

The Impact of Culture on Well-Being: Evidence from a Natural Experiment

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Abstract This paper examines the effect of culture on subjective well-being. By exploiting the natural experiment of migration we are able to separate the effect of culture (intrinsic cultural disposition, values, beliefs, norms) from other extrinsic institutional, economic and social factors. Using data from five rounds of the European Social Survey we find that holding constant the external environment (living in the same residence country) and controlling for the important socio-demographic attributes, immigrants from countries with high levels of life satisfaction report higher life satisfaction than immigrants from countries with low levels of life satisfaction. The effect of satisfaction in the birth country lasts across generations and is stronger for immigrants who are more attached to the culture of their birth country. Since any observed differences among the immigrants is their cultural background (their birth countries), the results can be interpreted as the effect of culture on life satisfaction. Our results suggest that besides economic and social variables, institutions and personal characteristics, cultural factors play an important role in satisfaction.

Keywords Subjective well-being · Life satisfaction · Culture · Beliefs · Values · International comparison · European Social Survey

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1 Introduction

In recent decades, cross-country comparison has gained increasing significance in social sciences as international migration has increased and borders have opened up, thus separating people less. Consequently, the analysis of the cultural determinants of different economic and social outcomes has been receiving more attention.

The vast majority of papers on well-being deal with the extrinsic socio-demographic, economic and political causes and correlates. A smaller but growing literature examines how culture contributes to individuals' subjective well-being (Diener 2009; Diener and Suh 2000; Knoop and Delle Fave 2013; Oishi 2010; Suh and Koo 2008). Initially, empirical research concentrated on the effect of language and on the cultural concept of subjective well-being (Oishi 2010; Veenhoven 1993, 1996). Inglehart and Klingemann (2000) found that, although well-being is largely determined by genes (Lykken and Tellegen 1996), beliefs and values have a sizeable influence on it: the protestant heritage has a positive impact on the average satisfaction of countries. Several studies show that individualism/collectivism is strongly related to satisfaction: people living in individualist countries tend to be more satisfied than people in collectivist countries because they can choose their personal goals and have more personal freedom (Diener et al. 1995; Suh and Oishi 2002). Helliwell and Putnam (2004), and Helliwell and Wang (2011) show that interpersonal and institutional trust both on the individual and on the national level has a positive impact on well-being. In an experiment, Kasser and Ahuvia (2002) found that students with strong materialistic values tend to be less happy, whereas Kasser and Ryan (1993) have revealed that materialistic values are typically associated with lower well-being and mental health.

These papers face two methodological problems: the direction of causality and omitted variables. One of the main challenges in analyzing the impact of culture is the problem of reverse and two-way causality: the impact may work both from culture to well-being and from well-being to culture. Another difficulty is that culture and environment are correlated: it is not easy to distinguish the effect of culture from the effect of a country's economic, institutional and social characteristics. When using cross-sectional data, we cannot control for every relevant variable: we cannot decide whether cultural variables or omitted environmental characteristics explain the differences observed. For example, Inglehart and Klingemann (2000) show that people living in more democratic countries are likely to be more satisfied, but they note that this is due at least partially to a higher level of economic development. When using panel or time series data, although we can control for time-invariant factors, we encounter the problem that values are fairly stable over time, hence it is difficult to observe enough variation in these variables and study the effect of value-changes.

The aim of this paper is to examine the effect of culture on life satisfaction (the cognitive aspect of subjective well-being) using international migration as a natural experiment. Our main research question is whether culture is an important determinant of life satisfaction.

Here culture is defined in a narrow term: as a set of values, beliefs, attitudes and norms transmitted between generations (Guiso et al. 2006) or following Fernández (2011: 484), differences in culture are defined "as systematic variation in beliefs and preferences across time, space, or social groups". That is, the notion of culture describes those intrinsic factors, such as values, beliefs and mental attitudes that form people's "cultural heritage".

The empirical method we use in this paper is called "the epidemiological approach". It allows us to isolate cultural effects from environmental effects and to avoid the issue of

reverse causality (Fernández 2011). The main innovation of this method is that it uses data on immigrants to study the role of culture in the variation of different outcomes. Using a sample of immigrants and taking into account the “portability” of norms, beliefs and mental attitudes, i.e. “portability” of culture (Fernández and Fogli 2009) relative to other economic, social, and institutional factors is a useful solution to the above mentioned problems of the previous literature. International migration provides a natural experiment because immigrants come from diverse cultures but in their host country share they the same environment (economy, institutions, political regime and law) with other immigrants.

Since in a particular country immigrants with the same economic and socio-demographic characteristics differ only in their cultural backgrounds, differences in their life satisfaction can be interpreted as the effect of cultural heritage. More specifically, our empirical research question is the following: in a particular residence country are immigrants from countries with high levels of life satisfaction more satisfied than immigrants from countries with low levels of life satisfaction? In other words, we examine if average life satisfaction in the birth country has a positive impact on immigrants’ life satisfaction. Although average life satisfaction in the birth country depends on environmental (e.g. economy, institutions, political and social features) and cultural factors as well, it is reasonable to assume that environmental variables of the birth country do not have a sizable impact on immigrants’ satisfaction in the residence country. Thus, a positive association between immigrants’ life satisfaction and the average life satisfaction in the birth country could be interpreted as the effect of the cultural component, i.e. as evidence for the causal effect of culture (persistent values, beliefs and norms) on individual subjective well-being.¹

Our analysis is related to the growing literature that uses this method to study the effect of culture on various economic and societal outcomes. The first papers were published in the 90s and in recent years samples of immigrants have been increasingly used to identify the effect of culture. Algan and Cahuc (2010) and Dinesen (2013) showed that immigrants’ generalized trust is determined by the culture of their country of origin (in terms of the level of trust of this country). Luttmer and Singhal (2011) related immigrants’ preference for redistribution to the average preference in their birth countries and concluded that preferences for redistribution have cultural determinants. Fernández and Fogli (2006, 2009) examined fertility and labor force participation of women in the United States and provided evidence that total fertility rates and female labor force participation in the woman’s country of ancestry are determinants of women’s fertility and labor force participation. Blau et al. (2011) demonstrated that labor supply of first-generation immigrant women in the United States is positively associated with the labor supply of the source country, while Blau et al. (2013) showed that fertility, education and labor supply of second-generation immigrant women are positively affected by these variables of the source country. Both papers suggested that these findings can be interpreted as the impact of culture, or more specifically as the impact of gender roles’ transmission. Using the epidemiological approach Alesina and Giuliano (2010) found that among second-generation immigrants in the United States, women and young adults from countries with strong family ties participate less in the labor market, and strong family ties are also associated with less geographical mobility. Carroll et al. (1994), comparing saving behavior of immigrants with different cultural backgrounds in Canada, found no evidence that cultural factors influence saving behavior.

¹ We have to emphasize that although we analyze the determinants of immigrants’ life satisfaction, we use this special sample purely for a methodological reason: in this way we are able to isolate the effect of culture from external factors (institutions, policies, markets, etc.).

In the context of culture and well-being there are only few papers that relate immigrants' satisfaction to satisfaction in country of origin. Veenhoven (1994) reports studies that compared immigrants' satisfaction in Australia and Germany to their birth countries and yielded contradictory results. Rice and Steele (2004) analysed a sample of Americans from General Social Survey data. They found that the average well-being score in the country of origin² correlates with the well-being of Americans. In a sample of seven European countries, Senik (2014) finds that living in a given country affects immigrants' and natives' satisfaction differently. Senik argues that the unhappiness of the French and the heterogeneity of happiness in cross-country comparison can be explained by mental attitudes.

The main novelty of our paper is that it analyses the impact of culture on well-being, applying a well-founded methodology that is able to avoid the problem of reverse causality using data from several residence and birth countries. Using data from 34 countries and five waves of the European Social Survey (2002–2010) and building on Luttmer and Singhal's (2011) exercise, this paper demonstrates that average life satisfaction in the birth country has a positive and significant effect on individuals' life satisfaction among European immigrants. This means that immigrants who come from countries with high levels of life satisfaction tend to be more satisfied than immigrants who migrate from countries with low levels of life satisfaction, even if they are living in the same environment (in the same country) and have same personal characteristics. Moreover, we find the same effect among immigrants who migrated to Europe and were born in one of the 96 participating countries of the World Values Survey. Concerns that our result might be driven by selective migration are primarily relaxed by two results: (1) the effect is robust to the choice of the sample, of the control variables, and of the estimation method, and (2) we observe the same effect for second-generation immigrants as well. We interpret our results as evidence for the effect of culture, since any observed differences among the immigrants is their cultural background (their birth countries).

Our interpretation is supported by the results that the impact of average satisfaction in the birth country appears stronger among immigrants who are more attached to their birth country's culture. We find that average life satisfaction in the birth country affects immigrants' satisfaction more strongly if they have lived less in the residence country, if they were adults at the time of their migration and therefore had less influential peer groups and school socialization effects in the residence country, if they are non-citizens of the residence country, if they speak a non-official language on a regular basis at home, and if the residence country is more permissive towards retaining the birth country's culture. Summing up, our results suggest that, indeed, culture does have a visible effect on subjective well-being.³

Our paper is structured as follows. The next section describes the data and explains our methodology. Section 3 provides some illustrative results about the main findings and shows the estimation of the OLS model. In Sect. 3.1 we test the robustness of the

² The country of origin was identified with the following question: "From what countries or part of the world did your ancestors come?"

³ Arguably, genuine cultural impact is captured, caused by differences in values, attitudes and beliefs, and the results are free from cultural bias (different response styles or social desirability), or at least are not primarily driven by it (Hui and Triandis 1989; OECD 2013; van de Vijver and Poortinga 1997). Although it is hard or impossible to distinguish between cultural impact and cultural bias, the risk of cultural bias can be managed by careful survey design and translation process (OECD 2013). It has to be emphasized that the ESS tries to ensure optimal comparability and the equivalence of the different language versions of the questionnaires.

estimations using alternative estimation techniques and changing the control variables. In Sect. 3.2 we test whether the effect of average satisfaction in the birth country is indeed stronger for immigrants who are more attached to their birth country's culture. In Sect. 3.3 we run models for second-generation immigrants to test whether the effect lasts across generations. Section 4 concludes.

2 Data and Methodology

As discussed in the Introduction, the empirical method we use is the epidemiological approach that allows us to isolate cultural effects from environmental effects (Fernández 2011). Therefore, we analyze a sample of immigrants with diverse cultural backgrounds who share the same environment in their host country. It means that, controlling for their personal characteristics, any observed difference in immigrants' satisfaction can be accounted for their culture.

We use data from five rounds of the European Social Survey (ESS). ESS is a repeated cross-sectional survey from every other year (2002–2003, 2004–2005, 2006–2007, 2008–2009, 2010–2011), which contains data for 34 European countries for at least one round, and for 16 countries for all five rounds. Our sample consists of immigrants: respondents who were born outside the country. The analysis is restricted to respondents born in another ESS country. Respondents with missing life satisfaction, age or gender variables are dropped. Respondents who report being born outside the residence country but their birth country variable is missing or the birth country variable and “born in country” variable are inconsistent (total 161 observations) are also dropped. The final sample size is 12,085.⁴

As there are 34 participating countries in the five rounds of ESS, there are potentially 34 birth countries and 34 residence countries in the data. There is sufficient heterogeneity in this sample: there are immigrants in 566 cells out of the possible 1122 cells of this migration matrix, which means 50.45 % of the potential migration ways are included in the data. Table 1 reports immigrant flow across the 34 countries. The most representative groups come from Russia (2571 observations), Germany (1192 observations) and the United Kingdom (843 observations), whereas Switzerland, Estonia, and Israel are the most popular destination countries (1277, 1115, 1089 observations respectively).

We estimate the impact of average life satisfaction in the birth country on life satisfaction, using the following OLS regression:

$$S_i = \beta_0 + \beta_1 \bar{S}_k + \beta_2 X_i + \delta_r + \lambda_t + \varepsilon_i$$

where S_i is the satisfaction of immigrant i , \bar{S}_k denotes the average satisfaction in the birth country k of immigrant i , X_i is the vector of personal characteristics⁵ of immigrant i . We also include residence country dummies (δ_r) to control for unobserved time-invariant country characteristics, and wave dummies (λ_t) that accounts for time trends that are

⁴ Demographic characteristics of the sample are given in Table 6 of “Appendix”.

⁵ We include variables that are standard control variables in the empirical literature (Dolan et al. 2008; Frey and Stutzer 2002): age, squared age, female respondent, education [measured by International Standard Classification of Education (ISCED)], living with a partner, main activity, living in a city, activity limitation (hampered in daily activities by disability or any health problem), household's total net income in logarithmic form, relative income (ratio of household income to average income in the country), and household size.

Table 1 Immigrants by birth country and destination country

	Immigrants by birth country		Immigrants by destination country	
	Number of immigrants from birth country	Number of destination countries	Number of immigrants in destination country	Number of birth countries
Austria	173	18	383	25
Belgium	216	19	498	23
Bulgaria	153	22	44	6
Croatia	275	12	43	9
Cyprus	24	7	145	14
Czech Republic	245	19	206	12
Denmark	118	13	199	26
Estonia	56	8	1115	11
Finland	250	12	190	20
France	666	24	285	25
Germany	1192	30	803	31
Greece	116	17	292	20
Hungary	160	22	123	10
Iceland	25	5	9	3
Ireland	106	10	906	26
Israel	17	10	1089	25
Italy	600	21	37	14
Latvia	83	13	368	6
Lithuania	122	14	54	6
Luxemburg	12	6	775	22
Netherlands	239	18	301	26
Norway	78	11	325	23
Poland	721	25	71	10
Portugal	495	11	120	13
Romania	555	26	7	4
Russia	2571	28	154	9
Slovakia	206	19	169	8
Slovenia	49	11	237	12
Spain	189	17	252	20
Sweden	209	16	558	30
Switzerland	78	17	1277	30
Turkey	556	15	35	5
United Kingdom	843	21	343	29
Ukraine	687	29	672	13

common to all countries. Finally, the equation includes the usual error term (ε_i). Standard errors are clustered at the birth country level.

The measure of subjective well-being is the cognitive evaluation of life quality (Diener et al. 1999) with a single item question on an 11-point scale (0—extremely dissatisfied, 10—extremely satisfied): “All things considered, how satisfied are you with your life as a

whole nowadays?" This variable is a valid and reliable measure of life satisfaction, and is used widely in the literature (Diener et al. 2013; Frey 2008; Frey and Stutzer 2002; OECD 2013).⁶ Using this variable, we attempt to capture countries' "permanent" satisfaction, which is not sensitive to other temporary shocks.⁷ We do this as follows: First, we calculate the mean satisfaction of the native respondents in all ESS rounds (weighting by design weight provided in the dataset), then we take the average of the five rounds. We use this measure as the main independent variable: average life satisfaction in immigrant's birth country.

Since there are dummies for the residence countries in the model that capture the time-invariant and unobservable country-specific effects, coefficient of \bar{S}_k can be interpreted as follows: whether in a particular residence country immigrant A who comes from a birth country with a high satisfaction level is more satisfied than immigrant B who was born in a country with a low satisfaction level if they have the same personal characteristics. Since they live in the same country, they share the same external environment (economy, institutions, law, welfare policy, etc.), and since we can also capture the effect of relevant socio-demographic factors, the only difference between them is their cultural backgrounds. Thus, if β_1 is positive and significant, we can interpret it as evidence for the effect of cultural heritage on life satisfaction. If life satisfaction were influenced solely by socio-demographic factors and the external environment, and cultural factors did not play a role, the average life satisfaction in the immigrant's birth country should not matter, i.e. β_1 would be insignificant.⁸

Although we argue that a positive coefficient on the average satisfaction in the birth country provides evidence that culture does matter, there is a theoretical possibility that selective migration can spuriously generate this result. There is empirical evidence that immigrants are not a random sample of their birth country's population: dissatisfied people have greater intention to migrate (Otrachshenko and Popova 2014), but spurious result would require immigrants from countries with high life satisfaction levels to be systematically different regarding an unobserved variable from immigrants from countries with low life satisfaction levels. In particular, the former immigrants should have higher life satisfaction driven by this unobserved variable. In this case, we would see that an immigrant from a country with a high satisfaction level is more satisfied than another immigrant from a country with a low satisfaction level even if they share the same external environment and observed socio-demographic characteristics; however, this difference would be not due to variation in cultural heritage. This is a strong assumption and it is unlikely that our results could be driven by such a selective migration, since we control for a rich set of socio-demographic variables that might have relevant impact on immigrants' life satisfaction. It is worth noting that selective migration could cause spurious results (a positive

⁶ Although our main interest is in life satisfaction, we checked the results using an alternative measure of well-being as well. Happiness was measured on an 11-point scale: "Taking all things together, how happy would you say you are?" Using this variable does not change the inference.

⁷ On the effect of temporary shocks on well-being, see e.g. Deaton (2012) or Askatas and Zimmermann (2011).

⁸ As mentioned above, average life satisfaction in the birth country depends on environmental and cultural factors, but we should not expect environment of the birth country to have a sizable effect on immigrants' satisfaction in the residence country. Therefore, the positive coefficient on average life satisfaction in the birth country can be interpreted as the effect of the cultural component.

coefficient on satisfaction in the birth country without any real cultural effect) only in this case.⁹

3 Results

Figure 1 illustrates the basic relationship between the average life satisfaction in the birth country and immigrants' satisfaction. On the vertical axis we measure the deviation of immigrants' satisfaction from the mean satisfaction of the residence country. Each point depicts the average deviation for all immigrants from a birth country (country labels denote countries of birth). On the horizontal axis we plot average satisfaction in the birth countries. The positive slope of the trend line means that the higher the life satisfaction in the birth country the more satisfied the immigrants are, i.e. birth country life satisfaction is positively associated with immigrants' satisfaction.

Figure 2 illustrates the same relationship for each residence country. The illustrations represent the average life satisfaction in the birth countries and the average satisfaction of immigrants born in the birth country. Each point indicates a birth country with at least five observations (individuals), and only those residence countries are represented where we have immigrants from at least five birth countries. In 17 of the 19 residence countries immigrants born in a country with a high satisfaction level are more satisfied than immigrants born in a country with a low satisfaction level.

The relationships in Figs. 1 and 2 might be explained by a composition effect: differences in satisfaction can be derived from differences in economic and socio-demographic characteristics of immigrants and natives from different countries. We run the OLS model to control for these variables and to rule out this possibility.

The results for the OLS model are shown in Table 2. Coefficients on variables of individual characteristics correspond with earlier findings (Dolan et al. 2008; Frey and Stutzer 2002).¹⁰ Satisfaction decreases with age, and it starts to increase around the age of 47 years. Individuals living with a partner report higher level of satisfaction than others. Students are more satisfied than people in paid work, and the unemployed are less satisfied than those in employment. The effect of the health proxy (activity limitation) is very strong. Coefficients on log household income and relative income are positive.

The coefficient on satisfaction in the individual's birth country is positive and significant. One unit increase in average satisfaction in the immigrant's birth country is associated with a 0.283 increase in the immigrant's satisfaction. In any given residence country, immigrants from countries with high satisfaction levels are *ceteris paribus* more satisfied than immigrants from countries with low satisfaction levels.

The effect of one standard deviation increase of average satisfaction in the birth country has a magnitude similar to 70 % of the effect of being married or living with a partner, 25–33 % of the effect of unemployment, and 140 % of the effect of living in a city or town. Moreover, if we take for instance immigrants who live in the same residence country and have identical personal characteristics, we will observe a satisfaction gap of 1.13 points between an immigrant from the country with the lowest satisfaction level (Ukraine) and

⁹ Moreover, Fernández (2011: 496) argues that “the epidemiological approach is biased towards finding that culture does not matter” since the effect of birth country culture is likely to diminish over time.

¹⁰ Excluding mean satisfaction in the birth country from the model, results for immigrants and natives are very similar, thus we suppose that the effect of culture would be the same for natives—if we were able to capture it.

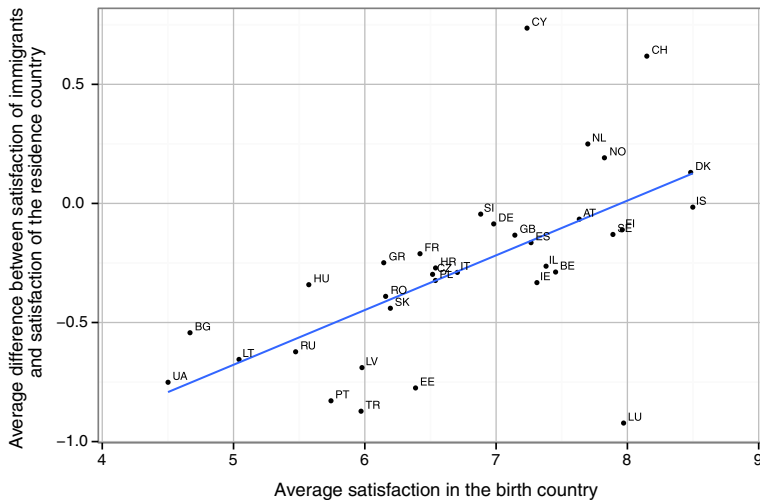


Fig. 1 Immigrants' satisfaction by birth country

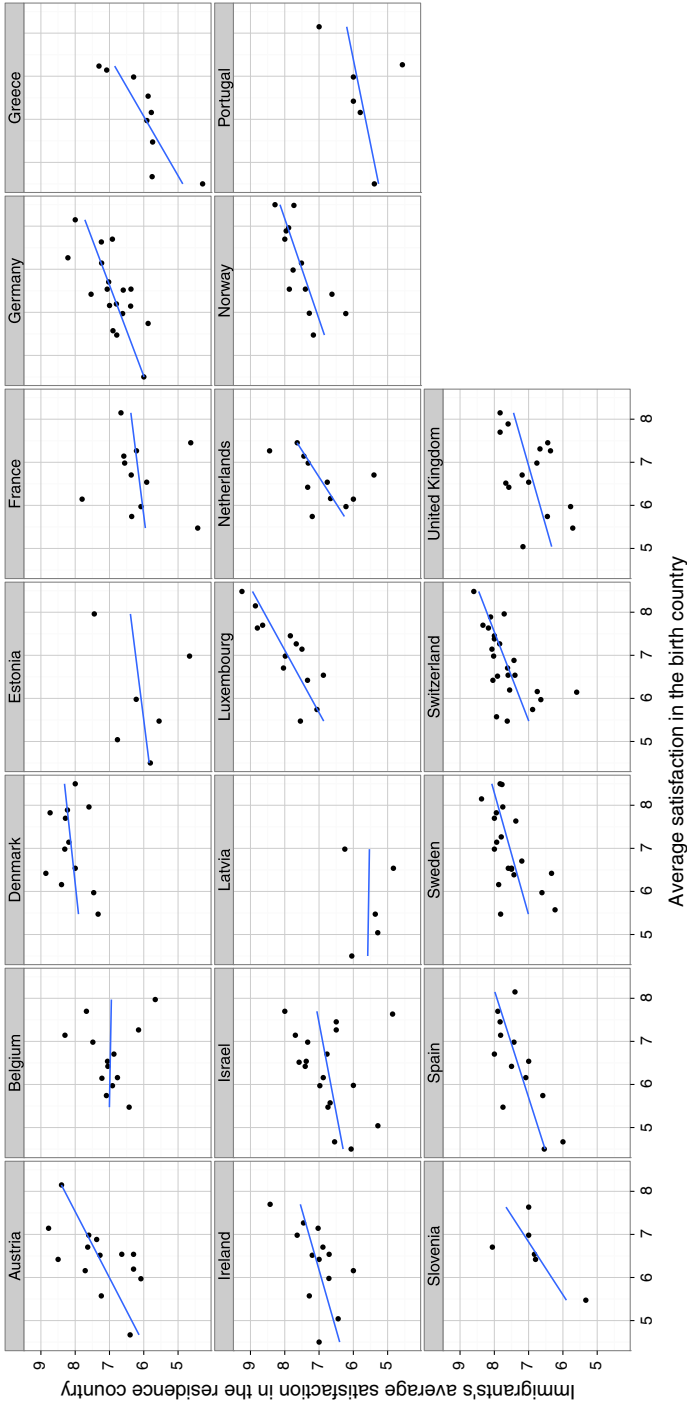
Note Labels indicate birth countries: *AT* Austria, *BE* Belgium, *BG* Bulgaria, *CH* Switzerland, *CY* Cyprus, *CZ* Czech Republic, *DE* Germany, *DK* Denmark, *EE* Estonia, *ES* Spain, *FI* Finland, *FR* France, *GB* United Kingdom, *GR* Greece, *HR* Croatia, *HU* Hungary, *IE* Ireland, *IL* Israel, *IS* Iceland, *IT* Italy, *LT* Lithuania, *LU* Luxembourg, *LV* Latvia, *NL* Netherlands, *NO* Norway, *PL* Poland, *PT* Portugal, *RO* Romania, *RU* Russia, *SE* Sweden, *SI* Slovenia, *SK* Slovakia, *TR* Turkey, *UA* Ukraine

one from the country with the second highest satisfaction level (Denmark) and this difference can be attributed to cultural heritage. Since our model includes dummy variables for the residence country and the most important individual variables, we may assume that the different cultural background can explain the difference.¹¹ This means that culture (transmitted values, beliefs and norms) is not only statistically significant but is also a meaningful determinant of well-being, and its magnitude is comparable to those of social and economic factors.

3.1 Robustness

Next, we test the robustness of the estimations. On the one hand, we use an alternative technique to create the average satisfaction of the countries of birth, on the other hand, we change control variables. First, we calculate the satisfaction in the birth country by running an OLS regression model for native respondents with individual control variables, wave dummies, and country dummies as in Table 2, and then we take the coefficients on country dummies as proxy for the satisfaction in the birth country. This variable represents the satisfaction when holding individual characteristics constant, and reflects the effect of

¹¹ Although omitted individual variables could be at least partially responsible for the observed effect of average satisfaction in the birth country if they differ systematically between immigrants from countries with high and low satisfaction levels, we show in the next section that the observed effect remains the same if we control for a richer set of individual characteristics. On the other hand, in line with the literature (Fernández and Fogli 2009; Luttmer and Singhal 2011), we assume that the economic, institutional and social environment of the birth country does not have any sizeable impact on the immigrants' life satisfaction in their new country. In the next section, we also show that in a model controlling for important characteristics of the birth country the effect of satisfaction in the birth country does not change.



◀ **Fig. 2** Immigrants' satisfaction by birth country in each residence country

Note The headers of the plots are labeled by residence countries. Every *point* represents immigrants' average satisfaction from a given birth country from where immigrants have come to the particular residence country

culture and institutions, as well as omitted individual variables. Row 1 in Table 3 shows the result. The coefficient on the satisfaction in the birth country is similar to the main model (0.325), thus it is not driven by the different socio-demographic characteristics of the birth countries.

In row 2 we turn to considering an alternative dataset. In this model, mean life satisfaction in the birth country is calculated from the World Values Survey data¹² for far more countries. Thus in this model we have 34 residence countries from the ESS dataset and 96 birth countries from the WVS dataset. The result is robust to enlarging the number of birth countries with non-European countries: the estimated coefficient is significant and has a magnitude that is similar to the baseline model (0.249).

In rows 3–5 of Table 3, we test the robustness of the estimations to the choice of the control variables. Row 3 presents the result with additional individual control variables: religiousness, sociability (how often the respondents meet friends, relatives or colleagues), having someone to discuss intimate and personal matters with, dummy for citizenship, and the length of time the respondent has lived in the residence country. The estimated effect is robust to controlling for more comprehensive individual characteristics; this specification yields similar results to the baseline model.

We next add controls for relevant country-level variables that the literature considers significant determinants of well-being: GDP in logarithmic form (Deaton 2008; Diener et al. 1995; Stevenson and Wolfers 2013), the Gini-coefficient (Alesina et al. 2004; Grosfeld and Senik 2010; Hajdu and Hajdu 2014), inflation rate, and unemployment rate (Di Tella et al. 2003; Wolfers 2003). Rows 4 and 5 present the results with additional country-level economic and social variables of residence country and birth country respectively. When controlling for these economic and social characteristics of the residence country, the size of the estimated coefficient on satisfaction in the birth country does not change (row 4). When including the economic and social characteristics of the birth country (row 5), the coefficient on average satisfaction slightly decreases (0.216) but remains significant at the 1 % level.

The estimated effect is also robust to the sample choice and the estimation method choice: for instance excluding five birth countries with the lowest or the highest satisfaction, running the model without post-communist birth countries, running ordered logit or ordered probit models. For the full list of specifications and the results, see Table 7 in the “Appendix”.

3.2 Heterogeneity

Immigrants are not uniform: some keep the culture of origin more alive, while others are more assimilated. If the effect of average life satisfaction in the birth country indeed captures the effect of transmitted norms, beliefs and mental attitudes, the estimated coefficient should be higher for immigrants who are more attached to the birth country's culture, or in other words, who are less assimilated to the residence country. In other

¹² We use the integrated World Values Survey and European Values Survey data. We calculate the average life satisfaction in an immigrant's birth country by computing the weighted mean satisfaction of all respondents in all six rounds of WVS and EVS (five rounds of WVS: 1981–1984, 1989–1993, 1994–1999, 1999–2004, 2005–2007, four rounds of EVS: 1981–1984, 1990–1993, 1999–2001, 2008–2010), and then taking the average of the six mean satisfactions.

Table 2 Determinants of subjective well-being, OLS

	B	Robust SE
Satisfaction in the birth country	0.283***	(0.030)
Age	-0.069***	(0.007)
Age squared	0.001***	(0.000)
Female	0.063*	(0.036)
Education: ISCED 5–6, tertiary education completed	0.178***	(0.039)
Married or living with a partner	0.360***	(0.050)
Main activity (ref. cat.: Paid work)		
Education	0.216**	(0.095)
Unemployed, looking for a job	-1.045***	(0.091)
Unemployed, not looking for a job	-0.770***	(0.180)
Retired	0.012	(0.051)
Housework	0.045	(0.082)
Other	-0.452***	(0.116)
City/town	-0.182***	(0.054)
Activity limitation	-0.791***	(0.046)
LN (household's total net income, all sources)	0.226***	(0.049)
Relative income	0.105**	(0.043)
Household size	-0.009	(0.021)
Wave dummies	Yes	
Residence country dummies	Yes	
Adjusted R ²	0.237	
N	12,085	

Dependent variable: life satisfaction

Robust standard errors adjusted for clustering by birth country are in parentheses. Dummies are included for missing regressors

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

words, if the estimated coefficient is higher for immigrants who are more attached to the birth country's culture, we have strong indirect supporting evidence to our interpretation that average life satisfaction of the birth country captures the effect of culture.

We create eight variables, each of which is supposed to indicate if an immigrant is less assimilated to the residence country, or in other words, if an immigrant is more attached to the birth country's culture.

1. Church attendance: Rice and Steele (2004) argue that church attendance is a relevant factor in the transmission of subjective well-being. They find that churchgoing Americans tend to be more embedded in the social networks of individuals with the same ancestry. Thus, in the group of regular church attenders the correlation between the well-being of Americans of foreign origin and the well-being of their ancestral country is stronger than among individuals who attend church less frequently. We assume that church attendance might also be a relevant indicator for immigrants' ethnic-related social networks in Europe, thus we create a binary indicator variable, which equals one if an immigrant attends religious services at least once a week.

Table 3 Effects of satisfaction in the birth country on subjective well-being, OLS

	Coefficient on satisfaction in the birth country	Robust SE	Adjusted R ²	N
1. Satisfaction in the birth country: from OLS country dummies	0.325***	(0.034)	0.236	12,085
2. Satisfaction in the birth country: from World Values Survey	0.249***	(0.025)	0.208	18,072
3. More individual control variables	0.267***	(0.037)	0.262	12,085
4. Residence country controls	0.292***	(0.039)	0.238	10,652
5. Birth country controls	0.216***	(0.040)	0.247	10,576

Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by birth country are in parentheses. All regressions include the same control variables as in Table 2. Dummies are included for missing regressors

Row 1: Average life satisfaction in the birth country: coefficients on country dummies from OLS with standard individual control variables from Table 2

Row 2: Average life satisfaction in the birth county: from World Values Survey data

Row 3: additional controls to Table 2: religiosity, seven dummies for sociability, dummy for whether the respondent has anyone to discuss intimate and personal matters with, dummy for citizenship, and five dummies for the length of time the respondent has lived in the residence country

Row 4: additional controls to Table 2: Gini index, log GDP, and residence country's inflation and unemployment rate

Row 5: additional controls to Table 2: Gini index, log GDP, and birth country's inflation and unemployment rate

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

- Length of living in the residence country: Immigrants who have lived in the residence country for a shorter time might be influenced more by the culture of the birth country. On the other hand, merely due to the time effect, immigrants who have lived in the residence country for a longer time have more opportunity to change their norms, preferences and behavior, and might more likely adopt the local culture. We create a binary indicator variable, which equals one if an immigrant has lived in the residence country for <10 years.
- The effect of socialization: Immigrants who moved to a new country as an adult have less malleable values and attitudes and are less affected by peer groups, thus they might be less assimilated. On the other hand, for immigrants who were relatively young when they migrated, school and peer groups might be a strong enhancing factor for assimilation. In addition, because of their younger age they are also able to assimilate better. We create a binary indicator variable, which equals one if an immigrant moved to the new country as an adult (after age 25).
- Citizenship: Becoming citizen of the residence country is a sign of assimilation, or at least intention for assimilation. Citizens of the residence country might keep the culture of origin less alive. Our binary indicator variable for citizenship equals one if an immigrant is non-citizen of the residence country.
- Linguistic minority: Immigrants who speak the language of the residence country are able to become more embedded in the culture of their new home. Immigrants who use their original language remain part of their original culture. We use a binary indicator variable to capture this difference, which equals one if an immigrant uses a non-official language on a regular basis at home.

6. Share of immigrants: In a country with a high share of immigrants, people might be pushed less toward assimilation, thus maintaining the birth country culture might be easier. We construct a variable that measures the share of immigrants in the residence country¹³ and transform it to a binary indicator variable, which equals one if the residence country has an immigrant population of over 10 % (high share of immigrants).
7. Level of xenophobia: It is reasonable to assume that if xenophobia is high in a given country, immigrants' rational or expected behavior is assimilation; in such a country the assimilation process is faster. Conversely, in a country with a lower level of xenophobia, immigrants might remain proud of their culture, and might maintain their culture. In the first step, we calculate xenophobia among natives with a principal component of three questions measuring the level of dislike for and fear of immigrants¹⁴ in all ESS rounds. Then we take the average of the five rounds by residence country. We create a binary indicator variable, which equals one if the level of xenophobia is low (below the median) in the residence country.
8. Discrimination on nationality: It is assumed that immigrants who were discriminated based on their nationality are less assimilated to the residence country culture. They are more likely to be victims of discrimination because their "ethnic identity" is more apparent, because they retain more their cultural identity than more assimilated immigrants. Thus discrimination on one's nationality might be a proxy for less assimilation. We create a binary indicator variable, which equals one if an immigrant describes himself/herself as a member of a group that is discriminated based on their nationality in the residence country.

We run eight models with the same control variables as in our main model in Table 2. Every model includes the respective indicator variable and an interaction term between satisfaction in the birth country and the indicator variable (Table 4). We expect the coefficient on the interaction term to be positive, i.e. among immigrants more attached to the birth country's culture the effect of average satisfaction should be higher than among immigrants assimilated into the residence country culture.

In row 1 of Table 4, contrary to Rice and Steele (2004) finding in their American sample, there appears no evidence that church attendance helps transmitting the culture in Europe: the estimated coefficient on the interaction term between religious service attendance and birth country satisfaction is almost zero. A possible explanation for this finding is that in Europe religious groups and church attendance are less connected to ethnic groups and to ancestry culture. It is possible that in the United States church attendance is a proper measure of social networks, but in Europe (ethnic-related) social networks might be more likely to be formed outside of churches, thus are less connected to religion. Other formal and informal institutions and factors assist in maintaining and transmitting the birth country culture.

Row 2 presents that the length of living in the residence country alters the effect of satisfaction in the birth country. Birth country satisfaction is a significant determinant of well-being among immigrants who have lived in the residence country for more than 10 years. The coefficient on the interaction term is positive and significant at the 10 % level. Among immigrants who have lived in the residence country for a shorter time

¹³ The data on the share of foreign-born population come from OECD Factbook 2011. We use data for 2005 because for this year they were available for most of the countries.

¹⁴ The three questions (0–10 scales) are the following: "Would you say it is generally bad or good for [country]'s economy that people come to live here from other countries?", "Would you say that [country]'s cultural life is generally undermined or enriched by people coming to live here from other countries?", "Is [country] made a worse or a better place to live by people coming to live here from other countries?"

Table 4 Effects of satisfaction in the birth country on subjective well-being, OLS

	B	Robust SE	Adjusted R ²	N
1. Satisfaction in the birth country	0.290***	(0.031)	0.239	12,085
Attends religious services at least once a week × Satisfaction in the birth country	−0.020	(0.057)		
2. Satisfaction in the birth country	0.247***	(0.034)	0.238	12,085
Has lived in the residence country less than 10 years × Satisfaction in the birth country	0.091*	(0.045)		
3. Satisfaction in the birth country	0.124*	(0.071)	0.238	12,085
Came to the residence country after age 25 × Satisfaction in the birth country	0.220***	(0.075)		
4. Satisfaction in the birth country	0.231***	(0.038)	0.238	12,085
Non-citizen of the residence country × Satisfaction in the birth country	0.112*	(0.066)		
5. Satisfaction in the birth country	0.168***	(0.032)	0.240	12,085
Uses a non-official language on a regular basis at home × Satisfaction in the birth country	0.194***	(0.067)		
6. Satisfaction in the birth country	0.139***	(0.047)	0.181	10,071
Share of immigrants above 10 % × Satisfaction in the birth country	0.200***	(0.049)		
7. Satisfaction in the birth country	0.188***	(0.062)	0.238	12,085
Low level of xenophobia in the residence country × Satisfaction in the birth country	0.144*	(0.078)		
8. Satisfaction in the birth country	0.269***	(0.030)	0.239	12,085
Discriminated based on his/her nationality × Satisfaction in the birth country	0.052	(0.129)		

Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by birth country are in parentheses. All regressions include the same control variables as in Table 2. Dummies are included for missing regressors

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

average satisfaction of the birth country appears to have higher impact. At the same time, satisfaction of the birth country has a significant impact even on the satisfaction of immigrants who have lived in their country of residence for over 10 years.

Row 3 controls for the effect of socialization. We can clearly see that the older the age at migration the higher the effect of the birth country's satisfaction: the coefficient on the interaction term with coming to the residence country after age 25 is 0.220 and significant at the 1 % level. This means that satisfaction of the birth country has a stronger impact among individuals who were adults at the time of their immigration. But persons who immigrated as children or young adults also have a 10 % level significant effect (0.124).

In row 4 we can see that the effect of satisfaction in the birth country varies by citizenship. The estimated effect of average satisfaction is somewhat higher among immigrants who are not citizens of their residence country (the coefficient on the interaction term is 0.112 and significant at the 10 % level).

Row 5 shows that the effect of satisfaction of the birth country moderated by linguistic minority. Immigrants who use a non-official language of the residence country on a regular

basis have a significantly stronger effect than other immigrants: the estimated coefficient of birth country's satisfaction is more than double for them ($0.168 + 0.194 = 0.362$ vs. 0.168).

Row 6 provides evidence that immigrants in residence countries with a high share of foreign-born population are affected stronger by average satisfaction. The estimated coefficient on the interaction term is 0.200 and significant at the 1 % level. However, satisfaction of the birth country also has a significant effect in countries with a low share of immigrants (0.139).

Row 7 presents that the coefficient on average satisfaction of the birth country is positive and significant (0.188) in countries with high levels of xenophobia, however, the effect is even higher in countries with low levels of xenophobia. The coefficient on the interaction term is 0.144 and significant at the 10 % level.

In row 8, we test the assumption that discrimination on nationality moderates the main effect. The results tend to support the assumption that among immigrants who describes themselves as members of a group that is discriminated based on their nationality the estimated coefficient is higher than immigrants who were not, although the difference is not statistically significant.

To sum up, our results confirm that the effect of average satisfaction in the birth country tends to be higher for immigrants more attached to their birth country's culture, which corroborates our interpretation that the coefficient on satisfaction in the birth country captures the effect of culture (intrinsic cultural disposition, values, beliefs, norms). However, the effect of average satisfaction in the birth country is also positive and significant in all models for immigrants presumed to be more assimilated to the residence country's culture. Although they adopt more likely the culture of the new country, the birth country's culture still seems to be strong enough to influence their satisfaction. Moreover, since this evidence supports the interpretation regarding the effect of culture, the results relax the concerns that selective migration might spuriously generate our result.

3.3 Second-Generation Immigrants

Finally, it is examined whether the effect of satisfaction in the country of origin (the effect of transmitted values, norms, and beliefs) lasts across generations. From the second wave of the ESS, we have data for the birth country of respondents' parents. We analyze a sample of individuals who were born in their residence country, and at least one of their parents was born in a different ESS country. This sample of second-generation immigrants consists of 10,172 observations. We calculate life satisfaction in the parental birth country as the mean of the average satisfactions in the two parents' birth countries.¹⁵

Row 1 in Table 5 presents the result. One unit increase in the satisfaction of the parental birth country is associated with an increase of 0.132 in the second-generation immigrant's satisfaction. The size of the estimated coefficient is about half of those among first-generation immigrants.

In line with other findings (Casey and Dustmann 2010), mothers appear to be more important in value transmission: average satisfaction in the mother's birth country has a

¹⁵ 2851 individuals' both parents emigrated from ESS countries, and 7321 individuals have a native parent and an immigrant parent. We calculate life satisfaction of the country of origin as the mean of the average satisfactions in the two parents' birth countries, because with the mean of the satisfactions of the two parental birth countries we capture correctly the potential influence of the immigrant parent's culture, but the direct effect of the native parent's birth country culture is captured by residence country dummies.

Table 5 Effects of satisfaction in the parental birth country on subjective well-being of second-generation immigrants, OLS

	Coefficient on satisfaction in the parental birth country	Robust SE	Adjusted R ²	N
1. Satisfaction in the parental birth country	0.132***	(0.046)	0.272	10,172
2. Satisfaction in the mother's birth country	0.148***	(0.051)	0.264	6411
3. Satisfaction in the father's birth country	0.099**	(0.046)	0.267	6612
4. Satisfaction in the parental birth country: from the World Values Survey	0.187***	(0.039)	0.260	12,712

Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by parental birth country are in parentheses. All regressions include the same control variables as in Table 2. Dummies are included for missing regressors

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

stronger effect on satisfaction of second-generation immigrants than average satisfaction in the father's birth country (row 2–3).¹⁶

Row 4 includes respondents whose parents were born in a WVS country as well. Like in row 2 of Table 3, we calculate average satisfaction in the parental birth country from the WVS dataset, thus we can analyze not only individuals with parents from the 34 ESS countries, but we have 88 birth countries of mothers and 84 birth countries of fathers. The estimated coefficient on average satisfaction in the parental birth country is 0.187 and significant at the 1 % level.

These results suggest that the effect of average satisfaction in the parental birth country (or, in other words, the effect of culture) is persistent for at least two generations. These results also provide additional evidence against the possibility that our result is driven by selective migration.

4 Conclusion

The aim of this paper has been to examine the effect of culture on life satisfaction. Using a sample of immigrants, we have provided evidence that, controlling for relevant socio-demographic and economic characteristics, in any particular residence country immigrants from countries with high life satisfaction levels are more satisfied than immigrants from countries with low life satisfaction levels. Living in the same country, immigrants with the same economic and socio-demographic characteristics differ only in their cultural backgrounds. Thus, our finding indicates that culture (transmitted values, norms and beliefs) is a significant determinant of subjective well-being.

¹⁶ In these specifications, we use a sample of native respondents with a mother from another ESS country (row 2), and a sample of native respondents with a father from another ESS country (row 3). Satisfaction in the parental birth country is calculated as average satisfaction in the mother's (row 2) or in the father's birth country (row 3). However, models with satisfaction in the parental birth country calculated like in row 1 of Table 5 (as the mean of the average satisfactions in the two parent's birth countries) yields similar coefficient magnitudes.

Our interpretation has been corroborated by the results that the effect of satisfaction in the birth country is stronger among immigrants more attached to their birth country's culture. Immigrants who have lived in their residence country for a shorter time, moved to their new country after the age of 25, are non-citizens of their residence country, use a non-official language on a regular basis at home tend to be more affected by the birth country's satisfaction. In countries where the share of immigrant population is higher, where immigrants' rational or expected behavior is not assimilation, the effect of satisfaction in the birth country also appears to be stronger. This effect is robust to controlling for comprehensive individual variables and for economic and social characteristics of the birth and the residence country, and to the choice of the sample.

Culture is not the only, or even the primary factor that explains well-being, but it has a statistically significant and socially and economically meaningful effect. By using a sample of second-generation immigrants, we have also shown that this effect lasts across generations.

Although our results suggest that culture affects well-being, we need more research to specify what values, norms or beliefs can best explain the effect of culture. As we have seen earlier, some of them have been already studied: for example interpersonal trust (Helliwell and Wang 2011), post-materialism and materialism (Kasser and Ahuvia 2002), individualism and collectivism (Diener et al. 1999; Suh and Oishi 2002), optimism (Diener et al. 1999). But it is a task for future, methodologically well-founded research to determine which of these aspects of culture do influence well-being besides economic, institutional and social factors.

The most important implication of our findings that—beside extrinsic economic, social and institutional factors—subjective well-being is determined by intrinsic cultural factors, thus in explaining international differences in life satisfaction culture cannot be neglected: a sizeable part of these differences can be explained by the variation in norms, beliefs or mental attitudes.

Although our primary focus has been on using a sample of immigrants to identify the effects of culture, the findings also shed light on determinants of immigrants' well-being and on the transmission of cultural values in more general terms. Our result suggests that cultural heritage should be taken into account in designing policies pertaining to immigrants. Although discussing the details of the social and managerial implications for immigrants' well-being or for transmission of cultural values are beyond the scope of this paper, these analyses might be important, as international migration is one of the main challenges of our world today.

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Appendix

See Tables 6 and 7.

Table 6 Summary statistics

Variable	Mean	SD	Min	Max	N
Life satisfaction	6.674	2.435	0	10	12,085
Satisfaction in the birth country	6.314	0.911	4.50	8.50	12,085
Age	49.775	17.808	15	99	12,085
Female	0.572	0.495	0	1	12,085
Education: ISCED 5–6, tertiary education completed	0.327	0.469	0	1	11,977
Married or living with a partner	0.569	0.495	0	1	11,965
Paid work	0.485	0.500	0	1	11,990
Education	0.049	0.217	0	1	11,990
Unemployed, looking for a job	0.045	0.208	0	1	11,990
Unemployed, not looking for a job	0.018	0.134	0	1	11,990
Retired	0.260	0.439	0	1	11,990
Housework	0.102	0.303	0	1	11,990
Other main activity	0.039	0.195	0	1	11,990
City/town	0.733	0.443	0	1	12,023
Activity limitation	0.279	0.448	0	1	11,968
Log household's total net income	7.113	1.301	2.33	9.95	9640
Relative income	0.958	0.959	0.014	27.81	9640
Household size	2.629	1.335	1	6	12,076
Religiousness	4.795	3.048	0	10	11,948
Never meets socially friends, relatives or work colleagues	0.024	0.153	0	1	12,046
Meets socially friends, relatives or work colleagues less than once a month	0.094	0.291	0	1	12,046
Meets socially friends, relatives or work colleagues once a month	0.105	0.307	0	1	12,046
Meets socially friends, relatives or work colleagues several times a month	0.183	0.387	0	1	12,046
Meets socially friends, relatives or work colleagues once a week	0.198	0.399	0	1	12,046
Meets socially friends, relatives or work colleagues several times a week	0.256	0.436	0	1	12,046
Meets socially friends, relatives or work colleagues every day	0.140	0.347	0	1	12,046
Non-citizen of the residence country	0.425	0.494	0	1	12,065
Has lived in the residence country for 0–1 year	0.013	0.112	0	1	11,914
Has lived in the residence country for 1–5 years	0.100	0.300	0	1	11,914
Has lived in the residence country for 6–10 years	0.098	0.298	0	1	11,914
Has lived in the residence country for 10–20 years	0.190	0.393	0	1	11,914
Has lived in the residence country for over 20 years	0.599	0.490	0	1	11,914
Has someone to discuss intimate and personal matters with	0.877	0.329	0	1	11,945
Discriminated based on his/her nationality	0.057	0.232	0	1	12,007
Attends religious services at least once a week	0.132	0.338	0	1	12,017
Uses a non-official language on a regular basis at home	0.422	0.494	0	1	12,044
Came to the residence country after age 25	0.743	0.437	0	1	11,914
Share of immigrants above 10 %	0.818	0.386	0	1	10,071
Xenophobia in the residence country below median	0.563	0.496	0	1	12,085

Table 6 continued

Variable	Mean	SD	Min	Max	N
Log GDP in residence country	9.711	0.971	6.87	10.82	12,085
Gini index in residence country	29.229	4.248	21.92	45.24	10,652
Unemployment rate in residence country	7.137	3.346	2.60	19.90	11,044
Inflation rate in residence country	3.378	3.146	-4.48	15.89	12,085
Log GDP in birth country	8.994	1.079	6.61	10.91	12,085
Gini index in birth country	33.271	6.708	21.92	45.24	10,576
Unemployment rate in birth country	8.266	3.010	2.60	20.10	10,937
Inflation rate in birth country	5.851	6.058	-1.09	44.96	12,085
ESS Wave 1	0.180	0.384	0	1	12,085
ESS Wave 2	0.208	0.406	0	1	12,085
ESS Wave 3	0.174	0.379	0	1	12,085
ESS Wave 4	0.232	0.422	0	1	12,085
ESS Wave 5	0.206	0.405	0	1	12,085

Table 7 Effects of satisfaction in the birth country on subjective well-being, OLS

	Coefficient on satisfaction in the birth country	Robust SE	Adjusted R ²	N
1. Without post-communist birth countries	0.357***	(0.069)	0.146	6202
2. Omitting 5 birth countries with the lowest satisfaction	0.335***	(0.053)	0.172	8392
3. Omitting 5 birth countries with the highest satisfaction	0.280***	(0.034)	0.234	11,602
4. ESS 1. wave	0.356***	(0.059)	0.154	2170
5. ESS 2. wave	0.303***	(0.066)	0.287	2516
6. ESS 3. wave	0.294***	(0.074)	0.295	2098
7. ESS 4. wave	0.245***	(0.060)	0.251	2809
8. ESS 5. wave	0.206***	(0.072)	0.209	2492
9. Only countries participating at least in 4 waves	0.265***	(0.035)	0.256	8942
10. Only residence and birth countries with at least 100 observations each	0.290***	(0.032)	0.234	11,402
11. Only residence countries with immigrants from at least 10 different countries	0.305***	(0.032)	0.233	11,202
12. Ordered logit	0.243***	(0.027)	0.061 ^a	12,085
13. Ordered probit	0.138***	(0.015)	0.058 ^a	12,085
14. Weighted by design weights	0.278***	(0.031)	0.236	12,085

Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by birth country are in parentheses. Dummies are included for missing regressors. Rows 1–14: Regressions include individual controls as in Table 2

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

^a Pseudo R²

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