

Evaluation of sustainable happiness with Sustainable Development Goals: Structural equation model approach

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Abstract

The concept of sustainable development has become the focal point of modern debates. The purpose of sustainable development is to improve the quality of life of people of the world. It could only be possible to talk about sustainable welfare and happiness for all when and if we achieve sustainable development. In 2015, the United Nations developed the Sustainable Development Goals. In order to ensure the welfare and happiness of countries in the future, it is argued that these objectives should be achieved. In this study, it has been investigated whether the dimensions of sustainable development are effective in explaining the sustainable happiness that provides welfare and life satisfaction. For example, does economic freedom also lead to higher levels of happiness? Do environmental impacts have a direct impact on happiness beyond the effects on human health? Can social sustainability bring satisfaction to happiness in society? In this context, three dimensions of sustainable development were analyzed with respect to sustainable happiness by using the structural equation model. According to the analysis results, it was found that the environmental dimension of sustainable development has a positive correlation with sustainable happiness. Furthermore, another finding was that improvements in social sustainability have a positive effect on sustainable happiness. On the other hand, there were no statistically significant correlations between the economic dimension and sustainable happiness. The results support previous work and emphasize that sustainable development should be taken into account clearly to ensure sustainable happiness.

KEYWORDS

economic sustainability, environmental sustainability, happiness, social sustainability, structural equation model, sustainable development

1 | INTRODUCTION

The concept of sustainable development has grown into a rather comprehensive and complex subject. This concept has emphasized that economic development, environmental development, and social development cannot be studied in isolation from each other. There are global action plans in place aimed at sustainable development. The latest addition to these action plans is the 2030 Agenda for Sustainable

Development. Drafted by the United Nations in 2015, the 2030 Agenda for Sustainable Development adopted 17 Sustainable Development Goals (SDGs) with the purpose of ending poverty and ensuring social participation, environmental protection, among others. It was suggested that these goals must be met in order to ensure welfare for all in the world. These goals were built on three dimensions, namely, economic, social, and environmental development, and they are defined to ensure sustainable development in the world (United

Nations, 2015). The aim is to measure sustainable development using the indicators created for each one of these dimensions. These indicators are necessary to meet the need for measuring the progress of sustainable development, to follow at national, regional, and global levels, and to facilitate decision-making processes, taking into account the three dimensions (Diaz-Sarachaga, Jato-Espino, & Castro-Fresno, 2018). The abovementioned SDGs were adopted by approximately 200 countries (Campagnolo & Eboli, 2015; United Nations Development Program [UNDP], 2015). It is evident that the indicators of economic, environmental, and social sustainability must be in balance all over the world to achieve sustainable development. To be able to ensure such balance, on the other hand, all the nations must work together (Malik, 2017).

Economic sustainability suggests a production system that is able to meet the level of consumption using available resources without compromising on future needs (Basiago, 1998). Social sustainability, on the other hand, is a social process that improves the quality of life of the people (McKenzie, 2004). The main purpose here is continuous social welfare. Environmental sustainability refers to the preservation of natural resources (Goodland & Daly, 1996).

Happiness and welfare of the societies heavily depend on the advancements made in sustainable development. O'Brien (2005) defines sustainable happiness as the pursuit of happiness that contributes to global welfare, society, and individual without exploiting other people, the environment, or future generations. The author also noted that such happiness depends on sustainability. The happiness of societies is related to personal income according to economists. Whereas sociologists underline the importance of social capital in order to have a happy community, ecologists suggest that human well-being is only possible through environmental sustainability. However, the advocates of sustainable development suggested, in their World Happiness report, that happiness depends on a number of factors such as well-being, which includes livelihood, housing, nutrition, clothing, security, feeling good, living in a clean environment, social adaptation, justice, freedom, equality, good social relationships, and many others, discussing that it is only possible through a combined focus on economic, social, and environmental dimensions (Helliwell, Layard, & Sachs, 2016). According to this report, sustainable development is a far more inclusive guide for happiness when compared with isolated concepts such as income, employment, and economic freedom. As mentioned by Helliwell et al. (2013), Helliwell, Layard, and Sachs (2015, 2017), and Helliwell et al. (2016), happiness is the product of many aspects of society. According to the World Happiness report (2017), happiness is a measure of social development and well-received public policies. The UNDP suggested that nations need to check on happiness as they try to ensure sustainable development. The New Economics Foundation (NEF) developed the Happy Planet Index as a measure of social happiness. The creator of Happy Planet Index, Marks (2006), promoted the idea that the welfare and happiness of a nation should be based not only on financial indicators but also on social and environmental dimensions. Also, the same index suggests that environmental issues, social justice, and general well-being should have equal standing as the improvement of national

income. Happy Planet Index focuses on how the nations can be happy and how they can live a longer and sustainable life. This index is calculated using the variables of well-being, life expectancy, inequality of outcomes, and the ecological footprint (Happy Planet Index, 2016).

There are different views in the literature about the effect of the economic dimension of sustainable development on happiness (Coyle, 2010; Deaton, 2008; Diener & Biswas-Diener, 2002; Fischer, 2008; Hagerty & Veenhoven, 2003; Veenhoven, 2004). According to the first view, economic sustainability increases happiness (Hagerty & Veenhoven, 2003; Inglehart, Foa, Peterson, & Welzel, 2008; Stevenson & Wolfers, 2008; Tella & MacCulloch, 2008; Tella, MacCulloch, & Oswald, 2003; Veenhoven, 1991). The advocates of the first view claim that developing nations with increasing gross domestic product will increase their happiness because they are not forced to meet their needs. They believe that economic development is the driving power behind the increased employment rate along with advancing in areas such as health and education, that is, it provides the riches needed in order to meet the needs of societies. Besides, they hold that the wealth, when increased at a national level, will also increase the level of happiness; otherwise, the shrinking economy will cause unrest in the society (Marks, Abdallah, Simms, & Thompson, 2006). According to the second view, economic sustainability does not have a positive impact on the happiness of societies (Easterlin, 1974, 1995; Diener, Sandvik, Seidlitz, & Diener, 1993; Easterlin & Angelescu, 2009; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006; Clark, Frijters, & Shields, 2008; Tella & MacCulloch, 2008; Layard, 2005; Dietz et al., 2001; Goldstein, 1985; Inglehart & Klingemann, 2000; Preston, 1975).

Easterlin (2004) found that there is no long-term correlation between personal income and life satisfaction; however, the author reported a statistically significant positive correlation between these two variables in the short term. According to the author, if the basic needs of people are met by economic growth in low-income societies, then such economic growth will have a positive impact on the happiness of the people. On the other hand, the economic growth of a nation with high-income would lead to diminishing marginal revenue. Thus, economic growth has no impact on the welfare of the society (Easterlin, 2013; Frey & Stutzer, 2002). Other studies on this subject suggested that economic growth leads to increased pollution (Cobb, Halstead, & Rowe, 1995), depletion of natural resources (Meadows, Meadows, Randers, & Behrens, 1972), and increased psychological stress (Thoits & Hannan, 1979), which are known to be detrimental to happiness. Malik (2017) suggested that the modern economic system behind the economic development consists of unequal economic functions, which have a negative impact on global peace and happiness. Moreover, the comparison of the correlation between economic development and happiness in developed, developing, and transition economies gave statistically insignificant results (Easterlin, 2009; Easterlin & Sawangfa, 2010). Many researchers reported similar results using different datasets in different periods in time (Blanchflower & Oswald, 2004; Frey & Stutzer, 2002; Layard, 2005; Oswald, 1997). Mayraz, Layard, and Nickell (2006) found that any increase in the income level by 20% leads to an increase of only by 2% in the life satisfaction observed in most of the Western world. Brady, Beckfield, and

Seeleib-Kaiser (2004), on the other hand, suggested that economic development is a prerequisite of welfare in underdeveloped countries. This notion also finds support in the literature (Bhagwati, 2004; Mill, 1963).

Environmental sustainability, the environmental dimension of sustainable development, and its effect on happiness continue to receive research interest. This dimension of sustainable development especially needs to be secured in the long term if it is to ensure the happiness of the nations. Underdeveloped countries have always placed more importance on economic development in order to offer the welfare and happiness their people needs. Unfortunately, these efforts took place in a manner disregarding nature, and these countries ended up depleting their natural resources, causing deforestation and polluting water reserves (Knight & Rosa, 2009, 2011; Mazur & Rosa, 1974; Steinberger & Roberts, 2010; Steinberger, Roberts, Peters, & Baiocchi, 2012). Although it is possible for a nation's economy to assume an uptrend, which brings happiness to the communities in the short term, they actually damage human well-being by destroying the ecosystem (Millennium Ecosystem Assessment, 2005).

The literature offers a number of studies suggesting the need for environmental sustainability in order to ensure that the nations have sustainable happiness (Dietz & Jorgenson, 2014; Dietz, Rosa, & York, 2012; Jorgenson, 2014; Knight & Rosa, 2011; Steinberger & Roberts, 2010). It was found that there is a direct, an indirect, and a mediation effect between environmental sustainability and happiness (Adger & Jordan, 2009; Dasgupta, 2001; Dietz et al., 2012; Dietz, Hepburn, & Stern, 2007; Dietz, Rosa, & York, 2009; Jorgenson, 2014; Marks, 2006; McKinnon et al., 2016; Reid et al., 2005; Russell et al., 2013). Lamb et al. (2014) showed that a number of nations are able to support strong and steady economies causing less damage to nature, achieving higher levels of welfare and happiness.

Having claimed that the purpose of sustainability is to minimize environmental stress while maximizing human happiness, Dietz et al. (2009) analyzed the nations for their social, economic, and environmental sustainability and the effects of such sustainability on happiness. The authors developed the concept of environmental efficiency of well-being and called for the minimization of the environmental damage in order to maximize human welfare. The concept of environmental efficiency of well-being is consistent with the definitions of sustainability as it considers both happiness and the level of environmental consumption.

Social sustainability, the last dimension of sustainable development, has always been in the background of the discussions (Anand & Sen, 2000; Dillard, Dujon, & King, 2008; Partridge, 2014; Vallance, Perkins, & Dixon, 2011; Woodcraft, 2015). Social sustainability refers to the welfare of individuals and societies, protection of cultural values, promotion of social adaptation and participation, equal opportunity for all, ensuring fair income distribution, equal access to facilities and services, and democratic and a better government. In short, it is a concept that calls for the satisfaction of material, immaterial, and social needs of the people (Atkins, 2008; Rogers et al., 2012; Sachs, 1999). Social sustainability actively supports the present and future generations in order to create healthy and livable societies. It

ensures improved quality of life for these people (WACOSS, 2004). The literature generally agrees that the people are satisfied with happiness as soon as social sustainability prevails. Yan and Spangenberg (2018) stated that ensuring social justice and fair distribution is also an indispensable component of the happiness of the citizens and, hence, of political stability. Rogers et al. (2012) advocated that human well-being is a more important factor in social sustainability when compared with consumption and called for the equitable distribution of natural resources for sustainable development. It is also believed that a socially sustainable society, which places more importance on cultural values and social relations, would be happier than a consumer society, which places more importance on economic growth (Rogers et al., 2012). Dillard et al. (2008) suggested that the welfare and happiness of societies depend on social sustainability. The author held that human beings are social creatures and that societies with better social relationships that allow for social engagement are happier than the others. A number of studies reported that social sustainability offers a number of benefits for individuals and societies in general (Fredrickson, 2001; Lyubomirsky, King, & Diener, 2005). Lyubomirsky et al. (2005) emphasized the limited interest in happiness in the literature, although happiness is a universal pursuit. In this respect, the authors focused on how to improve happiness and how to achieve sustainable happiness. Cloutier and Pfeiffer (2015) explored a hypothetical sustainable society that focuses on happiness. The authors developed Sustainability Through Happiness Framework as an approach to this hypothesis. In their approach, happiness was a goal in achieving social sustainability. Magee, Scerri, and James (2012) suggested that societies with a stable political scene, where the members of society engage in harmony, are sustainable societies with improved welfare.

2 | METHODS

The research model was tested using structural equation modeling. A structural equation model is a multivariate statistical technique used to explore the causal and correlational relationship between observed and latent variables. This technique simultaneously tests the relationships in a model using a holistic approach (Anderson & Gerbing, 1988). In this study, the structural equation model was used to measure the effect of the three dimensions of sustainable development on sustainable happiness.

2.1 | Data collection

This study used the SDGs defined by the United Nations and the Happy Planet Index developed by the NEF in order to measure and sustainable happiness. The SDGs specify 17 universal goals, 169 targets, and 230 indicators leading up to 2030. The Happy Planet Index of each nation is calculated by multiplying the average life expectancy and average life satisfaction of that nation divided by the ecological footprint (Happy Planet Index, 2016). The data for these variables were obtained from the UNDP and happyplanetindex.org websites.

The data were then rendered for the analysis using z-score standardization. Some nations were excluded as the data were insufficient to conduct an analysis. A total number of 131 nations ($n = 131$) were included in the study.

2.2 | Model

In this study, the sub-dimensions used were those obtained using the confirmatory factor analysis as conducted by Spaiser, Ranganathan, Swain, and Sumpter (2016) to reduce the SDGs defined by the United Nations Open Working Group into their economic, social, and environmental dimensions. There are a total number of 17 SDGs. Spaiser et al. (2016) categorized five SDGs under the economy dimension, six SDGs under the social dimension, and the remaining five SDGs under the environmental dimension of sustainable development. Global cooperation for sustainable development, which is goal 17, is not included in these dimensions. Goal 17 is about making sure all countries have what they need (funds, capacities, technologies, etc.) to achieve the rest of the SDGs (United Nations, 2015).

In the conceptual model, these three dimensions of sustainable development were defined as the exogenous latent variable, and the Happy Planet Index developed by NEF to measure happiness was defined as the endogenous latent variable (Figure 1). Happy Planet Index is developed on the basis of well-being, life expectancy, inequality of outcomes, and ecological footprint.

3 | RESULTS

The structural equation model estimated for happiness is shown in Figure 2. This model allowed covariates between the error terms and the indicators of the dimensions of sustainable development. However, these were not shown in the model. The model indicates a good fit to the data, with $\chi^2/df=2.762$, root mean square error of approximation (RMSEA) =0.10, standardized root mean square residual

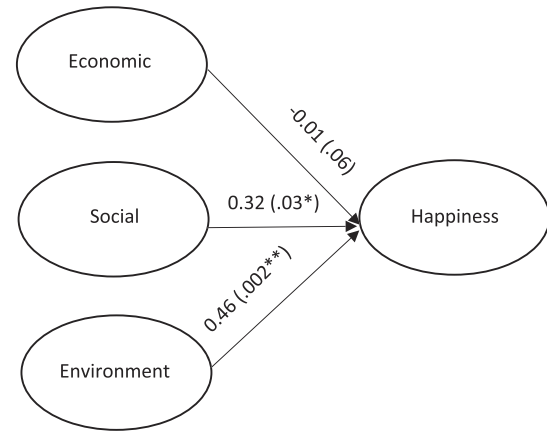
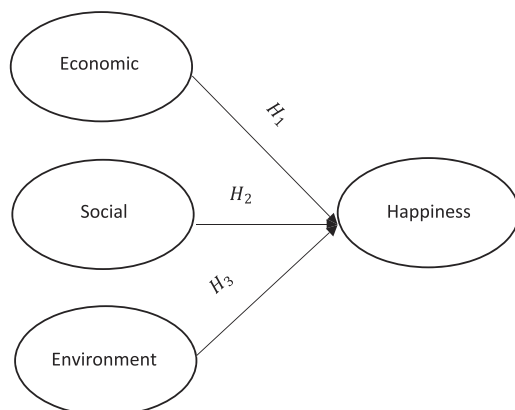


FIGURE 2 Standardized solution of the causal model. * $p < .05$; ** $p < .01$

(SRMR) =0.08, goodness of fit index (GFI) =0.76 and comparative fit index (CFI) =0.88 (Byrne, 2016). Among the results obtained, GFI and CFI values are out of acceptable limits. The R^2 was found to be 0.94 for sustainable happiness. This finding suggests that 94% of the variance in sustainable happiness can be accounted for by economic, social and environmental variables. Thus, the variables in our model predict a large share of the variance in sustainable happiness. The economic dimension of sustainable development was found to be statistically insignificant in the estimated model ($\beta = -0.01$; $p > 0.05$). This can be explained by the fact that the nations included in the dataset offer heterogeneous economic development levels. The difference in the economic development levels of nations lead to differences in the way they perceive happiness. It was found that social sustainability has a direct and positive correlation with happiness ($\beta = 0.32$; $p < 0.05$). This finding suggests that the welfare of society, protection of cultural values, promotion of social adaptation and participation, equal opportunity for all, equal access to facilities and services, and a democratic and a better government increase the happiness level of the society. Among the dimensions of sustainable development,



H_1 : The economic dimension of sustainable development has a correlation with happiness.

H_2 : The social dimension of sustainable development has a direct and positive correlation with happiness.

H_3 : The environmental dimension of sustainable development has a direct and positive correlation with happiness.

FIGURE 1 The model to be tested

environmental sustainability was found to be the dimension with the highest positive correlation with happiness ($\beta = 0.46$; $p < 0.01$). This finding suggests the importance of placing importance on environmental factors in order to ensure sustainable happiness as nations pursue sustainable development. In other words, reduction of environmental stress has a positive impact on happiness.

4 | DISCUSSION

O'Brien (2005) defined sustainable happiness as the pursuit of happiness that does not exploit other people, the environment, or future generations. On a social level, sustainable happiness requires nations to place importance on social, environmental, and economic dimensions of sustainable development. Sustainable happiness necessary for welfare for all and high levels of life satisfaction can only be achieved through sustainable development.

This study sets an example for the adoption of sustainable happiness as a goal for sustainable development and proposes an approach for achieving happiness through the SDGs. The study focuses on the sustainable happiness of the member states of the United Nations that has adopted the SDGs. It examines whether the dimensions of sustainable development are effective in explaining the levels of happiness in countries. For example, does economic freedom also lead to higher levels of happiness? Do environmental impacts have a direct impact on happiness as well as on human health? Does social sustainability contribute to sustainable happiness?

Countries, communities, or institutions use different indicators and methods to measure happiness. Happy Planet Index is a valid tool for measuring happiness (Marks et al., 2006). Sustainable development indicators are used to measure sustainable development. To date, interactions between sustainable development and happiness have been analyzed at a general level. Structural equation modeling was used to measure the potential relationships between different dimensions of sustainable development and happiness. The structural equation model is an analytical tool that enables the development of the theoretical structure and dynamics of sustainable development. The model results show that it is necessary to realize all dimensions of sustainable development for sustainable happiness. That is, in order to ensure sustainable happiness, a holistic approach to sustainable development is needed. Empirical findings show that the environmental and social dimensions of sustainable development positively affects happiness. Although the findings indicate that the economic dimension has no significant effect on happiness, there are different opinions in the literature. According to these views, perceptions of happiness vary according to the economic development of countries. Whereas economic sustainability affects happiness positively in less developed countries (Stevenson & Wolfers, 2008; Veenhoven, 1991), improvements in economic sustainability in developed countries do not affect happiness after a certain point (Diener et al., 1993; Easterlin, 1974; Schyns, 2000). Therefore, each country should establish its own national and regional policy in terms of economic sustainability. As a result, the findings showed that sustainable development should be

effective on the social and environmental dimensions in order to ensure sustainable happiness but not on economic development.

The results support previous work and emphasize that sustainable development should be clearly taken into account to ensure sustainable happiness. It is seen that countries should give importance to environmental policies in order to realize sustainable happiness (Dietz et al., 2009; Dietz & Jorgenson, 2014; Freitas, Schütz, & Oliveira, 2007). It also has a positive impact on happiness in social sustainability. Equality is linked to social justice and to a trustworthy society (Helliwell, Huang, & Wang, 2014; Hellström, Hämäläinen, Lahti, Cook, & Jousilahti, 2015; Sengupta, 2002). The perspectives in which economic growth is equal to development, increased income and consumption are enough to make people happy, and that environmental costs are ignored while ensuring sustainable development are out of date. From a new point of view, while achieving the necessary wealth to ensure sustainable development of societies, the environment, social equality, human rights, justice, and so forth are of utmost importance. For this, countries need to make significant changes in their policies and people in their behavior. These changes will bring sustainable happiness.

Flexible and efficient economic, environmental, and social systems should be developed through a multidimensional focus on economic, social, and environmental objectives in order to ensure the happiness of countries in the future. If a comprehensive and inclusive approach is adopted, sustainable happiness can be achieved by dealing with the environmental decline, inequality, and economic uncertainty.

In this study, the relationship between sustainable happiness and sustainable development is addressed only at the global level, but for future studies, analysis of country-specific perspectives will be beneficial because of the differentiation of national factors in geographical areas. It is recommended that a conceptual framework that intersects and combines themes at global, national, and local levels be created, where countries and regions can adapt to their own conditions and requirements and sustainability indicators.

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REFERENCES

- Adger, W. N., & Jordan, A. (Eds.) (2009). *Governing sustainability* (pp. 3–31). Cambridge: Cambridge University Press.
- Anand, S., & Sen, A. (2000). Human development and economic sustainability. *World Development*, 28(12), 2029–2049. [https://doi.org/10.1016/S0305-750X\(00\)00071-1](https://doi.org/10.1016/S0305-750X(00)00071-1)
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411.
- Atkins, S. (2008). Transport and social sustainability. In *a seminar at Oxford University Center for the Environment (OUCE)*.
- Basiago, A. D. (1998). Economic, social, and environmental sustainability in development theory and urban planning practice. *Environmentalist*, 19(2), 145–161. <https://doi.org/10.1023/A:1006697118620>
- Bhagwati, J. (2004). *In defense of globalization: With a new afterword*. New York: Oxford University Press.

- Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of public economics*, 88(7–8), 1359–1386. [https://doi.org/10.1016/S0047-2727\(02\)00168-8](https://doi.org/10.1016/S0047-2727(02)00168-8)
- Brady, D., Beckfield, J., & Seeleib-Kaiser, M. (2004). Economic globalization and the welfare state in affluent democracies, 1975–1998.
- Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Washington: Routledge. <https://doi.org/10.1037/ipp0000042>
- Campagnolo, L., & Eboli, F. (2015) Implications of the 2030 EU resource efficiency target on sustainable development, <https://doi.org/10.2139/ssrn.2600838>
- Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature*, 46(1), 95–144.
- Cloutier, S., & Pfeiffer, D. (2015). Sustainability through happiness: A framework for sustainable development. *Sustainable Development*, 23(5), 317–327. <https://doi.org/10.1002/sd.1593>
- Cobb, C., Halstead, T., & Rowe, J. (1995). *If the GDP is up, why is America down?* ATLANTIC-BOSTON (Vol. 276, pp. 59–79).
- Coyle, D. (2010). *The soulful science: What economists really do and why it matters*. United Kingdom: Princeton University Press.
- Dasgupta, P. (2001). *Human well-being and the natural environment*. Oxford University Press.
- Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the Gallup World Poll. *Journal of Economic perspectives*, 22(2), 53–72. <https://doi.org/10.1257/jep.22.2.53>
- Diaz-Sarachaga, J. M., Jato-Espino, D., & Castro-Fresno, D. (2018). Is the Sustainable Development Goals (SDG) index an adequate framework to measure the progress of the 2030 Agenda? *Sustainable Development*, 26(6), 663–671.
- Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social indicators research*, 57(2), 119–169.
- Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social indicators research*, 28(3), 195–223.
- Dietz, S., Hepburn, C. J., & Stern, N. (2007). Economics, ethics and climate change. <https://doi.org/10.2139/ssrn.1090572>
- Dietz, T., & Jorgenson, A. K. (2014). Towards a new view of sustainable development: Human well-being and environmental stress. *Environmental Research Letters*, 9(3), 031001.
- Dietz, T., Rosa, E. A., & York, R. (2009). Environmentally efficient well-being: Rethinking sustainability as the relationship between human well-being and environmental impacts. *Human Ecology Review*, 114–123.
- Dietz, T., Rosa, E. A., & York, R. (2012). Environmentally efficient well-being: Is there a Kuznets curve? *Applied Geography*, 32(1), 21–28.
- Dillard, J., Dujon, V., & King, M. C. (Eds.) (2008). *Understanding the social dimension of sustainability*. New York: Routledge.
- Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In *Nations and households in economic growth* (pp. 89–125). York, New York: Academic Press.
- Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization*, 27(1), 35–47.
- Easterlin, R. A. (2004). The economics of happiness. *Daedalus*, 133(2), 26–33.
- Easterlin, R. A. (2009). Happiness and the Easterlin paradox. <http://www.voxeu.org/vox-talks/happiness-and-easterlin-paradox>, Accessed 25 April 2018.
- Easterlin, R. A. (2013). Happiness, growth, and public policy. *Economic Inquiry*, 51(1), 1–15.
- Easterlin, R. A., & Angelescu, L. (2009). Happiness and growth the world over: Time series evidence on the happiness-income paradox. IZA Discussion Paper No. 4060.
- Easterlin, R. A., & Sawangfa, O. (2010). Happiness and economic growth: Does the cross section predict time trends? Evidence from developing countries. In E. Diener, J. F. Helliwell, & D. Kahneman (Eds.), *International differences in well-being* (pp. 166–216). New York, NY, US: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199732739.003.0007>
- Fischer, C. (2008). Comparing flexibility mechanisms for fuel economy standards. *Energy Policy*, 36(8), 3116–3124.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American psychologist*, 56(3), 218.
- Freitas, C. M. D., Schütz, G. E., & Oliveira, S. G. D. (2007). Environmental sustainability and human well-being indicators from the ecosystem perspective in the Middle Paraíba Region, Rio de Janeiro State, Brazil. *Cadernos de Saúde Pública*, 23, S513–S528.
- Frey, B. S., & Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic literature*, 40(2), 402–435.
- Goldstein, I. (1985). Hedonic pluralism. *Philosophical Studies*, 48(1), 49–55.
- Goodland, R., & Daly, H. (1996). Environmental sustainability: Universal and non-negotiable. *Ecological applications*, 6(4), 1002–1017.
- Hagerty, M. R., & Veenhoven, R. (2003). Wealth and happiness revisited—Growing national income does go with greater happiness. *Social indicators research*, 64(1), 1–27.
- Happy Planet Index (2016). Happy Planet Index 2016. *Methods Paper*. Zugriff vom, 18, 2017.
- Helliwell, J. F., Huang, H., & Wang, S. (2014). Social capital and well-being in times of crisis. *Journal of Happiness Studies*, 15(1), 145–162.
- Helliwell, J. F., Layard, L. R., & Sachs, J. D. (2015). World Happiness Report 2015. United Nations, Sustainable Developments Goals (SDGs). https://s3.amazonaws.com/happiness-report/2015/WHR15_Sep15.pdf. Accessed 25 April 2018.
- Helliwell, J. F., Layard, R., & Sachs, J. (2016). World Happiness Report 2016 update. New York: Sustainable Development Solutions Network: A global initiative for the United Nations. https://s3.amazonaws.com/happiness-report/2016/HR-V1_web.pdf. Accessed 22 April 2018.
- Helliwell, J. F., Layard, R., Sachs, J., & Council, E. C. (2013). World Happiness Report 2013: Sustainable Development Solutions Network. New York: *The Earth Institutr, Columbia University*. https://s3.amazonaws.com/happiness-report/2013/WorldHappinessReport2013_online.pdf. Accessed 25 April 2018
- Helliwell, J. F., Layard, R., & Sachs, J. D. (2017): World Happiness Report 2017. New York: *Sustainable Development Solutions Network Google Scholar*. <https://s3.amazonaws.com/happiness-report/2017/HR17.pdf>. Accessed 27 March 2018.
- Hellström, E., Hämäläinen, T., Lahti, V. M., Cook, J. W., & Jousilahti, J. (2015). Towards a sustainable well-being society: From principles to applications. Version 2.0. Sitra Working Paper 1.4. 2015. 35.
- Inglehart, R., Foa, R., Peterson, C., & Welzel, C. (2008). Development, freedom, and rising happiness: A global perspective (1981–2007). *Perspectives on psychological science*, 3(4), 264–285.
- Inglehart, R., & Klingemann, H. D. (2000). Genes, culture, democracy, and happiness. In E. Diener, & E. M. Suh (Eds.), *Culture and subjective well-being* (pp. 165–183). Cambridge, MA, US: The MIT Press.
- Jorgenson, A. K. (2014). Economic development and the carbon intensity of human well-being. *Nature Climate Change*, 4(3), 186.

- Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2006). Would you be happier if you were richer? A focusing illusion. *Science*, 312(5782), 1908–1910.
- Knight, K. W., & Rosa, E. A. (2009). The environmental costs of life satisfaction: A cross-national empirical test. In *SCORAI workshop on individual consumption and systemic societal transformation*. Clark University, Worcester, Massachusetts.
- Knight, K. W., & Rosa, E. A. (2011). The environmental efficiency of well-being: A cross-national analysis. *Social Science Research*, 40(3), 931–949.
- Lamb, W. F., Steinberger, J. K., Bows-Larkin, A., Peters, G. P., Roberts, J. T., & Wood, F. R. (2014). Transitions in pathways of human development and carbon emissions. *Environmental Research Letters*, 9(1), 014011.
- Layard, R. (2005). Happiness is back. *Felicidade e Políticas Públicas*, 39.
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, 131, 803–855.
- Magee, L., Scerri, A., & James, P. (2012). Measuring social sustainability: A community-centred approach. *Applied Research in Quality of Life*, 7(3), 239–261.
- Malik, A. S. (2017). Economics for a sustainable planet. In W. Y. Chen, T. Suzuki, & M. Lackner (Eds.), *Handbook of climate change mitigation and adaptation* (pp. 221–255). Cham: Springer.
- Marks, N. (2006). Happiness is a serious business. *Reflections on employee engagement*, 5–7. <https://www.cnc.cl/wp-content/uploads/2015/10/Presentacion-C3%B3n-Fundador-de-Hapiness-Works-Nic-Marks.pdf>. Accessed 17 April 2018.
- Marks, N., Abdallah, S., Simms, A., & Thompson, S. (2006). *The (un) Happy Planet Index: An index of human well-being and environmental impact*. London: New Economics Foundation.
- Mayraz, G., Layard, R., & Nickell, S. (2006). The functional relationship between income and happiness. In 3rd European Conference on Positive Psychology, Braga, Portugal (pp. 3–6).
- Mazur, A., & Rosa, E. (1974). Energy and life-style. *Science*, 186(4164), 607–610.
- McKenzie, S. (2004). Social sustainability: Towards some definitions. Hawke Research Institute Working Paper Series No. 27. University of South Australia: Adelaide.
- McKinnon, M. C., Cheng, S. H., Dupre, S., Edmond, J., Garside, R., Glew, L., ... Oliveira, I. (2016). What are the effects of nature conservation on human well-being? A systematic map of empirical evidence from developing countries. *Environmental Evidence*, 5(1), 8.
- Meadows, D. H., Meadows, D. H., Randers, J., & Behrens, W. W. III (1972). *The limits to growth*. New York, New York, USA: Universe Books.
- Mill, J. S. (1963). Collected works, vol. IV. *John Stuart Mill, Principles of Political Economy*, Ashley edition, 449.
- Millennium Ecosystem Assessment. (2005). Ecosystems and human well-being: Synthesis. Millennium Ecosystem Assessment Series. *World Resources Institute, Washington, DC*, 155.
- O'Brien, C. (2005). Planning for sustainable happiness: Harmonizing our internal and external landscapes. In *Rethinking Development: 2nd International Conference on Gross National Happiness* (pp. 1–22).
- Oswald, A. J. (1997). Happiness and economic performance. *The economic journal*, 107(445), 1815–1831.
- Partridge, E. (2014). Social sustainability. *Encyclopedia of Quality of Life and Well-Being Research*, 6178–6186.
- Preston, S. H. (1975). The changing relation between mortality and level of economic development. *Population studies*, 29(2), 231–248.
- Reid, W. V., Mooney, H. A., Cropper, A., Capistrano, D., Carpenter, S. R., Chopra, K., ... Zurek, M. B. (Eds.) (2005). *Ecosystems and human well-being: Synthesis* (p. 155). Washington, District of Columbia: Island Press.
- Rogers, D. S., Duraiappah, A. K., Antons, D. C., Munoz, P., Bai, X., Fragkias, M., & Gutscher, H. (2012). A vision for human well-being: transition to social sustainability. *Current Opinion in Environmental Sustainability*, 4(1), 61–73.
- Russell, R., Guerry, A. D., Balvanera, P., Gould, R. K., Basurto, X., Chan, K. M., & Tam, J. (2013). Humans and nature: How knowing and experiencing nature affect well-being. *Annual Review of Environment and Resources*, 38, 473–502.
- Sachs, I. (1999). Social sustainability and whole development: Exploring the dimensions of sustainable development. *Sustainability and the social sciences: a cross-disciplinary approach to integrating environmental considerations into theoretical reorientation*, 25–36.
- Schyns, P. (2000). The relationship between income, changes in income and life-satisfaction in West Germany and the Russian Federation: Relative, absolute, or a combination of both?. In *Advances in quality of life theory and research* (pp. 83–109). Springer, Dordrecht.
- Sengupta, R. (2002). Human well-being and sustainable development. *Economic and Political Weekly*, 37(42), 4289–4294.
- Spaiser, V., Ranganathan, S., Swain, R. B., & Sumpter, D. J. (2016). The sustainable development oxymoron: Quantifying and modelling the incompatibility of sustainable development goals. *International Journal of Sustainable Development & World Ecology*, 24(6), 457–470.
- Steinberger, J. K., & Roberts, J. T. (2010). From constraint to sufficiency: The decoupling of energy and carbon from human needs, 1975–2005. *Ecological Economics*, 70(2), 425–433.
- Steinberger, J. K., Roberts, J. T., Peters, G. P., & Baiocchi, G. (2012). Pathways of human development and carbon emissions embodied in trade. *Nature Climate Change*, 2(2), 81.
- Stevenson, B., & Wolfers, J. (2008). *Economic growth and subjective well-being: Reassessing the Easterlin paradox* (No. w14282). Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, vol. 39(1), 1–102.
- Tella, R. D., & MacCulloch, R. (2008). Gross national happiness as an answer to the Easterlin paradox? *Journal of Development Economics*, 86(1), 22–42.
- Tella, R. D., MacCulloch, R. J., & Oswald, A. J. (2003). The macroeconomics of happiness. *Review of Economics and Statistics*, 85(4), 809–827.
- Thoits, P., & Hannan, M. (1979). Income and psychological distress: The impact of an income-maintenance experiment. *Journal of Health and Social Behavior*, 120–138.
- United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. *Resolution adopted by the General Assembly*.
- United Nations Development Programme (2015). Human development report 2015 http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf. Accessed 6 April 2018.
- Vallance, S., Perkins, H. C., & Dixon, J. E. (2011). What is social sustainability? A clarification of concepts. *Geoforum*, 42(3), 342–348.
- Veenhoven, R. (1991). Is happiness relative? *Social indicators research*, 24(1), 1–34.
- Veenhoven, R. (2004). Happiness as an aim in public policy: The greatest happiness principle. In A. Linley, & S. Joseph (Eds.), *Positive Psychology in Practice* (pp. 658–678). Chichester: Wiley.
- WACOSS, (2004) West Australian Council of Social Services Annual Report. <http://wacoss.org.au/wp-content/uploads/2017/05/2003-04-WACOSS-Annual-Report.pdf> Accessed 22 may 2018.



- Woodcraft, S. (2015). Understanding and measuring social sustainability. *Journal of Urban Regeneration & Renewal*, 8(2), 133–144.
- Yan, B., & Spangenberg, J. H. (2018). Needs, wants and values in China: Reducing physical wants for sustainable consumption. *Sustainable Development*, 26(6), 772–780.

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