

This is a repository copy of *Determinants of subjective well-being in representative samples of nations*.

White Rose Research Online URL for this paper:
<http://eprints.whiterose.ac.uk/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 "Easterlin 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 ($\text{Prob} > \chi^2 = 0.096 > 0.05$) (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 happiness, 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 exception 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 satisfaction. 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 threat. 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 |

| | | | | | | |
|------------------|-------|----------|----------|------|------|---|
| 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).

| Independent var. | Happiness (dependant var.) | | | Life Satisfaction (dependant 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 | | |
| Rsquared 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).

