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Leisure and Happiness: Evidence from International Survey Data

Miao Wang

Marquette University, grace.wang@marquette.edu

M. C. Sunny Wong

University of San Francisco

Happiness and Leisure Across Countries: Evidence from International Survey Data

Miao Wang
Department of Economics, Marquette University, Milwaukee, WI

M. C. Sunny Wong
Department of Economics, University of San Francisco, San Francisco, CA

Abstract

We study the statistical link between leisure and happiness. Using survey data from 33 countries in 2007, we find that (1) certain leisure activities, leisure's role in self-fulfillment and social interaction, and leisure's relation to work and other spheres of life are significantly linked to individual happiness; (2) the effect of leisure quantity is not as important as other aspects of leisure; and (3) some leisure activities can be negatively associated with happiness. Consistent with findings in previous studies, family income and individual demographic variables such as age and health condition are significantly associated with happiness. National unemployment and political stability also have robustly significant effects on happiness.

Keywords
Happiness; Leisure; Multilevel model

1 Introduction

Empirical economic research on happiness dates back to Easterlin (1974). He was the first economist to study the association between income and happiness across countries over time. Inspired by his work, a rapid development in the literature on the economics of happiness has occurred over the past two decades, combining both economists' and psychologists' techniques to assess individual happiness. Frey and Stutzer (2002) point out that studies of happiness are important to economists for three major reasons, besides the intrinsic interest in happiness at the individual level. First, studies of happiness help us to better analyze the net impact of economic policy. Second, empirical studies on happiness strengthen our understanding of the effect of institutions. Third, these studies help economists explore the formation of individual happiness, which in turn shed lights on "basic concepts and assumptions in economic theory" (p. 403). Today, a large body of empirical literature focuses on factors such as demographic characteristics, ethics, individual income, and certain national economic features (Blanchflower and Oswald 2004; Clark and Oswald 1994; Easterlin 2001, 2003; Frey and Stutzer 2000, 2002; James 2011).

It is assumed in standard economic theories that individual happiness is derived from utility, which depends on income and leisure (Varian 2005). Income, either at the individual or the national level, is routinely included as an explanatory variable in empirical studies of happiness, while leisure is usually omitted, possibly due to a lack of quality data. Using a recently available unique set of leisure survey data, our paper tries to fill this gap in the literature by focusing on the statistical link between leisure and happiness.

Leisure is linked to individual happiness through different channels. Iwasaki (2007) states that "an overarching theme common to almost all cultural contexts appears to be the role of leisure-like activities…for creating meanings which then help to promote the quality of people's lives" (p. 251). Since social interaction and interpersonal communication can be central components of leisure activities, such activities may enhance individuals' self- as well as social-identities and in turn promote self-esteem and life satisfaction. Many studies in the field of psychology find that positive experiences often come with connections with families and friends (Csikszentmihalyi 1997). In addition, participation in leisure activities can contribute to individual learning and development, making people feel more capable and secure (Iwasaki 2007).

Existing research generally quantifies leisure by the number of (non-)working hours. However, a recent study by Kahneman et al. (2006) argues that subjective satisfaction is related to how people spend their free time, not just on how much free time they have. Stebbins (2011) also stresses the importance of "serious leisure" or leisure projects that can produce certain sense of fulfillment. Similarly, Frey (2008), based on data from University of Zurich, find mixed results on whether simply watching TV makes people happy. These imply that the effect of leisure on happiness should be studied through *both* the quantity and the quality of leisure, not the quantity alone.

Complementing previous research, we take into account both the quantity and quality of leisure by including multiple measures of leisure: (1) leisure time (or the lack thereof); (2) leisure activities; (3) leisure's role in self-fulfillment and social interaction; and (4) leisure's relation to work and other spheres of life. To the best of our knowledge, our paper is among the first empirical studies in economics to systematically explore the relationship between leisure and happiness across countries.

We use the 2007 survey from the International Social Survey Program (ISSP) for our analysis. It provides data from approximately 48,000 respondents in 33 countries. [1] We start with an OLS specification as in Blanchflower and Oswald ([2011](#)), then adopt ordered logit and multilevel (hierarchical) models for empirical estimation. In OLS regressions, the dependent variable, self-reported level of happiness, is treated as continuous and estimated results are relatively easy to interpret. Ordered logit regressions allow us to explore the sequential order of the dependent variable, such as "very happy" versus "fairly happy", while the multilevel (hierarchical) logit model takes into consideration both the order of different levels of reported happiness and the natural clustering of respondents in different countries.

To preview our results, we find that leisure time is *not as important as* other measures of leisure, namely, leisure's role in self-fulfillment and social interaction, and leisure's relation to work and other spheres of life. Leisure time, measured by weekly working hours, is not statistically significant in our regressions. However, leisure's role in self-fulfillment and social interaction (e.g., whether leisure activities enable the respondent to be the person he/she is) and leisure's relation to work and other spheres of life (e.g., whether the respondent thinks that he/she uses leisure time to establish useful contacts) have marked association with the level of happiness. We also find that some leisure activities are associated with higher level of happiness (e.g., listening to music) and others with a decreased level of happiness (e.g., spending time on the internet). Consistent with findings in previous studies in the literature, individual variables such as income, health condition, age, gender, and national economic variables such as the unemployment rate and political stability are all significantly associated with the individual perception of happiness.

The remainder of our paper proceeds as follows: Sect. [2](#) describes variables used in our study and provides data sources; Sect. [3](#) discusses empirical results from OLS, ordered logit, and multi-level regressions; conclusions are offered in Sect. [4](#).

2 Data and Methodology

The ISSP is an annual program of cross-country collaboration on surveys covering a variety of topics in social science research. Currently 47 countries are members of the ISSP. The ISSP provides "cross-sectional data on statistically representative samples of the population collected in the same way in every country", which make cross-country comparison of happiness more reliable (Blanchflower and Oswald [2011](#): 14). Our data come from the ISSP 2007 Leisure Time and Sports Survey, including approximately 48,000 respondents in 33 economies. The dependent variable "happiness" is constructed based on answers to the question "How happy or unhappy are you in general these days?" Respondents' answers to this question include "very happy", "fairly happy", "not very happy" and "not at all happy". We assign a value of 4 to the answer "very happy", 3 to "fairly happy", 2 to "not very happy", and 1 to "not at all happy".

We note that instruments of happiness can consist of multiple related questions. For example, Peterson et al. ([2005](#): 27) develop a scale to measure three orientations of happiness by "simultaneously examining the pursuit of pleasure and the pursuit of meaning as different route to happiness." Lyubomirsky and Lepper ([1999](#)) assess happiness based on a pool of 13 self-reported items and further reduce the pool to four items to construct the Subjective Happiness Scale. However, a single question for measuring happiness is also commonly adopted in the literature. For example, Frey and Stutzer

([2000](#)) and Blanchflower and Oswald ([2011](#)) use a single measure of happiness as an catch-all index (see also Frey and Stutzer [2005](#)) for a survey of economic literature on happiness studies).

Constrained by the setup of the ISSP survey, which has just one question related to happiness, we are unable to include alternative or multiple instruments of happiness in this study. However, the happiness measure in this study may be considered one of the most direct measures of happiness since the respondents are asked to make a judgment of whether they are happy or unhappy. Lyubomrisky and Lepper ([1999](#)) find that the four self-reported items in their study, one of which is "In general, I consider myself: 'not a very happy person'…'a very happy person,"' show good to excellent internal consistency according to 14 samples collected at different times and locations. The authors also show that the composite scale of happiness is highly correlated with other single-item measures of happiness such as Bradburn's ([1969](#)) Global Happiness Item. Hence, we believe that our measure can be a reasonable indicator of happiness, although it may not capture happiness as completely as an index based on multiple measures. Given that the survey covers more than 45,000 respondents across multiple countries and has rich information on leisure activities, the results of our paper should still be of considerable interest to researchers in this field.

The survey finds a high level of happiness internationally. The average value of happiness in our sample is 3.08, with a standard deviation of 0.71. About 26.5 % of all respondents feel "very happy", 56.5 % "fairly happy", 14.5 % "not very happy", and only 2.5 % "not at all happy". The happiest country in our sample according to the simple average of respondents' answers is Ireland, with an average level of happiness of 3.44. The least happy country is Russia, with an average happiness of 2.6. Mexico (3.37) and Switzerland (3.32) are ranked number two and three, respectively. The US (3.31) is the fourth happiest country in our sample while UK (3.21) is the ninth.

We estimate a happiness model as follows (Blanchflower and Oswald [2004](#), [2011](#)):

$$Happiness_{ij} = \beta Leisure_{ij} + \gamma'^{X_{ij}} + \delta'^{Z_j} + \epsilon_{ij}$$

where *Happiness* $_{ij}$ is the happiness rating of individual *i* in country *j*; *Leisure* represents an individual's leisure measures; *X* is a vector including individual characteristics, and *Z* includes national-level variables in country *j* suggested by previous studies.

Our main variable of interest is *Leisure*. We capture leisure by four groups of variables:

> 1. Leisure time: Leisure time is proxied by the log value of weekly working hours. The longer hours worked, the less leisure time an individual has.

> 2. Leisure activities: As mentioned previously, the subjective satisfaction is related to how people spend their free time. There may exist differences in consequences for happiness of compulsory non-work activities (e.g., childcare), active leisure (e.g., exercise), and passive leisure activities (e.g., going to movies) (Kahneman et al. [2006](#); Frey [2008](#)). In this study, we look at 13 different leisure activities covered in the survey by measuring the frequency of each activity in an individual's free time, which are "daily", "several times a week", "several times a month", "several times a year or less often", and "never". [2]

> 3. Leisure's role in self-fulfillment and social interaction: Measures are based on answers to two questions asking respondents whether their free time activities enable them to be the kind of

person they are or to strengthen their relationships with other people. Answers to these two questions range from "not at all" to "very much".

4. Leisure's relation to work and other spheres of life: Measures come from answers to three questions asking respondents whether they use their free time to establish useful contacts and try to develop skills, or whether they find themselves thinking about work in their free time. Answers to these three questions range from "never" to "very often".

All measures of leisure, except leisure time, are recorded cardinally on a 5-point scale, with 5 indicating "very much" or "very often". A detailed description of these variables and measures can be found in the appendix. We also report the top and bottom five countries in the appendix, ranked by their average values of leisure measures. The rankings show an evident cross-country heterogeneity. For example, South Korea and Taiwan have the longest working hours in our sample at an average of 49 hours a week, while Norway and UK report the shortest average working hours of 37 hours a week. [3] Respondents in Czech Republic tend to go shopping in their free time much more often than respondents in Croatia (3.58 vs. 1.91 on a five-point frequency scale). Individuals in Philippines are among the ones who most frequently think about work in their free time (a frequency measure of 3.84) and individuals in Dominican Republic are among the ones who least often think about work in their free time (a frequency measure of 2.55).

In terms of leisure activities, out of the 13 leisure activities, Cyprus and Switzerland appear six times in the top-five-country lists. Cyprus is among the top five for *watch TV*, *go to movies*, *get together with relatives*, *play cards*, *do handicrafts*, and *spend time on internet*. For Switzerland, the activities include*read books*, *attend cultural events*, *play cards*, *listen to music*, *sports and gym*, and *do handicraft s*. The US appears on the top-five lists for *listen to music* and *spend time on internet* with a frequency measure of 4.42 and 3.40, respectively.

Due to the cross-sectional characteristic of our data, it is difficult to interpret the estimated correlations between happiness and different measures of leisure as causal. For example, happier individuals may be more involved in leisure activities than those who are less happy because those individuals with higher levels of happiness self-select into certain leisure activities and not because leisure leads to happiness. However, we only observe individuals' responses at one point in time and we do not have perfect instruments for different measures of leisure. Hence, we attempt to alleviate this problem by controlling for individual demographic and economic characteristics (e.g., health condition, age, gender, or income) as well as national economic conditions (e.g., GDP, unemployment rate, and political stability) that may be simultaneously correlated with individual happiness and with leisure activities. However, we are aware of the potential issue where our findings could be partially driven by some unobservable characteristics. The individual and national variables are as follows:

1. Individual demographic variables: Self-rated health condition, age, gender, marital status (dummy variables with married, living with spouse as the base group), years of education of the respondent, and whether the respondent has children or not.

2. Individual economic variables: Employment status dummy variables (with unemployed and underemployed as the base group), and family income. The 2007 leisure survey has different questions concerning family income in different countries. For example, in Argentina, the survey question is "I would like that you tell me now the net monthly income, including all concepts, of

your family as a whole", while in the US, the survey question is "Your total family income last year before tax is…". As a result, answers to the income question are not directly comparable across countries. Previous literature indicates that the absolute level of income may not matter as much as one's position relative to others. Relative income can have a stronger association with individual happiness than absolute income (Luttmer 2005; Clark and Senik 2010).

To make the family income variable meaningful across countries, we construct a relative family income measure, which is the respondent's reported family income relative to his/her national average in our sample. For instance, the income variable for respondents in Argentina is constructed as the respondent's net monthly income over the average net monthly income of all Argentine respondents. A value of 110 represents that the respondent's family income is 10 % higher than his/her national average family income. On the other hand, a value of 90 means that the respondent's family income is 10 % lower than his/her national average.

3. National economic variables: The 33 countries in our sample have different cultural and social backgrounds. This diversity can affect the relationship between leisure and individual happiness. As Chick (1998) argues, human culture in general consists of two aspects: the instrumental-utilitarian aspect of culture, including the political and economic systems in a society, and the expressive aspect of culture through which people express their collective identity. An often used framework to assess culture is Hofstede's five dimensions of culture: power distance, individuality, masculinity, uncertainty avoidance, and long-term orientation. Some or all dimensions of culture regulate how individuals interact with each other in their free time and how they value their leisure activities. For example, Asian people might show a stronger preference toward quiet and reflective activities than individuals in the US and Western Europe. In many Asian countries, females often associate being "thin" with beauty while in the US and Latin America, females tend to associate being "fit" with beauty. A large number of popular global sports, such as soccer and tennis, were developed and modified in Europe. These can certainly affect an individual's preferences regarding the level of physical activities in his or her leisure time. Focusing on the individuality aspect of culture, the US and countries in Western Europe might be more individualistic than Asian, Eastern European, and Latin American countries. For instance, gatherings and activities of extended families could be valued more in Eastern Europe than in Western Europe.

As a result, in addition to individual economic variables, we include national unemployment rate, national income, and political stability. To be more specific, we use the log value of per capita GDP (purchasing power parity) to measure average national income. Although the literature is puzzled by the fact that over time, increasing income may not necessarily be associated with rising level of happiness, it is often found that individuals in high-income countries tend to report on average a higher level of happiness than those in low-income countries (Diener et al. 1995; Inglehart 1990).

Individuals may feel unhappy about general unemployment even when they themselves do have a job. As mentioned by Frey and Stutzer (2002), individuals "may feel bad about the unfortunate fate of those unemployed and they may worry about the possibility of becoming unemployed themselves in the future" (p. 420). Consequently, high national unemployment may be associated with low level of individual happiness.

Frey and Stutzer ([2000](#)) point out that institutional conditions in a country should influence individual happiness. Based on interview data of 6,000 residents in Switzerland, the authors find that development of direct democracy has a positive coefficient in individual happiness regressions (see also Helliwell and Huang [2008](#)). In our study, we employ the political risk index from the *International Country Risk Guide* to measure a country's institutional quality and political stability. This index ranges from zero (very risky) to 100 (very stable) and is a composite score from individual rankings of 12 components. [4] The *International Country Risk Guide* is published by the Political Risk Service Group, Inc.

All the national variables in our study are averaged over 2000–2007 to eliminate short-term fluctuations. Definitions and data sources for individual demographic variables, individual economic variables, and national economic variables can be found in the appendix. We also provide the summary statistics in Table [1](#).

Table 1 Descriptive statistics

Variable	Obs	Mean	SD	Min	Max	Variable	Obs	Mean	SD	Min	Max
Happiness	47,550	3.08	0.71	1	4	Log (weekly working hours)	27,812	3.65	0.44	0	4.56
Health	48,323	3.23	1.12	1	5	Watch TV	48,377	4.50	0.94	1	5
Age	48,559	45.89	17.36	15	98	Go to movies	48,118	1.68	0.74	1	5
Age-squared	48,559	2,407.45	1,705.99	225	9,604	Go out shopping	48,040	2.51	1.07	1	5
Years of education	44,165	11.86	3.73	1	32	Read looks	48,098	2.78	1.40	1	5
Children	48,670	0.61	0.49	0	1	Attend cultural events	48,033	1.77	0.76	1	5
Female	48,666	0.55	0.50	0	1	Get together with relatives	48,195	2.88	0.98	1	5
Widowed	47,466	0.09	0.28	0	1	Get together with friends	48,192	3.19	1.08	1	5
Divorced	47,466	0.07	0.25	0	1	Play cards	47,935	1.91	1.12	1	5
Separated	47,466	0.02	0.15	0	1	Listen to music	48,104	4.06	1.25	1	5
Single	47,466	0.27	0.44	0	1	Sports, gym	48,185	2.85	1.45	1	5
Family income	38,972	100.00	98.20	0.18	5,051.68	Attend sporting events	48,092	1.72	0.94	1	5
Employed	48,236	0.45	0.50	0	1	Do handicrafts	48,094	1.97	1.24	1	5
Student	48,236	0.06	0.23	0	1	Spend time on the internet	48,159	2.67	1.69	1	5
Retired	48,236	0.18	0.38	0	1	Strengthen your	45,725	3.50	1.06	1	5

					relationships					
Home duty	48,236	0.09	0.28	0	1	Enable you to be yourself	45,469	3.72	1.03	1	5
Log (GDP per capita)	48,702	9.84	0.57	8.31	10.70	Develop skills	46,862	3.00	1.15	1	5
Unemployment rate	48,702	9.18	5.99	3.10	27.41	Establish useful contacts	46,829	2.92	1.11	1	5
Political stability (in log)	48,702	4.35	0.11	4.14	4.54	Think about work	43,646	2.97	1.28	1	5

3 Empirical Results

3.1 Happiness Across Countries

We start with a specification as in Blanchflower and Oswald (2011) without leisure measures to perform a general comparison of happiness across nations. This regression includes individual variables and country dummies with the UK as the base country, against which comparisons are made in Table 2. Mexico (dummy coefficient of 0.14), Ireland (0.11), the US (0.08), and Switzerland (0.08) are significantly "happier" than the UK Countries that tend to report a similar level of happiness as the UK are Belgium, Norway, New Zealand, and Australia. The least happy countries include Slovakia (−0.36), Croatia (−0.37), South Korea (−0.37), Russia (−0.37), and Bulgaria (−0.48). Similar as in Blanchflower and Oswald (2011), Finland and France, being developed countries, somehow appear low on the happiness scale with country dummy coefficients of −0.18, and −0.35, respectively.

Table 2 Happiness across countries (OLS estimation) and relative ranking to United Kingdom

Variables	Coef.	SE	t-stat	Variables	Coef.	SE	t-stat	Relative ranking to UK
Health	0.2289***	0.003	67.75	Mexico	0.1388***	0.034	4.07	1
Age	−0.0142***	0.001	−10.70	Ireland	0.1134***	0.033	3.49	2
Age squared	0.0001***	0.000	10.94	United States	0.0793***	0.03	2.61	3
Income	0.0004***	0.000	11.62	Switzerland	0.0765**	0.034	2.25	4
Child	−0.0012	0.008	−0.15	Belgium	0.0253	0.032	0.8	5
Female	0.035***	0.007	4.91	Norway	0.0141	0.032	0.44	6
Widowed	−0.2458***	0.014	−18.01	New Zealand	−0.0104	0.033	−0.31	7
Divorced	−0.1873***	0.014	−13.68	Australia	−0.035	0.029	−1.22	8
Separated	−0.2434***	0.022	−11.17	Chile	−0.0572*	0.032	−1.82	9
Never married	−0.1818***	0.010	−18.10	Czech Republic	−0.0626*	0.035	−1.79	10
Employed	0.0451***	0.009	5.02	Philippines	−0.0633**	0.032	−1.99	11
Retired	0.0777***	0.020	3.86	Taiwan	−0.0806***	0.029	−2.74	12
Student	0.0957***	0.014	6.96	Dominican Republic	−0.0821***	0.031	−2.64	13
Homemaker	0.0900***	0.014	6.50	Argentina	−0.0938***	0.031	−3.05	14
Education	−0.0002	0.000	−1.06	Austria	−0.1079***	0.034	−3.14	15

				Country	Coef.	SE	t	Rank
Constant	2.7495***	0.045	60.7	Uruguay	−0.1135***	0.031	−3.72	16
				Sweden	−0.1262***	0.032	−3.94	17
				Germany	−0.1471***	0.031	−4.71	18
				Japan	−0.1629***	0.033	−4.97	19
				South Africa	−0.178***	0.029	−6.16	20
				Finland	−0.1842***	0.032	−5.67	21
				Slovenia	−0.2122***	0.038	−5.63	22
				Poland	−0.2123***	0.032	−6.73	23
				Israel	−0.2595***	0.033	−7.97	24
				Latvia	−0.3085***	0.036	−8.65	25
				Cyprus	−0.3292***	0.033	−9.9	26
				France	−0.3502***	0.03	−11.87	27
				Slovak republic	−0.3629***	0.033	−11.03	28
				Croatia	−0.3726***	0.034	−11	29
				South Korea	−0.3744***	0.031	−12.23	30
Observations	36,254			Russia	−0.3772***	0.03	−12.65	31
R-squared	0.221			Bulgaria	−0.483***	0.036	−13.57	32

*** Significant at 1 %, ** Significant at 5 %, * Significant at 10 %

3.2 Leisure and Happiness

Tables 3 and 4 present regression results with leisure measures. Note that it is not feasible to include three national economic variables and country dummies in the same regression due to multicollinearity. In addition, national variables can capture, to a certain extent, individual-country fixed effects. As a result, we include national economic factors instead of country dummies in Tables 3 and 4. In Table 3, the dependent variable, happiness, is treated as continuous (Blanchflower and Oswald 2011; James 2011). In Table 4, we report results of ordered logit regressions, where the dependent variable is treated as ordinal with a sequential order. Regression 1 in both Tables 3 and 4 includes log weekly working hours as the measure of leisure time (or the lack of); regression 2 includes different leisure activities. For the purpose of brevity we only report the coefficients on activities which are statistically significant. Estimated coefficients on other activities are available upon request. Leisure's role in self-fulfillment and social interaction are included in regressions 3 and 4, and regressions 5–7 focus on leisure's relation to work and other spheres of life.

Table 3 Happiness regressions with leisure variables (OLS estimations)

Table 3 Happiness regressions with leisure variables (OLS estimations)

	3.1	3.2	3.3	3.4	3.5	3.6	3.7
Working hours							
Log of weekly hours	−0.003						
	(0.010)						
Leisure activities							
Watch TV		0.007*					
		(0.004)					
Go shopping		0.010***					
		(0.003)					
Read books		0.017***					
		(0.003)					
Attend cultural events		0.020***					
		(0.005)					
Get together with relatives		0.010***					
		(0.004)					
Get together with friends		0.006*					
		(0.004)					
Listen to music		0.033***					
		(0.003)					
Sports, gym		0.005*					
		(0.003)					
Attend sporting events		0.033***					
		(0.004)					
Spend time on internet		−0.016***					
		(0.003)					
Leisure time enables you							
To strengthen relationship			0.069***				

Table 3 continued

	3.1	3.2	3.3	3.4	3.5	3.6	3.7
			(0.003)				
To be the person you are				0.080***			
				(0.003)			
Use free time to							
Develop skills					0.051***		
					(0.003)		
Establish useful contact						0.048***	
						(0.003)	
Do you find yourself							
Thinking about work in free time							−0.028***
							(0.003)
Health	0.222***	0.231***	0.226***	0.223***	0.229***	0.230***	0.236***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Age	−0.021***	−0.016***	−0.017***	−0.017***	−0.017***	−0.016***	−0.015***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age^2	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family income	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children	0.021**	0.030***	0.028***	0.034***	0.026***	0.022***	0.018**
	(0.010)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Female	0.021**	0.020**	0.024***	0.021***	0.027***	0.031***	0.025***
	(0.009)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Widowed	−0.177***	−0.244***	−0.233***	−0.230***	−0.229***	−0.240***	−0.250***
	(0.023)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)
Divorced	−0.167***	−0.184***	−0.171***	−0.169***	−0.169***	−0.176***	−0.168***

Table 3 continued

	3.1	3.2	3.3	3.4	3.5	3.6	3.7
	(0.016)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Separated	−0.172***	−0.178***	−0.173***	−0.177***	−0.180***	−0.190***	−0.175***
	(0.025)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)
Single	−0.157***	−0.165***	−0.155***	−0.156***	−0.157***	−0.158***	−0.154***
	(0.012)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Employed		0.025***	0.019**	0.014	0.016*	0.022**	0.012
		(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Student		0.007	0.021	0.023	0.017	0.040*	0.031
		(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.022)
Retired		0.025*	0.035**	0.026*	0.041***	0.042***	0.013
		(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Home duty		0.117***	0.110***	0.115***	0.115***	0.111***	0.110***
		(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Education	−0.000	−0.000	−0.001***	−0.001***	−0.001***	−0.001***	−0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log GDP per capita (PPP)	−0.023	−0.007	−0.023**	−0.019*	−0.021*	−0.017	−0.028**
	(0.014)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
National unemployment	−0.005***	−0.004***	−0.005***	−0.005***	−0.004***	−0.004***	−0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political stability	0.402***	0.467***	0.488***	0.431***	0.474***	0.518***	0.519***
	(0.064)	(0.055)	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)
Observations	21,649	34,534	34,284	34,109	35,141	35,082	32,681
R-squared	0.155	0.198	0.187	0.19	0.185	0.186	0.184

Standard errors in parentheses, *** significant at 1 %, ** significant at 5 %, * significant at 10 %. There are 13 different leisure activities estimated in regression 3.2, but only those with significant coefficients are reported in the table. The leisure activities which do not significantly affect happiness are: (1) going to the movies; (2) playing cards; and (3) doing handicrafts. The coefficients on the three variables can be obtained upon request

Standard errors in parentheses, *** significant at 1 %, ** significant at 5 %, * significant at 10 %. There are 13 different leisure activities estimated in regression 3.2, but only those with significant coefficients are reported in the table. The leisure activities which do not significantly affect happiness are: (1) going to the movies; (2) playing cards; and (3) doing handicrafts. The coefficients on the three variables can be obtained upon request

Table 4 Happiness regressions (ordered logit estimations)

	4.1	4.2	4.3	4.4	4.5	4.6	4.7
Working hours							
Log of weekly hours	−0.005						
	(0.033)						
Leisure activities							
Go shopping		0.029***					
		(0.011)					
Read books		0.056***					
		(0.009)					
Attend cultural events		0.059***					
		(0.017)					
Get together with relatives		0.033***					
		(0.012)					
Listen to music		0.101***					
		(0.009)					
Attend sporting events		0.106***					
		(0.013)					
Spend time on internet		−0.054***					
		(0.009)					
Leisure time enables you							
To strengthen relationship			0.222***				
			(0.011)				
To be the person you are				0.255***			
				(0.011)			
Use free time to							
Develop skills					0.162***		
					(0.010)		

Table 4 continued

	4.1	4.2	4.3	4.4	4.5	4.6	4.7
Establish useful contact						0.149***	
						(0.010)	
Do you find yourself							
Thinking about work in free time							−0.094***
							(0.009)
Health	0.766***	0.758***	0.743***	0.733***	0.746***	0.751***	0.772***
	(0.015)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Age	−0.071***	−0.051***	−0.055***	−0.056***	−0.055***	−0.053***	−0.049***
	(0.007)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
Age^2	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family income	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Children	0.065**	0.090***	0.084***	0.105***	0.076***	0.064**	0.058**
	(0.032)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Female	0.069**	0.055**	0.064***	0.055**	0.077***	0.088***	0.071***
	(0.029)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)
Widowed	−0.567***	−0.731***	−0.707***	−0.698***	−0.684***	−0.713***	−0.754***
	(0.079)	(0.045)	(0.046)	(0.047)	(0.045)	(0.045)	(0.049)
Divorced	−0.535***	−0.546***	−0.512***	−0.510***	−0.501***	−0.520***	−0.500***
	(0.054)	(0.045)	(0.045)	(0.045)	(0.044)	(0.044)	(0.045)
Separated	−0.565***	−0.564***	−0.542***	−0.557***	−0.564***	−0.594***	−0.550***
	(0.085)	(0.071)	(0.072)	(0.072)	(0.071)	(0.071)	(0.072)
Single	−0.512***	−0.511***	−0.492***	−0.492***	−0.491***	−0.494***	−0.481***
	(0.040)	(0.033)	(0.033)	(0.033)	(0.032)	(0.032)	(0.033)

Table 4 continued

	4.1	4.2	4.3	4.4	4.5	4.6	4.7
Employed		0.039	0.015	−0.001	0.006	0.026	0.002
		(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)
Student		0.004	0.043	0.046	0.024	0.093	0.074
		(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.068)
Retired		0.070	0.094**	0.061	0.111**	0.114**	0.036
		(0.045)	(0.045)	(0.045)	(0.044)	(0.044)	(0.048)
Home duty		0.362***	0.343***	0.359***	0.357***	0.346***	0.346***
		(0.046)	(0.046)	(0.046)	(0.045)	(0.045)	(0.049)
Education	−0.001	−0.001	−0.002***	−0.002***	−0.002***	−0.002***	−0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log of GDP per capita (PPP)	−0.076	−0.019	−0.072**	−0.060*	−0.068*	−0.055	−0.091**
	(0.047)	(0.037)	(0.036)	(0.036)	(0.035)	(0.035)	(0.036)
National unemployment	−0.017***	−0.012***	−0.014***	−0.013***	−0.012***	−0.011***	−0.011***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Political stability	1.220***	1.357***	1.407***	1.235***	1.354***	1.490***	1.506***
	(0.215)	(0.172)	(0.170)	(0.170)	(0.168)	(0.168)	(0.170)
Cut1	0.990	3.996***	3.233***	2.706***	2.817***	3.571***	2.611***
Cut2	3.450***	6.273***	5.506***	4.977***	5.073***	5.835***	4.901***
Cut3	6.720***	9.401***	8.647***	8.123***	8.199***	8.955***	8.017***
Observations	21,649	34,534	34,284	34,109	35,141	35,082	32,681

Standard errors in parentheses, *** significant at 1 %, ** significant at 5 %, * significant at 10 %. There are 13 different leisure activities estimated in regression 4.2, but only those with significant coefficients are reported in the table. The leisure activities which do not significantly affect happiness are: (1) watching TV; (2) going to the movies; (3) playing cards; (4) sports and gym; (5) getting together with friend; and (6) doing handicrafts. The detailed results of other control variables can be obtained upon request

3.2.1 Leisure Measures

We start with graphs depicting to the average level of happiness and different leisure measures in our sample. In Fig. 1, we plot non-parametric regression lines for the average level of happiness and GDP per capita over different groups of individuals according to their answers to leisure questions. We present graphs on selected leisure measures including *read books*, *use leisure time to strengthen relationship*s, *use leisure time to learn skills*, and *think about work in free time*. Panel A in Fig. 1 shows that on average individuals who read books more frequently report a higher happiness score. The average value of happiness for individuals who read books "several times a week" is higher than that for

individuals who read books "several times a month" and this pattern holds in countries with different levels of national income. Similarly, individuals who feel that they use leisure time *to learn skills* and *to strengthen relationship with others* report a higher value of happiness score. Individuals who tend to "often" think about work in their free time report a lower happiness score than others.
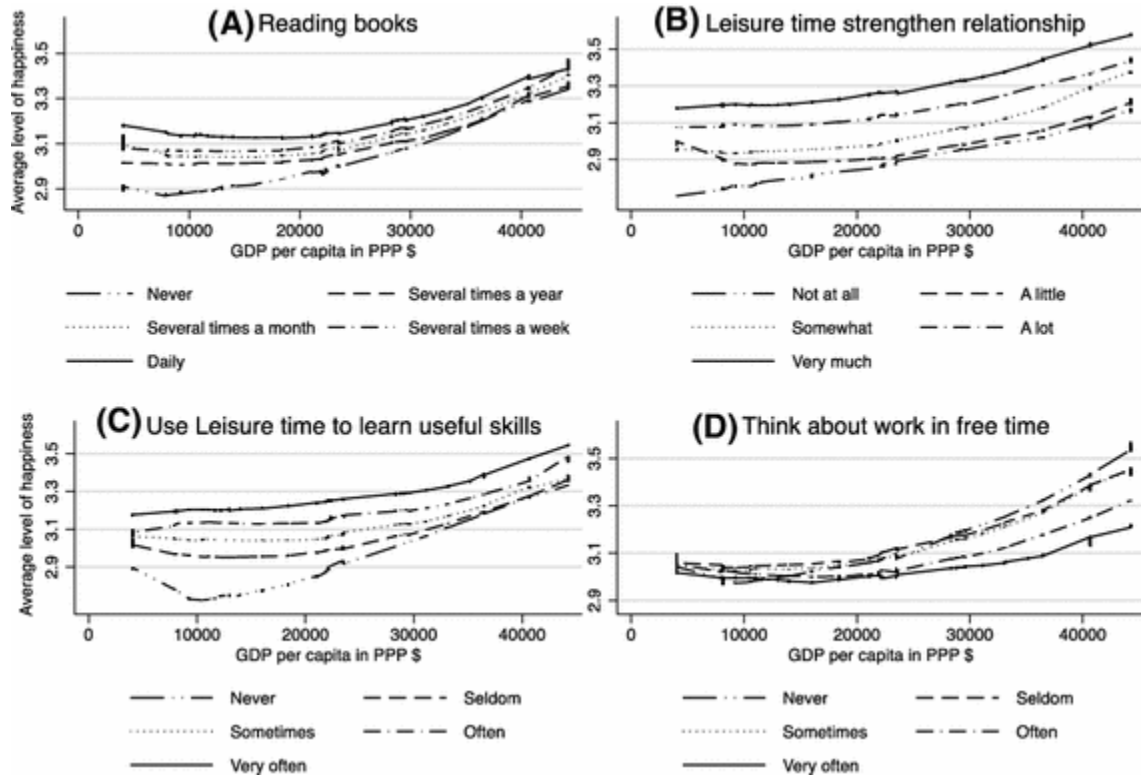
Fig. 1 Happiness and selected leisure activities

We now focus on the statistical link between leisure and happiness. Qualitatively, OLS and ordered logit regressions in general provide similar results. The coefficient on the log value of weekly working hours is negative, but not statistically different from zero. It appears that longer working hours (or less leisure time) are not necessarily associated with unhappiness. The coefficient on working hours is not statistically significant. Instead, there are significant effects from leisure activities, leisure's role in self-fulfillment and social interaction, and leisure's relation to work and other spheres of life. Leisure activities such as *attend sports event*, *read books*, *get together with relatives*, and *listen to music* enter happiness regressions positively. Out of the 13 different leisure activities, nine have a significantly positive coefficient in the OLS regression and six in the ordered logit regression. Coefficients on *go to the movies*, *play cards*, and *do handicrafts* are in general not statistically different from zero.

Table 3 shows that out of all leisure activities covered in the survey, *attend sporting events* and *listen to music* are more closely associated with happiness, followed by *attend cultural event*, *read books*, and *get together with relatives*. For example, according to regression 2 in Table 3, the difference in happiness between an individual who listen to music "several times a week" and "several times a month" is 0.033 points on a 4-point happiness scale; and the difference in happiness between reading books "several times a week" and reading books "several times a month" is 0.017 points on a 4-point scale, holding other things constant. *S pend time on the internet*, on the other hand, is associated with

unhappiness. According to the OLS estimated coefficient, individuals who spend time on the internet daily are less happy than individuals who spend time on internet several times a week by 0.016 points, *ceteris paribus*.

Since we cannot directly interpret coefficients in ordered logit regressions quantitatively, two measures of probability are derived from ordered logit results. In Table 5, we report the marginal probability of different leisure measures, which shows a change in happiness probability given a change in, for example, frequency of leisure activities. In addition, we report the average predicted probability of happiness in Table 6, which shows the predicted probability of feeling, for instance, "very happy" or "fairly happy" given certain values of leisure measures. [5] Table 5 shows that spending more time on the internet is associated with an increase the probability of an individual feeling "not at all happy" by 0.13 %, but a decrease in the probability of an individual feeling "very happy" by 0.89 %. [6] Individuals who attend cultural events more frequently are more likely to report "very happy" by 0.96 % points, and less likely to report "not at all happy" by 0.14 % points. In Table 6, the predicted probability of feeling "very happy" is 16.95 % if an individual "never" *listens to music*, 18.43 % if an individual listens to music "several times a year", 20 % when listening to music "several times a month", 21.68 % when listening to music "several times a week", and reaching 23.45 % if an individual listens to music "daily", *ceteris paribus*.

Table 5 Marginal effects of leisure activities (ordered logit estimations)

Activities	Not at all happy	Not very happy	Fairly happy	Very happy
Go shopping	−0.0007***	−0.0029***	−0.0012***	0.0048***
	(0.0002)	(0.0011)	(0.0004)	(0.0017)
Read books	−0.0013***	−0.0056***	−0.0022***	0.0091***
	(0.0002)	(0.0008)	(0.0003]	(0.0014)
Attend cultural events	−0.0014***	−0.0059***	−0.0023***	0.0096***
	(0.0004)	(0.0017)	(0.0006)	(0.0027)
Get together with relatives	−0.0007***	−0.0032***	−0.0012***	0.0053***
	(0.0002)	(0.0012)	(0.0004)	(0.0019)
Listen to music	−0.0024***	−0.0102***	−0.004***	0.0166***
	(0.0002)	(0.0009)	(0.0004)	(0.0015)
Attend sporting events	−0.0025***	−0.0106***	−0.0041***	0.0173***
	(0.0003)	(0.0013)	(0.0005)	(0.0021)
Spend time on internet	0.0013***	0.0054***	0.0021***	−0.0089***

	(0.0002)	(0.0008)	(0.0003)	(0.0013)
To strengthen relationship	−0.005***	−0.022***	−0.0099***	0.037***
	(0.0002)	(0.0010)	(0.0005)	(0.0017)
To be the person you are	−0.0057***	−0.0252***	−0.0113***	0.0424***
	(0.0003)	(0.0011)	(0.0006)	(0.0018)
Develop skills	−0.0037***	−0.0162***	−0.0068***	0.0269***
	(0.0002)	(0.0009)	(0.0004)	(0.0016)
Establish useful contact	−0.0034***	−0.0149***	−0.0062***	0.0246***
	(0.0002)	(0.0010)	(0.0004)	(0.0016)
Thinking about work in free time	0.0021***	0.0095***	0.0039***	−0.0156***
	(0.0002)	(0.0009)	(0.0004)	(0.0015)

The marginal effects are calculated based on the ordered logit regressions in Table 4. Delta-method standard errors in parentheses, *** significant at 1 %, ** significant at 5 %, * significant at 10 %. The marginal effects for the rest of control variables are omitted. The results can be obtained upon request

Table 6 Predicted probabilities of happiness

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily
Frequency of free time activities: go out shopping						Frequency of free time activities: spend time on the internet					
Not at all happy	0.0166	0.0161	0.0157	0.0152	0.0148	Not at all happy	0.0145	0.0153	0.0162	0.017	0.018
Not very happy	0.1247	0.1217	0.1187	0.1158	0.1129	Not very happy	0.1111	0.1164	0.1219	0.1276	0.1335
Fairly happy	0.6485	0.6471	0.6456	0.6439	0.642	Fairly happy	0.6408	0.6443	0.6472	0.6497	0.6515
Very happy	0.2102	0.2151	0.2201	0.2251	0.2303	Very happy	0.2336	0.224	0.2147	0.2057	0.197

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Not at all	A little	Somewhat	A lot	Very much
Frequency of free time activities: read books						Free time activities strengthen your relationship					
Not at all happy	0.0175	0.0166	0.0157	0.0149	0.0141	Not at all Happy	0.0262	0.0211	0.0169	0.0136	0.0109
Not very happy	0.1306	0.1246	0.1189	0.1134	0.108	Not very happy	0.1808	0.1518	0.1264	0.1045	0.0859
Fairly happy	0.6507	0.6485	0.6457	0.6423	0.6384	Fairly happy	0.6509	0.6557	0.6513	0.6378	0.6158
Very happy	0.2012	0.2103	0.2197	0.2294	0.2394	Very happy	0.1421	0.1714	0.2054	0.2441	0.2874

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Not at all	A little	Somewhat	A lot	Very much
Frequency of free time activities: attend cultural events						Free time activities enable you to be yourself					
Not at all happy	0.0166	0.0157	0.0148	0.014	0.0132	Not at all happy	0.0299	0.0233	0.0182	0.0141	0.011
Not very happy	0.1248	0.1187	0.1129	0.1073	0.1019	Not very happy	0.2002	0.1646	0.1339	0.1078	0.0862
Fairly happy	0.6485	0.6456	0.642	0.6378	0.633	Fairly happy	0.6441	0.6553	0.6545	0.6416	0.6172
Very happy	0.2101	0.22	0.2303	0.2409	0.2519	Very happy	0.1258	0.1567	0.1935	0.2365	0.2365

Table 6 continued

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Never	Seldom	Sometimes	Often	Very often
Frequency of free time activities: get together with relatives						How often in free time: learn or develop skills					
Not at all happy	0.0169	0.0163	0.0158	0.0153	0.0148	Not at all happy	0.0218	0.0186	0.0159	0.0135	0.0115
Not very happy	0.1265	0.1231	0.1197	0.1164	0.1132	Not very happy	0.1538	0.1347	0.1176	0.1023	0.0887
Fairly happy	0.6492	0.6478	0.6461	0.6443	0.6423	Fairly happy	0.6535	0.6516	0.6447	0.6332	0.6171
Very happy	0.2074	0.2128	0.2183	0.224	0.2297	Very happy	0.1709	0.1951	0.2218	0.251	0.2827

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Never	Seldom	Sometimes	Often	Very often
Frequency of free time activities: listen to music						How often in free time establish useful contacts					
Not at all happy	0.0215	0.0195	0.0176	0.016	0.0145	Not at all happy	0.021	0.0181	0.0157	0.0135	0.0117
Not very happy	0.1551	0.1429	0.1314	0.1207	0.1106	Not very happy	0.1499	0.1327	0.1171	0.1031	0.0905
Fairly happy	0.6538	0.6533	0.6509	0.6466	0.6404	Fairly happy	0.6528	0.6502	0.6435	0.6329	0.6184
Very happy	0.1695	0.1843	0.2	0.2168	0.2345	Very happy	0.1763	0.1989	0.2237	0.2505	0.2794

The predicted probability of	Never	Several times a year or less often	Several times a month	Several times a week	Daily	The predicted probability of	Never	Seldom	Sometimes	Often	Very often
Frequency of free time activities: attending sporting events						How often in free time: thinking about work					
Not at all happy	0.0171	0.0154	0.0139	0.0125	0.0113	Not at all happy	0.0129	0.0142	0.0155	0.017	0.0187
Not very happy	0.128	0.117	0.1069	0.0975	0.0888	Not very happy	0.1013	0.11	0.1192	0.1291	0.1396
Fairly happy	0.6498	0.6447	0.6375	0.6284	0.6174	Fairly happy	0.6299	0.6376	0.6437	0.6481	0.6509
Very happy	0.2051	0.2229	0.2417	0.2616	0.2825	Very happy	0.2558	0.2383	0.2216	0.2058	0.1908

The predicted probabilities are estimated based on the ordered logit regressions in Table 4

In terms of leisure's role in self-fulfillment and social interaction and leisure's relation to work and other spheres of life, individuals who consider that their leisure activities enable them *to become the person they are* or *to strengthen their relationships* with others generally are happier than others. In Table 4, the estimated coefficient on the leisure measure of *to strengthen relationships* is 0.222. This indicates that for individuals who think their leisure activities enable them to strengthen their relationships with friends, families, and colleagues "a lot", the odds of them feeling happier is 1.25 times as much as those for individuals who feel that their leisure activities "somewhat" strengthen their relationships with others. [7] Individuals who often use their leisure time to *develop important skills* or *establish useful contacts* report a higher level of happiness. In Table 5, the marginal probability estimates indicate that more frequently using free time to establish useful contacts is associated with a lower probability of an individual feeling "not at all happy" by 0.34 %, and with an increase of the probability of "very happy" by 2.46 %. Table 6 estimates show that the predicted probability of an individual feeling "very happy" is 28 % if he/she "very often" uses free time to learn or develop new skills while the probability of "very happy" drops to 17 % if he/she "never" uses free time to develop important skills. Similarly, the predicted probability of "very happy" for individuals who think that they "very often" use their free time to establish useful contacts is 27.94 %, twice as likely (to be "very happy") as individuals who think that they "never" establish useful contacts in their free time.

Individuals who frequently *think about work* in their free time on average report a lower happiness score. According to Table 5, more frequently thinking about work in free time is associated with a drop in probability of feeling "very happy" by 1.56 %, other things constant. In Table 6, the predicted probability of "very happy" is 26 % if an individual "never" thinks about work in his/her free time, which is 7 % points higher than the predicted probability of "very happy" for an individual who "very often" thinks about work in their free time.

3.2.2 Individual and National Economic Factors

Looking across columns, individual variables such as health condition, age, gender, marital status, and employment status are significantly associated with happiness, which are consistent with findings in previous studies.

Health enters all regressions strongly positively in Tables 3 and 4, suggesting that individuals who are healthy feel happier. [8] The estimated coefficient on age is negative and significant while the estimated coefficient on the square term of age is positive and significant. Our results echo Stone et al. (2010) and Blanchflower and Oswald (2011), who suggest that well-being or happiness typically has a U-shaped age profile. Based on a telephone survey of respondents in the US, Stone et al. find that Americans in general experience a decrease in well-being as age rises before 50, but experience an increased well-being after the age of 50. Regression 1 in Table 3 suggests that in our sample, the estimated level of happiness starts to increase when the individual is about 50 years of age as well. [9]

Family income relative to the country average has a positive coefficient, significant at the 1 % level in Tables 3 and 4. Individuals with family income above the country average report a higher happiness score than those whose family income is below their national average (Hirsch 1976; Clark and Oswald 1996).

The coefficient on education is consistently negative and significant in different specifications. Some previous studies on happiness in developed countries find that education might be negatively associated with the level of happiness (Veenhoven 1996; Headey and Wooden 2004) and people with higher education can feel less happy than people with relatively lower education. A possible reason for this might be that individuals with higher education may face more career pressure, hence less happy than others.

We also find other demographic variables are significantly associated with happiness: (1) females on average are happier than males; (2) having children in the household is positively associated with happiness; (3) happiness is higher among married people living with their spouses;[10] (4) respondents who are employed full time, retired, and taking care of home duties in general report a higher level of happiness than individuals who are unemployed or underemployed.

At the macro-level, national unemployment is strongly associated with unhappiness. The coefficient on average unemployment rate over 2000–2007 is negative and significant in all regressions. Results in Table 3 indicate that a 1 % point increase in national unemployment is associated with a decrease in individual level of happiness by 0.004–0.005 points, *ceteris paribus*. The coefficient on political stability is positive and significant in all regressions. The results show that individuals in a more politically stable country report a higher happiness rating than individuals in a less politically stable country, which is consistent with Frey and Stutzer (2000).

Interestingly, the coefficient on national income seems to be sensitive to model specifications. For example, regression 6 in Table 3 shows that the effect of log of per capita GDP is not statistically significant. In other words, respondents in low-income countries may feel as happy as individuals in high-income countries. Conversely, regression 5 reports a significantly negative coefficient on national income, which suggests a negative relationship between GDP per capita and the level of happiness.

Some previous studies find that national income tends to be positively associated with the average level of happiness in a country (Diener et al. 1995; Diener and Oishi 2000; Hagerty 2000). One possible reason for the difference between our results and previous research is that previous studies on macroeconomic factors and individual happiness typically do not include individual variables such as personal income. The national income measure in their models might be capturing the effect of individual income. For comparison, we exclude the measure of family income from our models and run the regressions with only the log value of real per capita GDP. The estimated coefficient on GDP per capita becomes positive after the exclusion of the individual income measure and these results can be obtained upon request.

In general, with the addition of individual income, the magnitude of coefficient on national income is reduced. Higher individual income is associated with a higher level of happiness. However, higher level of national income may not necessarily be associated with higher level of individual happiness. Because of the ambiguity, more conclusive support for the effect of national income will need to await further research.
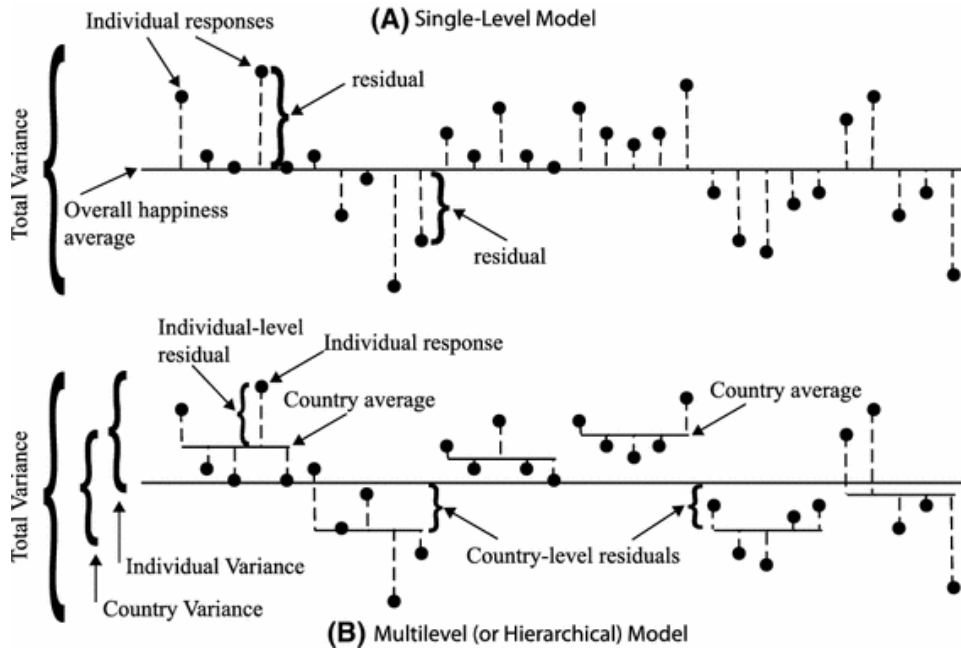
3.3 Multilevel Model Results

The ISSP survey data, with individual respondents grouped in countries, offer a great opportunity for us to consider the natural clustering in the sample. The self-assessed levels of happiness of two individuals in the same country may be more similar than the levels of happiness of two individuals in different countries. As a result, we perform a robustness check of our empirical results by introducing the multilevel model (or hierarchical) framework. Multilevel analysis can also help to detect the observed variations in the dependent variable attributable to individual characteristics and to country characteristics.

The multilevel estimation technique has been recognized as an important methodology for survey data where micro-level units are nested within macro-level groups (Kreft et al. 1995). Multilevel data often occur in social science when natural clustering arises. For example, students are nested in schools and the performance of students in the same school might be more similar than the performance of students in different schools. This concept also applies to patients who are nested in hospitals, or workers who are grouped in companies.

Different from single-level models, "multilevel models assume a hierarchically structured population, with random sampling of both groups and individuals within groups" (Hox and Kreft 1994: 285) and consider that errors within each randomly-sampled group (country in our case) are likely to be correlated. In single-level models, groups (countries) are treated as fixed. It is noted that single-level models cause the between-macro-level groups variance to be absorbed into the general error term in a regression, which can lead to underestimation of standard errors and unreliable statistical significance (Austin et al. 2003).[11]

The general concept of a multilevel model is illustrated in Fig. 2. Panel A of Fig. 2 shows a single-level model when the clustering of individuals within countries is ignored. The horizontal line in panel A represents the overall average of happiness across all respondents in a sample. Each dashed vertical line represents the spread of a respondent's perceived level of happiness around the overall average. Panel B of Fig. 2 illustrates the same data after taking into consideration both country variance and individual respondent variance. Short horizontal lines in panel B represent the average level of happiness for each country. Country-level residual is the difference between country average and the overall average of

happiness. Individual-level residual is the difference between individuals perceived level of happiness and the country means. In a single-level model, total variance of individual happiness is the range of individual residuals around the overall average level of happiness. In contrast, in a multilevel model, the total variance of individual happiness (var($total$)) is partitioned into: (1) between-country variance (var($ctry$)), and (2) variation between individuals within countries (var(ind)). That is, var($total$)=var($ctry$) + var(ind).

Fig. 2 Single-level and multilevel (or hierarchical) models

We present the multilevel ordered logit regression results in Table 7. The multilevel model results are generally similar to single level models presented in Table 4. For the purpose of brevity, we restrict the reported results to significant coefficients on leisure measures. Coefficients on other individual and national variables are available upon request. The coefficient on *do handicrafts* is not significant in single-level models, but is positively significant in the multilevel model. The coefficient on *spend time on the internet* is negatively significant in single-level models, but is not statistically significant in the multilevel model.

Table 7 Multilevel ordered logit happiness regressions

Table 7 Multilevel ordered logit happiness regressions

	7.1	7.2	7.3	7.4	7.5	7.6	7.7
Working hours							
Log of weekly hours	−0.035						
	(0.040)						
Leisure activities							
Watch TV		0.048***					
		(0.012)					
Go shopping		0.051***					
		(0.011)					
Read books		0.056***					
		(0.009)					
Attend cultural events		0.044**					
		(0.017)					
Get together with relatives		0.053***					
		(0.012)					
Get together with friends		0.061***					
		(0.012)					
Play cards		0.018*					
		(0.011)					
Listen to music		0.057***					
		(0.010)					
Attend sporting events		0.067***					
		(0.013)					
Do handicrafts		0.027***					
		(0.009)					

Table 7 continued

|	7.1	7.2	7.3	7.4	7.5	7.6	7.7
Leisure time enables you							
To strengthen relationship			0.219***				
			(0.011)				
To be the person you are				0.259***			
				(0.011)			
Use free time to							
Develop skills					0.150***		
					(0.010)		
Establish useful contact						0.167***	
						(0.010)	
Do you find yourself							
Thinking about work in free time							−0.108***
							(0.009)
Cut1	0.523	6.624***	2.465***	1.461***	−0.598	3.471***	7.253***
Cut2	3.017	8.941***	4.771***	3.773***	1.701***	5.777***	9.583***
Cut3	6.41	12.171***	8.016***	7.034***	4.935***	9.010***	12.816***
Intraclass correlation	0.04	0.07	0.05	0.03	0.05	0.06	0.05
Observations	21,612	34,534	34,284	34,109	35,141	35,082	32,681

Standard errors in parentheses, ***significant at 1%, **significant at 5%, *significant at 10%. Individual variables (Health, Age, Age Squared, Family income, Children, Female, Widowed, Divorced, Separated, Single, Employed, Student, Retired, Home Duty, Education), and national variables (log GDP per capita (PPP), National unemployment, Political stability) are included in each regression model. There are 13 different leisure activities estimated in regression 7.2, but only those with significant coefficients are reported in the table. The leisure activities which do not significantly affect happiness are: (1) going to the movies; (2) sports and gym; and (3) spending time on internet. The detailed results of other control variables can be obtained upon request

We also provide the intraclass correlation (*ICC*) for multilevel model regressions. The *ICC* is calculated as the share of variance of happiness at the country level to the total variance of happiness, or $ICC = \frac{var(ctry)}{var(ctry)+var(ind)}$. *ICC* generally lies between zero and one. If all individuals in one country report the same level of happiness, *ICC* equals one. In this case, all observed variations in individual happiness are due to country differences. On the other hand, if all country means are the *same* in a sample (which is the entire sample average), then *var*(ctry) = 0 and *ICC* = 0. This suggests that all variations in individual happiness around the sample mean are due to differences in individual characteristics. The larger the *ICC*, the more important it is to recognize the cluster feature of the data. Our *ICC* from different

specifications ranges between 0.03 and 0.07. This indicates that roughly 3–7 % of the total variance in individual happiness around our sample average is attributable to certain country characteristics even after we have included national variables.

There do exist substantial variations between countries. We use the case of "very often" using free time *to establish useful contacts* as an example. The probability of an individual feeling "very happy" is 25 % when they "very often" use free time *to establish useful contacts* in Russia and 24.6 % in Latvia whereas the probability of individuals feeling "not at all happy" is 2.6 % in Russia and 2 % in Latvia. In contrast, the probability of feeling "very happy" is an amazing 53 % in Norway and that of feeling "not at all happy" is only 0.59 %. In the UK, the average predicted probability of being "very happy" when individuals very often *use free time to establish useful contacts* is 36 % while the predicted probability of "not at all happy" is 1.7 %.

Similar heterogeneity also occurs at the regional level. We divide our sample of 33 economies into six regions/countries and present the predicted probability of happiness for four selected leisure measures based on the multilevel results in Fig. 3. The six regions/countries include the US, Western Europe, Central and Eastern Europe (C. & E. Europe), Latin America, Asia, and South Africa. [12] It seems that individuals in the US and Western Europe tend to feel happier than individuals in other regions such as C. & E. Europe and Latin America. We observe a higher predicted probability of "very happy" and lower probability of "not at all happy" in the US and Western Europe than in other regions. For example, individuals who often think about work in their free time are more likely to report a lower happiness score than others. However, the average probability of feeling "very happy" is still much higher in the US and Western Europe than in other regions when individuals "very often" think about work in their free time. The average predicted probability of "very happy" when individuals "very often" thinks about work in their free time is 30.3 % in the US and 28.5 % in Western Europe, which are significantly higher than the estimated 21.9 % in Latin America and 23.6 % in C. & E. Europe.
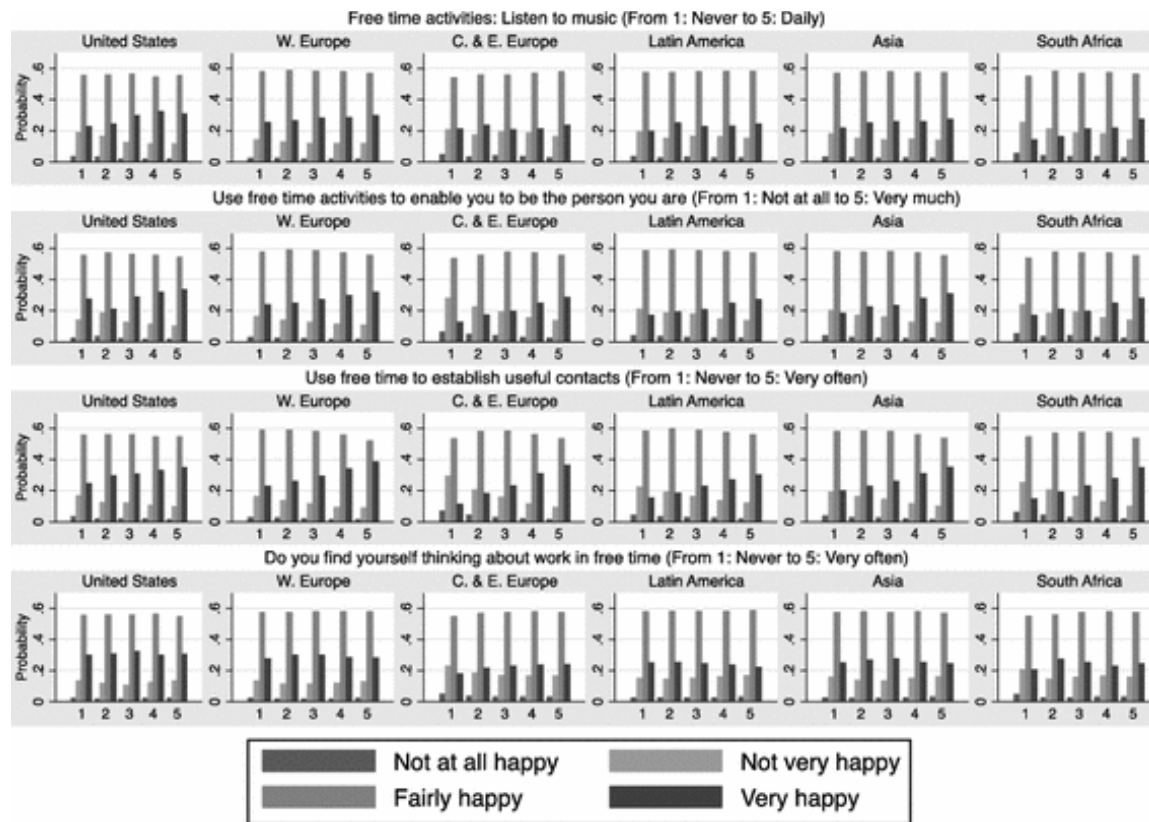
Fig. 3 Predicted probabilities of selected leisure activities by region

4 Conclusions

Leisure provides individuals an opportunity to receive relief from stress, to socialize with others, to examine personal values, and to fulfill goals. Leisure reinforces an individual's happiness. In this paper, we explore the statistical link between leisure and happiness. As the concept of leisure is multifaceted, we measure leisure in different ways and study the association between individual happiness and four measures of leisure: leisure time, leisure activities, leisure's role in self-fulfillment and social interaction, and leisure's relation to work and other spheres of life. Using international survey data from 33 countries in 2007, we find that leisure does play a significant role in affecting happiness. However, the quantity of leisure is not as important as other aspects of leisure–leisure's role in self-fulfillment and social interaction; and leisure's relation to work and other spheres of life.

In general, individuals who feel that they establish useful contacts and develop important skills in their leisure time feel happier than others. Similarly, individuals who think that their leisure activities enable them to be who they are and help them to strengthen relationships with others report a higher happiness score. Weekly working hours is used as a proxy for a lack of leisure time in our study and the coefficient on working hours is negative, but not statistically significant at conventional levels.

Different leisure activities also have different effects on happiness. Out of the 13 leisure activities covered in the survey, six are significantly associated with happiness—shopping, reading books, attending cultural events, getting together with relatives, listening to music, attending sporting events,

and spending time on the internet. These six activities are associated with a higher level of happiness with the exception of spending time on the internet.

Our findings on individual demographic and economic factors are consistent with the existing literature. People feel happy when they have excellent health, have high family income, are married (living with spouse), and have children in the household. Females on average report a higher happiness score than males, other things constant. At the national level, unemployment rate is negatively associated with individual happiness and the effect of political stability is positive. The effect of national income, measured by GDP per capita, is somehow sensitive to model specifications.

It is important to note that, after including national features, our results show that there still remains 3–7 % of total variance in individual happiness (around the sample mean) due to country differences. Some countries in our sample are significantly happier than others. The US, Ireland, Mexico, the UK and Switzerland do well in terms of happiness ranking while the average level of happiness is low in Bulgaria, Russia, and Slovakia.

Footnotes

1. Economies in our sample include Argentina, Australia, Austria, Belgium, Bulgaria, Chile, Croatia, Cyprus, Czech Republic, Dominican Republic, Finland, France, Germany, Ireland, Israel, Japan, South Korea, Latvia, Mexico, New Zealand, Norway, Philippines, Poland, Russia, Slovak Republic, Slovenia, South Africa, Sweden, Switzerland, United Kingdom, United States, and Taiwan.

2. The leisure activities include: Watch TV, Go to the movies, Go shopping, Read books, Attend cultural events, Get together with relatives, Get together with friends, Play cards, Listen to music, Join physical activities, Attend sporting events as a spectator, Do handicrafts, and Spend time on the internet.

3. For the purpose of illustration, we report here the actual weekly working hours instead of the log of weekly working hours.

4. The 12 individual components are government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, and bureaucracy quality.

5. The predicted probabilities are calculated holding other variables at their sample mean.

6. For the proportional odds model, an increase in activity frequency from "never" to "several times a year or less often" is assumed to be associated with the same marginal change in the probability of "very happy" as an increase in activity frequency from "several times a week" to "daily".

7. The odds ratio is calculated as exp(0.222)=1.25.

8. Based on the numerical results in Table 4, we can calculate the predicted probability of being "very happy", "fairly happy", "not very happy", and "not at all happy" for different respondents. According to regression 1 in Table 4, the average predicted probability of a person with excellent health being "very happy" is 50.6 %, while the predicted probability of a person with excellent health being "not at all happy" is only 0.32 %, holding other things constant. The probability is calculated as:

$$Prob(Y = m \mid X) = \frac{1}{1 + \exp\left(-(\tau_m - X\beta)\right)} - \frac{1}{1 + \exp\left(-(\tau_{m-1} - X\beta)\right)}$$

where m = 1 – 4 and τ is the cut point value, average across different countries.

9. The partial derivative of happiness with respect to age is: $\beta_{age} + 2\beta_{age^2}age$. As a result, the age that individuals on average report the lowest level of happiness is $age = -\beta_{age}/2\beta_{age^2} = 0.02/2 \times 0.0002 = 50$.

10. Coefficients on dummy variables for marital status such as widowed, divorced, separated, and never married (single), are robustly negative.

11. Multilevel research has been widely employed in various fields such as education, health care and medicine, sociology, and geography (Paterson 1991; Hox and Kreft 1994; Jones and Duncan 1996; Langford et al. 1998; Hill et al. 2005; Larsen and Merlo 2005; Leyland and Goldstein 2001; Magnus et al. 2001). However, as pointed out by Schyns (2002), this technique is still in its infancy in studying the individual quality of life with a possible reason that often there are not enough cases at the macro-groups level (25 groups as the rule of thumb suggested by Jones et al. 1992).

12. In our sample, South Africa is the only country in Africa.

Appendix

Table 8 Definitions of variables

Variable	Definition	Data source
Weekly hours	Respondents hours worked weekly	ISSP 2007 survey
Leisure activities		
Thirteen different leisure activities are covered in the survey, including:	Survey Question: *Frequency of (corresponding activities) in free time*	ISSP 2007 survey
(1) Watch TV, (2) Go to Movies, (3) Go out shopping, (4) Read books, (5) Attend cultural events, (6) Get together with relatives, (7) Get together with friends, (8) Play cards, (9) Listen to music, (10) Go to gym (sports), (11) Attend sporting events, (12) Do handicrafts, (13) Spend time on the internet.	Answer with assigned value: *Daily* (5), *several times a week* (4), *several times a month* (3), *several times a year or less often* (2), and *never* (1)	
Leisure time enables you		
To strengthen relationship	Survey Question: *When you are involved in free time activities to what extent do they enable you to strengthen your relationship with other people?*	ISSP 2007 survey
	Answer with assigned value: *Very much* (5), *a lot* (4), *somewhat* (3), *a little* (2), *not at all* (1)	
To be the person you are	Survey Question: *When you are involved in free time activities to what extent do they enable you to be the kind of person you are?*	ISSP 2007 survey
	Answer with assigned value: *Very much* (5), *a lot* (4), *somewhat* (3), *a little* (2), *not at all* (1)	
Use free time to		
Develop skills	Survey Question: *how often you use your free time to try to learn or develop skills?*	ISSP 2007 survey
	Answer with assigned value: *Very often* (5), *often* (4), *sometimes* (3), *seldom* (2), *never* (1).	
Establish useful contact	Survey Question: *how often you use your free time to establish useful contacts?*	ISSP 2007 survey
	Answer with assigned value: *Very often* (5), *often* (4), *sometimes* (3), *seldom* (2), *never* (1)	
Do you find yourself:		ISSP 2007 survey
Thinking about work in free time	Survey Question: *how often do you find yourself thinking about work in free time?*	
	Answer with assigned value: *Very often* (5), *often* (4), *sometimes* (3), *seldom* (2), *never* (1)	

Table 8 continued

Variable	Definition	Data source
Health	Survey question: what is your status of health in general? Answer with assigned value: *Excellent* (5), *very good* (4), *good* (3), *fair* (2), *poor* (1)	ISSP 2007 survey
Age	Respondent's age in years	ISSP 2007 survey
Family Income	Respondent's family income relative to his/her own country average.	ISSP 2007 survey
Children	Dummy variable with a value one if the respondent lives in a household with children, zero otherwise	ISSP 2007 survey
Female	Gender dummy variable with one for female, zero otherwise.	ISSP 2007 survey
Widowed, divorced, separated, single	Marital status dummy variables, with a value one if the respondent is widowed, divorced, separated, or never married (single), respectively. The base group is married and living with spouse	ISSP 2007 survey
Employed, student, retired, home duty	Work status dummy variables, with a value one if the respondent is employed full time, a student, retired, or taking care of home duty, respectively. The base group is unemployed and under-employed.	ISSP 2007 survey
Education	Respondent's formal years of education.	ISSP 2007 survey
Log GDP per capita (PPP)	Log value of the GDP per capita in PPP $. It's the log of the average of national GDP per capita over the period of 2000–2007	Penn world table 6.3
National unemployment	The average of unemployment rate over the period of 2000–2007.	World development indicators by the World Bank, and Asian Development Bank
Political stability	The average value of political risk index over the period of 2000–2007. The index ranges from 0 (extremely risky) to 100 (extremely stable)	Political risk service group

Table 9 Frequencies of leisure activities—top and bottom 5 countries

Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD	Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD
Working hours						*Leisure activities: (10) Sports, gym*					
South Korea	49.00	17.34	Austria	38.00	11.17	Switzerland	3.69	1.17	Poland	2.16	1.44
Taiwan	47.00	15.57	France	38.00	10.66	Finland	3.68	1.04	Russia	2.11	1.36
Philippines	47.00	20.12	Germany	38.00	13.87	New Zealand	3.64	1.16	South Africa	2.04	1.43
Dominican Republic	46.00	15.71	Ireland	38.00	12.79	Sweden	3.60	1.05	Bulgaria	1.79	1.23
Chile	45.00	15.57	Sweden	38.00	9.39	Australia	3.52	1.17	Cyprus	1.77	0.97
Mexico	45.00	15.08	Switzerland	38.00	16.81						
			Finland	37.00	10.76						
			Norway	37.00	13.00						
			United Kingdom	37.00	12.92						
Leisure activities: (1) Watch TV						*(11) Attend sporting events*					
Latvia	4.81	0.52	Philippines	4.33	1.01	Philippines	2.52	1.26	Cyprus	1.40	0.87
Cyprus	4.78	0.51	Belgium	4.23	1.04	Israel	2.33	1.42	Russia	1.38	0.72
Bulgaria	4.77	0.66	Israel	4.20	1.31	Dominican Republic	2.32	1.18	Japan	1.35	0.57
Croatia	4.77	0.66	South Africa	4.01	1.48	Ireland	1.91	0.97	Bulgaria	1.31	0.66
Poland	4.73	0.67	Dominican Republic	3.93	1.26	Mexico	1.90	1.12	Taiwan	1.27	0.53
(2) Go to movies						*(12) Do handicrafts*					
South Korea	1.94	0.89	Croatia	1.49	0.72	Slovak Republic	3.26	1.27	Israel	1.67	1.13
France	1.88	0.61	Russia	1.46	0.71	Cyprus	2.50	1.64	Uruguay	1.63	1.14
Australia	1.88	0.56	Uruguay	1.35	0.62	Switzerland	2.48	1.29	Ireland	1.58	1.07
Austria	1.87	0.78	Chile	1.32	0.64	France	2.43	1.21	Taiwan	1.39	0.78
Cyprus	1.86	0.85	Bulgaria	1.30	0.58	Finland	2.35	1.12	South Korea	1.38	0.85
(3) Go shopping						*(13) Spend time on internet*					
Czech Republic	3.58	0.96	Slovenia	2.06	1.06	Cyprus	4.21	0.67	Chile	2.02	1.53
Poland	3.54	1.16	Sweden	2.02	0.76	Sweden	3.74	1.50	Uruguay	1.67	1.28

Table 9 continued

Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD	Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD
United Kingdom	3.51	0.85	Uruguay	1.99	1.08	Norway	3.64	1.44	Philippines	1.63	1.16
New Zealand	3.13	0.82	Argentina	1.94	1.01	United States	3.40	1.68	Russia	1.61	1.18
Japan	3.05	0.87	Croatia	1.91	1.06	South Korea	3.39	1.76	South Africa	1.60	1.26
(4) Read books						*Leisure time enables you to strengthen relationship*					
New Zealand	3.38	1.40	Belgium	2.38	1.26	Dominican Republic	3.95	1.04	Sweden	3.30	1.03
United Kingdom	3.27	1.40	Croatia	2.37	1.34	Slovenia	3.86	0.88	Russia	3.24	0.99
France	3.24	1.35	Uruguay	2.34	1.50	South Korea	3.85	0.94	Taiwan	3.22	1.02
Australia	3.20	1.40	Cyprus	2.21	1.21	South Africa	3.73	1.11	Japan	3.12	0.96
Switzerland	3.14	1.46	Chile	2.10	1.24	Czech Republic	3.69	0.94	Cyprus	2.62	1.17
(5) Attend cultural events						*Leisure time enables you to be the person you are*					
Austria	2.08	0.81	South Korea	1.57	0.73	Finland	4.43	0.71	Russia	3.41	0.99
Dominican Republic	2.06	1.10	Bulgaria	1.56	0.73	Norway	4.17	0.84	Croatia	3.40	1.04
Latvia	2.05	0.69	Russia	1.54	0.72	Dominican Republic	4.12	0.92	Austria	3.36	1.02
Switzerland	2.05	0.65	Uruguay	1.47	0.71	Czech Republic	4.09	0.88	Japan	3.27	0.94
Slovenia	1.93	0.76	Chile	1.44	0.75	Slovenia	4.08	0.87	Taiwan	3.08	1.02
(6) Get together with relatives						*Use free time to develop skills*					
Cyprus	3.71	0.83	Chile	2.65	1.03	Dominican Republic	3.76	1.08	Taiwan	2.69	1.17
Israel	3.62	1.00	Australia	2.63	0.82	Cyprus	3.75	0.79	Uruguay	2.65	1.35
Dominican Republic	3.36	1.08	South Korea	2.42	0.76	Switzerland	3.36	0.97	Croatia	2.56	1.21
Japan	3.35	1.28	Taiwan	2.38	0.78	Argentina	3.33	1.25	South Korea	2.48	1.09
Croatia	3.23	1.02	Argentina	2.27	1.07	Austria	3.29	1.04	Russia	2.35	1.21
(7) Get together with friends						*Use free time to establish useful contact*					
Croatia	4.19	0.95	Belgium	2.82	0.89	Dominican Republic	3.85	0.96	Latvia	2.53	1.12
Bulgaria	3.70	0.97	Uruguay	2.70	1.25	Cyprus	3.65	0.89	United Kingdom	2.51	1.01
Israel	3.63	1.12	Taiwan	2.65	0.99	Switzerland	3.32	1.02	Australia	2.43	0.99

Table 9 continued

Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD	Top 5 countries	Mean	SD	Bottom 5 countries	Mean	SD
Dominican Republic	3.55	1.05	Chile	2.62	1.26	South Korea	3.28	0.94	Russia	2.38	1.12
Philippines	3.55	1.26	Cyprus	2.28	1.18	Austria	3.23	0.98	Norway	2.38	0.85
(8) Play cards						*Do you find yourself thinking about work in free time*					
Cyprus	4.47	0.86	Chile	1.67	1.05	Philippines	3.84	1.04	Russia	2.67	1.27
Dominican Republic	2.45	1.38	Russia	1.63	1.02	Slovenia	3.42	1.05	Austria	2.64	1.22
Austria	2.21	1.06	Poland	1.59	0.99	South Africa	3.40	1.35	United Kingdom	2.62	1.28
Sweden	2.20	0.92	Japan	1.47	0.79	Poland	3.35	1.13	Switzerland	2.61	1.15
Switzerland	2.17	1.11	South Korea	1.41	0.86	Bulgaria	3.22	1.14	Dominican Republic	2.55	1.38
(9) Listen to music											
Switzerland	4.48	0.93	South Korea	3.73	1.45						
Germany	4.45	0.91	Russia	3.56	1.48						
United States	4.42	1.01	Taiwan	3.52	1.50						
Croatia	4.39	1.15	Japan	3.29	1.44						
Slovenia	4.36	1.02	Cyprus	2.39	1.42						

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