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Advances in subjective well-being research

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The empirical science of subjective well-being, popularly referred to as happiness or satisfaction, has grown enormously in the past decade. In this Review, we selectively highlight and summarize key researched areas that continue to develop. We describe the validity of measures and their potential biases, as well as the scientific methods used in this field. We describe some of the predictors of subjective well-being such as temperament, income and supportive social relationships. Higher subjective well-being has been associated with good health and longevity, better social relationships, work performance and creativity. At the community and societal levels, cultures differ not only in their levels of well-being but also to some extent in the types of subjective well-being they most value. Furthermore, there are both universal and unique predictors of subjective well-being in various societies. National accounts of subjective well-being to help inform policy decisions at the community and societal levels are now being considered and adopted. Finally we discuss the unknowns in the science and needed future research.

For millennia, human well-being was the scholarly province of philosophy and religion, with notables such as Aristotle, Confucius and Buddha weighing in by defining the good life. Recently, behavioural scientists have turned their attention to the topic, and have focused not on defining what a good life ought to be, but rather on the factors that lead people to subjectively experience their lives as worthwhile and rewarding. Whereas philosophers and religious leaders sought to prescribe what the good life entails, behavioural scientists observe the factors that lead people to think and experience their lives in positive versus negative ways, labelled 'subjective well-being' (SWB). Thus, scientists studying SWB do not prejudge what people will consider a good life for themselves, but instead rely on the judgements respondents themselves provide, based on whatever criteria research participants deem to be most important.

Scientists in the field of SWB do not say that the other approaches to a good life are incorrect; they only claim that people's own evaluations of their lives are important phenomena and should be considered to be an aspect of the good life. Major reviews of the area over the past several decades are available[1–8]. The most comprehensive reviews of the field can be found in the new handbook of SWB by Diener et al., which has 70 chapters[9]. The present Review does not provide a comprehensive review of the enormous literature on SWB. Instead, it presents a selective summary of the basic literature on SWB written for a broad audience not familiar with SWB research. To quantify findings, we provide effect sizes in terms of *d* (standard deviation term), *r* (correlation) or OR (odds ratio) where appropriate.

SWB includes people's appraisals and evaluations of their own lives[2]. It includes both reflective cognitive judgements, such as life satisfaction, and emotional responses to ongoing life in terms of positive and pleasant emotions versus unpleasant and negative emotions. When people reflect on their lives and give judgements about their life as a whole, or about domains in their life such as work and health, they compare with the standards they have for the good life. Thus, what elements contribute to life satisfaction are determined by respondents rather than by the researcher. Similarly, when people experience pleasant emotions it is because they are responding to events and circumstances in their lives that they evaluate as desirable.

The types of well-being — what are referred to as judgements versus experiences — are correlated but show some degree of independence[10,11]. For instance, positive and negative affect are not exact opposites, but are moderately inversely related. There are individuals who experience one frequently and the other infrequently — for example, 'happy' people — but there also those who experience both frequently and those who experience few intense emotions. Because SWB is not a unitary phenomenon, scientists must study each of the components separately. For this reason and others, the global term 'happiness' is used colloquially but is often not the scientific term of choice.

The study of SWB has grown immensely over the past several decades, from a very small backwater area with a few studies to a large endeavour occupying many scientists across different fields. Early studies in the area often studied a few individuals very intensively, or small samples of convenience. More recent research has included very large sample surveys that represent the entire world, intensive longitudinal studies in which individuals are followed over time, and big-data approaches where well-being is estimated through Internet searches or social media.

In this Review, we discuss several issues related to the scientific study of SWB. First, we discuss the measures of well-being that are used and some of the major research methods used. Next, we describe some of the major factors that are thought to influence people's SWB, at both the individual and community levels. We also describe cultural differences as well as universals in the causes of well-being. A recent topic of interest is examining not only the causes of SWB, but also its outcomes. When people have high versus low well-being, do they behave differently? We will summarize evidence showing that in many life domains those who are relatively high in SWB tend to exhibit certain desirable behaviours more often than those low in well-being. Finally, we describe another new trend — using societal measures of well-being to help guide policy.

Measures and methods

The study of SWB has advanced using scientific methods within psychology and beyond. Given its subjective nature, one of the major ways SWB has been measured is through self-report rating scales, which privileges personal evaluations and experiences. These self-report measures have good reliability — they are fairly stable over

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short periods of time when there is little change in life circumstances (for example, $r = 0.79$ for the test–retest stability for one month or less in the meta-analysis by Schimmack and Oishi[12]). They also show substantial convergent validities with reports from others, such as friends and family (the average self-informant correlation was $r = 0.42$ in the meta-analysis by Schneider and Schimmack[13]). The mean levels of life satisfaction between self-reports and informant reports are not usually different, and if any different, informant reports tend to be slightly higher than self-reports (for example, on a 0–10 happiness scale, self-reports = 7.32, s.d. = 1.16 versus informant reports = 7.44, s.d. = 0.89, $d = -0.13$)[14]. This shows that there is some consensus from among acquaintances and the person about their level of happiness. Further, self-ratings also converge with behaviours such as smile intensity ($r = 0.34$–0.47 in Seder and Oishi[15]), the number of good versus bad life events recalled ($r = 0.42$ in Pavot et al.[16]), positive/negative words used on social media ($r = 0.26$ across 1,300 US counties in Schwartz et al.[17]) and physiological indicators (cortisol outputs were on average 32.1% greater among the least happiest quintile than the happiest quintile in Steptoe et al.[18]).

It should be noted that concerns continue to exist about the possibility of irrelevant factors affecting ratings of SWB, such as weather at the time of well-being judgements[19], and the type of questions asked immediately before the well-being questions[20,21]. Multiple large-scale studies find few substantial effects of weather at the time of well-being judgements[22,23]. Similarly, a meta-analysis of the item-order effect is relatively small ($d = 0.18$ in Schimmack and Oishi[12]), although even effects of this size might introduce spurious conclusions into findings. A large nationally representative study found a substantial item-order effect of asking political questions first on life satisfaction ($d = -0.67$ in Deaton and Stone[20]). This study suggests that well-being judgements could be affected by immediately preceding questions, especially if they are concerned with the domains that matter to people's lives, but that people do not spontaneously think about. In addition, there are well-known diurnal and day-of-the week variations in SWB. For instance, positive emotions tend to reach peak around noon and evening[24,25]. Furthermore, people are in general happier on Saturday than on Monday (roughly a small effect size of $d = 0.11$ in Csikszentmihalyi and Hunter[26]). Thus, researchers must be aware and cautious about various spurious influences on their measurements of well-being, such as item-order and current-mood effects.

Finally, recent research found that the number of calls made to get survey responses may bias the population estimate of SWB, although the differences were relatively small. The level of SWB for the hard-to-reach respondents was different across genders and age groups (for example, the hard to reach women were slightly less happy than the easy to reach women (83.8% happy versus 85.7% happy), whereas the hard to reach men were slightly happier than the easy to reach men (87.5% versus 86.2%))[27]. In short, although there is evidence for the reliability and validity of self-reported SWB (see review by Diener et al.[28]), they may be affected by various extraneous factors that can bias the conclusions.

As well as global self-reports, the assessment of SWB also includes more varied methods to provide greater validity and temporal resolution to the assessment of well-being. In this vein, researchers have advocated for real-time estimates of daily SWB to increase fidelity to actual experiences, including the use of ecological momentary assessment and the day reconstruction method[29]. It should be noted though that a series of experience sampling studies showed that self-reports of SWB are highly correlated with the aggregates of numerous momentary reports (for example, $r = 0.62$–0.77)[30]. Apart from self-reports, other innovative measures are also becoming more prevalent with the proliferation of technology, including facial measures, text analyses of biographies, physiological measures and neuroimaging (L. Tay, E. Diener, R. E. Lucas & R. J. Larsen, manuscript in preparation). As with all measurement techniques, there are unique strengths and weaknesses. One caveat is that these new methods tend currently to be more labour intensive and may be difficult to scale, although this may change as technology advances. More recent use of big-data approaches where SWB is assessed via social media language[31] encounter concerns of social desirability and representativeness compared with anonymized self-reports that can be collected via representative sampling.

To generalize findings to a broad number of individuals, research on SWB has moved from smaller-scale studies towards large representative samples in nations and across the world. This has led to establishing the universality of the positivity bias where individuals generally have positive SWB[32] and key psychological needs that underpin it[33], allowing a deeper evolutionary understanding of SWB that spans cultures. Moreover, these types of data allow researchers to isolate the role of national and community factors (for example, political freedom, corruption, gross domestic product (GDP) per capita) in SWB, and not just individual factors (for example, personal income)[34]. To infer the different factors that are predictive of SWB, research has moved towards different types of study designs beyond cross-sectional studies, including longitudinal, experimental and intervention studies. For example, scientists can assess the cross-lagged effects of income on SWB (and vice versa) over time[35], and examine the buffering role of happiness against experimental exposure to the cold virus[36]. These methods enable stronger causal inferences to be made.

Known influences of SWB

The factors that underpin or influence SWB range from genetics to societal conditions. SWB has been shown to be attributable to genetics and is moderately heritable, with average heritability estimates ranging from 0.32 to 0.41 in past meta-analyses[38–40]. This indicates that, on average, about 30 to 40% of the variance in individual differences in SWB is attributable to genetic effects. One explanation is that there are happy and unhappy personalities, where more extraverted individuals are happier, along with people who are less anxious and worried[40]. At the same time, the heritability estimates also indicate that about 60 to 70% of SWB is attributable to environmental effects. Thus, there are likely many controllable factors that can increase or lower SWB.

Researchers have theorized that there are basic and psychological needs that when fulfilled lead to SWB. Derivable from evolutionary theory[41] and organisimic theories of humans' inherent desire for growth[42], these needs are thought to be universal. Recent e4vidence has supported this. Across 123 nations, the fulfilment of basic and psychological needs has been shown to be positively associated with SWB[33]. Life evaluations were most strongly associated with fulfilling basic needs such as food and shelter ($r = 0.31$). Positive feelings were most strongly associated with having social needs met ($r = 0.29$) and experiencing respect from others ($r = 0.36$). Importantly, the fulfilment of basic and psychological needs was additive for SWB, indicating that each need promotes SWB independent of other needs.

One of the most extensively studied topics is income and SWB, and one reason for its association is because it helps fulfil basic (for example, shelter, food) and psychological needs (for example, autonomy)[43]. Interestingly, this association may depend on the type of SWB assessed. Across the world, income appears to be more strongly associated with life evaluation than with positive/negative feelings[44]. Within the United States, income was observed to be fairly linearly associated with life evaluation, but it satiated around the annual income of US$75,000 for positive affect[45]. Globally, across 1.7 million individuals, spline regression models revealed that satiation occurs at US$95,000 for life evaluation and US$60,000–75,000 for emotional well-being[46]. This suggests that income serves to fulfil basic and psychological needs to a point.

Apart from fulfilling inherent human needs, life circumstances have also been shown to influence SWB. People are typically happier one year before marriage and stay happy after marriage ($d = 0.23$). However, people on average adapt back to their pre-marriage baseline levels after a couple of years ($d = -0.01$)[47]. Although many people believe that having children will make them happier, having children does not seem to be associated with higher levels of SWB, especially once household income, education, religiosity and health are statistically controlled for[48]. The association between having children and SWB also depends on a variety of other factors such as finances, marital quality and sleep disturbances[49]. In contrast, other life events such as widowhood ($d = -0.40$)[47], unemployment ($d = -0.40$)[50] and disability ($d = -0.40$ to -1.27)[51] are often associated with lower levels of SWB for a longer term. Thus, SWB is sensitive to changing personal circumstances[52].

Community and societal factors are also associated with SWB. Geerling and Diener (D. Geerling & E. Diener, manuscript in preparation) examined in a large and representative sample of the world the effect sizes of various influences on SWB, so that they could be directly compared within the same population. They found that certain effects, such as the differences between nations in life satisfaction, were very large. Economic factors such as national income, or GDP per capita, have been associated with SWB in the cross-section ($r = 0.83$, $P < 0.001$)[53] and over time, particularly when economic gains are translated to fulfilling citizen needs[35,54]. Sociopolitical factors such as lower inequality ($r = 0.47$, $P < 0.001$)[55], more political freedoms ($r = 0.55$, $P < 0.001$)[56] and lower corruption (accounting for 13% of variance in national life satisfaction over time)[57] have also been linked to SWB. SWB is also higher in healthy environments. Experimental and longitudinal studies have shown that having green space can raise SWB ($d = 0.78$ in Hartig et al.)[58–60]; and living downwind from smokestacks is associated with lower SWB — although the installation of air pollution control devices buffer these effects[61]. Altogether, SWB reveals the importance of the desirability of economic, sociopolitical and natural environments. It also has implications for community and national policies seeking to enhance SWB (for example, zoning and taxation, for example)[62].

Theoretical processes associated with SWB

Theories of SWB can be classified into three types: (1) biological/temperament theories, (2) satisfaction of goals theories and (3) mental-state theories. The biological/temperamental theories of SWB focus on biology and genetics to explain why some people are consistently happier than others. For instance, this approach explains why monozygotic twins reared apart are more similar to each other than dizygotic twins reared together[63]. Similarly, biological theories explain why most daily events affect one's SWB for a short time with an eventual return to baseline[64]. This phenomenon is known as set-point theory, in which individuals have their own biologically determined set-points to which they return over time.

Although genetic influence on SWB is indisputable, the set-point theory has been criticized based on the findings that many people who experienced serious negative events, such as unemployment, divorce and widowhood, do not invariably return to their baseline[65,66]. On the positive side, immigrants to Canada change from the previous levels of life satisfaction of their former nations, usually lower, to the higher average level of life satisfaction in Canada[67]. Furthermore, set-point theory cannot explain substantial cross-national differences in SWB. Thus, although there may be individual propensities to more or less happiness, the environment and circumstances can influence SWB so that there is not a firm set-point for each individual.

The second type of theory — satisfaction of goals theories — is based on the idea that people are satisfied with their lives to the extent that their needs, desires and goals are satisfied[68]. This type of theory assumes that the satisfaction of key needs, desires and goals will give rise to high levels of SWB, and the dissatisfaction of them will give rise to low levels of SWB. Many longitudinal studies show that when people achieve their valued goals, they become more satisfied with their lives than before[69]. In addition, this approach explains in part why US multimillionaires are not far more satisfied with their lives than the Amish[70]. A multimillionaire might need ever more luxurious lifestyles to feel happy, whereas Amish persons need much less to feel that their needs are being met. Finally, this explanation is consistent with the resource theory of SWB[71], in that people are satisfied with their lives to the extent that they have enough material, cognitive, spiritual and/or relational resources to fulfil their personal needs and desires.

The third type of theory — mental-state theories — centres on cognitive and attentional processes. For instance, the hedonomics theory of Hsee et al.[72] explains how the presentation of information affects one's happiness. Specifically, people who make the same income will differ in how happy they are about their income, depending on reference points and the standard of comparisons. This helps us understand counterintuitive findings, such as those who live in a rich neighbourhood are less happy than those living in a poor neighbourhood, once their own income was statistically controlled[73]. It also provides specific examples of how to avoid common suboptimal life decisions (for example, when making a purchase decision of a house, people tend to focus too much on comparative aspects of the house relative to other potential houses, such as number of bathrooms and square footage, and pay insufficient attention to how it will feel to live in the house day-to-day). Hsee et al.'s hedonomics theory prescribes how to increase happiness using well-known cognitive and attentional biases. Other similar theories[70,74,75] also argue that happiness is in part affected by one's attention to a particular event, and interpretation of and memory for the event. From a different perspective, researchers also theorize that mindfulness[76] and savouring[77] increase positive emotional experiences and decrease negative emotions via differential attention to certain objects, thoughts and feelings.

Outcomes of SWB

In recent years, a new focus of research in this area is whether high SWB is truly a good thing. Besides feeling good for the person, does it help or hinder the person in achieving goals, and how does it influence a person's relationships with others and society at large? Some might argue that too much SWB could interfere with motivation, for example, to achieve new goals, or make a person complacent about problems. In contrast, one could imagine that people who are low in SWB might be more consumed with their own worries and concerns, and thus not become involved in solving societal issues. Much research has now been conducted on this question, and the general answer is that positive SWB seems to be beneficial in a number of life activities, but in some cases too much of it might not be optimal. Research indicates that SWB is beneficial for health and longevity, supportive social relationships, citizenship, work performance and resilience (see review by De Neve et al.[78]).

There are now hundreds of studies related to the longitudinal association between SWB and later health and longevity[79]. It appears that people who are high in SWB tend to experience better health and live longer on average ($r = 0.18$ in Lyubomirsky et al.[80]). The reasons for this have been extensively explored, and it seems that there are a number of ways that SWB can improve health. Perhaps the most important reason that people high in well-being experience better health is that they are more likely to perform health behaviours such as exercising ($r = 0.12$–0.33), not smoking ($r = -0.24$) and drinking less alcohol ($r = -0.22$). However, the cardiovascular, immune and endocrine systems all seem to be affected by a person's psychological well-being as well. As people high in SWB tend to be healthier, it is not surprising that they tend on average to live longer[81,82]. For example, in a study of nuns, the

nuns who were among the happiest quartile when entering the convent had a 2.5 times lower mortality rate than the lowest quartile sisters[83]. Larger studies that have followed older people over time also show substantial differences in mortality between those experiencing the most and least positive emotion (a five-year follow-up death rate of 3.6% in the highest third versus 7.3% in the lowest third in positive emotion)[84].

In the realm of social relationships, people high in SWB excel. They are more likely to get married ($d = 0.28$ in Lucas et al.[47]) and less likely to get divorced (OR = 0.58–0.85 in Luhmann et al.[85]). They have more friends and people like them more (see review by Moore et al.[86]). At work, employees who are higher in positive feelings and higher in job satisfaction have higher performance than their unhappy counterparts ($r = 0.24$–0.27 in Lyubomirsky et al.[87]). The outperformance of happier individuals is apparent in organizational citizenship — helping others and doing extra things for the company and one's colleagues that are not demanded by their job description ($r = 0.16$ in a meta-analysis by Borman et al.[88]). Happy workers may excel for several reasons, including lower job turnover, better social relations at work, less absenteeism and higher levels of creativity. Another area where happier individuals on average outshine their unhappy fellow citizens is in terms of resilience — they tend to bounce back more quickly from bad events, and recover from stress more rapidly ($r = 0.32$)[89].

A challenging question in this field is of causality — does high SWB follow from the salubrious conditions mentioned above, or cause them? It now seems likely that the causal arrow often travels in both directions. For example, health and illness can influence SWB, just as it in turn can influence them. The same is also true for supportive social relationships and work performance. Apart from using longitudinal designs to infer causality as mentioned earlier, another line of causal inquiry is research with animals, where more can be controlled and manipulated than is possible with human studies. When animals are exposed to chronic stressors, for instance, they are more likely to suffer from certain maladies. Finally, there are long-term experiments in which researchers tend to raise long-term levels of SWB and improved health is observed. There are fewer studies of this type, but some of them have found effects for well-being intervention on physical health. For health, the causal evidence has been reviewed by Diener et al.[79]. For social relationships, the evidence has been reviewed by Moore et al.[86], and for work productivity, it has been reviewed by Tenney et al.[87]. In each of these areas, more research is needed, for example, in which long-term levels of SWB are raised and objective measures of the outcomes are assessed.

There are caveats to note when asserting that SWB is beneficial. First, we know only a little about the cross-cultural generality of the findings. Most of the research has been conducted in highly economically developed Western nations. As happiness is highly valued in these nations, we do not know whether the findings might also apply in Africa, South America or Asia. A second caveat is that there may be threshold effects — more and more SWB might not be beneficial after people reach a certain point. Oishi et al.[90], for instance, found that for social relationships, the higher the life satisfaction, the better were the outcomes. However, for achievement activities such as earning high college grades and high income, moderately high SWB was optimal, and above that there was a small falling-off[90]. Similarly, Pressman and Cohen[91]reported that highly aroused positive affect can have some negative influences on health.

A noteworthy finding in this area of the outcomes of SWB is that momentary negative emotions can in some instances be helpful[92]. Whereas chronic negative emotions are often harmful in a variety of ways, momentary unpleasant feelings can benefit the individual and his or her group. They can stimulate the person to be more careful and analytical. Furthermore, more anxious individuals may be more likely to warn the group of dangers. In addition, people in positive moods, although creative, can rely more on stereotypes of default decisions, even when it would be better to think critically. Kashdan and Biswas-Diener[93] have reviewed evidence showing that openness to some temporary unpleasant feelings in certain situations can be beneficial. Thus, we can conclude that a tendency to mostly experience pleasant feelings can often help the person in many circumstances, but that temporary bad moods can also at times be beneficial. So far, we know little about whether a tendency to positive moods is as beneficial in very dire and threatening circumstances as it is in more felicitous circumstances.

Cross-national comparisons in SWB

With the advance in the measurement of SWB described above, researchers have ventured into cross-cultural comparisons in mean levels and predictors of SWB (see Oishi and Gilbert[94] for a review). The first question that was explored was whether residents of wealthy nations are happier than those of poor nations. In 1974, Easterlin used survey data from 14 of the wealthiest (for example, the United States, West Germany) and the poorest nations (for example, Nigeria, India) in the world, and found surprisingly small differences between the wealthiest and the poorest nations[95]. However, this aspect of the Easterlin paradox has been highly disputed. Veenhoven[96] reanalysed the original data and reported a significant association between GDP per capita and the happiness of nations ($r = 0.65$, $P < 0.01$). Diener et al.[97] analysed data from 55 nations and found a substantial correlation between GDP per capita and the mean SWB of nations ($r = 0.58$, $P < 0.001$). An analysis of 131 countries by Stevenson and Wolfers[98] resulted in an even higher estimate ($r = 0.82$)[98]. When Cantril's ladder scale was used (responses varying from 1 = worst possible life to 10 = best possible life)[99], residents of wealthy countries on average reported their current life to be closer to the best possible life than residents of poor countries. The mean difference is large: around 4 in Zimbabwe and around 7.5 in Denmark, on the 1–10 point scale[100]. Thus, the consensus today is that the wealth of nations is closely associated with whether residents can live their lives close to their ideal.

It should be noted, however, that the wealth of nations is less strongly associated with the mean levels of positive emotions. For instance, when happiness was assessed with two items ('enjoyed your life yesterday?' and 'smiled a lot yesterday?'), the mean levels of happiness were only moderately associated with GDP per capita ($r = 0.35$)[101]. Furthermore, countries where residents reported more happiness tend to report being able to choose how to spend their time ($r = 0.43$, $P < 0.001$). Thus, even in a poor country, as long as residents were able to choose how to spend their time, they were likely to enjoy their lives and smile a lot. In contrast, even in a wealthy country, unless residents were able to choose how to spend their time, they were less likely to enjoy their lives or smile a lot.

In addition to cross-national differences in mean levels of SWB, researchers have explored potential cultural variations in predictors of SWB. For instance, self-esteem is a strong predictor of life satisfaction among US citizens, whereas it is not among Indian women[102]. Similarly, financial satisfaction is more strongly associated with life satisfaction in poor countries than in wealthy countries[102,103]. Religiosity is more strongly associated with life satisfaction in religious countries than in secular countries[104]. An age–life satisfaction association is typically a U-shape; people in their 20s as well as in their 70s and 80s are more satisfied with their lives in general than those in their late 40s and early 50s[105]. However, the bottom of the U-shape varies across countries; it is far later for Russians and Croatians than for British, Brazilians and Australians[106]. That is, on average British, Brazilians and Australians reach the worst time of their lives in their early 40s, then become more satisfied with their lives as they age further, whereas Russians and Croatians' life satisfaction continues to drop into their 70s (because these analyses were based on cross-sectional data, however, these findings could be due to cohort effects).

Some researchers argue that the satisfaction of basic psychological needs such as autonomy, relatedness and competence is universally associated with SWB[107]. A recent meta-analysis showed that need satisfaction in autonomy was similarly associated with SWB between Western samples (for example, United States) and Eastern samples (for example, China)[108]. Approach orientation is known to be positively associated with SWB, whereas avoidance orientation is known to be negatively associated with SWB among US citizens ($r = -0.36$)[109]. However, avoidance orientation was not negatively associated with SWB among Russians ($r = -0.05$). Furthermore, some researchers did not find significant correlations between autonomy and positive affect, even among the US ($r = 0.09$) and Australian ($r = 0.13$) samples[110]. To be sure, self-esteem, income, financial satisfaction, family satisfaction and job satisfaction are positively associated with SWB in most countries. However, the degree to which these are associated with SWB varies across countries, due in part to differential reliability and validity of measures, but also in part due to cultural values and norms[102,103].

Yet other researchers have explored different meanings of SWB across cultures. For instance, the dictionary analysis of happiness in 30 countries (for example, German definitions of glück, Japanese dictionary definitions of 幸福) revealed that in 24 of these nations (for example, Japan, Korea, China, Russia, Norway) happiness literally means good luck and fortune[111]. Whereas in the US happiness is now typically believed to be something people can actively pursue and attain, in many cultures it is construed as something that is determined at least in part by luck. The following Chinese saying reflects the luck-based happiness: 'When man has done his work, the rest is up to the Heaven'[112]. Even in luck-based happiness societies, people tend to feel happy when they attain their personal goals. However, there is often a sense that they were lucky to attain their goals, which tends to lead to a feeling of gratitude rather than pride per se[113]. In the countries where people construe happiness as good luck and fortune, they also tend to fear happiness in part because they think that happiness is likely to be followed by unhappiness[114].

To the extent that US citizens typically construe happiness as something pursuable, they tend to associate happiness with success. Thus, US citizens also value success-related emotions such as pride and excitement[115]. In contrast, Chinese tend to associate happiness with a harmonious state of existence[112]. Thus, Chinese tend to value low arousal positive emotions such as calm and contentment[115]. In summary, culture and SWB research has shown that mean levels and predictors of SWB vary across cultures and variations are systematically associated with the wealth of nations and/or cultural values and norms. Recent research further highlights some important conceptual variations in SWB across cultures, which further suggests that a path to greater happiness might differ across cultures.

National accounts of SWB for policy

In 2000, Diener suggested that national accounts of SWB be created to help inform policy decisions beyond the economic indicators that are currently ubiquitous, and in subsequent articles the rationale, defence and details of this suggestion were fleshed out[62,116,117]. A number of economists also proposed to use an aggregate of self-reported SWB as an indicator of how society is doing[118–120]. Like most psychologists, many economists advocate using global reports of life satisfaction, positive emotions, and additionally purpose/meaning as an indicators of (subjective) well-being[118,119]. However, there are other economists who seek to create a new index of SWB with a comprehensive list of non-overlapping components (for example, family, health, finance), just as GDP is computed based on money spent on numerous goods and services[121,122].

Regardless of the contents of a specific SWB index, the key idea rests on the recognition that although economic indicators contain valuable information about the well-being of societies, they have blind spots and shortcomings as well. In view of this, there are several reasons for the desirability of national accounts of well-being[118,119,123]. Foremost, well-being measures are highly valued by citizens and it is important to assess it directly. Surveys across 17 nations consistently revealed that individuals value SWB more than money[124]. Second, SWB augments information that is not apparent in economic measures, such as the recognition that material production has costs as well as benefits, for example, to the environment. Finally, as discussed above, SWB is associated with other desirable outcomes, such as greater health and work productivity.

Empirically, there are a number of findings that support the use of SWB to provide a richer societal account. For example, although national economic development is one of the strongest predictors of life satisfaction around the world, it is not as strongly predictive of high positive or low negative feelings, implying that we may need to consider non-economic factors to improve affective well-being. SWB indicators can also provide grounds for economic policy decisions. Oishi et al.[125] found that progressive taxation is associated with higher well-being, even when controlling for national income and overall amount of taxation. Also in the economic sphere, income inequality is often associated with lower SWB[126]. One of the more highly replicated findings in this area is that unemployment is strongly associated with lower SWB[127] and is even related to lowered national job satisfaction among employed workers over time[128]. Finally, income security programmes repeatedly have been found to be associated with higher well-being[129].

In the environmental realm, clean air seems to lead to higher SWB[61], and heavy, longer commuting to work can be associated with lower well-being[130]. Smoking seems to be related to lower SWB, and thus perhaps counterintuitively, increasing cigarette taxes can actually raise the happiness of smokers[131]. There are many more examples in the references listed above of cases where well-being findings have the potential to inform policy. Although the well-being scores do not trump other considerations such as costs, health outcomes, or fairness and justice, they can provide insights into policy alternatives (see, however, Weimann et al.[132] for skepticism; see Feffetz and Rabin[27] for possible sampling bias issues).

There have been several notable advances in the use of well-being for policy input. Both the National Academy of Sciences and the Organisation for Economic Co-operation and Development reviewed the idea of using well-being measures to inform policy deliberations, and issues reports that are sympathetic to the idea, although also offering cautions. In the United Kingdom, a large amount of additional public funds were allocated to mental health treatment for an underserved population, based on the finding of the widespread misery produced by mental illness. The United Arab Emirates recently issued a manual to its government employees, describing how well-being should be considered and monitored when new policies and programmes are discussed and implemented.

A number of issues remain regarding the use of well-being measures in informing discussions of policy alternatives. For one thing, there is a question of whether survey respondents might skew their responses to move policy in directions they view as desirable. This concern combines with the potential measurement biases[20,21] to indicate that more research is needed to determine when biases are most likely to influence the measures. Another concern is whether adaptation to conditions and respondents aspirations are so influential in moulding their responses that the actual circumstances of their lives are not strongly reflected in the well-being measures. A similar concern is that national leaders can heavily influence the measures of well-being by creating external enemies and other strategies to influence public attitudes, and thereby negate the ability of the well-being measures to reflect the actual underlying conditions of life in the society.

Unknowns and future research

Although the number of empirical studies on SWB has grown dramatically over the past decade, there remain many unknowns. First, much research has been conducted in North America and Europe. It is important to explore whether the well-replicated findings, such as the adverse effects of unemployment and widowhood, would replicate elsewhere. Second, the majority of SWB research has relied on self-report surveys. Although informant reports and other reports show some convergence, it is important to examine the unique predictive value of different methods. For instance, what kinds of outcomes are predicted better by informant reports, biological measures or an aggregate of momentary reports than by self-report surveys? Because the self-report survey measures contain some biases, we need to ask whether the findings replicate when using other types of measures of SWB. Third, field experiments are rare in evaluating the effects of policy on SWB. As policymakers become interested in SWB as a criterion, it is critical to conduct field experiments and take advantage of a natural experiment. Fourth, although there is no doubt that genes play a role in individual differences of SWB, more research needs to explicate the biological mechanisms underlying the genetic effects. Finally, optimal levels of SWB are likely to vary, not just in terms of outcomes (for example, earning, stable romantic relationships), but also across individuals and cultures. It is important to identify systematic individual and cultural variations in optimal levels of SWB.

In conclusion, SWB research reveals that a subjective sense of happiness and life satisfaction is beneficial for an individual's as well as a society's effective functioning. Furthermore, SWB reflects a composite reflection of how people appraise the many facets of their lives. Thus, SWB is a very useful indicator of personal and societal quality of life. It is essential to track citizens' subjective sense of happiness and life satisfaction to improve societal conditions and maximize the fulfilment of human potential.

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Competing interests

The authors declare no competing interests.

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