Why some people are not as happy as they could be: the role of unobservable subjective factors

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Abstract: This paper investigates the relative importance of unobservable subjective factors (i.e., genetic, personality, cognitive traits) on happiness. We apply a residual-based approach to distinguish between the direct and indirect effects of unobservable subjective time persistent traits on happiness. We refer to the 'indirect' effects as the effects of unobservable variables on happiness mediated by social, economic and family factors. We find that these 'indirect" effects only explain approximately 25% of the happiness variation at the individual level, while unobserved (i.e., genetic and personality) traits may explain up to 75% of the differences in happiness. We also find that socioeconomic, demographical and institutional factors better explain the variance of happy vs. unhappy people. The empirical analysis is based on the European Quality of Life Survey dataset.

Keywords: happiness; unobservable traits; subjective well-being; unhappiness; genes.

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1 Introduction

This paper focuses on one of the latest frontiers of the happiness literature and investigates how unobservable subjective time persistent traits (i.e., genetic, psychic, biological) may affect happiness and contribute to explaining individual-level differences in outcomes. In particular, we aim to empirically decompose the direct effects from the indirect (i.e., mediated by other characteristics) effects of unobservable traits on happiness through a two-step residual-based estimation approach.

Happiness is often strongly correlated with innate subjective traits, which are stable over time and range from a moderate to a strong component (for a review, see Diener et al., 1999, 2009). For this strand of literature, each individual would have a happiness set point to which he inexorably returns to, following positive or negative life events. Diener and his coauthors show that individuals have emotional responses that are stable across a long period of time. For Kahneman et al. (1999), happiness tends to return to a 'baseline' level of happiness, due to personality and genetic predispositions. According to Diener et al. (2009), one reason for the stability of subjective well-being – which can be considered as a proxy of happiness – is that there is an important genetic component to it, that is, "*to some degree people are born to be happy or unhappy*". Proto and Oswald (2017) argue that genetic traits can affect subjective well-being directly, by affecting psychological and biological individual attitudes, and indirectly, by modifying environmental factors. In this paper, following Proto and Oswald's hypothesis, we try to empirically estimate the relevance of the direct effect of genes and psychological factors on happiness. To further clarify what we mean by the 'indirect' effects of unobservable traits on happiness, we can take into account some mental attitudes, such as optimism or self-esteem[1]. Accordingly, for people born with a sunny disposition, to filter and ignore information that does not match their brighter outlook, we assume that their 'glass' is not only perceived as 'half full' – this is the direct effect of inborn traits (e.g., optimism) on happiness – but, effectively, their positive attitude plays a role in 'filling up' the glass. In other words, given that the optimists are more likely to counteract negative events such as they are able to develop plans to remove obstacles to their goals, they have better chances of obtaining more satisfying work, social life, marriage,[2] higher income, better health and longevity. All these are what we define as 'indirect effects' of unobservable traits on happiness and measured by variables on socioeconomic (such as income and employment) status; demographic (such as educational attainment, household size, marital status), relative life concerns (such as job, standards of living, family, housing and social life).

The first potential contribution of our analysis is to apply an 'indirect' empirical approach to focus on the direct effect of genetic and psychological traits in explaining the differences in happiness. Our basic intuition is to explain the direct influence of innate traits on self-reported happiness by looking at the residuals of exhaustive multivariate regressions based on a large cross-country study (i.e., the European Quality of Life Survey, hereinafter, EQLS). Unobservable time-invariant individual variations (i.e., genetic traits) are usually accounted in econometric models by fixed effects. Thus, panel data are used to control for individual traits that has been shown to be crucial components in the modelling of subjective well-being (Ferrer-i-Carbonell and Frijters, 2004). However, this approach has two relevant disadvantages for the aim of this research. First, it makes problematic to analyse how these unobservable traits vary over happiness distribution. Second, it precludes the use of one of the largest cross-sections survey of European countries containing both information on happiness and a large set of socio-demographic characteristics (i.e., EQLS). In contrast to such approach based on fixed effects regression, we choose to omit innate traits among the regressors (as fixed effects) and examine unobserved subjective traits in a second step by analysing the residuals.

Following the abundant empirical literature on the determinants of happiness (see Veenhoven, 2017 for a digital archive of these studies), in the first step of the analysis, we estimate a set of regressions that aim to include all the determinants of happiness except for one, i.e., the direct effect of innate subjective traits. Accordingly, we expect that the residuals of these regressions –, i.e., the difference between the observed scores and the predicted values of happiness – reveal the share of unexplained variance due to the unobserved characteristics omitted in the regression. Specifically, these traits are both (good or bad) luck and the direct effect of psychological, genetic, and biological attitudes or personalities on happiness.

By assuming that luck is distributed among the individuals according to a normal distribution curve (e.g., Ferral and Smith, 1999), in the second step of the analysis, we examine the departures from normal distribution as a signal that the residuals contain a factor that is not accounted for in the model, i.e., the unobservable direct effect of traits not related to the socioeconomic, demographic, and educational characteristics of people on happiness.

A second potential contribution of our research is to investigate if these unobservable traits have a different relevance on explaining unhappiness and happiness, by controlling for environmental variables.

Our results provide empirical evidence to the hypothesis that the innate component of happiness is more relevant for unhappy rather than for happy people. On this issue, we find that for the unhappy, the innate traits weigh more on their overall happiness than for happy people. In other terms, on the one hand, a happy person can be adequately predicted by accounting for his or her quality of health, economic, social life and his or her demographic traits, while on the other hand, the reasons behind unhappiness require the inclusion of additional sources of unobserved heterogeneity. Specifically, unhappy people typically declare lower happiness than what we would expect by taking into account their relative and absolute social and material endowments or demographic attributes. This result indicates that the unobservable –, e.g., genetic, emotional, character, biological – traits of the subject play a relevant role in this field of research.

The empirical analysis is based on three cross-sections waves (2007, 2011 and 2016) of the EQLS dataset. This dataset, which is compiled from a representative household survey of people aged eighteen and up in Europe, enables an accurate estimation of happiness[3] and other relevant variables across 30 European countries.

The paper is organised as follows. The next section briefly surveys the literature on the heritability of happiness. Section 3 reports on the variables, empirical strategy, and hypotheses and discusses the findings. Section 4 concludes. An appendix provides statistical descriptions of the dataset.

2 Literature on hereditability of happiness

Over the last decades, a significant body of research has examined the heritability of happiness; however, this has not led to a commonly accepted conclusion. We could classify at least three main strands in this empirical literature according with the type of data sources, as follows:

i the analyses based on samples of identical and fraternal twins taken from some national longitudinal studies (e.g., Heath et al., 1998; De Neve et al., 2012)

ii the analyses based on genome-wide association studies (GWAS) (e.g., Okbay et al., 2016; Wingo et al., 2016)

iii the studies using data from general, national or cross-countries, social surveys (e.g., Caporale et al., 2009).

The first two empirical approaches are typically used by genetic analyses, while psychological, social and economic studies usually utilise data from social surveys. As a consequence of the nature of the data, these analyses may have some structural bias. For instance, the GWAS provide tests on the exact gene that may affect subjective well-being, but they have lower accuracy to control for environmental factors. In contrast, the analyses based on general social surveys are fairly accurate regarding investigating the effect of environmental factors on happiness, but they tend to overlook the inborn traits of happiness because they are unobservable by self-reported surveys. These diverse qualities of empirical approaches on this issue may contribute to explaining the divergent results regarding the role of genetics on happiness.

In a classic paper of psychological literature on adaptation, Brickman and Campbell (1971) argue that people are confined to a hedonic treadmill.[4] This theory has led some researchers to conclude that adaptation is quick, complete, and inevitable and that most of the long-term stable variance in happiness can be accounted for by personality and genetic predispositions rather than by life circumstances. As Lucas et al. (2003, p.527) reveal, some researchers (e.g., Lykken and Tellegen, 1996) have stated that "*adaptation processes are so strong that trying to change one's happiness is futile because an individual inevitably returns to a genetically predetermined state*". Similarly, abundant psychological research (e.g., De Neve et al., 2012) finds that personality and genetic measures are more important happiness determinants than external life circumstances (e.g., economic, social, health, employment status). Lykken and Tellegan (1996) estimate that heritability can explain between 50% and 80% of the variance in happiness. In particular, they decompose the genetic effect on happiness and conclude that, although between 40% and 55% of the variation in current happiness can be explained by genetic traits, almost 80% of long-term happiness is heritable. According to Diener et al.'s (1999, p. 279) survey of empirical literature, "*heritability estimates are often smaller than those found by Lykken and Tellegen* (1996)". Bartels and Boomsma (2009) find that the individual set point for happiness is also influenced by environmental factors unique to each individual. In particular, they estimate that from one third to one half of the individual differences in happiness are accounted for by genetic factors, while the remaining variance is accounted for by nonshared environmental factors.

De Neve et al. (2012) show that identical twins are significantly more similar in their level of happiness than fraternal twins, which suggests that genetic factors might play a role in this trait. In particular, they find that a third of the variance in happiness in their sample is due to the variance in genetic factors. Additionally, they maintain that, though socioeconomic variables are significantly associated with happiness, not one of them typically accounts for more than 3% of the happiness variation.

In Bartels (2015) the heritability of happiness is estimated to range from 0% to 64%. The author carries out two meta-analyses based on twin-family studies (one for well-being and another one for satisfaction with life) and concludes that the weighted average heritability of well-being and life satisfaction are 36% for well-being and 32% for satisfaction with life. Bartels (2015) deduces that the individual differences in happiness are attributed to both genetic (for one third) as well as environmental factors (for two third). Similarly, Vukasovic and Bratko (2015) and Røysamb et al. (2018) estimate that the personality variation is partly innate, with the broad-sense heritability being in the 30–40% range. As far as the ‘socioeconomic’ strand of literature is concerned, the most important environmental determinants of happiness are as follows: income (e.g., Stutzer, 2004, Flèche and Layard, 2017); education (e.g., Michalos, 2007); unemployment (e.g., Clark and Oswald, 1994); religion (e.g., Ciarrochi and Deneke, 2005); physical exercise (e.g., Stubbe et al., 2007); marriage (e.g., Brown, 2000); friendship (e.g., Lelkes, 2006); and the economic/political environment (e.g., Kahneman et al., 2004).

If we look at the ‘genetic’ strand of this literature, several studies focus on which could be the candidate gene(s) able to affect happiness. Minkov and Bond (2017) clearly explain that the causal link between genetics and happiness is due to the role played by serotonin – a chemical in the human brain that maintains mood balance and particularly affects the probability of depression and suicide. Many studies analyse the role of the serotonin transporter promoter polymorphism (5-HTTLPR) (e.g., De Neve et al., 2012; Benjamin et al., 2012; De Neve, 2011). De Neve et al. (2012) specifically test if individuals with a transcriptionally more efficient version of the serotonin transporter gene are significantly more likely to report higher levels of life satisfaction. However, they do not find robust results, in fact, the 5-HTT genotype explains less than 1% of the variation in happiness. Accordingly, the authors deduce that because the twin analysis generally suggests that all genes together account for approximately a third of the total variance, it is very likely that many other genes, in conjunction with environmental factors, help to explain how baseline happiness varies from one person to another. A recent empirical approach explores the interactions between aggregate (i.e., at a national or ethnic level) genetic traits and happiness. The basic idea of this approach is that differences in aggregate subjective well-being can be explained by distances between aggregate genetic heritages. A valuable example in this regard is Proto and Oswald (2017), who link cross-national differences in happiness to cross-national differences in the proportion of the population that has the short version of an allele (5-HTTLPR). The authors find that happier populations have lower prevalence short alleles in the serotonin transporter gene promoter polymorphism. They estimate that a standard deviation in the genetic distance is associated with more than one third of a standard deviation in the country happiness. Sgroi et al. (2017) find that the genetic variations among ethnic groups explain approximately a maximum of 33% of the variation in country happiness. In particular, they estimate that in Denmark, which has the highest levels of satisfaction with life, there is the smallest percentage of citizens with short alleles in the 5-HTTLPR. In contrast, Italy that has the lowest recorded level of life satisfaction (among the 30 nations of their international sample) and has the highest proportion of citizens with the short gene. Burger et al. (2015) disagree with this 'aggregate' empirical approach. They believe that it is probable to find by this approach that genetic differences among populations are not a very important determinant of variations in happiness among countries. This is due to the evidence that approximately 95% of the total human variability is found within a population, whereas only approximately 5% is found between populations (Rosenberg et al., 2002).

To be exhaustive, it is important to point out that several studies do not find a significant correlation between differences in gene frequencies and happiness (e.g., Diener and Suh, 1999; Tov and Diener, 2007). The reasons for these relevant discrepancies among results are still unclear, but the interactions between genes and environmental factors seem to be a possible cause for the indefiniteness of genetic associations. In particular, Burger et al. (2015) sustain that controlling for socioeconomic and institutional differences between countries could cause an underestimation of the effect of genetic factors on happiness.

One of the most critical viewpoints regarding the empirical findings of the impact of genes on happiness is provided by Benjamin et al. (2012). The authors state that, despite the huge increase in the number of papers reporting genotype-behaviour associations, the findings from candidate gene studies typically fail to replicate the results. They identify three main factors to account for the apparently high rate of false positives produced by these studies. First, the sample sizes were often relatively small, and thus, the statistical power is low. Second, when the hypothesis-based approach is applied to complex diseases (or human behaviours), the basis for the hypothesis is almost always less precise than a direct link between a disease – or trait-relevant protein and the gene that codes for it. Finally, the publication bias[5] is magnified in the genetic association research because the typical dataset has data on many outcomes and many genetic polymorphisms. The investigation of gene-gene and gene-environment interaction effects, although well motivated in theory, in practice exacerbates the multiple hypothesis-testing problem (see, e.g., Duncan and Keller, 2011).

To conclude, it is worth pointing out the difficulty of identifying a clear direction of causality between happiness and innate traits. As previously explained, it is widely shared by scholars that people who are genetically predisposed to being happy – because they have a positive approach towards life events – are also healthier, richer and have a better social and family life. While the literature finds that genetics have a strong influence on happiness, an open question on the issue of causality between the attitude to happiness and life circumstances exists. In particular, the empirical research shows that a very happy individual is likely to be married, optimistic, have an active social life, feel fulfilled at work and feel he/she is in good health.[6] As a consequence of being healthier, wealthier and a more social person, these people have additional positive determinants for greater happiness. Røysamb et al. (2003) highlight this self-enforcing characteristic. They point out that genetic factors account for substantial amounts of individual variation in well-being and health conditions. In particular, health and happiness may mutually influence each other, as good health tends to be associated with greater happiness, and a number of studies have found that positive emotions and optimism can have a beneficial influence on health. These cofounding (direct and indirect) effects constitute one of the most relevant technical hitches to decomposing the direct from the indirect effect of innate traits on happiness. As Rietveld et al. (2013) underline, many genes influence happiness through their effects on preferences, personality, and abilities, which, in turn, influence the individuals' choices concerning friendships, marriage, fertility, and occupational choices. Consequently, some of the variance in happiness explained by genes or personality traits is the same variance explained by these environmental factors. Moreover, an individual's genotype is correlated with his or her parents' genotypes, which, in turn, are correlated with the individual's family environment.

3 Empirical analysis

The empirical analysis is based on the EQLS integrated data file 2003–2016. EQLS is a representative household survey of people aged eighteen and older. The EQLS examines a variety of issues, including employment, income, education, housing, family, health, work-life balance, level of happiness, life satisfaction and perceived quality of society. Given the prospective European enlargements, the geographical coverage of the survey has gradually expanded from 28 countries in 2003 to 36 countries in 2016. From this dataset, we selected 30 countries for which we have data for the last three waves (i.e., 2007, 2011 and 2016), however observations are not observed in different periods in time, i.e., EQLS does not provide a panel structure.

The abundant empirical literature on the determinants of happiness (e.g., Frey and Stutzer, 2002; Ferrer-i-Carbonell, 2005; Schimmack, 2006; Frey, 2008) shows that the happiness measure is affected by a set of observable variables, as follows: socioeconomic (i.e., income and employment status) demographic (i.e., gender, age, education attainment, household size, marital and health status), multidimensional determinants of relative life concerns (i.e., job, standards of living, family, housing and social life); institutional and cultural determinants (i.e., year[7] and country dummies). Most of them also account for the abovementioned indirect effects of unobservable subjective time persistent traits on happiness; therefore, we expect to find in the residuals this omitted determinant that accounts for the direct effect of unobservable traits on happiness.

Our analysis pays particular attention to including a set of *multidimensional deprivation indexes,* which measure relative deprivation ($Rd_{i,s}^{j}$) in six different attributes/deprivations of human life. The theoretical support to include relative deprivation among the determinants of happiness derives from Festinger's (1954) theory of social comparison processes, which assumes that the tendency to compare oneself to others increases when there are fewer differences between individuals. A growing body of literature addresses the relevance of the multidimensional indexes of deprivation and well-being, which do not only refer to material, economic, labour or health deprivation but also to social deprivation and inability to participate in society (e.g., see Aaberge and Brandolini, 2015 for a review). Accordingly, we assume that people perceive themselves as 'disadvantaged' when they are more deprived than their reference group. Therefore, the indicators should take into account the difference between subjective deprivation in each dimension of deprivation and a benchmark level of deprivation in his or her reference group (i.e., the minimally acceptable defined as the median on each reference group). Following Amendola et al. (2020), we exhaustively partition the N individuals of the EQLS household survey into *J* mutually exclusive groups on the basis of a set of *F* observable exogenous characteristics. Each individual faces S relevant dimensions of deprivation, each measured by K_s subindicators. We denote by $x_{i,s}^{k,j}$ the outcome of indicator $k \in \{1,...,K\}$ over the dimension of deprivation $s \in \{1,...,S\}$ for individual $i \in \{1,...,N\}$ belonging to reference group $j \in \{1,...,J\}$. In particular, the surveyed population comprises $N = 79{,}612$ individuals, who represent 30 national populations, divided into J = 988 reference groups[8] based on the following four observable exogenous characteristics:

i three waves

ii four age classes

iii three education levels

iv 30 countries.[9]

The $S = 5$ dimensions of deprivations are labour, standard of living, accommodation, family lifeand social life, and each dimension is measured by K different subindicators.[10]

To calculate the index of relative deprivation ($Rd_{i,s}^{j}$), we preliminarily estimate the following:

a the index of absolute deprivation of the *i*th individual belonging the *j*th reference group over the *s*th dimension of deprivation ($Ad_{i,s}^{j}$) as sum of individual absolute deprivations over all dimensions of deprivation: $\underset{(S \times i)}{Ad_{i,s}^{j}} = \sum_{k=1}^{K} x_{i,s}^{k,j}$

b the benchmark (median) level of deprivation in his or her reference group for each dimension: $z_s^j = \underset{\forall k \in K, \forall i \in J}{Median}\left(x_{i,s}^{k,j}\right)$. Accordingly, the relative deprivation of individual *i* belonging to the *j*th reference group over the dimension of deprivation *s* ($Rd_{i,s}^{j}$) is calculated as the percentage of people that are more deprived than a reference value based on their peer-group.

In formal terms, as follows:

$$\underset{(S \times i)}{Rd_{i,s}^{j}} = \begin{cases} 1 & \text{if} \quad Ad_{i,s}^{j} > z_s^j \\ 0 & \text{if} \quad Ad_{i,s}^{j} \leq z_s^j \end{cases} \tag{1}$$

According to this index of relative deprivation, people derive their perceived deprivation not from being simply deprived, but from being more deprived than their reference group. Therefore, the proper indicators should take into account the difference between individual deprivation on each considered dimension and a benchmark (i.e., the minimally acceptable) level of deprivation in his or her reference group.

As a consequence of this potentially exhaustive model specification, we assume that in the residuals of the regressions, we expect to find the direct effect of genetic and personality traits on happiness.

Table 1 shows the number of observations and the weighted percentages of individuals in the sample in each category of happiness, by wave. Overall, individuals report a high value of happiness, with the mode being 8. Specifically, more than 50% of the people are concentrated in the first three top values (from 8 to 10). There are no striking differences among periods (i.e., EQLS waves).

Table 1 Number of observations and weighted percentages of people by happiness and waves

Happiness	2007		2011		2016		Total	
	N. of Obs.	Weigh. %	N. of Obs.	Weigh. %	N. of Obs.	Weigh. %	N. of Obs.	Weigh. %
1	290	1.05%	329	1.11%	457	1.54%	1,076	1.24%
2	319	1.16%	404	1.41%	382	1.31%	1,105	1.31%
3	578	2.17%	784	2.60%	820	2.80%	2,182	2.54%
4	775	3.02%	958	3.26%	1,034	3.52%	2,767	3.28%
5	2,459	9.81%	3,063	10.15%	3,337	11.24%	8,859	10.42%
6	2,108	8.83%	2,959	10.17%	3,070	10.76%	8,137	9.98%
7	4,141	17.66%	5,437	19.10%	5,102	18.53%	14,680	18.49%
8	6,321	27.99%	7,682	26.33%	6,496	24.75%	20,499	26.28%
9	3,641	16.90%	4,217	14.18%	3,306	13.06%	11,164	14.59%
10	2,558	11.41%	3,507	11.70%	3,078	12.48%	9,143	11.88%
Total	*23,190*	*100.00%*	*29,340*	*100.00%*	*27,082*	*100.00%*	*79,612*	*100.00%*

3.1 How do observable (Socioeconomic, demographic, institutional and relative domains) traits affect happiness?

The model specification is as follows:

$$happ_i = \alpha' \overbrace{\begin{bmatrix} Ln(y_i) \\ Ln\left(y_j^{mean}\right) \\ Worker_i \end{bmatrix}}^{Socioeconomic} + \delta' \overbrace{\begin{bmatrix} Male_i \\ Ln(Age_i); Ln(Age_i)^2 \\ Edu\_sec_i; Edu\_ter_i \\ Hsize_i \\ Marital_i \\ Illness_i \\ VeryReligious_i \\ \\ \end{bmatrix}}^{Demographic}$$

$$+\lambda' \overbrace{\begin{bmatrix} Year_i^{2011}; Year_i^{2016} \\ Q\_Health\_Serv_i \\ Q\_Edu\_Syst_i \\ Q\_Transp_i \\ Country_i \\ \\ \end{bmatrix}}^{Institutional} + \lambda' \overbrace{\begin{bmatrix} R\_Job_{i,s}^j \\ R\_StdLife_i^j \\ R\_Housing_i^j \\ R\_Family_i^j \\ R\_SocLife_i^j \\ \\ \end{bmatrix}}^{Relative\ Domains} + \varepsilon_i \tag{2}$$

where $i = 1,\ldots,79612$; $j = 1,\ldots,1080$; $c = 1,\ldots,30$.

In equation (2), we group the observable determinants of happiness (*happ*$_i$) into the following three groups:

i socioeconomic (unidimensional) determinants: absolute income '$Ln(y_i)$'; mean income within each *j* reference group '$Ln(y_j^{mean})$';[11] work status '*Worker*')

ii demographic determinants: gender '*Male*'; age '*Ln(Age)*'; education '*Edu_sec*' and '*Edu_ter*'; household size '*Hsize*'; marital status '*Marital*'; health '*Illness*'; and Religiosity '*Very religious*')

iii institutional/cultural determinants (*Year 2011 and 2016*, Quality of Health '*Q_Health_Serv'*, Education '*Q_Edu_Serv*' and Transport 'Q_*Transp'* services, *Country dummies*).

iv the multidimensional determinants of relative life concerns – a.k.a. 'domains': employment '*R_Job*'; standard of living '*R_StdLife*'; '*R_Housing*'; '*R_Family*'; social life '*R_SocLife*').

The reference categories of the model are as follows: Austrian unemployed, female, compulsory educational level, not-married, good level of health, not very religious, in 2007.

The model is estimated with the following four different compositions of the sample: Model I.*a* includes the full dataset (*All*); Models *I.b* and *I.c* include people who declare a level of happiness lower than six (*Unhappy*) and people with happiness greater than five (*Happy)*, respectively. Given that 81% of the respondents declare a happiness index greater than six, the results based on the whole sample may be led by the happy people because of their overrepresentation in the sample. Consequently, we perform a robustness check of model *I.a* by considering only the first (Q_1) and the fourth (Q_4) quartile of respondents in terms of the self-reported happiness score (model *I.d*). Model *I.d* includes the less happy respondents (people that declare a happiness score between 1 and 6) which are 28% of the entire sample, and the happier people, (i.e., people that declare a happiness score between 9 and 10) which are the top 27% of the entire sample. As a result, model *I.d* $(Q_1 + Q_4)$ consists of approximately 55% of the total sample.

The analysis based on the split sample (*I.b-c*) aims to test the hypothesis that structural differences between the determinants of unhappiness and happiness exist. We consider this estimation approach, which uses two 'separate' regressions for each group of unhappy and happy people as more suitable.

Table 2 reports OLS estimates of equation (2).[12]

The empirical outcomes of regression (2) confirm the predominant results in the literature. In particular, for socioeconomic determinants, we find that, ceteris paribus:

i An increase in the individual level of income increases happiness ($\alpha_1 > 0$) while

ii An increase in the mean income within each reference group has not robust positive effect on happiness ($\alpha_2 \geq 0$). The latter is a test of the relative income hypothesis.[13]

iii Workers are happier than unemployed people ($\alpha_3 > 0$), but this result does not hold if we split the sample between unhappy and happy people (i.e., models I.b and I.c). As far as demographic variables are concerned, we find different results between the whole sample and the sample separated by levels of happiness. Based on the whole sample.

iv Females are happier than males ($\delta_1 < 0$).

v A concave upward correlation exists between age and happiness ($\delta_2 < 0; \delta_3 > 0$). There is clear evidence that gender and age (model *I.b*) are uncorrelated to the level of happiness for people who declare a happiness score lower than 5

vi Education attainments seem to positively affect happiness with the exclusion of happy people $(\delta_4, \delta_5 > 0)$.

vii Larger families (i.e., more people living together) are happier than smaller families $(\delta_6 > 0)$.

viii People who are married (or living with a partner) are happier than singles $(\delta_7 > 0)$.

ix People with chronic illness or disability are less happy than healthy people $(\delta_8 > 0)$.

x Very religious people are happier than others, with the exclusion of unhappy people $(\delta_9 > 0)$. With reference to institutional and relative domains of deprivation are concerned.

xi The time/wave dummies indicate that people declared to be less happy, on average, in 2016 $(\lambda_2 < 0)$ than in 2007 and 2011 ($\lambda_1 = 0$). Observing the regression for happy people (*I.c*), the Great Recession does not affect the self-reported happiness, on average. In other words, the economic recession has only worsened the well-being of unhappy people.

xii Higher is the quality of health $(\lambda_3 > 0)$, education $(\lambda_4 > 0)$ and transport $(\lambda_5 > 0)$ systems, higher the happiness. These results are robust to alternative sample composition with the exclusion of the effect of the education system that does not affect the well-being of unhappy (model I.b).

xiii In all regressions, we also include country dummies to account for differences in political, cultural and institutional factors among European citizens. These dummies allow testing whether cultural peculiarities, as well as genetic differences between populations (e.g., ethnic differences), may explain some of the puzzling findings, such as that individualistic nations have, on average, both high levels of happiness and the highest levels of suicide and divorce (Diener, 1996). These issues indicate that institutional and cultural factors should be adequately taken into account among the determinants of happiness. Moreover, the relative domains are negatively correlated to self-declared happiness as expected, with the exclusion of the relative deprivation in the job and family domains that have no statistically significant effect on happiness for unhappy people (model *I.b*).

An interesting result of this first step of the analysis is that the estimates based on the subsample of unhappy respondents (model *I.b*) show that the determinants of happiness are different between unhappy and happy people. For instance, higher individual income and/or education decrease the unhappiness for unhappy people, but they do not affect the level of happiness for happy people. In the same way, gender, age, household size and religiosity shape happiness only for happy people, while these determinants are ineffective in affecting the (un)happiness of 'unhappier' people.

Table 2 OLS Estimation output of equation (2)

Models		*I.a*	*I.b*	*I.c*	*I.d*
Sample		*All*	*Unhappy*	*Happy*	$Q_1 + Q_4$
Level of Happiness (Mean)		*7.205*	*4.083*	*7.978*	*5.983*
Socioeconomic	*Expected sign*				
$Ln(y_i)$	$\alpha_1 > 0$	0.124***	0.106***	0.014	0.110***
$Ln(y_j^{mean})$	$\alpha_2 \geq 0$	0.148**	–0.021	0.030	0.108*
Worker	$\alpha_3 \geq 0$	0.123***	0.060*	0.009	0.108***
Demographic					
Male	$\delta_1 < 0$	–0.138***	–0.034	–0.090***	–0.117***
Age	$\delta_2 < 0$	–0.063***	–0.005	–0.035***	–0.052***
Age^2	$\delta_3 > 0$	0.001***	0.0000	0.0001***	0.0001***
Edu_sec	$\delta_4 \geq 0$	0.175***	0.087***	0.035*	0.141***
Edu_ter	$\delta_5 \geq 0$	0.235***	0.185***	0.049*	0.237***
Hsize	$\delta_6 > 0$	0.196***	0.057*	0.126***	0.181***
Married	$\delta_7 > 0$	0.492***	0.148***	0.277***	0.440***
Illness	$\delta_8 < 0$	–0.377***	–0.177***	–0.144***	–0.367***
Very religious	$\delta_9 > 0$	0.158***	–0.013	0.130***	0.118***
Institutional					
Year 2011	$\lambda_1 < 0$	–0.024	–0.070**	0.005	0.002
Year 2016	$\lambda_2 < 0$	–0.236***	–0.142***	–0.052**	–0.182***
Q_Health_Serv	$\lambda_3 > 0$	0.079***	0.027***	0.026***	0.068***
Q_Edu_Syst	$\lambda_4 > 0$	0.063***	0.011	0.032***	0.055***
Q_Transp	$\lambda_5 > 0$	0.056***	0.019***	0.035***	0.048***
Country dummies		Yes	Yes	Yes	Yes
Relative domains					
R_Job^j	$\gamma_1 < 0$	–0.151***	0.031	–0.100***	–0.133***
$R\_StdLife^j$	$\gamma_2 < 0$	–0.487***	–0.120***	–0.212***	–0.440***
$R\_Housing^j$	$\gamma_3 < 0$	–0.284***	–0.132***	–0.083***	–0.262***
R_Family^j	$\gamma_4 < 0$	–0.114***	0.0001	–0.055***	–0.092***
$R\_SocLife^j$	$\gamma_5 < 0$	–0.507***	–0.242***	–0.183***	–0.478***

Table 2 OLS Estimation output of equation (2) (continued)

Models		*I.a*	*I.b*	*I.c*	*I.d*
Sample		*All*	*Unhappy*	*Happy*	$Q_1 + Q_4$
Level of Happiness (Mean)		*7.205*	*4.083*	*7.978*	*5.983*
Socioeconomic	*Expected sign*				
Constant		5.866***	2.992***	8.050***	4.932***
R^2		0.246	0.075	0.111	0.298
Adjusted-R^2		0.254	0.074	0.115	0.304
F-test		155.72***	14.81***	92.84***	152.94***
Root MSE		1.695	1.197	1.147	1.423
Number of obs.		77,948	15,463	62,485	43,356

**p*-value < 0.10; ***p*-value < 0.05; and ****p* < 0.01. Statistical significance is based on a robust cluster t-statistic at the reference group level. Post-stratification weights to correct for sampling bias in EQLS are applied. Adjusted-R^2 is based on regressions estimated without sample weights. According to F-Test, we cannot reject the hypothesis that the independent variables, when used together, reliably predict individual happiness.

From this outcome, in a normative perspective, we deduce that, with the exclusion of public policies aimed to promote marriage and improve individual health conditions and perceived quality of health and transport systems, a policy maker should apply different policies to improve self-declared happiness, depending on whether its target population is the happy people or unhappy people.

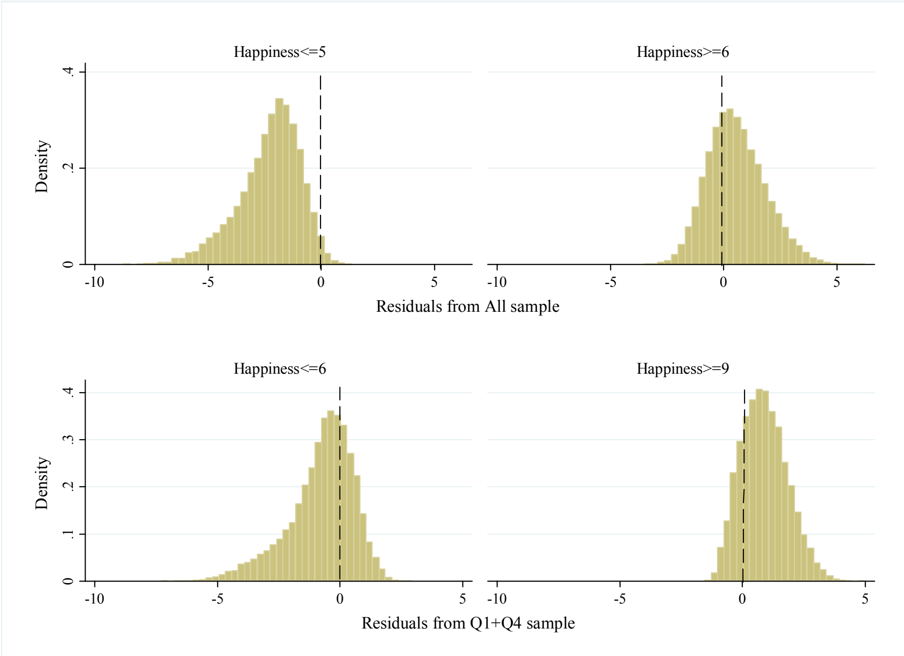
In general, we find that for the whole sample (i.e., without splitting the sample between happy and unhappy people), socioeconomic, demographic, institutional and relative deprivations explain approximately one-fourth of total happiness variation at the individual level (i.e., *I.a:* $R^2 = 0.24$ and *I.d:* $R^2 = 0.29$). However, the proportion of the individual happiness explained by regressors strongly decreases once that we focus only on the determinants of happiness for unhappy (model I.b: $R^2 = 0.075$) and happy people (model I.b: $R^2 = 0.11$).

3.2 How do unobservable subjective (genetic and personality) traits directly affect happiness?

In this section, we describe how unobservable subjective traits may directly affect happiness. Indeed, unobservable traits indirectly affect individual happiness by the socioeconomic, demographic and relative domain factors that are already included in the model specification. Accordingly, we expect to find unobservable time persistent traits in the residuals ($residuals = happ^{declared} - happ^{estimated}$). We consider the proposed approach to be an ancillary method to support De Neve et al.'s (2012) finding of a relevant role of genetic traits in the happiness analysis.

In particular, given that the residuals can be thought of as elements of variation unexplained by the fitted model, we expect significant departures from a normal distribution, with the mean and median equal to zero, reveal the effects of variables omitted from the model, i.e., the direct effects of genetic and personality traits on happiness. Figure 1 plots the residuals of model *I.a* – whole sample – and *I.d* – balanced sample (i.e., first and fourth quartile).

Figure 1 Residuals of model I.a and I.d (unhappy vs. happy) (see online version for colours)



The top panel shows the residuals for model I.a estimated on the whole sample plotted after splitting the sample between people who declare happiness < 5 and happiness $\geq$ 6. The bottom panel shows the residuals of model I.d estimated on 55% (approximately the sum of the first and fourth quartile) of the sample and plotted after splitting the sample between people who declare happiness < 6 and happiness $\geq$ 9.

The graphical analysis of Figure 1 displays the asymmetry of the residual distribution between happy and unhappy people. In particular, it highlights that while the histogram of happy people (*happ* ≥ 6) has both a mean and median slightly greater than zero, looking at the histogram of unhappy people (*happ* ≤ 5), a bias emerges – i.e., there is something unexplained – due to the omitted relevant variable(s) in the model specification. The empirical signal of this unexplained component is given by the evidence that the residuals are largely negative (i.e., the observed values are lower than the predicted ones $happ^{declared} < happ^{estimated}$), which means that sad people (*happ* ≤ 5) report, on average, a lower happiness score than should be expected according to their socioeconomic, demographic, and institutional characteristics and peer comparisons. Accordingly, we consider this unexplained component to be the effect of omitted unobserved subjective time-invariant traits.

Observing the lower part of Figure 1 –, i.e., the residuals of very happy people (*happ* ≥ 9 – estimated by model I.d – we find that these individuals declare higher happiness scores than what is expected according to their environmental characteristics ($happ^{declared} > happ^{estimated}$). The hypothesis of functional separation between positive and negative emotions has also received particular scrutiny in the psychological literature (e.g., Cacioppo et al., 1999, Diener et al., 1995). Following this interpretation, we suggest that an increase in happiness or a decrease in unhappiness may require distinct public policies, not only because the impacts of the determinants of happiness are different (*I.b vs. I.c)* but also because genetic and psychological traits play more relevant roles for unhappy and very happy people than for moderately happy individuals.

Table 3 reports the statistics on the residuals based on the regressions estimated on different samples as reported below. Preliminarily, the tests on the normality of the residuals reject the hypothesis of normality. These findings indirectly support the hypothesis that there is something unexplained in the model specifications (i.e., genetic and personality traits).

Table 3 Residual Statistics of estimated models

Model		*I.a*		*I.b*	*I.c*	*I.d*		
Sample		*All*		*happp < 5*	*happ ≥ 6*	*happ < 6(Q_1) + happ ≥ 9(Q_4)*		
Subjects	*All*	*happ < 5*	*happ ≥ 6*	*happ < 5*	*happ ≥ 6*	*$Q_1 + Q_4$*	*happ < 6*	*happ ≥ 9*
N. Obs	77,948	15,463	62,485	15,463	62,485	43,356	23,394	19,962
Mean	–0.0044	–2.2773*	0.5581	0.0045	–0.001	–0.0064	–0.7661*	0.8839*
Median	0.0858	–2.0672*	0.4584	0.4503	–0.0744	0.12	–0.5413	0.8285
Skewness	–0.463	–0.7477	0.3558	–1.0775	0.195	–0.7168	–0.8876	0.3261
Kurtosis	3.7715	3.5658	2.9718	3.2704	2.4165	4.1525	3.8629	2.7564

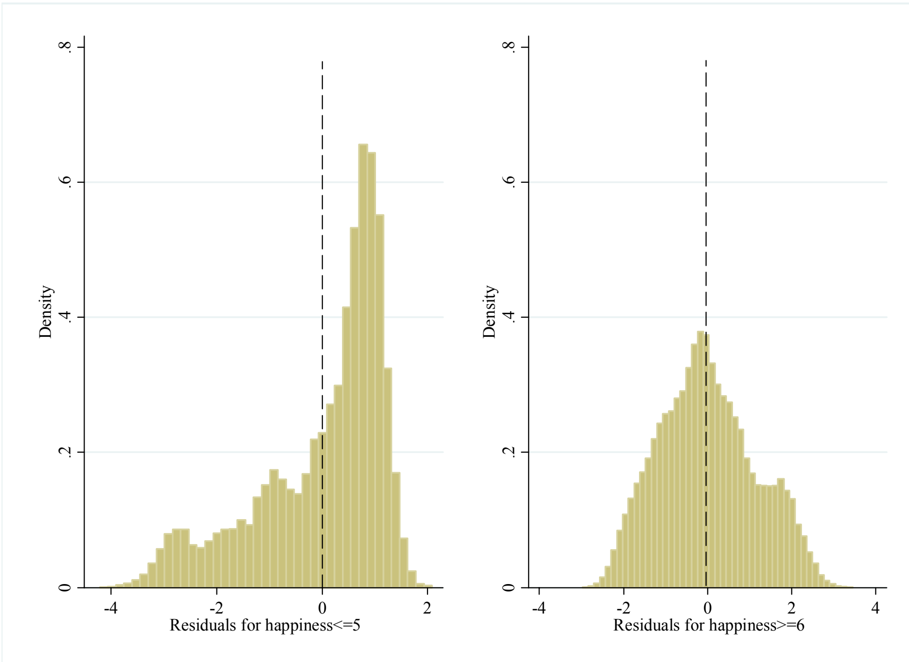
*Means are significantly different from zero at 1% (based on t-test).

This analysis of residuals follows two complementary approaches. The first approach estimates the residuals by using the whole sample, i.e., *All* (*I.a*) and $Q_1 + Q_4$ (*I.d*). In this analysis, we find that the residuals have a mean statistically lower than zero (i.e., –2.2773 and –0.7661) for unhappy people – implying that self-declared happiness scores are lower than the predicted values – and a mean statistically higher than zero (i.e., 0.5581 and 0.8839) for happy people – implying that self-declared happiness is higher than the predicted scores based on socioeconomic, demographic and environmental determinants.[14]

The second approach to analyse the unobservable traits estimates the residuals by two separate regressions, i.e., unhappy (Table 2, I.b: *happ* < 5) and happy (Table 2, I.c: *happ* ≥ 6) people. According to this analysis, although the means of the probability density functions of the residuals are equal to zero (by construction) for both happy and unhappy people (i.e., 0.0045 and –0.001), these distributions reveal significant differences in terms of skewness (–1.0775 and 0.195). This result emerges also by observing the histograms of the residuals of models *I.b*, *I.c* (Figure 2).

Specifically, while the histogram of model *I.c* (i.e., happy people) shows an approximately symmetric distribution (*skewness = 0.195*), for unhappy people (*I.b*) the distribution of residuals is negatively skewed (*skewness = –1.0775*), that is to say that, the probability density function has a long tail to the left. This negative skewness of residuals corroborates the hypothesis that the unexplained component of variability in individual happiness for unhappy people – which remains once we control for socioeconomic, demographic, environmental and relative deprivation determinants – is more relevant than for happy people.

Figure 2 Residuals of model I.b; I.c. (unhappy vs. happy) (see online version for colours)



The residuals are calculated from the separate estimates of model I.b (happ < 5) and model I.c (happ ≥ 6).

In conclusion, we interpret these empirical results as an implicit validation of the hypothesis that genetic and psychological traits, affecting the cognitive process for unhappy individuals, induce those people to declare a lower happiness index than should result based on their relative socioeconomic, demographic and institutional characteristics.

4 Conclusions

This paper investigates the direct influence of unobservable subjective time persistent traits on happiness. The common empirical approach to control for unobservable time-invariant individual variation in literature consists to include fixed effects in a panel model. However, this approach makes challenging to focus on how unobservable traits vary over happiness distribution and preclude the use of large cross-sections survey for European countries (e.g., EQLS). Accordingly, we propose a heterodox approach aimed to disentangle the black-box approach based on fixed effects regression. It consists to omit innate traits among the regressors in order to analyse them as residuals.

The empirical analysis confirms that the innate and psychological factors significantly affect happiness both directly and indirectly. In particular, the environmental and mediated (or indirect) effects of unobservable traits explain approximately one-third of the happiness variation at the individual level – models *I.b* and *I.d* have R^2 values equal to 0.24 and 0.29, respectively. As a consequence, we find that, in the residuals of the regressions, the direct effect of personality and genes on happiness and good or bad luck may explain up to two-thirds of the variance in happiness.

A second empirical result of the analysis is that the relevance of unobservable traits on happiness is different between happy and unhappy individuals. In this sense, we provide some empirical evidence to corroborate the hypothesis that individual heterogeneity in terms of hereditable and psychological traits can cause differences in the cognitive process between unhappy and happy people. The psychological rationale behind this result depends on the cognitive phenomenon of people's adaptation to the changing of life circumstances (e.g., income; work status, housing and standards of living).

A caveat of the empirical methodology is that, although the results are statistically robust to several checks (e.g., estimation approach, model specification and sample composition) and the model specification is consistent with the predominant empirical literature, i.e., the evidence of a departure from a normal distribution as well as differences in density functions between unhappy and happy individuals in the residuals are necessary but not sufficient conditions to state that the only factors that are not accounted for in the model are direct genetic and psychological traits. Specifically, the unexplained variance depends on what we (do not) include as observables and, as argued above, it might mean that we have left out from regression more relevant variables to explain 'unhappiness' than determinants of happiness (e.g., the death of a beloved reduce happiness more than the birth of a child increase happiness and this may affect the asymmetry of residuals). As a result, we are well aware that the most important robustness check for this analysis is to re-estimate the model (1) by panel data. Unfortunately, EQLS does not allow this test therefore we would recommend future researches on this issue.

Regarding the economic policy implications of the analysis, assuming that a policy maker aims to increase happiness, the asymmetric effect of unobservable time persistent traits between unhappy and happy people could have a relevant consequence on public policy. Schimmack (2006) was among the first scholars to point out the relevance of people adaptation for the effectiveness of public policy. He concluded that, while adaptation to negative life events is beneficial because of a moderate decrease in happiness during times of adversity, adaptation to positive changes in life circumstances may undermine the positive effects of public policies. We 'expand' this result by stating that public policies that affect the socioeconomic determinants of happiness may be less effective in improving happiness for the subjects who declare an unsatisfactory level of happiness (i.e., lower than 5 in an ordinal scale 1-10) than happy people. This is due to the evidence that the innate components of happiness are more relevant among the unhappy than happy people (as shown by the differences between the means of the residuals in Table 3 – model *I.a* and *I.d*).

In conclusion, this research provides two main policy implications. On the one hand, we find some practical insights for the effectiveness of public policy (i.e., with the exclusion of public policies aimed to promote marriage and improve health conditions, policy makers have to apply distinct strategies to improve self-declared happiness depending on whether the target of their policies are the happy citizens rather than the unhappy – e.g., individual income and education only influence the unhappy; gender, age, household size and religiosity only shape the happy. On the other hand, regardless of these policies, policy makers have few chances to eradicate the happiness gap because of the component of individual (un)happiness that remains unexplained once we control for the socioeconomic, demographic, environmental and relative deprivation determinants of unhappiness (i.e., –2.3 points on a scale 1–10), which is significantly larger than the unexplained component of individual happiness for happy people (i.e., + 0.6 points). Accordingly, if you are born, or your personality is prone, to be unhappy, policy makers have few opportunities to completely remove the happiness gap within society.

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Notes

[1]Several genetic studies have indicated that these psychological traits are highly heritable (e.g., Saphire-Bernstein et al., 2011).

[2]For instance, there is extensive evidence that divorce is heritable (Jerskey et al., 2010) and marriage appears to protect an individual from depression (Heath et al., 1998).

[3]Specifically, the EQLS happiness question is as follows: Q41 - *Taking all things together on a scale of 1–10, how happy would you say you are? Here, 1 means you are very unhappy and 10 means you are very happy*. Unfortunately individuals are not observed in different periods in time, i.e., it does not provide a panel structure, therefore is not possible to check the robustness of our results by using statistical methods for longitudinal data (e.g., fixed effect estimator).

[4]The hedonic treadmill theory has had a profound effect on the happiness research (for general reviews of the area, see Diener et al., 1999; Kahneman et al., 1999; Lyubomirsky, 2001).

[5]It refers to the tendency for positive findings, as opposed to nonfindings, to be selectively reported by researchers and selectively published by journals.

[6]Headey and Wearing (1989) provide evidence that "happy people were more likely than unhappy people to experience good events, and that unhappy people were more likely than happy people to experience bad events". Thus, they argued, one's baseline is due, in part, to the fact that certain individuals are more or less likely to experience certain affect-inducing events" (Lucas et al., 2003, p. 528).

[7]This dummy variable is included in order to account for the economic crisis of 2008.

[8]Due to the presence of a minimum threshold for the reference group sample size fixed equal to 20, the theoretical number of reference groups ($3 \times 4 \times 3 \times 30 = 1080$) is reduced by 92 units and the sample size is reduced by 1% (approximately 800 individuals). However, the results are robust to different minimum thresholds for the reference group sample size.

[9]We also tried to include gender to define reference groups and results do no change.

[10]$K_s = (3,7,7,3,5)$ is the number of sub-indicators in each dimension. Details regarding the EQLS and the definitions of different types of deprivation are provided in Table A3 of the online Appendix.

[11]Income variables are based on the OECD equivalised household income in PPP euro.

[12]In this empirical literature, both OLS and ordered probit (OP) estimators are equivalently used. Following De Neve et al. (2012), we opt for OLS because we do not find meaningful differences in the coefficients or statistical significance. De Neve et al. (2012) preference is grounded on Ferrer-i-Carbonell and Frijters (2004) analysis of the methodology for the estimates of the determinants of happiness. Ferrer-i-Carbonell and Frijters (2004) conclude that assuming cardinality (i.e., OLS) or ordinality (i.e., OP) of happiness surveys makes little difference in studies where the dependent variable is measured at a single point in time. As a further robustness check, we convert the dependent variable in a dichotomous variable (assuming value one to indicate happy people (i.e., $happ_i \geq 6$) and value zero for unhappy people (i.e., $happ_i \leq 5$) to apply logistic regression. These checks show as our results are robust to the different estimation approaches.

[13]The results do not qualitatively change if we assume that the expected income is the log of the median individual income within the *j*th group. For an empirical analysis of the relative income hypothesis in European countries, see Amendola et al. (2018).

[14]We also test that the difference between the means of the residuals calculated over the two subsamples of happy and unhappy people (H_0: (–2.2773 – 0.5581) = 0 and (–0.7661 – 0.8839 = 0) are statistically different from zero. These tests corroborate the hypothesis that both the differences between means are statistically different from zero.

Appendix: Descriptive statistics and variables definitions (online available)

Table A1 Descriptive statistics

	All		*Happy*		*Unhappy*	
	Mean	*S.D*	*Mean*	*S.D*	*Mean*	*S.D*
Socioeconomic						
$Ln(y_i)$	6.720	0.889	6.824	0.852	6.302	0.913
$Ln(y_j^{mean})$	6.930	0.542	6.992	0.523	6.677	0.547
Worker	0.475	0.499	0.513	0.500	0.322	0.467
Demographic						
Male	0.433	0.496	0.441	0.496	0.404	0.491
Age	50.334	17.608	49.325	17.528	54.410	17.339
Age^2	2843.498	1825.840	2740.165	1799.774	3261.060	1870.377
Edu_sec	0.441	0.497	0.445	0.497	0.425	0.494
Edu_ter	0.232	0.422	0.258	0.437	0.126	0.332
Hsize	0.791	0.543	0.817	0.533	0.684	0.571
Married	0.588	0.492	0.618	0.486	0.463	0.499
Illness	0.305	0.460	0.270	0.444	0.446	0.497
Very religious	0.176	0.381	0.174	0.379	0.182	0.386
Institutional						
Year 2011	0.376	0.484	0.380	0.485	0.357	0.479
Year 2016	0.327	0.469	0.319	0.466	0.357	0.479
Q_Health_Serv	6.254	2.296	6.492	2.198	5.291	2.428
Q_Edu_Syst	6.406	2.019	6.608	1.944	5.589	2.110
Q_Transp	6.319	2.127	6.454	2.064	5.770	2.285
Country dummies						
Relative domains						
R_Job^j	0.069	0.253	0.063	0.242	0.092	0.290
$R\_StdLife^j$	0.367	0.482	0.314	0.464	0.583	0.493
$R\_Housing^j$	0.322	0.467	0.287	0.452	0.464	0.499
R_Family^j	0.188	0.391	0.188	0.391	0.189	0.391
$R\_SocLife^j$	0.444	0.497	0.391	0.488	0.658	0.474
Number of obs.	*77948*		*62485*		*15463*	

Table A2 Reference groups composition

Variables	*Categories*
Age of respondent	*18–34, 35–49, 50–64, 65+*
Education	Primary or less; Secondary; Tertiary. Completed education abroad; Don't know; Refusal are recoded as missing.
Country	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, UK.
Time dummy	EQLS 2007; EQLS 2011; EQLS 2016

Table A3 Questions to build the sub-index of deprivation

Variables	*Category associated to a deprivation status*
	1- Labour deprivation
Not having a job	Unemployed less than 12 months; unemployed 12 months or more; unable to work due to long-term illness or disability.
Long term unemployment	Unemployed 12 months or more
Ever had a paid job	No
	2- Standard of living deprivation
Holiday	No, cannot afford it
Replacing furniture	No, cannot afford it
Buy new clothes	No, cannot afford it
Meeting friends	No, cannot afford it
Arrears paying rent	Yes
Arrears paying bill	Yes.
Able buy fresh meal	With difficulty; With great difficulty;.
	3- House deprivation
Shortage of space	Yes
Rots in window, door etc.	Yes
Damp in walls or roof	Yes
Lack of indoor toilet	Yes
Lack of garden or balcony	Yes
Likely to leave accommod.	Very likely; Quite likely.
Keep home warm	No, cannot afford it.

Table A3 Questions to build the sub-index of deprivation (continued)

Variables	*Category associated to a deprivation status*
	4- Family deprivation
Marital status	Separated or divorced and not living with partner; Widowed and not living with partner
Having children	No child
Contact face to face with children	One to three times a month; Less often; Never.
	5- Social Life Deprivation
Feeling out of society	Strongly agree; Agree
Feeling lost	Strongly agree; Agree
Feeling unrecognised	Strongly agree; Agree
People look down to me	Strongly agree; Agree
Feeling closeness	Disagree; Strongly disagree.