White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of York.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/123726/

Version: Accepted Version

Article:
Ngamaba, Kayonda Hubert (2017) Determinants of subjective well-being in representative samples of nations. European Journal of Public Health. pp. 377-382. ISSN: 1101-1262

https://doi.org/10.1093/eurpub/ckw103

Reuse
Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Determinants of subjective well-being in representative samples of nations

Author

Kayonda Hubert Ngamaba

Affiliation

School of Psychological Sciences, University of Manchester, UK.

Correspondence details

Kayonda Hubert Ngamaba

Kayonda.ngamaba@manchester.ac.uk

School of Psychological Sciences, University of Manchester

Oxford Road, Manchester, M13 9PL, United Kingdom, Tel: +44 (0) 161 275 2562

Abstract

Background: Maximising the happiness and life satisfaction (i.e., subjective well-being) of citizens is a fundamental goal of international governmental organizations' policies. In order to decide what policies should be pursued in order to improve subjective well-being (SWB) there is a need to identify what the key drivers of SWB are. However, to date most studies have been conducted in unrepresentative samples of largely "developed" nations.

Methods: Data from the latest World Value Survey (2010-2014) and gathered 85,070 respondents from 59 countries (Age 16 to 99 years, Mean = 42, SD = 16.54; 52.29% females) were pooled for the analysis. A cross-sectional multilevel random effects model was performed where respondents were nested by country.

Results: The average levels of SWB varied across countries and geographical regions. Among the lowest 10 SWB countries are countries from: Eastern Europe and Former Soviet Union and Middle East and North Africa. Factors driving SWB include state of health, financial satisfaction, freedom of choice, GDP per capita, income scale, importance of friends, leisure, being females, weekly religious attendance, unemployment and income inequality. Nevertheless, according to Cohen's rules of thumb, most of these factors have "small" effect sizes. Thus, the main factors that possibly will improve the SWB of people across the globe are: state of health, household's financial satisfaction and freedom of choice.

Conclusions: To maximize the well-being of the population, policy makers may focus on health status, household's financial satisfaction and emancipative values. The levels of prosperity and political stability appear to positively improve the SWB of people.

Keywords: happiness, life satisfaction, determinants of subjective well-being, international governmental organizations.

Introduction

Maximising the well-being of citizens is a fundamental goal of international governmental organizations' policies (1). Traditionally, international governmental organizations have assessed citizens' well-being based on objective and observable data such as Gross Domestic Product (GDP) (2, 3). However, while GDP may provide a measure of economy activity, it does not take potential nonmonetary aspects of well-being into account, such as government subsidies, household childcare and informal activities (1, 4).

Measuring subjective well-being (SWB) using measures of happiness and life-satisfaction not only overcomes the limitations of GDP, but allows researchers to investigate the factors that may improve SWB (1, 5). Thus, the Commission on the Measurement of Economic Performance and Social Progress recommend that subjective measures of well-being should be used alongside objective economic data to assess social progress and evaluate policy (1). Also, the World Happiness Report 2016 highlighted that measurements of SWB can be used effectively to assess the progress of nations (6).

To maximise SWB, it is first necessary to identify the key drivers of SWB. To date, researchers have suggested several domains that may affect people's SWB, such as: genes, personality, possessing good health, managing your economic life, having supportive relationships, liking where you live, freedom to make life choices, and liking what you do (6-8). Many researchers and policy makers prefer to focus on factors under our control. So far, factors as diverse as: income, financial satisfaction, health status, income inequality, employment status, age group, emancipative values, living in developed nations, social welfare, religiosity and social connections are suggested to be important determinants of SWB (9-12). However, the studies on which these conclusions are based suffer limitations in three key respects.

First, the majority of studies into the drivers of SWB are conducted in developed nations because these countries have the financial resources to conduct research and participants are accessible in contrast to developing nations with poorer infrastructure. This is problematic in terms of the representativeness for the purpose of global decision-making (13).

Second, the terms *happiness* and *life satisfaction* have been used interchangeably to assess SWB (2, 3) but there is strong evidence to suggest that these terms are not synonymous. Happiness is more closely associated with emotions, feelings or moods; in contrast, life satisfaction is concerned with people's judgments about life-as-a-whole, which might include evaluations of their work or personal relationships. Thus, the OECD guidelines on measuring SWB suggest that all aspects of SWB should be measured separately to develop a more comprehensive measure of people's quality of life and to allow a better understanding of its determinants (14).

Third, indicators of happiness and life satisfaction may have different salience across countries. For example, the "Eaterlin paradox" stated that, while richer individuals/countries were happier than those with lower incomes, there is no evidence to suggest that average reported happiness increases over time in line with rises in Gross Domestic Product (GDP) (2, 15). The data of World Happiness Report 2016 supports the argument that developed nations are happier than poor nations. Although there has been some swapping of places, the top 10 countries are developed (Denmark, Switzerland, Iceland, Norway, Finland, Canada, Netherlands, New Zealand, Australia, and Sweden). Also, the 10 countries with the lowest average happiness are poor nations (Madagascar, Tanzania, Liberia, Guinea, Rwanda, Benin, Afghanistan, Togo, Syria, and Burundi) (6). By the way of contrast, according to the Gallup Healthways Well-Being Index, the global well-being map is dynamic and changing in favour

of growing economies. For the Gallup Healthways Well-Being Index the highest 10 well-being countries are including developing and Latin America economies (Panama, Costa Rica, Puerto Rico, Switzerland, Belize, Chile, Denmark, Guatemala, Austria, and Mexico). Also, the lowest 10 well-being countries are largely poor nations (Ghana, Haiti, Benin, Ivory Coast, Democratic Republic of Congo, Tunisia, Togo, Cameroon, Bhutan, and Afghanistan) (7).

Higher economic growth or higher household income may result in improvements in the life conditions of the poor. Income rise may improve nutrition, access to food, adequate shelter, health care, education opportunities and, as a result, an increase of happiness (3). Nevertheless, according to the "need theory" in both low-income countries and high-income countries, income or money is crucial to have a standard of living or to live comfortably (16). Individuals in the high-income world may also need more income to overcome social isolation, obesity and depression by attending social groups and gym sessions (6, 7).

Using representative samples of nations, this present study aims to address the limitations of previous research by undertaking a multivariate data analysis of the determinants of happiness and life satisfaction, in order to address an important gap in the literature and inform international government organizations' policies (1, 9, 17).

Methods

Sources of data

The present study analyses data from the latest survey conducted by the World Value Survey (WVS) from 2010 to 2014. The WVS in collaboration with the European Values Study (EVS) provides evidence on what people want out of life and what they believe in. To

monitor these value changes, the WVS/EVS has carried out six different survey waves from 1981 to 2014 in 100 countries from different continents (13).

The latest WVS survey wave (2010-2014) is used because it is up-to-date and includes a representative sample of nations and participants, recruited using Stratified Random Sampling. Also, the latest survey wave overcomes some significant limitations reported in previous waves such as: improving sample size, collection mode and response rates. In recent years, WVS has improved their methodology including their collection mode (13).

Sample

The total sample size was 85,070 respondents from 59 countries (52.29% females). With an average of 1,442 respondents, ranging from 841 to 3,531 individuals, participants of each country were interviewed face-to-face by a local field organisation and supervised by WVS's academic researchers (13). Respondent ages range from 16 to 99 years, with a mean of 42 years and standard deviation of 16.54. Appendix 1 presents the list of countries, year the survey was conducted, number of participants, average happiness and life satisfaction, and country geographical region.

Data collected by the WVS was checked for missing data and although more than 95% of cases were complete, *listwise deletion* was applied (18). Given that many explanatory variables were used in the multivariate model, the final number of respondents decreased from 85,070 to 75,476. Correlations among variables were tested prior to analysis because highly correlated predictors might lead to multicollinearity and multivariate techniques might throw up spurious statistically significant associations (11, 19). There was no evidence of multicollinearity among the measured variables (see Appendix 2).

Measures

The survey measures are presented in Table 1. Survey responses came from the main data (i.e. WVS) and were combined with objective economic data from reputable sources. For example, GDP per capita was taken from World Bank data (20) and income inequality was operationalized using the Gini coefficient (21), which was drawn from Standardised World Income Inequality Data (SWIID) (22).

Analysis

The present study used data from the latest WVS survey conducted from 2010 to 2014 in 59 countries. Stata 13.1 software (23) was used for a cross-sectional multilevel study in which individuals were nested by countries (18). Multilevel analysis is an appropriate approach for this study because it takes into account the social contexts as well as the individual respondents. Both fixed effects and random effects have been used in previous studies to analyse this kind of data. However, in this study random-effects has been selected because of the assumption that differences across entities are random and have some influence on happiness and life satisfaction. The Hausman test suggests that it is safe to use random effects (Prob>chi2 = 0.096 > 0.05) (24-26).

Three steps were taken in the analysis: First, a descriptive statistics of dependent variables (happiness and life satisfaction) and explanatory variables was presented. Second, a cross-national multilevel analysis was conducted to test whether the explanatory variables were associated in a similar way with each dependent variable (i.e. happiness and life satisfaction). Finally, after controlling for covariates, the thumb's effect sizes was applied to ascertain which of the explanatory variable has a greater effect on happiness and life satisfaction.

Variables used in the present study were measured using different scales, thus standardisation procedures were applied to ascertain which of the explanatory variables has a greater effect on SWB. The variables were scaled so that higher values reflected more of the positive characteristics. This study used $p < .001$, $p < .01$ and $p < .05$ as level of significance and I emphasised the interpretation of the results using thumb's effect sizes (27). Thus, $r \leq .10$ was used as a "small" effect size, $r > .10$ and $\leq .30$ as a "medium" effect size, and $r > .30$ as a "large" effect size.

Results

Descriptive results

Table 1 provides an overview of the descriptive statistics used later in the multilevel regression analysis. The average levels of happiness (on a scale of 1 to 4) was M = 3.141 and of life satisfaction (on a scale of 1 to 10) was M = 6.863 suggesting that the SWB of people across the globe was above the midpoint of the scale. However, the average levels of happiness and life satisfaction varied across countries and geographical regions. Countries were grouped into eight regions: (1) Western Europe, (2) Eastern Europe and Former Soviet Union, (3) North America, (4) Latin America, (5) Asia, (6) Sub-Saharan Africa, (7) Middle East and North Africa, and (8) Australia. In terms of happines, the top 10 countries were: Mexico, Uzbekistan, Qatar, Malaysia, Ecuador, Colombia, Trinidad and Tobago, Philippines, Sweden, and Nigeria. With regard to life satisfaction, the top 10 countries were: Mexico, Colombia, Qatar, Ecuador, Uzbekistan, Brazil, New Zealand, Sweden, Uruguay, and Thailand. On the other hand, in terms of happiness, the bottom 10 countries were: Russia, Bahrain, Estonia, Yemen, Ukraine, Palestine, Romania, Belarus, Iraq, and Egypt. With regard to life satisfaction, the bottom 10 countries were: Morocco, Iraq, Ukraine, Yemen, Belarus, Palestine, Tunisia, Armenia, Egypt, and India.

Among all regions, Latin America has the highest values of SWB. Mexico leads all other countries (happiness M = 3.613 and life satisfaction M = 8.512). On the other hand, two regions, namely Eastern Europe and Former Soviet Union and Middle East and North Africa have the lowest values of SWB (with an exeption of Qatar). Egypt ranks the lowest with an average of happiness M = 1.939 and life satisfaction M = 5.01 (see Appendix 1 for the list of countries, average happiness and life satisfaction of each country).

The average levels of other factors such as state of health, household's financial satisfaction, freedom of choice, preference for income inequality, trust, importance of friends and leisure were above the midpoint of the scale. However, in some factors such as scale of incomes (on a scale of 1 to 10), the average levels was lower as M = 4.908.

Multilevel modelling analysis results

Table 2 presents the results of the multilevel regression analysis investigating potential predictors of SWB. The table is organised so that the left part presents the multilevel analysis results of happiness and the right part presents the multilevel analysis results of life satisfaction.

The most significant factors driving happiness and life satisfaction include state of health, household's financial satisfaction, income ranking position, freedom of choice, trust, national pride, importance of friends and family, leisure, being females, weekly religious attendance, GDP per capita, and income inequality (see Table 2). Nevertheless, when the Cohen's rules of thumb (27, 28) was applied most factors seem to have "small" effect sizes ($r \leq 0.10$).

In terms of happiness only two factors were above the "small" effect size: state of health and household's financial satisfaction showed a "medium" effect sizes and were positively associated with happiness (b= 0.300, p<0.001; b= 0.169, p<0.001, respectively) (see Table 2).

With regard to life satisfaction, a similar trend has been observed and most factors had “small” effect sizes. The most significant factors driving life satisfaction were state of health, household’s financial satisfaction and freedom of choice (b= 0.159, p<0.001; b= 0.300, p<0.001; b= 0.207, p<0.001, respectively) (see Table 2).

Discussion

This study investigated the determinants of happiness and life satisfaction across 59 countries using the latest WVS survey conducted from 2010 to 2014. In excluding factors that have “small” effect sizes (27), the main finding of the present study is that health status, household’s financial satisfaction and freedom of choice will improve global SWB. In line with the World Happiness Report 2016 and State of Global Well-Being 2014, some regions are performing better than others. The levels of prosperity and *political will* appear to positively improve the SWB of people. On the other hand, political instability seems to negatively affect the SWB of people in some countries such as Yemen, Ukraine, Palestine, Iraq, Tunisia and Egypt.

Healthier people are happier and more satisfied with their lives. Good health is associated with greater well-being, while setbacks in health have negative effects on SWB. For example, people who have painful chronic conditions and those who have become seriously disabled have permanently lower levels of SWB compare to their counterparts who are not disabled (29). In line with previous studies (30), multilevel analysis showed a positive association between health status, happiness and life satisfaction even after controlling for several factors.

Traditionally, governments have assessed citizens’ well-being using GDP per capita (2, 3). Nevertheless, in line with previous studies, findings suggest that policy targeting the

improvement in health status is likely to be more effective for improving well-being than increasing the income per se.

Alongside health status, household's financial satisfaction was another significant driver of happiness and life satisfaction (10, 31). Being satisfied with your household's financial situation showed a positive association with happiness and life stisfaction. The results relating to financial satisfaction suggest that income not only allows individuals to purchase goods and services (3), but it also goes hand-in-hand with happiness and life satisfaction. In line with several other previous studies, absolute and highly relative income play an important role in influencing happiness and life satisfaction (2, 15, 16, 32).

This study found a positive association between freedom of choice and life satisfaction. Most nations are promoting emancipative values and a link has been established between freedom of choice and SWB (10, 33). Emancipative values such as freedom of choice, gender equality and tolerance have been link with Maslow's hierarchy of needs and human development theory (10, 33, 34). Political instability in countries such as Yemen, Ukraine, Palestine, Iraq, Tunisia and Egypt not only affect the prosperity of these countries, but restrict emancipative values and negatively affects people's SWB. For example, the WVS conducted three surveys in Egypt between 2001 and 2014 and saw an increase in the number of respondents who self-reported as "not at all happy", from 47 in 2001, to 56 in 2008, rising to 633 in 2013. This may explain why in WVS data Egypt was ranking at the bottom of the global SWB.

In line with the Easterlin paradox, Western and post-industrial countries were happier and more satisfied with their lives compared to poor countries, but according to WVS data only Sweden and New Zealand were listed in the top 10 of the global SWB. This may suggest that in the long run, increased income doesn't correlate with increased SWB (2, 15).

According to Inglehart's human development theory, a shift from materialist to post-materialist values may occur due to changes in people's behaviour, as they move from subsistence to high levels of economic (35). On the other hand, recent surveys including WVS suggest that the global well-being map is dynamic and changing (7). Some growing economies and Latin American countries in particular are performing well in terms of SWB. In Mexico, for example, the number of respondents who self-reported as "very happy" has increased since mid-1990s; the number of "very happy" respondents increased from 646 in 1996, to 877 in 2000, 909 in 2005 and finally to 1350 in 2012.

Lastly, despite the "small" effect sizes of many other factors, previous studies suggest a positive association between social connections and SWB because people greatly value the quality of their social connections (6). This study reports a positive relationship between SWB and trust in other people, importance of friends and family, leisure and weekly attendance to religious services. The importance of social relationships on SWB seems to be similar across countries (9, 11, 36). The lack of social connections may explain why unemployed people are not only less connected to others, but also they are less happy and satisfied with their lives (4, 9, 11).

Limitations and further directions

This study has the following limitations.

First, according to Cohen's rules of thumb, the positive association between SWB and several factors appear to be trivial because of their "small" effect sizes. However, there may be circumstances (that were not measured in this study) under which these factors may powerfully affect people's SWB.

Second, this study found a significant positive association between preferences for income inequality and SWB. According to the "tunnel" effect theory the rise of income inequality may signal future mobility and an increase of SWB (37). A study conducted in Poland, for example, suggests that when an increase of income inequality is associated with growth and when it is perceived to change rapidly (38), people may not see income inequality as a treat. Future studies are needed to investigate the circumstances in which people see income inequality as incentives rather than a threat in order to explore theory-driven mechanisms that might underlie that difference (10).

Third, the World Value Survey does have its limitations, such as the small sample size for each country and the collection mode, which varies between countries and the low responses rates for some countries. The latest WVS survey (2010-2014) had a small number of countries, 59 in total, which may affect the results of this study.

Finally, this cross-national study found similarities in major determinants of SWB, which is very useful for the purpose of global decision-making. Nevertheless, there may be differences in SWB between countries due to socio-cultural variances and levels of national development. An up-to-date longitudinal study will be very informative. Due to the small number of countries included in this study, factors that predict SWB might change, or their effects may decrease or increase. The present research was a cross-sectional; it means only the association between SWB and key factors was examined and further study is needed to investigate the causal relationships.

Acknowledgements

I thank Professor Chris Armitage and Dr Maria Panagioti for their help and support with this study. I thank the reviewers for their useful comments on the manuscript.

Conflicts of interest: ‘none declared’

Key points

1. As maximising the well-being of citizens seems to be a fundamental goal of most governments around the world.
2. This study can play an important part in orientating public health policy directions.
3. To maximize the well-being of the population, the international governmental organizations' policy makers may focus on health status, household's financial satisfaction and emancipative values.
4. The levels of prosperity and political stability appear to positively improve the SWB of people.

References

1. Stiglitz JE, Sen A, Fitoussi J-P. Report by the Commission on the Measurement of Economic Performance and Social Progress. Paris: INSEE, 2009.

2. Easterlin RA. Does economic growth improve the human lot? Some empirical evidence. In: David PA, Reder MW, editors. Nations and Households in Economic Growth: Essays in Honour of Moses Abramovitz. New York: Academic Press; 1974.

3. Howell RT, Howell CJ. The relation of economic status to subjective well-being in developing countries: A meta-analysis. Psychol Bull. 2008;134(4):536-60.

4. Helliwell JF, Barrington-Leigh CP. Measuring and Understanding Subjective Well-being. National Bureau of Economic Research, 2010.

5. van Reekum CM, Urry HL, Johnstone T, Thurow ME, Frye CJ, Jackson CA, et al. Individual differences in amygdala and ventromedial prefrontal cortex activity are associated with evaluation speed and psychological well-being. J Cognitive Neurosci. 2007;19(2):237-48.

6. Helliwell JF, Layard R, Sachs J. World Happiness Report 2016, Update (Vol. I). New York: Sustainable Development Solutions Network., 2016.

7. Gallup-Healthways. The State of Global Well-Being: 2014 Country Well-Being Rankings. Franklin, USA: Gallup-Healthways Well-being Index, 2015.

8. Machado L, Tavares H, Petribú K, Zilberman M, Torres RF, Cantilino A. Happiness and health in psychiatry: what are their implications? Archives of Clinical Psychiatry. 2015;42(4):100-10

9. Fleche S, Smith C, Sorsa P. Exploring Determinants of Subjective Wellbeing in OECD Countries: Evidence from the World Value Survey. OECD Economics Department Working Papers: OECD Publishing; 2011. p. 921.

10. Diener E, Inglehart R, Tay L. Theory and Validity of Life Satisfaction Scales. Social Indicators Research. 2013;112(3):497-527.

11. Jorm AF, Ryan SM. Cross-national and historical differences in subjective well-being. International Journal of Epidemiology. 2014.

12. Zagorski K, Evans MD, Kelley J, Piotrowska K. Does national income inequality affect individuals' quality of life in europe? Inequality, happiness, finances, and health. Social Indicators Research Jul. 2013(Pagination):No Pagination Specified.

13. World-Values-Survey. 1981-2014 Longitudinal Aggregate v.20150418. . In: Association JWVS, editor. Madrid SPAIN2015.

14. OECD. OECD guidelines on measuring subjective well-being. . Paris: OECD Publishing; 2013; Available from: http //www.oecd.org/statistics/guidelines on measuring subjective well-being.

15. Easterlin RA. Feeding the illusion of growth and happiness: A reply to Hagerty and Veenhoven. Social Indicators Research. 2005;74(3):429-43.

16. Ng W, Diener E. What Matters to the Rich and the Poor? Subjective Well-Being, Financial Satisfaction, and Postmaterialist Needs Across the World. Journal of Personality and Social Psychology. 2014;107(2):326-38.

17. Levin KA, Torsheim T, Vollebergh W, Richter M, Davies CA, Schnohr CW, et al. National income and income inequality, family affluence and life satisfaction among 13 year old boys and girls: A multilevel study in 35 countries. Social Indicators Research. 2011;104(2):179-94.

18. Snijders TAB, Bosker RJ. Multilevel Analysis: An introduction to basic and advanced multilevel modelling. Edition n, editor. London: Sage; 2012.

19. Miller GA, Chapman JP. Misunderstanding analysis of covariance. Journal of Abnormal Psychology. 2001;110(1):40-8.

20. World-Bank. GDP per capita (current US$). . World Bank, 2015.

21. De Maio FG. Income inequality measures. Journal of Epidemiology and Community Health. 2007;61(10):849-52.

22. Solt F. The Standardized World Income Inequality Database. Working paper 2014(SWIID Version 5.0, October 2014).

23. Stata. Stata 13.1 Statistics / Data Analysis. Texas: Stata Press.; 2013.

24. Bell A, Jones K. Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data. Political Science Research and Methods. 2015;3(1):133-53.

25. Hausman JA. Specification Tests In Econometrics. Econometrica. 1978 46(6):1251-71

26. Torres-Reyna O. Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2)2007. Available from: http://www.princeton.edu/~otorres/Panel101.pdf.

27. Cohen J. A Power Primer. Psychol Bull. 1992;112(1):155-9.

28. Wright SP. Adjusted P-Values for Simultaneous Inference. Biometrics. 1992;48 (4):1005-13

29. Headey B. The Set Point Theory of Well-Being Has Serious Flaws: On the Eve of a Scientific Revolution? Social Indicators Research. 2010;97(1):7-21.

30. Miret M, Caballero FF, Chatterji S, Olaya B, Tobiasz-Adamczyk B, Koskinen S, et al. Health and happiness: cross-sectional household surveys in Finland, Poland and Spain. Bull World Health Organisation 2014;92:716-25.

31. Havasi V. Financial Situation and Its Consequences on the Quality of Life in the EU Countries. Social Indicators Research. 2013;113(1):17-35

32. Boyce CJ, Brown GDA, Moore SC. Money and Happiness: Rank of Income, Not Income, Affects Life Satisfaction. Psychological Science. 2010;21(4):471-5.

33. Inglehart R, Foa R, Peterson C, Welzel C. Development, Freedom, and Rising Happiness A Global Perspective (1981-2007). Perspect Psychol Sci. 2008;3(4):264-85.

34. Frick WB. Humanistic psychology: interviews with Maslow, Murphy, and Rogers. Columbus: Charles E. Merrill Publishing Company; 1971.

35. Inglehart R. Modernization and Postmodernization: cultural, economic, and political change in 43 societies. Princeton, New Jersey: Princeton University Press; 1997.

36. Sarracino F. Determinants of subjective well-being in high and low income countries: Do happiness equations differ across countries? The Journal of Socio-Economics. 2013;42:51-66.

37. Hirschman AO, Rothschild M. The Changing Tolerance for Income Inequality in the Course of Economic Development. The Quarterly Journal of Economics. 1973;87(4):544-66.

38. Grosfeld I, Senik C. The emerging aversion to inequality. Economics of Transition. 2010;18(1):1-26.

39. CPI. Corruption Perceptions Index Berlin: Transparency International; 2014.

1 Table 1

2 Descriptive Statistics and measures

Variable	Participants	Mean	Std. Dev.	Min	Max	Description & measurement
Happiness	84339	3.141678	.7434577	1	4	Taking all things together, would you say you are: 1=Not at all happy; 2=Not very happy; 3=Quite happy; and 4=Very happy.
Life satisfaction	84517	6.863637	2.264329	1	10	All things considered, how satisfied are you with your life as a whole these days? On a scale of 1 to 10 if 1=dissatisfied and 10=satisfied.
Scale of incomes	82003	4.908784	2.104927	1	10	"We would like to know in what group your household is, counting all wages, salaries, pensions and other incomes that comes in". 1 indicates the lowest income group, and 10 the highest income group.
State of health	84753	3.916605	.8484247	1	5	All in all, how would you describe your state of health these days? If 1=very poor, 2=poor, 3=fair, 4=good, and 5=very good.
Employment status	83516	3.327303	2.120538	1	8	Full time, Part time, Self-employed, Retired, Housewife, Student, Unemployed, and Other employment category.

Educational attainment level	79673	4.976981	2.176089	1	8	Participants were asked to indicate their highest educational attainment level; from elementary, secondary to degree level.
Financial satisfaction	84433	5.958014	2.45419	1	10	How satisfied are you with the financial situation of your household? If '1' completely dissatisfied, and '10' completely satisfied.
Freedom of choice	83675	7.103866	2.213356	1	10	How much freedom of choice and control you feel you have over the way your life turns out, where 1 "none at all" and 10 "a great deal".
Meaning of life	83727	3.155159	.8582036	1	4	How often, if at all, do you think about the meaning and purpose of life?
Trust	82874	.256353	.4366216	0	1	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" 0= Can't be too careful or; 1= Most people can be trusted.
Friends important	84607	3.315825	.7397572	1	4	Indicate how important friends are in your life; if 1=not at all important, 2=not very, 3=rather important and 4=very important
Family important	84754	3.892064	.3758205	1	4	Indicate how important family in your life; if 1=not at all important, 2=not very, 3=rather important and 4=very important

Leisure important	84117	3.11679	.8341943	1	4	Indicate how important leisure time is in your life; if 1=not at all important, 2=not very, 3=rather important and 4=very important
National pride	82724	3.463856	.7143984	1	4	How proud are you to be [nationality]? if 1=not at all proud, 2=not very proud, 3=quite proud and 4=very proud
Preferences for income inequality	82527	5.43347	2.935386	1	10	1 = Incomes should be made more equal; and 10 = We need larger income differences as incentives.
Religious services attendance	80436	3.090606	1.596975	1	5	Apart from Weddings, Funerals and Christenings, how often do you attend religious services? 1= never, 2= once a year or less, 3= on special holidays, 4=once a month, 5= every week.”
Gender	84982	.5228637	.4994799	0	1	men=0, women=1
Marital status	84836	2.720861	2.183185	1	6	married, living together, divorced, separated, widowed, single
Age group	84917	42.05654	16.54851	16	99	Which age group you are: 15-24, 25-34, 35-44, 45-54, 55-64, 65 & over
GDP per capita	85070	17837.68	18930.81	630	71510	GDP per capita (in U.S. dollars) was drawn from the World Bank 2015 (20)

Gini coefficient	85070	.3844632	.0827492	.239	.594	The Gini coefficient was drawn from SWIID, and ranges from 0 to 1, which represent perfect equality and inequality, respectively.
Corruption	85070	5.346019	2.047123	1	8.3	Corruption Perceptions Index (CPI) drawn from Transparency International (39), showing the degree of public sector corruption as perceived by business people and country analysts, we rescale this measure as Corruption=10-CPI score means 0=highly clean and 10=highly corrupt.

3 Source: (13, 20, 22, 39).

Table 2

Results of the Multilevel Regression Analysis (b) investigating the association between potentials predictors and subjective well-being (i.e. happiness and life satisfaction).

	Happiness (dependant var.)			**Life Satisfaction (dependant var)**		
Independent var.	Coef. b	Std. Err.	p value	Coef. b	Std. Err.	p value
Low income scale	-0.021	0.010	0.031	-0.018	0.009	0.045
Middle income scale	0.013	0.009	0.140	0.022	0.008	0.007
High income scale	0.018	0.008	0.029	0.047	0.007	0.001
State of health	0.300	0.004	0.001	0.159	0.003	0.001
Employment						
Full time	0.029	0.021	0.174	-0.008	0.018	0.644
Part time	0.022	0.012	0.068	-0.007	0.011	0.534
Self-employed	0.017	0.014	0.225	-0.015	0.012	0.222
Retired	0.031	0.015	0.031	-0.010	0.013	0.415
Housewife	0.049	0.016	0.002	0.006	0.014	0.686
Students	0.031	0.012	0.011	0.008	0.011	0.424
Unemployed	0.001	0.013	0.978	-0.020	0.011	0.081
Other employment	0.011	0.007	0.098	-0.006	0.006	0.287
Education						
Elementary educ	-0.017	0.007	0.009	0.006	0.006	0.347
Secondary educ	-0.026	0.007	0.001	-0.005	0.007	0.482
University educ	-0.030	0.006	0.001	-0.004	0.006	0.476
Gender	0.022	0.003	0.001	0.028	0.003	0.001
Marital status						
Married	0.050	0.039	0.203	0.053	0.035	0.133
Together	0.011	0.019	0.541	0.018	0.017	0.295

Divorced	-0.016	0.014	0.246	-0.009	0.013	0.502
Separated	-0.011	0.011	0.300	0.000	0.010	0.963
Widowed	-0.023	0.019	0.224	-0.002	0.017	0.906
Single	-0.016	0.034	0.623	0.011	0.030	0.730
Age group						
Age 16to24	0.052	0.033	0.111	-0.004	0.029	0.881
Age 25to34	0.034	0.036	0.337	-0.025	0.032	0.431
Age 35to44	0.018	0.035	0.587	-0.033	0.031	0.288
Age 45to54	0.019	0.031	0.535	-0.022	0.028	0.427
Age 55to64	0.021	0.028	0.434	-0.008	0.025	0.756
Age 65andover	0.036	0.026	0.156	0.006	0.023	0.809
Financial satisfaction	0.169	0.004	0.001	0.300	0.003	0.001
Freedom of choice	0.098	0.004	0.001	0.207	0.003	0.001
Meaning of life	0.003	0.003	0.290	-0.010	0.003	0.001
National proud	0.084	0.004	0.001	0.060	0.003	0.001
Trust	0.025	0.003	0.001	0.026	0.003	0.001
Friends important	0.031	0.003	0.001	0.009	0.003	0.001
Family important	0.052	0.003	0.001	0.027	0.003	0.001
Leisure important	0.035	0.003	0.001	0.015	0.003	0.001
Inequality preference	0.010	0.003	0.001	0.024	0.003	0.001
Religious attendance						
Weekly attend	0.023	0.015	0.137	0.052	0.013	0.001
Monthly attend	0.011	0.010	0.305	0.036	0.009	0.001
Special days attend	0.006	0.012	0.641	0.033	0.010	0.001
Yearly attend	0.003	0.012	0.832	0.034	0.010	0.001
Never attend	0.001	0.013	0.917	0.044	0.011	0.001
National indicators						

GDP per capita	0.078	0.041	0.058	0.044	0.021	0.034
Gini coefficient	0.111	0.038	0.004	0.029	0.019	0.123
Corruption	0.060	0.052	0.242	0.004	0.026	0.882
Intercept	**0.081**	**0.133**	**0.544**	**-0.090**	**0.043**	**0.035**
Rho	0.059			0.018		
Rsq overall	0.248			0.321		
N	75476			75476		

Note: Level of significance: p< 0.001; p< 0.01; p< 0.05. All variables were standardised to a mean of 0 and standard deviation of 1 in the pooled individual-level sample. Source: (13, 20, 22, 39).

Appendix 1.

List of countries, year the survey was conducted, the number of participants, average happiness and life satisfaction, and country geographical region.

	Country (year surveyed)	N	Happiness (1-4)	Life satisf. (1-10)	Region
1.	Mexico (2012)	2,000	3.613	8.512	LA
2.	Uzbekistan (2011)	1,500	3.611	7.888	Asia
3.	Qatar (2010)	1,060	3.541	8.013	ME & NA
4.	Malaysia (2012)	1,300	3.526	7.133	Asia
5.	Ecuador (2013)	1,202	3.5	7.918	LA
6.	Colombia (2012)	1,512	3.476	8.388	LA
7.	Trinidad & Tob.(2011)	999	3.412	7.465	LA
8.	Philippines (2012)	1,200	3.385	7.335	Asia
9.	Sweden (2011)	1,206	3.369	7.62	Western Europe
10.	Nigeria (2011)	1,759	3.345	6.262	AfSS
11.	Ghana (2012)	1,552	3.339	6.422	AfSS
12.	Kuwait (2014)	1,303	3.333	7.209	ME & NA
13.	Kyrgyzstan (2011)	1,500	3.319	6.963	EE & FSU
14.	Thailand (2013)	1,200	3.312	7.566	Asia
15.	Singapore (2012)	1,972	3.304	6.971	Asia
16.	Australia (2012)	1,477	3.303	7.382	Australia & NZ
17.	Rwanda (2012)	1,527	3.299	6.467	AfSS
18.	New Zealand (2011)	841	3.286	7.648	Australia & NZ
19.	United States (2011)	2,232	3.263	7.441	North America
20.	Brazil (2014)	1,486	3.26	7.85	LA

21.	Netherlands (2012)	1,902	3.248	7.492	Western Europe
22.	Pakistan (2012)	1,200	3.248	7.478	ME & NA
23.	Zimbabwe (2012)	1,500	3.223	6.041	AfSS
24.	Libya (2014)	2,131	3.217	7.26	ME & NA
25.	Japan (2010)	2,443	3.215	6.911	Asia
26.	Kazakhstan (2011)	1,500	3.2	7.254	EE & FSU
27.	Uruguay (2011)	1,000	3.186	7.6	LA
28.	Turkey (2011)	1,605	3.184	7.272	ME & NA
29.	Argentina (2013)	1,030	3.18	7.476	LA
30.	Taiwan (2012)	1,238	3.17	6.885	Asia
31.	Poland (2012)	966	3.156	7.06	EE & FSU
32.	South Africa (2013)	3,531	3.126	6.678	AfSS
33.	Hong Kong (2013)	1,000	3.113	6.849	Asia
34.	Peru (2012)	1,210	3.107	7.134	LA
35.	India (2014)	1,581	3.1	5.006	Asia
36.	Germany (2013)	2,046	3.09	7.393	Western Europe
37.	Cyprus (2011)	1,000	3.085	7.004	EE & FSU
38.	Chile (2011)	1,000	3.084	7.269	LA
39.	Armenia (2011)	1,100	3.082	5.226	EE & FSU
40.	Azerbaijan (2011)	1,002	3.057	6.74	EE & FSU
41.	South Korea (2010)	1,200	3.043	6.61	Asia
42.	Jordan (2014)	1,200	3.02	6.61	ME & NA
43.	Slovenia (2011)	1,069	3.016	7.351	EE & FSU
44.	China (2012)	2,300	3.006	6.858	Asia
45.	Spain (2011)	1,189	3.002	6.77	Western Europe
46.	Lebanon (2013)	1,200	2.945	6.503	ME & NA
47.	Algeria (2013)	1,200	2.944	6.301	ME & NA

48.	Morocco (2011)	1,200	2.939	5.944	ME & NA
49.	Tunisia (2013)	1,205	2.914	5.582	ME & NA
50.	Russia (2011)	2,500	2.898	6.126	EE & FSU
51.	Bahrain (2014)	1,200	2.882	6.794	ME & NA
52.	Estonia (2011)	1,533	2.868	6.2	EE & FSU
53.	Yemen (2014)	1,000	2.865	5.887	ME & NA
54.	Ukraine (2011)	1,500	2.834	5.898	EE & FSU
55.	Palestine (2013)	1,000	2.795	5.622	ME & NA
56.	Romania (2012)	1,503	2.769	6.642	EE & FSU
57.	Belarus (2011)	1,535	2.762	5.8	EE & FSU
58.	Iraq (2012)	1,200	2.744	5.914	ME & NA
59.	Egypt (2013)	1,523	1.939	5.01	ME & NA
	Number of participants	85,070			

Note: WE: Western Europe; EE & FSU: Eastern Europe & Former Soviet Union; NA: North America; LA: Latin America; AfSS: Africa Sub-Sahara; ME & NA: Middle East & North Africa; the highest values of happiness are the top. Source: (13)

Appendix 2 Zero-order correlation between happiness, life satisfaction and other variables

		Happiness	Life satisfaction
1.	Happiness	1.00	
2.	Life satisfaction	0.46	1.00
3.	Income scales	0.19	0.25
4.	State of health	0.38	0.29
5.	Employment status	-0.04	-0.06
6.	Education level	0.05	0.07
7.	Financial satisfaction	0.30	0.47
8.	Freedom of choice	0.24	0.38
9.	Meaning of life	0.06	0.02
10.	Trust	0.05	0.07
11.	Friends important	0.11	0.08
12.	Family important	0.12	0.08
13.	Leisure important	0.14	0.11
14.	National pride	0.17	0.14
15.	Inequality preferences	0.09	0.08
16.	Religious attendance	0.06	0.00
17.	Gender (F)	0.01ns	0.01
18.	Marital status	-0.04	-0.04
19.	Age group	-0.08	-0.02
20.	GDP per capita	0.08	0.13
21.	Gini coefficient	0.06	-0.01ns
22.	Corruption	-0.06	-0.10

Note: level of significance: $p < 0.01$, otherwise ns = non-significant. Source: (13, 20, 22, 39).