Diener (2005); Myers (2000); Diener & Seligman (2002); Cunningham (1988b); Baron (1987, 1990); Berry & Hansen (1996).
- <sup>23</sup> Cunningham (1988b); Mehl, Vazire, Holleran, & Clark (2010).
- <sup>24</sup> Lucas, Diener, Grob, Suh, & Shao (2000); Tay & Diener (2011); Fowler & Christakis (2008).
- <sup>25</sup> Chida & Steptoe (2008); Cohen & Pressman (2006); Diener & Chan (2011); Howell, Kern, & Lyubomirsky (2007); Lyubomirsky et al. (2005); Pressman & Cohen (2005).
- <sup>26</sup> Appleton et al. (2011); Slopen et al. (2012).
- <sup>27</sup> Edwards & Cooper (1988); Kiecolt-Glaser et al. (2002).
- <sup>28</sup> Ostir et al. (2001).
- <sup>29</sup> Christian, Graham, Padgett, Glaser, & Kiecolt-Glaser (2006).
- <sup>30</sup> Tay & Diener (2011).
- <sup>31</sup> Cacioppo & Patrick (2008).
- <sup>32</sup> Boehm & Kubzansky (2012); Boehm, Peterson, Kivimaki, & Kubzansky (2011).
- <sup>33</sup> Fredrickson et al. (2000); Fredrickson (1998).
- <sup>34</sup> Bray & Gunnell (2006).
- <sup>35</sup> Smith, Glazer, Ruiz, & Gallo (2004).
- <sup>36</sup> Dinan (2009).
- <sup>37</sup> Gotz, Martin, & Volker (2008); Neggers, Goldenberg, Cliver, & Hauth (2006); Wisner et al. (2009).
- <sup>38</sup> Field, Diego, & Hernandez-Reif (2006); Field et al. (2009); Orr & Miller (1995); Williamson et al. (2008).
- <sup>39</sup> Pelled & Xin (1999).
- <sup>40</sup> Ashby et al. (2002); Jovanovic & Brdaric (2012).
- <sup>41</sup> Isen et al. (1987).
- <sup>42</sup> Baas et al. (2008); Davis (2009).
- <sup>43</sup> Baron et al. (1990); Barsade (2002); Carnevale (2008); Forgas (1998).
- <sup>44</sup> Baron et al. (1990); Baron, Rea, & Daniels (1992).
- <sup>45</sup> Carnevale, & Isen (1986).
- <sup>46</sup> Lawler, Thye, & Yoon, (2000).
- <sup>47</sup> Hertel et al. (2000); Lount (2010).
- <sup>48</sup> Judge & King (2007).
- <sup>49</sup> Judge, Thoreson, Bono, & Patton (2001).
- <sup>50</sup> Riketta (2008).
- <sup>51</sup> Judge et al. (2010).
- <sup>52</sup> Diener, Nickerson, Lucas, & Sandvik (2002); Graham, Eggers, & Sandip (2004); Marks & Fleming (1999).
- <sup>53</sup> De Neve (2011); De Neve, Christakis, Fowler, & Frey (2012); Rietveld et al. (2013).
- <sup>54</sup> Similarly, Edmans (2011, 2012) found evidence consistent with the importance of employee satisfaction for firm performance.
- <sup>55</sup> Fredrickson & Branigan (2005); Estrada, Isen, & Young (1997); Isen, Rosenzweig, & Young (1991).
- <sup>56</sup> Aspinwall (1998).
- <sup>57</sup> Guven (2012).
- <sup>58</sup> Ibid.
- <sup>59</sup> Goudie et al. (forthcoming) estimate that the probability of being involved in an accident is reduced by a factor of about 0.9.
- <sup>60</sup> Johnson & Fredrickson (2005).
- <sup>61</sup> Carlson, Charlin, & Miller (1988).
- <sup>62</sup> Anik, Aknin, Norton, & Dunn (2009).
- <sup>63</sup> Lyubomirsky et al. (2005); Myers (2000).
- <sup>64</sup> Diener & Seligman (2002).
- <sup>65</sup> Cunningham (1988b).

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- <sup>66</sup> Baron (1987); Baron (1990).  
<sup>67</sup> Watson et al. (1995).  
<sup>68</sup> Coyne (1976).  
<sup>69</sup> Tay & Diener (2011).  
<sup>70</sup> Berry & Hansen (1996).  
<sup>71</sup> Fowler & Christakis (2008).  
<sup>72</sup> Gotlib & Hammen (2009).  
<sup>73</sup> Beck & Koenig (1996).  
<sup>74</sup> Romera et al. (2010).  
<sup>75</sup> Pressman & Cohen (2005).  
<sup>76</sup> Fredrickson (1998, 2001); Fredrickson & Branigan (2005); Kok et al. (2013).  
<sup>77</sup> Schmitz, De Rosa, & Anderson (2009).  
<sup>78</sup> Hölzela et al. (2011).  
<sup>79</sup> De Neve & Oswald (2012).  
<sup>80</sup> Ashby, Isen, & Turken (1999).  
<sup>81</sup> Lyubomirsky & Boehm (2010); Graham & Oswald (2010).  
<sup>82</sup> The Gallup World Poll is a representative sample of 941,161 individuals from 160 nations.

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