

Happier and greener? The relationship between subjective well-being and environmental performance

Well-being and
environmental
performance

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Camila Horst Toigo and Ely José de Mattos
Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, Brazil

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Abstract

Purpose – The purpose of this paper is to investigate, at a national scale, how self-reported happiness varies with the different levels of environmental conditions resulting from national policies, while also considering different levels of freedom.

Design/methodology/approach – The authors estimated the effects of environmental performance on happiness using the log-log regression model presented.

Findings – Environmental performance is shown to have a direct impact on happiness. Nonetheless, the explanatory influence of freedom is only significantly positive for free countries, where the institutional and political arrangements are better established and thereby the effective democracy is more solid.

Originality/value – This article offers insights into happiness levels within the context of the current clamour for environmental protection and more sustainable development goals.

Keywords Happiness, Freedom, Environment, Subjective well-being

Paper type Research paper

1. Introduction

In attempting to explain variation in individual happiness levels, economists have typically focussed on macroeconomic aspects and the concept of personal utility (Easterlin, 1974, 2001; Clark and Oswald, 1994; Frey and Stutzer, 2000, 2002a, b; Di Tella *et al.*, 2001; Lane, 2017; Rasiah *et al.*, 2019). However, since the 1990s, the concept of happiness has been revisited and various perspectives added (Diener *et al.*, 2002; Diener and Suh, 2003; Phillips *et al.*, 2017; Tamir *et al.*, 2017; Medvedev and Landhuis, 2018; Usai *et al.*, 2020; Aldieri *et al.*, 2021), enabling further insights into what makes people happy.

In addition to issues such as poverty and inequality, researchers began relating happiness to environmental quality, due largely to the contemporary global debate on environmental sustainability (Welsch, 2002, 2006; Brereton *et al.*, 2008; Pol *et al.*, 2017). Although interest in addressing essentially environmental aspects in the study of happiness is recent, the approach has quickly come to be seen as a potential analytical tool to help policymakers rethink the effects of promoting a sustainable development on individuals and societies (Helliwell *et al.*, 2019; Detori and Floris, 2019; Visvisi and Lytras, 2020; Zhao and Sun, 2020).

To determine what makes us happy is an ongoing task. Although several elements – including the feeling of pleasures and pains, as well as spiritual satisfaction and mental distress (Ng, 2015) – are considered as predictors of happiness, part of contemporary literature has discussed the effect of environment and nature on the people's subjective well-being. Following MacKerron and Mourato (2013), there are at least three reasons to consider that environment as a whole affects individual happiness: (1) the effect on the nervous system by the contact with nature – for example, stress reduction – (2) the effect in the health as a whole caused by air, sanitation and water conditions and (3) by encouraging a diversity of beneficial behaviours, such as outdoor sports and cultural activities.



So, taking into consideration a scenario where knowing to what extent happiness is related to the environment can help policymakers, we ask: how self-reported happiness varies with the different levels of environmental conditions resulting from national policies? Additionally, as we consider socio-economics and political elements to be intrinsic to this debate, we also want to analyse the role of GDP and freedom on the relationship between environmental performance and happiness levels.

This article offers insights showing that democracy, freedom, economic performance and environmental policies are jointly affecting, to some extent, the level of happiness in societies. By dialoguing with different fields of study, the research advances in proposing a broad multidisciplinary research agenda based on the results we found.

The next section offers a review of the economics literature regarding happiness and how that debate has been linked to environmental issues. The two subsequent sections present, respectively, the methodological approach adopted and the results about the relationships between environmental performance and self-reported subjective well-being. In the final section we present our conclusions.

2. Happiness, well-being and the environment

Happiness is a research topic in a wide range of academic fields, including psychology (see [Alfalah and Alganem, 2020](#)), sociology (see [Hill, 2020](#)), political science (see [Esaiasson et al., 2020](#)) and economics (see [Roka, 2020](#)). Much has changed since Aristotle first expressed his views on happiness, although some specialists, such as [Csikszentmihalyi \(2013\)](#), believe we have made little progress in understanding what makes us happy. Regardless of the field of study, the main challenge has been to deal with the relativity of the concept and with the different possibilities of measuring it to make inferential research feasible ([Veenhoven, 1991](#); [Norrish and Vella-Brodrick, 2008](#); [Diener et al., 2009](#); [Chen et al., 2019](#)).

[Veenhoven \(1991\)](#) offered three premises that highlight the subjective and relative nature of happiness and which, consequently, bring complexity to the debate. The first emphasizes that the “feeling” of happiness comes from comparison; that is, one’s assessment of one’s life and the extent to which one is happy depends on the “*perceptions of life-as-it-is*” and whether it meets “*the individual’s standards of what-life-should-be*” ([Veenhoven, 1991](#), p. 3). Thus, if these perceptions are closely matched, the individual feels happy. This highlights the relativity of the idea of happiness: I think my life is good in comparison to the lives of others; so, my happiness is something to be compared.

The second premise emphasizes that subjective well-being is adjusted according to the reality of societies and/or individuals. According to [Norrish and Vella-Brodrick \(2008\)](#), the individual has a tendency to adapt to given circumstances; therefore, if living conditions improve, the feeling of happiness also improves. In this sense, this premise considers happiness to be volatile, in addition to relative. [Quoidbach et al. \(2019\)](#) also bring an interesting perspective on social behaviour and happiness. According to the authors, people tend to maintain social relationships that stimulate their happiness at times that they are feeling unhappy or bad, as well as tend to isolate themselves and/or avoid social relationships when they are feeling good.

The last premise highlights the arbitrary nature of happiness. It suggests that a person can feel happy despite being immersed in a bad situation or engaged in an activity that is bad for them. It occurs because “*standards of comparison are individual mental constructs which do not necessarily fit any real requirements for a good life*” ([Veenhoven, 1991](#), p. 3). From a psychological standpoint, happiness depends on the way in which an individual interprets it. Therefore, the self-reporting of happiness is related to normative assessment and different

views about what is “good” or “bad” (Csikszentmihalyi, 2013; Ng, 2015; Quoidbach *et al.*, 2019).

Numerous studies have reported that, despite being better off in material, health and educational terms, groups of rich people may feel less happy than groups of considerably poorer people. King and Napa (1998), for example, found that for Americans, happiness appeared to be more important than money, moral goodness and religious beliefs such as going to heaven. In conclusion, money, morality and religion (exogenous facts) are not happiness itself, but rather a means of achieving it or a part of it. In the same direction, Jebb *et al.* (2018) examined a sample of 1.7m individuals of different regions and found that in some of them, people that have incomes beyond satiation have also lower life evaluations.

Due to the semantic and etymological complexities surrounding the concept of happiness and its multifaceted nature, some researchers have sought to combine it with the notion of well-being (Medvedev and Landhuis, 2018; Goldman, 2019; Flèch *et al.*, 2019). This approach has attracted criticism, mainly due to divergences regarding how happiness can be accurately measured (Haybron, 2000; Norrish and Vella-Brodrick, 2008; Diener *et al.*, 2009; Chen *et al.*, 2019). Therefore, the challenge lies not only in defining what happiness is but also in discovering how, and whether, we can measure in such a way as to facilitate further research.

In terms of measurement, surveys applied to sample groups are commonly employed (see Ng, 1996; Veenhoven, 2000a; Argyle, 2013; Ng, 2015; Helliwell *et al.*, 2019; Huang, 2019). Many such surveys enquire about how happy or satisfied with life a person is, with the answers usually being structured on scales (e.g. from 1 to 10) or indexes (see the follow studies: Musikanski *et al.*, 2017; Musa *et al.*, 2018; Prakash and Garg, 2019). Norrish and Vella-Brodrick (2008) argue that this sort of survey requires a person to assess his/her current feelings about life in relation to past experiences, which increase the complexity of the analysis because, as Diener *et al.* (2009) and Ng (2015) argue, such an assessment can be affected by an individual’s mood, emotions and circumstantial elements.

In addition to asking what happiness is and how to measure it, researchers have sought to understand what contributes most to make people happy. Easterlin (1974) was the first economist to revisit the notion of happiness in Economics. He saw happiness as being something beyond the consequences generated by a set of preferences determined by the utility of goods, as was commonly considered by economists. Using an expressed-preferences approach rather than revealed choices for a sample of 19 countries from 1946 to 1970, he found that increased individual income did not raise the levels of happiness in all the countries. The results also indicated that, although there was a positive association between happiness and income within countries, no such relationship existed between them. In later publications, he concluded that income could only partially explain the variation in happiness levels (Easterlin, 2001).

Years later, Oswald (1997) reported similar results. His investigation, involving the USA between 1972 and 1990 and Europe between 1973 and 1990, found that the improvements in people’s quality of life that could be attributed to increased income were quite small. Demonstrating that factors besides income affected people’s happiness, Clark and Oswald (1994) and Oswald (1997) found that unemployment was one of the main drivers of individuals’ unhappiness in the years preceding the publication of their studies. Similar investigations carried out later by Layard (2006) and Gilbert (2009) corroborated their findings. Also Jebb *et al.* (2018) and Fanning and O’neil (2019) recently have investigated new relationship among income, consumption and happiness worldwide.

Following Easterlin’s contribution, the economic literature on happiness adopted a broader range of perspectives in an effort to understand what factors affect happiness. Within this context, culture (see Inglehart and Klingemann, 2000; Ye *et al.*, 2015;

Shin *et al.*, 2018; Lawal *et al.*, 2020), socio-demography (see Easterlin, 2006; Michalos, 2017; Nikolaev, 2018; Perelli-Harris *et al.*, 2019), religion (see Lelkes, 2006; Campante and Yanagizawa-Drott, 2015; Devine *et al.*, 2019), health (see Abdel-Khalek and Lester, 2017; Satuf *et al.*, 2016; Steptoe, 2019), inequality (see Kollamparambil, 2020) and democratic and institutional aspects (see Easterlin, 2013; Li and An, 2020) have been the most popular variables analysed. With these advances in scientific knowledge, economists and social scientists concluded that governments should be more concerned with what people feel rather than with how much they earn (De Prycker, 2010).

With advancing technological and economic developments, the debate has increasingly come to include environmental issues. Today, there are investigations into the relationship between happiness and air pollution (Zheng *et al.*, 2019; Levinson, 2020), climatic aspects (Sekulova and Van den Bergh, 2013; Lamb Steinberger, 2017), greenhouse gas emissions (GHG) (Zidansek, 2007; Di Tella and MacCulloch, 2008; Apergis, 2018) and local environmental features (Mackerron and Mourato, 2013; McMahan, 2018; Benita *et al.*, 2019). Most of them showed a decrease in people's physical and mental well-being due to the worse environmental conditions, consequently leading to lower levels of happiness.

Ferrer-i-Carbonell and Gowdy (2007), for example, identified a negative association between concerns about the ozone layer and the satisfaction levels among British individuals between 1991 and 1996. The authors noted that not only are the effects of pollution negatively related to well-being and health, but also concerns about the environment may be related to damage to psychological condition. Put another way, being overly concerned with pollution (or any environmental problem) decreases one's level of happiness, probably due to the stress and frustration involved in such a process. McMahan and Estes (2015), Biedenweg *et al.* (2017) and McMahan (2018) draw similar conclusions.

Ferrer-i-Carbonell and Gowdy (2007) also found a positive relationship between biodiversity and happiness. According to them, "*concern with biodiversity loss is a sign of caring about the living world*", and those who care about the loss of biodiversity likely hold a "*psychological connection with other living organisms*" (Ferrer-i-Carbonell and Gowdy, 2007, p. 514). Thus, a concern with biodiversity positively affects the level of happiness.

Cuñado and Gracia (2013), in turn, demonstrated that temperature levels and air pollution have a negative on happiness in different regions of Spain. According to their findings, such environmental variables could better explain differences in happiness status than the usual macroeconomic variables.

Using spatial data, Mackerron and Mourato (2013) investigated the association between environment, green spaces and happiness in the United Kingdom. Contrary to the results found by Cuñado and Gracia (2013), happiness in this study was positively related to higher temperatures, sunny days and moderate breezes, since such contexts facilitated greater involvement in outdoor activities (such as running and gardening) and spending time in green spaces (such as mountains). Consequently, these contexts provided higher levels of well-being and happiness. By developing an app called Mappiness, they mapped the perceptions of happiness associated with local environmental variables, allowing government to make decisions based on individual well-being factors.

As with existing studies in the economic literature on happiness, we are interested in observing whether the environmental variables were real factors related to the happiness of countries, within an aggregate framework. So, this paper aims to contribute to the current literature in building wider and stronger connections between happiness and the environment, which can be useful for policymakers interested in multidimensional approaches, to a reorientation of the political agenda, placing greater understanding in the citizens' happiness. The next section details the methodological strategy used to achieve these objectives.

3. Data and method

To investigate the relationship between environmental performance and subject well-being, we adopted the concept of happiness put forward by [Veenhoven \(1991, p. 2\)](#): “*the degree to which an individual favourably judges the general quality of their life*”. The aim is to capture the perception of happiness obtained from free self-reports, regardless of how people judge what it is to be happy. In this sense, it does not matter whether the person thought he/she was happy in comparison to someone else’s life, based on his/her past experiences or assessing it from his/her mood, emotion or psychological factors. The most important element for this study is the self-perception of happiness itself.

We have used the World Happiness Index (WHI) as the subject well-being measure in the statistical estimations. The WHI is elaborated from a large-scale research on the self-perception of happiness in different countries and is comprised of information from one of the most robust databases on happiness and subjective well-being, the Gallup World Poll.

The WHI uses the Cantril Scale ([Cantril, 1965](#)) to assess happiness levels. In a simple way, the indicator represents the national average of the individual answers to the following question: “*Please imagine a ladder with rung numbered from 0 (bottom) to 10 (top). The top of the ladder represents the best life for you and the bottom of the ladder represents the worst possible life. On which rung would you say you are at this point in your life?*” ([Helliwell et al., 2019](#)). This question leaves people free to evaluate their lives according to the element/context they judge the best without putting limits on interpretation.

In the methodological strategy adopted here, the econometric modelling has WHI as the dependent variable, and the environmental performance as the main covariate, with the last one representing the environmental political outcomes. Our analysis uses a cross-sectional database from 2018, with a total sample of 118 countries and nine control variables. It was impossible to elaborate a panel data model due to the unavailability of a time series.

As the explanatory variable, we selected the 2018 Environmental Performance Index (EPI), which is designed to classify countries according to their status in the achievement of global environmental goals. We used two EPI measures: the final score and the scores for its two objectives, namely Environmental Health (EH) and Ecosystem Vitality (EV). While the EH measures the protection of human health against environmental damage, the EV measures the performance of actions related to the protection of the ecosystem and the management of natural resources ([Wendling et al., 2018](#)).

The EPI score ranges from 0 to 100, where the closer to 100, the better the countries’ performance in relation to the goals of each indicator. [Table 1](#) illustrates the categories covered by the EPI objectives.

In addition to the explanatory variable, we used control variables commonly applied to minimize endogeneity issues in similarly studies, such as GDP per capita and the Gini Index

Index	Objectives	Categories
Environmental performance index	Environmental health	Air quality Water and sanitation Heavy metals
	Ecosystem vitality	Biodiversity and habitat Forests Fisheries Climate and energy Air pollution Agriculture

Source(s): [Wendling et al. \(2018\)](#)

Table 1.
Environmental performance index’s objectives and categories – 2018

(as used in MacKerron and Mourato, 2013; Rehdanz and Maddison, 2005; Welsch, 2006). We also included variables available in the WHI database that are thought to affect happiness, such as social support (as demonstrated in Zhu *et al.*, 2013; Tan *et al.*, 2018), freedom to make life choices, perceptions of corruption and confidence in national government (as included by Tavits, 2008; Rothstein, 2010).

Veenhoven (2000b), Grooper *et al.* (2011), Inglehart *et al.* (2008) and Rahman and Veenhoven (2018) have specially highlighted the importance of freedom in relation to levels of happiness in societies. According to Rahman and Veenhoven (2018), the concept of freedom is closely related to the possibility of making choices or, as Sen (2014) also argues, to the capability of expanding the opportunities to choose in life. So, as pointed out by Rahman and Veenhoven (2018, p. 436), “*the common-sense theory behind this belief [that freedom impacts happiness levels] is that life will be more satisfying if we can live the way we want*”, or, in other words, if we can live freely.

Today, more and more people are calling for other kinds of freedom – freedom of expression, freedom of law, freedom to vote. One of our arguments here is that this context of expanding liberties also reflects different relationships between society and the environment. Because of this, we also analyse the effect the environmental performance on the average happiness in relation to different categories of national freedom.

In line with Rahman and Veenhoven (2018, p. 437), we argue that if the country’s environmental performance is positive and significantly related to its level of happiness in a context of total freedom (few restrictions), it implies that the gains provided by freedom in the country exceed the costs of being free, thus producing positive effects on sustainability. In other words, freedom contributes to a better society–environment relationship, which, in turn, is associated with the happiness of that society. However, if environmental performance is positively and significantly related to happiness in a context of non-freedom (authoritarianism), it implies the opposite: the gains from “non-freedom” in the country exceed the costs of being “not free”, also affecting the sustainability.

To measure the level of freedom, we used the Freedom House Index (FHI), which indicates national levels of freedom and rights in countries from a liberal perspective. Structurally, the index includes 25 indicators: ten corresponding to the “political rights” category and 15 corresponding to “civil liberties”. Country status is determined based on the aggregated scores: from 1 to 2.5 is “Free”, from 3.0 to 5.0 is “Partially Free” and from 5.5 to 7.0 is “Not Free” (Freedom House, 2018).

Table 2 displays the description of each variable contemplated in this study, as well as its sources.

We estimated the effects of environmental performance on happiness using the log-log regression model presented in Equation (1) below.

$$\log Y_i = \alpha + \beta_1 \log X_i + \beta_2 \log Z'_i + \varepsilon_i \quad (1)$$

where the dependent variable, Y_i , is the WHI for country i and the independent variables, X_i and Z'_i , are, respectively, EPI and the control variables set for country i , and ε_i is the residual. The coefficients in this log-log model are interpreted as elasticities of the WHI in relation to the EPI and the other covariates. The elasticity function is described in Equation (2).

$$\frac{\%E(Y|X)}{\%\Delta X} = \beta_1 \quad (2)$$

We used a robust standard error technique in OLS estimation, called clustered standard error, in order to minimize the problem of heteroscedasticity that may violate Gauss Markov’s assumptions and, consequently, bias the coefficients (Torres-Reyna, 2007). As this robust

Variable	Description	Source
World Happiness Index	Self-reported perception of happiness. From 0 to 10 where the closer to 10, the happier	World happiness database
Environmental Performance Index	From 0 to 100 where the closer to 100, the better the environmental performance	Yale university
GDP per capita	GDP per capita in purchasing power parity at constant 2018 international dollar prices	World Bank
GINI Index	The distribution of income, from the GWP, 2018. The closer to 1, the greater the inequality	World happiness database
Social support	The national average of the binary responses (either 0 or 1) to the question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?" The higher the value, the better	World happiness database
Freedom House Index	Freedom categorization according to civil liberties and political rights: "free", "partially free" and "not free"	Freedom house
Freedom to make life choices	The national average of responses to the question "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?" The higher the value, the better	World happiness database
Perceptions of corruption	The national average of the questions in the GWP: "Is corruption widespread throughout the government or not?" and "Is corruption widespread within businesses or not?" The overall perception is just the average of the two 0-or-1 responses. The higher the value, the worse	World happiness database
Confidence in national government	Confidence in national government from the GWP. The question is "Do you have confidence in each of the following, or not? How about the national government? (WP139)". The higher the value, the better	World happiness database

Source(s): Elaborated by the authors

Table 2.
Description of the variables – 2018

option rejects the assumption that the errors are identically distributed, then the estimated coefficient is trustworthy (Mehmetoglu and Jakobsen, 2016).

Since observations from within a country are likely to be more similar to each other than between observations from different countries, we clustered the error term by country. We therefore consider the error term to be different in each unit of analysis (country), since there are several factors that differ between them, which, in turn, affect their level of happiness.

With this methodology, it was possible to draw a correlation with public policies and multilateral agreements and analyse which country profile is most likely to meet the 2030 agenda.

4. Results and discussion

In a postmodern context characterized by globalization, rapid technological advances and behavioural changes, there is an abundance of questions for those interested in social behaviour. And few are more fundamental than "what has happened to the pursuit of happiness?" and "do you remember how happy you were a few years ago?"

According to the WHI Report, in 2018, the world was not happy enough. The global average of self-reported happiness was 5.5 points out of 10.0. The happiest country that year, Finland, with a score of 7.85, was the one that came closest to the maximum, while Afghanistan was in last place in the happiness ranking, with a score of 2.69, almost three percentage points below the world average.

Despite the economic and political-socio-cultural differences between the countries analysed and the many factors that almost make them incomparable, as well as the different

reasons that make their populations happy, the variation in the level of happiness around the average value was very slight in 2018. In the same year, the global average level of environmental performance was 56.77 points, out of 100. That is, the world's progress towards sustainability was very unsatisfactory, since a little less than 44% of the targets were not achieved. While some countries, such as Switzerland (87.42), came close to meeting the maximum global sustainability goal, others, such as Burundi (27.43), exhibited the opposite behaviour, thus flattening the global average score. The standard deviation in Table 3 corroborates this great variance.

The initial exploratory analysis showed a regular level of happiness and insufficient environmental commitment on a global scale. But what is it making the population less happy and the levels of environmental preservation more unstable? When investigating what factors could be associated with this situation, we found that the literature, in addition to technical reports, highlighted aspects associated with the political system and democracy.

According to the 2019 Happiness Report, the countries that had experienced the greatest declines in happiness levels over the years were generally suffering from some political and socio-economic weakness (Helliwell *et al.*, 2019). The 2018 EPI Report also supports the existence of a relationship between political aspects and environmental performance, highlighting that those countries that showed a tendency to lose positions in the ranking were also those that usually exhibited some degree of political and economic fragility.

Based on these findings, we investigated the relationship between happiness and environmental performance while simultaneously considering political and socio-economic factors, such as freedom, income and inequality. Many studies have argued that these elements are triggers of happiness since they reflect long-term processes and decision-making and should, therefore, be more central to the debate on well-being and sustainability (Inglehart, 2009; Oishi *et al.*, 2011, 2018).

Figure 1 corroborates the arguments exposed so far by illustrating a positive association between happiness and environmental performance in freer, unequal and wealthier countries. Note that the bigger the symbol, the higher the *per capita* income and the darker the shade of blue, the more economically unequal the country was in 2018.

The scatter plot's positive slope suggests that, in 2018, the wealthiest, freest and most egalitarian countries also displayed the highest levels of happiness and environmental performance. In the middle of the graph some paradoxical relationships can be seen, such as for Botswana (free country, with high environmental performance but with a low level of happiness) and for Uzbekistan (non-free country, with low environmental performance, but a high degree of happiness).

Having detected a correlation between EPI and WHI, we investigated the extent to which environmental performance can be used to predict the average national level of happiness. In Table 4, two specifications were estimated: (1) without the control variables and (2) with control variables and clustered standard errors by country. While the first only included the EPI as the predictor, the second model comprised socio-economic and political elements in

Variable	Mean	Standard deviation	Minimum	Maximum	Coefficient of variation (%)
World happiness index	5.504	1.133	2.694	7.858	20.585
EPI	56.770	13.871	27.43	87.42	24.433

Source(s): Prepared by the authors

Table 3.
Descriptive
statistics – 2018

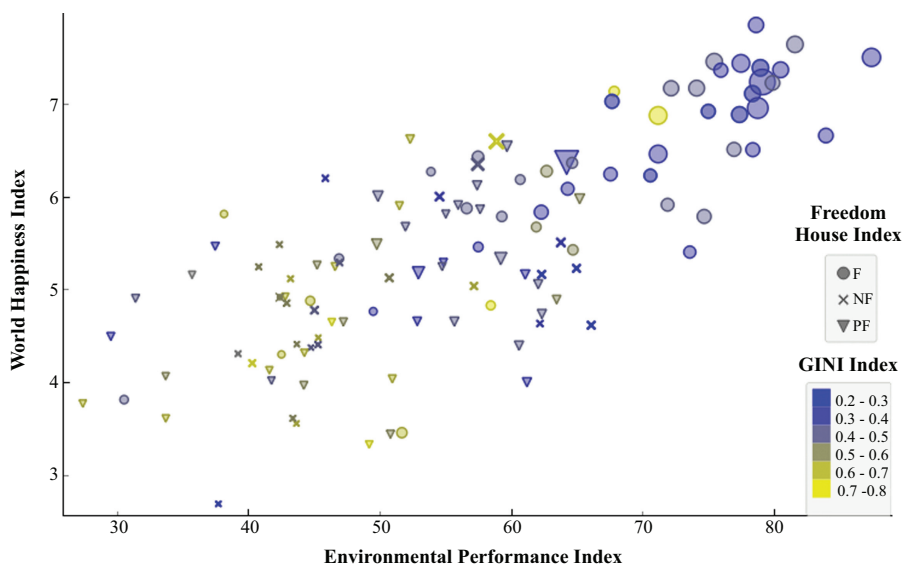


Figure 1. Country dispersion by WHI-EPI association considering the Freedom House Index, GINI Index and GDP per capita, 2018

Source(s): Prepared by the authors

Variables	Model (1) OLS without control variables	Model (2) OLS with control variables
lnEPI	0.610*** (0.0541)	0.190* (0.103)
lnGDPPC_PPP		0.0515* (0.0267)
lnGINI		-0.0204 (0.0568)
lnFreedomtomakelifechoices		0.361*** (0.114)
lnSocial_support		0.257 (0.232)
lnPerceptionsOfcorruption		-0.0338 (0.0460)
lnConfidenceinnationalgovernment		-0.0553 (0.0389)
Constant	-0.760*** (0.218)	0.517 (0.367)
Observations	118	103
R-squared	0.522	0.712
AIC test	-112.1952	-131.8757
VIF test	1.00	2.96

Note(s): Robust standard errors in parentheses
*** $p < 0.01$, * $p < 0.1$

Source(s): Prepared by the authors

Table 4. Estimated results – WHI, 2018

order to obtain an effect closer to what can be considered the net effect of sustainability on happiness.

In both models, the results indicate a positive and significant relationship between environmental performance and happiness. This suggests that in 2018, greater engagement with environmental issues was related to a higher level of happiness. Hence, we can suppose the performance of governments *vis-a-vis* the environment in that period had a positive impact on their populations' happiness. So, as suggested by De Prycker (2010, p. 588), this knowledge "could be used for the evaluation of existing policy proposals", in order to assess "the need to maintain certain existing policy measures or to implement new ones" to direct the strategy of national development in line with people's feelings and expectations.

The importance of government performance in predicting subjective well-being around the world was also corroborated by the results from the model (2). We find freedom to make choices and *per capita* GDP (two relevant factors for sustainable development) have a significant and positive effect on average national happiness.

However, our interest here is to investigate nuances in the happiness–environment relationship that earlier models were unable to explain. Accordingly, our analysis considers each country's status of freedom (according to the FHI scale), which we relate to the level of effective democracy in the countries. In our perception, freedom and effective democracy are closely connected, since we understand the latter as "the extent to which formally institutionalized civil [and political] rights are effective in practice" (Inglehart and Welzel, 2005, p. 10). Hence, we were able to debate political freedom and civil rights (represented by the FHI) in the environmental context, correlating it with the degree of effective democracy in the analysed countries.

The happiness literature also highlights the role of the political process in people's self-perception of happiness (Inglehart and Klingemann, 2000; Graham and Peitinato, 2001). Likewise, a number of papers suggest the importance of democracy and freedom in increasing environmental protection (Li and Reuveny, 2006; Povitkina, 2019). To check whether these relationships can be statistically verified for our sample, we first undertook an ANOVA test (Table 5). This confirmed that there is a statistically significant difference between the means of the three categories of freedom. In other words, the levels of happiness and environmental commitment between countries differ according to their status of freedom and, therefore, with their level of effective democracy.

Therefore, we can hypothesize that freer institutions can be positively correlated with strong environmental commitment and happier societies – exactly as indicated in Figure 1. As proposed by Diener *et al.* (2009), policymakers can use measures to assess the happiness of the population to ponder situations and value non-market goods that affect different sections of the population in different ways, such as the externalities of the political context and/or economic activities. One way of testing this hypothesis is to estimate different models considering the above-mentioned aspects.

		Analysis of variance				
Source		SS	df	MS	F	Prob > F
WHI	Between groups	8290.61	2	4145.30	33.72	0.00
	Within groups	14015.57	114	122.94		
	Total	22306.18	116	192.29		
EPI	Between groups	51.55	2	25.77	29.86	0.00
	Within groups	98.41	114	0.86		
	Total	149.96	116	1.29		

Table 5.
One-way ANOVA
tests – free, partially
free and not free status

Source(s): Prepared by the authors

The three estimations in Table 6 indicate a positive and statistically significant impact of environmental performance on happiness regardless of the status of freedom. The elasticity coefficients demonstrated, however, that the impact of EPI on WHI is stronger in free nations (0.64) than in partially free (0.34) and non-free (0.55). Nevertheless, the low values of R -squared for partially free and non-free nations indicate that environmental quality explains a small fraction of the average national happiness, which suggests the multidimensional nature of happiness.

Table 7 shows the estimations of the impact of EPI on WHI according to the status of freedom in the presence of social, political and economic variables [1]. The models from (6) to (8) are the same as those in Table 6, with the addition of other happiness prediction variables. The EPI coefficient was only significant for the free and partially free countries. For non-free nations, we could not infer any non-aleatory relationship between happiness and environmental quality.

The model (6) suggests that environmental performance had a positive impact on the average happiness of free countries in 2018. According to the magnitude of the coefficient, an increase in the EPI score (which indicates better environmental performance) was related to a 0.515% increase in the level of happiness, on average, in democratic societies. The expansion of the freedom to make life choices had the same effect, allowing us to correlate the results with the degree of effective democracy in the world.

The variable “perception of corruption”, however, signalled an opposite impact on the happiness of free countries. This result suggests that the more fraudulent and dishonest is the conduct of institutions in democratic countries, the lower the level of happiness in their societies.

The results support the argument about the role of effective democracy and freedom in the context of environmental quality as a predictor of happiness. The model (6), more specifically, indicated that political (freedom to make life choices, corruption, confidence in the government) and environmental factors (EPI) exert more influence on happiness in free societies than socio-economic elements such as income, inequality and social support – these coefficients were found not to be statistically significant.

Model (7), in turn, shows very different results for partially free countries. Although the relationship between happiness and environmental performance was also statistically significant, the effect of the latter on the former is the opposite. In other words, an increased EPI score produces a negative impact on happiness.

A plausible explanation for an inverse relationship between EPI and WHI in partially free countries can be based on the existence of the classic trade-off between economic growth and

Variables	Model (3) OLS for free countries	Model (4) OLS for partially free countries	Model (5) OLS for not free countries
lnEPI	0.642*** (0.0906)	0.345*** (0.0921)	0.559** (0.220)
Constant	-0.860** (0.388)	0.251 (0.356)	-0.603 (0.867)
Observations	48	43	26
R -squared	0.628	0.188	0.256
AIC test	-73.47514	-33.47512	-16.31716
VIF test	1.00	1.00	1.00

Note(s): Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$

Source(s): Prepared by the authors

Table 6.
Estimated results by
FHI status – WHI,
without control
variables, 2018

Variables	Model (6) OLS for free countries	Model (7) OLS for partially free countries	Model (8) OLS for not free countries
lnEPI	0.515*** (0.169)	-0.215* (0.124)	0.384 (0.393)
lnGDPPC_PPP	-0.000790 (0.0362)	0.0947*** (0.0257)	0.0941 (0.0857)
lnGINI	-0.0754 (0.0750)	0.137 (0.0923)	-0.0112 (0.171)
lnFreedomtomakelifecoices	0.397** (0.154)	0.403*** (0.103)	0.837*** (0.269)
lnSocial_support	-0.327 (0.339)	0.501** (0.187)	-0.444 (0.665)
lnPerceptionsofcorruption	-0.113** (0.0465)	-0.0123 (0.0351)	0.255** (0.106)
Confidenceinnationalgovernment	-0.253* (0.131)	-0.281** (0.127)	0.1035 (0.259)
Constant	-0.288 (0.529)	2.107*** (0.455)	-0.568 (1.975)
Observations	48	38	16
R-squared	0.743	0.684	0.743
AIC test	-79.2784	-52.2889	-10.44373
VIF test	3.31	2.38	4.14

Table 7.
Estimated results for
free, partially free and
not free countries –
WHI, with control
variables, 2018

Note(s): Robust standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source(s): Prepared by the authors

environmental protection. According to [Welzel et al. \(2003\)](#) and [Welzel and Inglehart \(2010\)](#), socio-economic development implies the spread of values that emphasise autonomy, rights and freedoms, which, in turn, tend to contribute towards improving institutions, reflecting the level of effective democracy in a country. Based on this, if we consider the degree of freedom to be synonymous with effective democracy, and this to be closely related to the degree of development, we can generally argue that partially free nations are relatively less developed than free nations.

Therefore, in a context of less freedom and low development, decision-makers are more likely to have a strictly economic motivation in political planning, neglecting other important issues such as the environment. Therefore, the contextual dimensions, namely development, democracy and the degree of freedom, may affect macro decisions, social priorities and thus the level of happiness. In a situation where a government prioritises economic issues to the detriment of others and that choice is perceived as ensuring the greatest levels of happiness to the greatest number within society (direct or indirectly), attempts to prioritise any other dimension may contradict the expectations of the population and thus reduce their level of happiness.

Model (7) also specified three other important predictors of happiness in partially free nations: *per capita* GDP, social support and freedom to make life choices. Their coefficients suggest they have a positive impact, with “social support” having the largest. We argue then that happiness in partially free countries is relatively more affected by socio-economic factors than political and environmental conditions, exactly the opposite of what was observed in the free nations.

Model (8) indicated a positive EPI-WHI association in non-free nations, but we could not infer that the independent variable produced significant effect. For authoritarian countries,

only the freedom to make life choices and the perceptions of corruption affected the happiness level. Any other relationship between the happiness level and environmental quality may simply be aleatory in the context of our investigation.

However, while the elasticity of freedom to make life choices had a positive impact on happiness, an increased perception of corruption had a similar positive effect. Attempting to discern the reasons why people might be happier in a context of more corruption is quite challenging, but we cannot ignore the fact that cultural and social values might also influence someone's world view and what being happy means to them. Therefore, we can expect an increase in happiness in the presence of corrupt institutions if a society agrees with corrupt behaviour, and/or if corruption is so rooted in the social culture that corruption is almost a *sine qua non* condition or a *fait accompli*. In such contexts, corrupt behaviour might not be seen as predatory but as the *status quo*. Then, Model (8) reveals that elements related to the political arena were more closely associated with the prediction of happiness in authoritarian nations than socio-economic and environmental indicators.

In order to deepen the analyses made so far, we estimated the effect of EH and EV on global average happiness. The results in Table 8 show that only EH has a positive and significant impact on happiness, indicating that the quality of water, air, the level of heavy metals and sanitary conditions directly affect how happy people feel. It highlights the anthropocentric bias of environmental performance on happiness, since happiness is negatively affected if human health is being harmed by environmental problems.

However, that relationship was only found in free countries; and, again, the political variables were those that also partially explain the variation in the level of happiness. Figures 2 and 3 partially support these findings. The first indicates the clear positive relationship

Variables	(9) Total	(10) OLS for free countries	(11) OLS for partially free countries	(12) OLS for not free countries
lnEH	0.0895* (0.0536)	0.271*** (0.0522)	-0.0577 (0.0502)	0.0811 (0.261)
lnEV	-0.0385 (0.0759)	0.0195 (0.0983)	-0.119 (0.127)	0.185 (0.350)
lnGDPPC_PPP	0.0566** (0.0239)	0.0224 (0.0240)	0.0895*** (0.0254)	0.0992 (0.0943)
lnGINI	-0.0509 (0.0579)	-0.0955 (0.0728)	0.137 (0.102)	-0.0461 (0.197)
lnFreedomtomakelifecoices	0.475*** (0.119)	0.437*** (0.144)	0.411*** (0.137)	0.861*** (0.288)
lnSocial_support	0.197 (0.234)	-0.408* (0.229)	0.487** (0.196)	-0.400 (0.675)
lnPerceptionsofcorruption	-0.0499 (0.0440)	-0.0992** (0.0399)	-0.0131 (0.0350)	0.241* (0.116)
Confidence in national government	-0.198** (0.0818)	-0.204** (0.0981)	-0.273** (0.131)	-0.0292 (0.393)
Constant	1.155*** (0.376)	0.355 (0.438)	1.992*** (0.499)	-0.145 (2.213)
Observations	103	48	38	16
R-squared	0.733	0.806	0.681	0.729
AIC test	-137.5027	-90.68719	-49.8711	-7.626625
VIF test	2.71	2.77	2.41	4.21

Note(s): Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source(s): Prepared by the authors

Table 8.
Estimated results by
degrees of freedom –
WHI, 2018

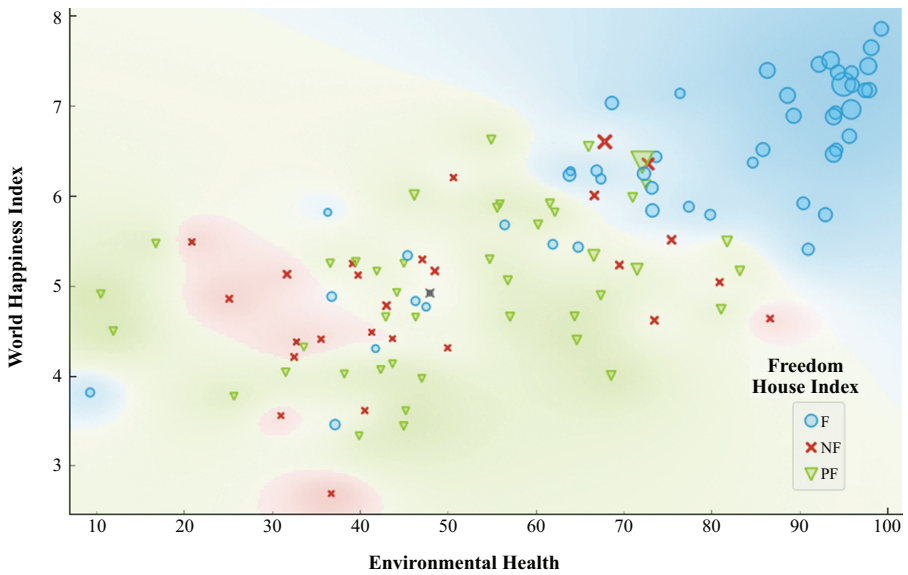


Figure 2.
Country dispersion by WHI-EH association considering the Freedom House Index and GDP per capita, 2018

Source(s): Prepared by the authors

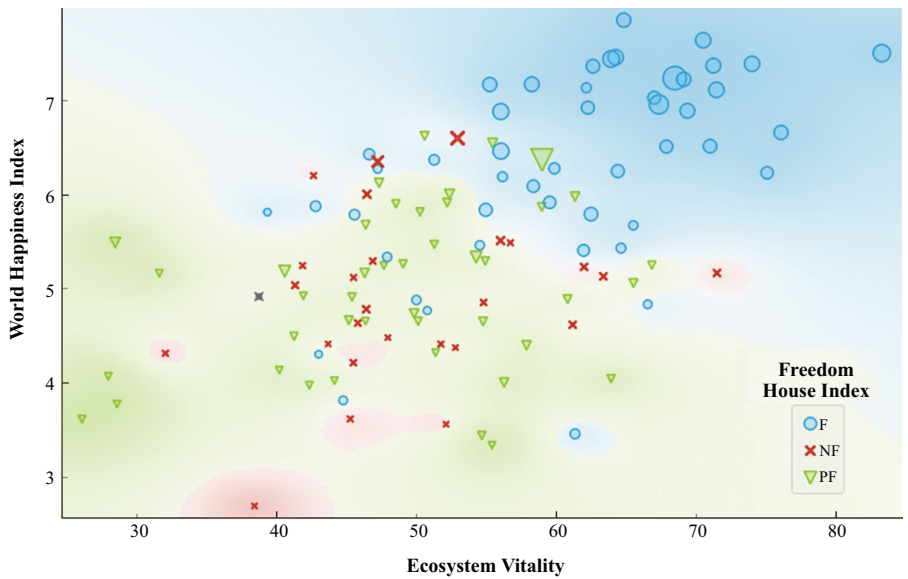


Figure 3.
Country dispersion by WHI-EV association considering the Freedom House Index and GDP per capita, 2018

Source(s): Prepared by the authors

between happiness and environmental health for free and rich [2] countries, highlighted by the blue region. Finland and Denmark, for example, are still in the top right of the chart, representing stronger relationships. The green and red regions, in turn, reveal the disperse

associations encountered for partially and non-free countries, due to which it is impossible to infer a clear relationship between environmental health and happiness for them.

While we find the authoritarian United Arab Emirates has high level of happiness (6.60) and good environmental performance (67.88 EH score), we also see Afghanistan has low levels of self-reported happiness and a weak environmental commitment (36.76 EH score). The situation is similar for partially free countries.

Although [Figure 3](#) also illustrates a positive relationship between happiness and environmental vitality, this association is not as evident as that shown in [Figure 2](#) because the distribution of observations is concentrated in the middle of the graph. We suppose, then, that the lack of a clear relationship between happiness and elements related to environmental vitality has probably provided non-significant coefficients in models from (9) to (12).

Despite the mixed results, the evidence demonstrates that environmental performance played a positive role as a predictor of happiness in 2018. Thus, we confirmed our argument that there is an association between government performance *vis-a-vis* the environment, effective democracy and happiness. Furthermore, within that context, the degree of freedom is shown to be crucial. This knowledge shows the importance of several domains in people's lives related to their level of happiness.

5. Conclusions

Although some studies have shown environmental variables to be related to subjective happiness or well-being, our research has attempted to go further. In addition to investigating the impact of environmental performance, expressed by globally measured environmental policies, on self-reported happiness at the national level, we have taken into account the different political–institutional scenarios that characterize the different countries.

We note that the links between happiness and environmental quality are explicitly positive in countries where institutional and political arrangements are most firmly established. The results therefore suggest that there are important elements within this relationship, such as political and economic performance and the quality of democracy, which can be considered drivers of happiness. Consequently, we cannot disassociate the political sphere from environmental decisions and behaviour.

In fact, when the analysis was segmented between the status of freedom, we found that the political system (which we associate with effective democracy) is correlated not only with the level of happiness, but also with environmental quality. The results suggest that in freer countries environmental performance has a statistically significant and positive impact on happiness. With this, we can argue that the gains provided by freedom exceed the costs in the context of the environmental issue.

Therefore, we can infer that, at least at the macro-spatial level, the self-reported level of happiness depends substantially on the underlying socio-economic and political context, which, in turn, influences decision-making related to sustainability. That is probably why developed countries score best in terms of environmental performance and happiness when compared to developing countries.

The study reveals the existence of a significant relationship between subjective well-being and environmental elements and that other aspects not presented in the model, such as behaviour, culture, religion, demography, may affect the investigated relationship. As [De Prycker \(2010\)](#) argues, “this information is crucial for making decisions that pit various policy goals against one another. More concretely, measures of happiness can help solve the ‘apples versus oranges problem’ that policy makers constantly face when deciding which domain most urgently needs resources”. Thus, continuing this line of research is recommended in order to extend our understanding of important elements that affect people's happiness.

Notes

1. Due to the low number of observations in each group, parsimony is required when interpreting the estimates.
2. Represented by the size of the sign. The bigger it is, the higher the *per capita* income.

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Corresponding author

Camila Horst Toigo can be contacted at: camilahorstoigo@gmail.com