Scuola di Economia, Management e Statistica di Forlì
Corso di Laurea Magistrale in
Economia Sociale

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Marzo 2013

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27th March 2013

Abstract

Empirical evidence documents that other regarding activities (voluntary/charity work, helping friends/neighbours) done with other regarding motivations contribute positively and signi cantly to subjective wellbeing. The question is why only a restricted group of people performs these activities with such motivations if doing so adds up to satisfaction in life. We develop a model in which individual's utility grows in the consumption of a stimulus" goods which may however be enjoyed only with a su cient level of investment in civic capital. The stimulus good (a contingent good produced by the interaction of an action with a motivation) is represented by the performance of other regarding activities with other regarding motivations and civic capital may be accumulated through education. The model has multiple equilibria since more patient individuals accumulate along their lives enough civic capital which allows them to enjoy such goods. Less patient individuals do not accumulate enough civic capital and therefore cannot enjoy performing these activities even if they observe others doing so. We test our theoretical predictions by comparing a group of Europeans aged above 50 who performs other regarding activities with other regarding motivations with a group of the same age which does not perform such activities. Parametric and non parametric tests document that the rst group has signi cantly more schooling years coupled with higher cognitive and eudaimonic life satisfaction. Our results are robust to several checks among which health shocks, variations in local social norms and consistent with the procedural utility hypothesis arguing that not only outcome but also all other circumstances of action matter for subjective wellbeing.

Keywords: sociability, education, life satisfaction.
JEL Classi cation Numbers: A13, D13, D64.

1 Introduction

It is commonsense in our society to believe that adequate income is a su cient condition to access consumption which in turn contributes to our happiness. The standard textbook analysis explains it properly when illustrating that an income rise may produce a rightward shift of the budget constraint which can allow us to achieve higher isoutility (indi erence) curves. Under this conventional static single period approach the budget constraint is the frontier which delimits ine ciency (I consume less than I can) from wishful thinking (the more I would like which is unfortunately out of reach). In our paper we argue that this is not always the case. Imagine a sunny winter day in which a bystander observes several skiers enjoying the weather and the slopes. The awareness that skiing in a sunny day contributes to life satisfaction of the skiers is not enough to allow the bystander to participate to such satisfaction even though the latter has no nancial constraints and can a ord to rent a pair of skis. If our individual has not previously invested in learning how to ski the desired good

s.t. the law of motion of civic capital (2) holds and S is a variable stands for Social Norms, under the same budget and time constraints (4)–(5) as before.

Proposition 2. *If there are no social norms $S = 0$, subject i performs no other regarding activities i.e. $X_s^* = 0$.*

Proof. The problem (27)–(2) under constraints (4)–(5) can be analyzed as (1)–(2) under constraints (4)–(5) where instead of considering the parameter β we have $\beta' = \beta S$. Hence, recalling (23), substituting β with β' and setting $\beta' = 0$ when $S = 0$, we get the result. □

In the empirical part of the paper we will test whether predictions from Proposition 1 are supported by empirical evidence. More specifically we aim to test whether characteristics of individuals performing other regarding activities with other regarding motivations (compared with individuals not performing other regarding activities) are significantly different in terms of education and happiness. In order to discriminate between the base version and the social norm version of the model we will also check whether our results are robust in areas with different levels of social norms.

3 Testing our theoretical hypothesis

We test our theoretical hypothesis on a sample of 30,430 individuals aged above 50 using the SHARE database. The legend of the main variables used in the empirical analysis is in Table 1 while summary descriptive statistics are provided in Table 2. The main variable of interest for us is the question asking *"'have you done any of these activities in the last month?"*. The answers which can be provided are: i) voluntary or charity work (variable *voluntary* in our sample); ii) cared for a sick or disabled adult (*cared for sick*); iii) provided help to friends or neighbours (*help to friends*); iv) gone to a sport, social or other kind of club (*sport/social clubs*); v) taken part in activities of a religious organization (church, synagogue, mosque etc.) (*religion attendance*); vi) taken part in a political or community-related organization (*political participation*). We consider actions i) and iii) as other regarding. The question considered is combined with another one in which respondents are asked to choose one of the following motivations for each of the above mentioned actions: i) *because I'm needed*; ii) *to contribute to something useful*; iii) *to meet friends*, iv) *to earn money*; v) *to use skills*; vi) *to keep fit*. We consider the first two motivations as other regarding in a strict sense since they make explicit reference to the satisfaction of others beyond one's own self (even though they do not exclude that a mix of self and other regarding motivations is behind the action). Based on this assumption we build the variable *OtherRegardingSociable* which takes value one if the individual has done at least one between activities i) or iii) in the last month before the interview, declaring (for at least one of them) one of the first two other

regarding motivations.
Our control sample is represented by individuals who did not perform any of the above mentioned social activities (*NonSociable*). This implies that we eliminate from the sample all individuals not belonging either to the *OtherRegardingSociable* or to the *NonSociable* group, that is, individuals who performed at least a social activity in the last month but without mentioning any other regarding motivation for them (which we define as *NonOtherRegardingSociable*). In a robustness check we will however consider as control group all individuals not belonging to the *OtherRegardingSociable* group. In such case we will include the *NonOtherRegardingSociable* group in the control sample.
The introductory evidence from which our analysis starts comes from Becchetti et al. (2013) who demonstrate that the *OtherRegardingSociable* variable contributes positively and significantly to life satisfaction in an econometric estimate with standard controls (see Table 3 on this point).
As it is well known in the case of the sociability-happiness nexus the endogeneity problem is serious and reverse causality cannot be ruled out (see, among others, Diener, 2012, Becchetti et al., 2011 and 2012). The same mentioned empirical work however documents with IV and sensitivity to the removal of the CIA assumption that a direct causality nexus from sociability to happiness exists.
The theoretical model presented in section 2 ended up with multiple equilibria in which some individuals, due to their lower degree of impatience, invest in education, accumulate enough civic capital which allows them to enjoy social activities performed with other regarding motivations. A second group of individuals with a higher degree of impatience does not accumulate enough civic capital and therefore cannot enjoy other regarding activities performed with other regarding motivations. Last, since we assumed that the impact of other regarding activities with other regarding motivations on the utility function was higher than that of traditional consumption goods ($\beta > \alpha$), we also argue that the first group of individuals is happier than the second.

Based on what considered above the first null hypothesis to be tested is whether the *OtherRegardingSociable* group has the same number of average education years of the *NonSociable* group. Our results document that the former has indeed on average 12.165 education years against 9.691 of the *NonSociable* group (a remarkable difference which amounts to more than 60 percent of the variable standard deviation) (Table 4). The null is strongly rejected with parametric test (t stat 44.37) and with the Wilcoxon rank sum non parametric test typically used to test between group differences (z-stat 43.02). The total number of observations on which the test is performed is 25,556 (7,824 for the *OtherRegardingSociable* group against 17,732 for the *NonSociable* group).
Note that the null is rejected as well if we include in the complementary group all those individuals who performed a social activity in the last month but without other regarding

motivations (the *NonOtherRegardingSociable* group).[8]
As is well known the literature on voluntary work considers that a typical strategic motivation of individuals "working for nothing" (Freeman, 1997) may be prompted by the need to improve their network of relationships and their curricula for future job opportunities (Katz and Rosenberg, 2005). For this reason we repeat our test by limiting the sample to retired individuals. The difference in education years remains consistent (2.3 years and slightly less if we aggregate those performing other regarding activities without other regarding motivations to the *NonSociable* group) and highly significant (t-stat 29.97 in the parametric test and z-stat -28.99 in the non parametric test).
The second null we test is whether the two groups have the same level of life satisfaction. We in fact assumed in our model that our stimulus good (other regarding activities performed with other regarding motivations) yields higher satisfaction than traditional goods (and, consequently, higher satisfaction than other regarding activities performed without other regarding motivations which are not included in X_s). Empirical evidence shows also in this case that the null is rejected. The *OtherRegardingSociable* group declares on average a level of life satisfaction of 8.08 against 7.26 of the *NonSociable* group (the group difference is around one half of the standard deviation of the variable). The difference is strongly significant both on parametric and non parametric tests (parametric test t-stat 33.85, non parametric test z-stat 33.51). The distance in life satisfaction is narrower when the complementary group includes the *NonOtherRegardingSociable* group (in this case the average life satisfaction of the complementary group rises to 7.40), but the difference remains strongly significant (Table 4). When we limit the sample to retired individuals the difference in life satisfaction becomes even larger than in the overall sample and close to 1 point.
Our third null concerns the controversy whether satisfaction from performing social activities with other regarding motivations depends on other regarding preferences or on social norms. We test this hypothesis by repeating our base test on the subsample of respondents living in NUTS1 regions with individuals in the *OtherRegardingSociable* group below the median when considering the sample distribution of NUTS1 regions. We find that our results on education years and life satisfaction are confirmed in the overall sample and in the restricted sample of retired individuals only. As expected average education is lower in both (*OtherRegardingSociable* and *NonSociable*) groups in regions with low social norms, while the distance in education between the two groups is higher in low social norm regions (more than two years in high social norm and less than 1.5 years in low social norm areas) (Table 4). The likely interpretation is that the gap in accumulation of virtuous capital required to

[8] It may be argued that our findings simply depend on preference heterogeneity, ie. individuals belonging to the *NonsSociable* group) do not perform those activities because they do not find satisfaction in them. But this is actually what our model says. Its specificity is however to derive preference heterogeneity from insufficient accumulation of a specific form of (civic) capital enabling individuals to activate such preferences and to enjoy such activities.

prompt individuals to perform other regarding activities with other regarding motivations is higher in regions with low social norms, as it is reasonable to be since in such regions individuals are not helped by other regarding "conformism". In the light of the controversy between other regarding preferences and social norms this suggests that social norms matter (you need more human capital to perform and enjoy other regarding activities with other regarding motivations in low social norm areas). Note however that, since life satisfaction of the *OtherRegardingSociable* group is significantly higher than that of the two complementary (*NonSociable* and *NonOtherRegardingSociable*) groups also in low social norms areas, our assumption that other regarding preferences do matter (as interviewed individuals communicate when answering on the motivation of their action) is highly plausible. Unfortunately, it remains impossible to test whether other regarding motivations matter also in absence of social norms (the first version of the model) since we do not have "zero social norms areas" in which this hypothesis can be tested. We can however document that the significant difference in life satisfaction between the *OtherRegardingSociable* and the *NonSociable* groups persists also if we limit the analysis to areas with average social norms below the 33rd centile (parametric test t-stat -5.6, non parametric test z-stat -5.90) and below the 20th centile (parametric test t-stat 5.14, non parametric test z-stat 4.51) in spite of the much lower number of observations. Similarly, we find significant differences in education years and life satisfaction when using the *NonOtherRegardingSociable* group as control sample.

4 Robustness check

As a first robustness check we verify whether our base hypotheses are confirmed when performed at country level. Even though the number of observations falls considerably (usually below thousands) results are remarkably stable (Table 5). The largest difference in education years is in Spain (almost four), while it remains above 2 in Italy and Poland and above 1.5 in almost all other countries. The largest differences in life satisfaction are in Austria, Italy and Poland. The only country out of the 13 in which the null hypothesis of no difference in education years is not rejected is Austria (the difference is around half a year but is not significant), while the only country in which same occurs for life satisfaction is Greece.

Endogeneity and reverse causality are important concerns we need to address when testing model predictions. The specific characteristics of our sample allow us to rule out reverse causality since social activities performed in the month before the interview cannot affect education choices of individuals aged above 50. However there may be third factors which may cause the observed correlation. A natural suspect is health. It may reasonably happen that a health shock can constrain social activities of individuals aged above 50. At the same time the literature tells us that education helps individuals to develop life habits which may

positively affect health and that health has a two-way causal relationship with life satisfaction[9]. If we consider these literature contributions the higher satisfaction and propensity to other regarding activities performed with other regarding motivations of the more educated would still depend on human capital but through the main channel of health (and the higher life satisfaction of the *OtherRegardingSociable* group could depend on health and not on the activity itself) differently from what assumed in our theoretical model. The SHARE database is extremely rich in terms of health information with a large number of questions concerning different dimensions of physical disabilities and reported illnesses (see Table 1 for details). We group them into three variables which we use as synthetic indicators for health status, namely *long-term illnesses, numb. of illnesses and limited activities*.
Average levels of the synthetic health variables in the two groups confirm our concerns showing that the *OtherRegardingSociable* group has significantly better health (on average 1.18 illnesses against 1.52 of the *NonSociable* group) (Table 6). We therefore repeat our tests on the subsample of respondents who do not report illnesses. The difference in education years persists and remains strongly significant even though it becomes slightly narrower (12.64 against 10.60 years). The difference in life satisfaction remains strong as well (8.28 against 7.77). The null is rejected for both hypotheses also when we consider the complementary *NonOtherRegardingSociable* group which includes individuals performing social activities without other regarding motivations (average education years and life satisfaction being respectively 10.98 and 7.85 for this group). Differences remain significant also when we repeat the test by splitting the sample into low and high social norm areas (Table 5).

A second robustness check concerns our happiness measure. As it is well known, the standard life satisfaction question is subject to several potential measurement errors due to cultural biases caused by different nuances that the term means in different languages and to the difficulty of evaluating one's own synthetic subjective wellbeing. We may reasonably assume that, when individuals are reflecting on their life satisfaction, they implicitly weight different components such as vitality, evaluation of past life, opportunities for the future, overall meaning of their own life, etc. The SHARE database provides the unique

[9] In his recent survey on the issue Diener (2012) identifies many channels through which the life satisfaction effect on health occurs. Among them, negative emotions harm cardiovascular, immune, and endocrine systems in humans, whereas positive emotions appear to help them (e.g., Edwards and Cooper, 1988; Kiecolt-Glaser et al., 2002). Appleton et al. (2011) and Slopen et al. (2012) find that adversity and stress in childhood predict elevated markers of inflammation a few years later. Blanchflower et al. (2012) found that happier individuals have a healthier diet, eating more fruits and vegetables. Strine and her colleagues (2008a and b) found that depressed individuals are more likely to be obese, twice as likely to smoke, and parallel results were found for those very high in anxiety. Other contributions find significant and positive links between self-declared happiness levels and healthy physical reactions such as smiling attitudes (Pavot et al., 1991 and Eckman et al., 1990) and heart rate and blood pressure responses to stress (Shedler, Mayman and Manis, 1993).

opportunity of measuring directly these subcomponents on a 1-4 scale where any numeric item is matched by an adjective. This makes the evaluation easier with respect to the 0-10 synthetic life satisfaction question where there is a higher number of numeric items without verbal correspondence.

More specifically, the ancillary life satisfaction question asks about the following 11 items: *i) how often do you think your age prevents from doing the things you would like to do?; ii) how often do you feel that what happens to you is out of control?; iii) how often do you feel left out of things?; iv) how often do you feel that you can do the things that you want to do?; v) how often do you feel that family responsibilities prevent you from doing what you want to do?; vi) how often do you feel that shortage of money stops you from doing the things that you want to do?; vii) how often do you look forward to another day?; viii) how often do you feel that your life has meaning?; ix) how often on balance, do you look back to your life with a sense of happiness?; x) how often do you feel full of energies these days?; xi) how often do you fell that life is full of opportunities?*

For each item answers are given on a 1-4 scale with an adjective (often, sometimes, rarely, never) being matched to any value. We exploit this information in three ways for our robustness check. First, we calculate a predicted subjective wellbeing indicator by regressing the standard life satisfaction variables on discrete qualitative variables based on the above mentioned 11 items and use the predicted indicator for our test. Second, we simply create an unweighted average of the answers to the 11 items. Third, we extract the first principal component and use it as our proxy of subjective wellbeing.[10] In all of these cases findings of our tests prove to be robust to the above described changes in the life satisfaction dependent variable[11] (see Table 7).

A third robustness check provides an additional attempt to control for endogeneity. More specifically, we calculate the predicted education years regressing the observed variable on country dummies, gender, income, age class and place of living (suburb, big city, large town, small town, etc.). We then calculate the residual education years not explained by such controls and use them as variable for our tests. In this way we eliminate some of the potential third factors which may drive spurious correlations. Significance of our previous results is confirmed in all the considered cases (Table 8).

[10] Becchetti and al. (2012) document that the use of the transformed life satisfaction variables significantly reduces country specific biases and substantially improves goodness of fit.

[11] The first principal component accounts for 37 percent of the variability. The Kaiser-Meyer-Olin measure of sampling adequacy (Keiser and Rice, 1974) rejects the hypothesis that the variables have too little in common to make a principal component analysis valuable.

In a final robustness check we calculate the residual propensity to perform other regarding activities with other regarding motivations not explained by standard sociodemographic controls and health and test whether the difference in education years and life satisfaction persists between the top and the bottom tercile of the distribution of the residual propensity variable. We find that our results are robust also to this perturbation (Table 9). This implies that also unpredictably other regarding sociable individuals have substantially different education years and life satisfaction. Or, in the light of our model, that higher education leads individual to enjoy and pursue other regarding activities with other regarding motivations beyond what other sociodemographic factors would induce them to do.

In addition to it, all the robustness checks described in these sections have been repeated for the subsample of retired respondents. In all the considered cases results maintain their significance.[12] Last but not least, we want to provide stronger econometric evidence of the nexus between other regarding activities with other regarding motivations and education years. In order to do so we estimate a logit model whose dependent variable takes valueone for individuals belonging to the *OtherRegardingSociable* group and zero otherwise. The dependent variable is regressed on education years and on the usual socio-demographic controls (country dummies, gender, income, age class and place of living (suburb, big city, large town, small town, etc.). Table 10 shows that education years affect positively and significantly the dependent variables in the four different considered specifications (overall sample, retired only, individuals not reporting illnesses, retired not reporting illnesses).

5 Policy and conclusions

Results in behavioural economics and life satisfaction literature illustrating that individuals perform other regarding activities with other regarding motivations and enjoy them open some important issues in microeconomic foundations of economics. Such findings led researchers to wonder i) whether individuals deviate from purely self regarding behavior due to other regarding preferences or social norms and ii) why not everyone consumes the contingent goods represented by the product of an other regarding action with an other regarding intention if such contingent goods are complimentary and contribute positively and significantly to happiness.
In this paper we build a simple model which addresses the two issues. The above mentioned contingent goods can be consumed and enjoyed only if individuals have accumulated enough civic capital via investment in education. In any period individuals choose to allocate their time between work, other regarding activities (available only if enough civic capital has been accumulated) and investment in human capital. The model has multiple equilibria

[12] Evidence is omitted for reasons of space and available upon request.

since only the more patient individuals accumulate human capital, and perform and enjoy other regarding activities with other regarding motivations. We test model predictions on Europeans aged above 50 using information from the SHARE database. We find that the difference in schooling years (and in life satisfaction) between individuals consuming/non consuming the above mentioned contingent goods is remarkable and highly significant. The result is robust to several checks controlling for health shocks, local social norms, retirement, country and other socio-demographic effects. The social norm robustness check highlights that social norms matter (individuals invest more in education, are happier and enjoy more the contingent goods where social norms are higher, and the human capital gap between those consuming and not consuming them is higher in areas with low social norms). We cannot provide an ultimate test of the existence of other regarding preferences (even in absence of social norms) since we do not have regions with zero social norms. However the fact that the life satisfaction difference between those consuming/not consuming them in low social norm areas remains significant induces us to think that also other regarding preferences matter.

Our findings add original elements to the literature on returns from human capital accumulation. They show that the benefits of education are not just pecuniary such as those traditionally measured by the return to schooling and by the skill wage differential literature. More specifically, we identify a form of non pecuniary benefits of education represented by the possibility of enjoying a special category of (stimulus) goods which positively and significantly contribute to life satisfaction. Our findings do not reject the hypothesis that the enjoyment of such stimulus goods can be "trained" with education.

A consequence of our results from the normative point of view is that social benefits of education may be underestimated when limited only to the contribution of the latter to economic productivity.

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Table 1 - Variable Legend

Commento [PC1]: DA SISTEMARE

VARIABLE	DESCRIPTION
Female	*Dummy var =1 if respondent is female; =0 otherwise.*
Log income	*Log of household total gross income. Its value is equal to the sum over all household members of the individual-level values of: annual net income from employment and self-employment (in the previous year); Annual public old age/early or pre-retirement/disability pension (or sickness benefits); Annual public unemployment benefit or insurance, public survivor pension from partner; Annual war pension, private (occupational) old age/early retirement/disability pension, private (occupational) survivor pension from partner's job, public old age supplementary pension/public old age/public disability second pension, secondary public survivor pension from spouse or partner, occupational old age pension from a second and third job; Annual public and private long-term insurance payments; Annual life insurance payment, private annuity or private personal pension, private health insurance payment, alimony, payments from charities received; Income from rent. Values of the following household level variables are added: Annual other hhd members' net income; Annual other hhd members' net income from other sources; Household bank accounts, government and corporate bonds, stocks/shares; mutual funds.*
Education years	*Years the respondent has been in full time education*
Household size	*Household size.*
Age class	*Respondent's age class: =1 age class if respondent's age<55;=2 if resp.'s age=[55,59]; =3 if resp.'s age=[60,64]; =4 if resp.'s age=[64,69]; =5 if resp.'s age =[69,74]; =6 if resp.'s age =[74,79]; = 7 if age>79.*
Single	*Dummy var =1 if respondent lives as a single.*
Number of children	*Respondent's numer of children (imputed as in Christelis, 2011).*
Number of grandchildren	*Respondent's numer of grandchildren (imputed as in Christelis, 2011).*
Hrooms	*Number of rooms in the main residence (imputed as in Christelis, 2011).*
Big city	*Dummy var=1 if respondent lives in a big city (imputed as in Christelis, 2011).*
Suburbs	*Dummy var=1 if respondent lives in suburbs or outskirts of a big city (imputed as in Christelis, 2011).*
Large town	*Dummy var=1 if respondent lives in a large town (imputed as in Christelis, 2011).*
Small town	*Dummy var=1 if respondent lives in a small town (imputed as in Christelis, 2011).*
Rural area	*Dummy var=1 if respondent lives in a rural area or village (imputed as in Christelis, 2011).*
F. distressed	*Dummy var=1 if respondent declare the household has great or some difficulty to make ends meet (imputed as in Christelis, 2011). Survey question: "Thinking of your household's total monthly income, would you say that your household is able to make ends meet".*
Longtermill	*Dummy var =1 if respondent declares any long-term health problems, illness, disability or infirmity. Survey question: "Some people suffer from chronic or long-term health problems. By long-term we mean it has troubled you over a period of time or is likely to affect you over a period of time. Do you have any long-term health problems, illness, disability or infirmity?".*
No limited activities	*Dummy var=1 if respondent has not been limited because of a health problem in activities people usally do. Survey question: "For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?".*
Numb illnesses	*It is the sum of illnesses the respondent is currently being treated for or bothered (A heart attack including myocardial infarction or coronary thrombosis or any other heart problem including congestive heart failure; High blood pressure or hypertension; High blood cholesterol; A stroke or cerebral vascular disease; Diabetes or high blood sugar; Chronic lung disease such as chronic bronchitis or emphysema; Asthma; Arthritis, including osteoarthritis, or rheumatism; Osteoporosis; Cancer or malignant tumour, including leukaemia or lymphoma, but excluding minor skin cancer; Stomach or duodenal ulcer, peptic ulcer; Parkinson disease; Cataracts; Hip fracture or femoral fracture; Alzheimer's disease, dementia, organic brain syndrome, senility or any other serious memory impairment; Benign tumor).*
Lifesat	*Respondent's degree of life satisfaction. Survey question: "On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?".*
Age no prevent	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you think your age prevents from doing the things you would like to do ?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
No out control	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel that what happens to you is out of control?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
No fel left out	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel left out of things ?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Fred. choice	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel that you can do the things that you want to do?".For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*

No lack money	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel that shortage of money stops you from doing the things that you want to do?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Life meaningful	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel that your life has meaning ?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Past good	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often on balance, do you look back to your life with a sense of happiness?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Vitality	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you feel full of energies these days?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Opportunities	*Respondent's degree of statements that have used to describe their lives or how they feel. Survey question: "How often do you fell that life is full of opportunities?". For each item answers are given on a 1-4 scale where an adjective (often, sometimes, rarely, never) is matched to any value.*
Voluntary	*Dummy var=1 if respondent has done voluntary or charity work in the last month.*
Rel. attendance	*Dummy var=1 if respondent has taken part in activities of a religious organization (church, synagogue, mosque etc.) in the last month.*
Poitical act..	*Dummy var=1 if respondent has taken part in a political or community-related organization in the last month.*
Help to friends	*Dummy var=1 if respondent has provided help to friends or neighbors in the last month.*
Cared for sick	*Dummy var=1 if respondent has cared for a sick or disabled adult in the last month.*
Att. education	*Dummy var=1 if respondent has attended an educational or training course in the last month.*
Sport social	*Dummy var=1 if respondent has gone to a sport, social or other kind of club in the last month.*

Table 2a. Descriptive Statistics (full sample)

Life satisfaction		7.56	1.782	0	10
Female	34415	0.5	0.5	0	1
Logincome	32991	10.598	1.398	2.993	15.335
Education years	33838	10.537	4.279	0	25
Hhsize	34415	2.249	1.085	1	14
Age class					
55-59	34406	0.19	0.392	0	1
60-64	34406	0.176	0.38	0	1
65-69	34406	0.152	0.359	0	1
70-74	34406	0.126	0.332	0	1
75-79	34406	0.097	0.296	0	1
above 80	34406	0.108	0.311	0	1
Widowed	34389	0.148	0.355	0	1
Divorced	34389	0.064	0.245	0	1
Separated	44190	0.01	0.101	0	1
Regpartner	34389	0.014	0.119	0	1
Married	34389	0.71	0.454	0	1
N of children	33280	2.188	1.367	0	16
N. of grandchildren	33280	2.598	3.049	0	22
Hrooms	33280	3.914	1.639	0	25
Bigcity	33280	0.143	0.348	0	1
Suburbs	33280	0.157	0.361	0	1
Large town	33280	0.194	0.393	0	1
Small town	33280	0.23	0.418	0	1
Sociability	33620	0.122	0.166	0	1
Voluntary	33620	0.124	0.33	0	1
Long term illness	34292	0.472	0.499	0	1
Limited activities	34293	0.428	0.495	0	1
Numb illnesses	44190	1.093	1.396	0	13
Rel. attendance	33620	0.119	0.324	0	1
Political act.	33620	0.043	0.203	0	1
Help to friends	33620	0.175	0.380	0	1
Cared for sick	33620	0.075	0.263	0	1
Sport social	33620	0.198	0.399	0	1

Table 3. Determinants of life satisfaction and life meaning: social norms and strategic behaviour - Source: Becchetti, Corrado, Conzo (2013)

	(1) life sat Base	(2) life sat Retired	(3) life sat High Norm	(3) life sat Low Norm	(5) life meaning Base	(6) life meaning Retired	(7) life meaning High Norm	(8) life meaning Low Norm
Female	0.09*	0.08	0.02	0.05	0.01	-0.00	-0.00	-0.01
	(0.039)	(0.047)	(0.019)	(0.030)	(0.025)	(0.032)	(0.009)	(0.036)
logincome	0.15***	0.15***	0.17***	0.12**	0.04***	0.06***	0.03***	0.04**
	(0.024)	(0.027)	(0.021)	(0.035)	(0.009)	(0.014)	(0.004)	(0.016)
education years	0.03***	0.02***	0.01**	0.04***	0.01***	0.01*	0.00	0.02***
	(0.006)	(0.007)	(0.004)	(0.008)	(0.005)	(0.006)	(0.002)	(0.005)
household size	-0.05**	-0.03	-0.05***	-0.04***	-0.00	-0.00	-0.00	-0.01
	(0.018)	(0.025)	(0.013)	(0.009)	(0.007)	(0.008)	(0.004)	(0.008)
n. of children	0.01	0.04*	0.01	0.01	0.03***	0.03***	0.04***	0.02
	(0.013)	(0.022)	(0.023)	(0.026)	(0.008)	(0.009)	(0.004)	(0.024)
n. of grandchildren	0.01	-0.00	0.00	0.01	-0.01*	-0.01*	-0.01***	-0.01
	(0.005)	(0.006)	(0.003)	(0.011)	(0.003)	(0.003)	(0.003)	(0.008)
hrooms	0.06***	0.05**	0.06**	0.04*	0.01*	0.01	-0.00	0.02
	(0.018)	(0.018)	(0.023)	(0.019)	(0.005)	(0.008)	(0.004)	(0.009)
bigcity	0.03	0.08	0.06	-0.03	-0.01	-0.04	-0.02	-0.06
	(0.041)	(0.050)	(0.043)	(0.062)	(0.017)	(0.038)	(0.025)	(0.029)
suburbs	-0.04	0.10	-0.04	-0.14	0.02	0.03*	0.01	0.05
	(0.049)	(0.075)	(0.045)	(0.076)	(0.015)	(0.018)	(0.015)	(0.037)
largetown	0.05	0.09	0.17***	-0.01	0.01	0.01	0.03**	-0.03*
	(0.044)	(0.082)	(0.043)	(0.025)	(0.013)	(0.022)	(0.009)	(0.014)
smalltown	0.05	0.14	0.15**	0.07	0.00	0.01	0.01	-0.01
	(0.058)	(0.097)	(0.046)	(0.100)	(0.014)	(0.016)	(0.041)	(0.012)
long term illness	-0.25***	-0.24***	-0.26***	-0.26***	-0.03***	-0.03**	-0.04***	-0.04**
	(0.023)	(0.047)	(0.039)	(0.043)	(0.009)	(0.010)	(0.011)	(0.012)
limited activities	-0.59***	-0.64***	-0.43***	-0.74***	-0.16***	-0.19***	-0.12***	-0.21***
	(0.057)	(0.034)	(0.034)	(0.075)	(0.021)	(0.027)	(0.029)	(0.045)
numb. Illnesses	-0.13***	-0.12***	-0.08***	-0.13***	-0.04***	-0.03***	-0.03***	-0.04***
	(0.015)	(0.023)	(0.014)	(0.007)	(0.005)	(0.006)	(0.008)	(0.004)
OtherRegardingSociable	0.23***	0.31***	0.14***	0.32***	0.12***	0.17***	0.13***	0.17**
	(0.038)	(0.044)	(0.018)	(0.020)	(0.024)	(0.029)	(0.013)	(0.058)
care for sick pure altruism	-0.06	-0.05	-0.03*	-0.10	0.04***	0.04	0.05***	0.02
	(0.034)	(0.042)	(0.014)	(0.101)	(0.011)	(0.023)	(0.015)	(0.019)
sport/social clubs pure altruism	0.15***	0.13***	0.10***	0.22***	0.09***	0.11***	0.08***	0.16***
	(0.018)	(0.019)	(0.022)	(0.035)	(0.013)	(0.011)	(0.020)	(0.026)
religion attend. pure altruism	0.24***	0.31***	0.07	0.31***	0.12***	0.12***	0.13***	0.14***
	(0.075)	(0.098)	(0.088)	(0.049)	(0.014)	(0.033)	(0.020)	(0.019)
political act. pure altruism	0.20**	0.24***	0.23**	0.38	0.02	0.06***	-0.01	0.13**
	(0.084)	(0.070)	(0.094)	(0.201)	(0.045)	(0.019)	(0.062)	(0.039)
voluntary no altruism	0.21	0.23	0.31	-0.01	-0.03	-0.03	0.01	0.08
	(0.125)	(0.161)	(0.191)	(0.088)	(0.057)	(0.119)	(0.042)	(0.102)
cared for sick no altruism	-0.04	0.13	0.16	-0.36	0.03	0.07	0.10***	0.04
	(0.124)	(0.214)	(0.107)	(0.257)	(0.041)	(0.080)	(0.027)	(0.031)
help to friends no altruism	-0.13	-0.13	-0.15	0.01	-0.02	0.02	0.01	0.06
	(0.079)	(0.147)	(0.128)	(0.172)	(0.058)	(0.039)	(0.035)	(0.160)
sport/social no altruism	0.25***	0.33***	0.18***	0.23**	0.13***	0.18***	0.04*	0.18***
	(0.033)	(0.104)	(0.036)	(0.079)	(0.028)	(0.027)	(0.021)	(0.033)
Rel. attendance no altruism	0.25***	0.38***	0.21**	0.19	0.10***	0.12***	0.12***	0.09***
	(0.065)	(0.120)	(0.082)	(0.139)	(0.017)	(0.025)	(0.034)	(0.016)
political act. no altruism	0.11	0.16	0.11	-0.08	0.06	0.01	0.03	0.21**
	(0.100)	(0.115)	(0.080)	(0.219)	(0.050)	(0.047)	(0.054)	(0.061)
at least one pure altruism act.	-	-	0.94**	1.27	-	-	0.18	-0.12
(Average NUTS2)	-	-	(0.370)	(0.816)	-	-	(0.240)	(0.224)
marital status dummies	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
country dummies	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
age class dummies	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Observations	30,430	15,860	15,787	11,425	30,295	15,789	15,692	11,396
Adj. (or pseudo) R^2	0.179	0.178	0.157	0.182	0.129	0.138	0.111	0.125
Log-Likelihood	-58741	-30993	-29388	-22617	-32326	-17142	-16905	-12801
AIC	117505	62010	58791	45244	64675	34309	33825	25612
BIC	117605	62102	58852	45281	64775	34401	33887	25648

Notes: [1] Robust standard errors in parentheses clustered by country; [2] *** p<0.01, ** p<0.05, * p<0.1. [3] Reference categories: Age class = 50-54; Marital Status = Single; Area of Residence = Rural; Country = Germany. [4] Other regardingSociable: at least one activity performed between voluntary/charity work and helping friends/neighbours with at least one other regarding motivation (because I'm needed, to contribute to something useful).Pure altruism variables: social activities performed with at least one other regarding motivation (because I'm needed, to contribute to something useful).No altruismo variables: social activities performed without at least one other regarding motivation (because I'm needed, to contribute to something useful).

Table 4. Education years and life satisfaction for the other regarding sociable, non other regarding sociable and non sociable groups

	Other regarding sociable (1)	Non sociable (2)	Test (1) vs (2)	Non sociable+non other regarding sociable (3)	Test (1) vs (3)
Education years	12.165	9.691	44.374	10.048	-39.233
			(43.016)		(-38.592)
Life satisfaction	8.075	7.263	33.854	7.399	-29.850
			(33.514)		(-29.620)
Education years	11.047	8.906	19.268	9.073	-17.859
(low social norm areas) *			(18.961)		(-17.668)
Life satisfaction	7.708	6.989	14.257	7.059	-13.290
(low social norm areas) *			(14.692)		(-13.774)
Education years	12.447	10.962	21.332	11.300	-18.032
(high social norm areas)**			(21.313)		(-18.092)
Life satisfaction	8.178	7.699	16.884	7.827	-13.764
(high social norm areas)**			(15.038)		(-12.077)
Retired Individuals					
Education years	11.579	9.215	29.968	9.492	-27.261
			(28.989)		(-26.620)
Life satisfaction	8.124	7.162	27.161	7.308	-24.150
			(26.583)		(-23.714)
Education years	10.542	8.575	13.323	8.704	-12.530
(low social norm areas)*			(13.317)		(-12.578)
Life satisfaction	7.812	6.891	13.229	6.972	-12.378
(low social norm areas)*			(13.453)		(-12.610)
Education years	11.889	10.333	15.574	10.603	-13.990
(high social norm areas)**			(15.367)		(-13.780)
Life satisfaction	8.221	7.646	13.661	7.793	-11.221
(low social norm areas)**			(11.928)		(-9.800)

Legend: Other regarding sociable: individual who performed at least one other regarding activity (helping friends/neighbours, voluntary/charity work) with at least one other regarding motivation (because I'm needed, to contribute something useful) in the last month. Non other regarding sociable: individual who performed at least one social activity (voluntary or charity work, cared for a sick or disabled adult, provided help to friends or neighbours, gone to a sport, social or other kind of club, taken part in activities of a religious organization, taken part in a political or community-related organization) without other regarding motivations in the last month. Non sociable: individual who did not perform any social activity in the last month. *NUTS1 regions with below median average social regarding activities performed with other regarding motivations (considering the SHARE survey as the reference distribution). **NUTS1 regions with above median average social regarding activities performed with other regarding motivations (considering the SHARE survey as the reference distribution). Non parametric test in parenthesis.

Table 5. Education years and life satisfaction for the other regarding sociable, non other regarding sociable and non sociable groups - Country Split

	Education Years				Life satisfaction		
	Other regarding sociable (1)	Non sociable (2)	Compulsory school years	Test (1) vs (2)	Other regarding sociable (1)	Non sociable (2)	Test (1) vs (2)
Austria	9.008	8.650	9	1.132 (2.414)	8.091	7.341	5.432 (5.342)
Germany	13.579	11.8501	9/10	11.466 (10.803)	8.031	7.405	7.189 (6.877)
Sweden	11.900	10.253	9	9.734 (10.062)	8.431	8.135	4.3744 (2.511)
Netherlands	11.582	10.313	12	7.822 (8.088)	8.061	7.742	6.241 (5.606)
Spain	10.726	6.945	8	7.375 (6.465)	7.643	7.205	2.301 (2.180)
Italy	9.873	7.316	8	10.597 (10.968)	7.766	7.059	6.462 (6.494)
France	12.203	10.629	10	8.842 (8.935)	7.609	7.140	5.832 (5.772)
Denmark	13.649	12.275	9	8.817 (8.107)	8.646	8.325	4.747 (3.113)
Greece	9.647	8.701	9	3.102 (2.898)	7.163	7.036	1.139 (1.808)
Switzerland	11.801	11.086		2.333 (3.198)	8.520	8.253	2.853 (2.407)
Belgium	12.718	10.886	12(last three part time)	12.362 (12.108)	7.852	7.412	7.243 (12.108)
Czechia	12.653	11.341		7.371 (6.848)	7.482	6.949	4.601 (4.582)
Poland	11.324	8.995	10	8.276 (8.339)	7.204	6.431	4.167 (4.156)
Ireland	13.254	11.137	10	7.988 (7.763)	8.364	7.827	4.368 (3.524)

Variable Legend: see Table 4. Non parametric test in parenthesis.

Tab 6. Education years and life satisfaction for the other regarding sociable, non other regarding sociable and non sociable groups - Subsample of individuals non reporting illnesses

	Other regarding sociable (1)	Non sociable (2)	Test (1) vs (2)	Non sociable+non other regarding sociable (3)	Test (1) vs (3)
Education years	12.640	10.606	21.774 (21.037)	10.978	-18.560 (-18.186)
Life satisfaction	8.281	7.7716	14.590 (14.186)	7.848	-13.132 (-12.681)
Education years*	11.687	9.982	8.791 (8.632)	10.153	-8.000 (-7.856)
Life satisfaction*	8.101	7.598	6.554 (6.920)	7.630	-6.294 (-6.654)
Education years**	12.849	11.503	11.312 (10.972)	11.911	-8.736 (-8.518)
Life satisfaction**	8.320	8.032	6.836 (6.012)	8.098	-5.923 (-5.112)

Variable Legend: see Table 4. Non parametric test in parenthesis.

Tab 7. life satisfaction for the other regarding sociable, non other regarding sociable and non sociable groups – robustness check on happiness measures

	Other regarding sociable (1)	Non sociable (2)	Test (1) vs (2)	Non sociable+non other regarding sociable (3)	Test (1) vs (3)
Happy predicted	8.151	7.291	81.546 (71.481)	7.423	-69.338 (-63.842)
Happy predicted*	7.582	7.040	30.741 (27.997)	7.099	-27.481 (-34.175)
Happy predicted**	8.325	7.729	45.767 (41.778)	7.887	-36.257 (-34.175)
Happy predicted for no illness	8.489	7.746	49.173 (42.872)	7.876	-41.034 (-37.789)
Life satisfaction Items' unweighted average	3.263	2.942	44.932 (43.508)	2.992	-39.817 (-38.986)
Life satisfaction Items' unweighted average *	3.131	2.835	20.500 (20.536)	2.863	-19.100 (-19.184)
Life satisfaction Items' unweighted average **	3.307	3.121	21.395 (19.072)	3.168	-17.674 (-15.632)
Life satisfaction Items' unweighted average +no illness	3.344	3.162	17.116 (16.598)	3.192	-15.247 (-14.865)
Life satisfaction principal component	0.813	-0.449	46.515 (44.854)	-0.251	-41.200 (-40.242)
Life satisfaction principal component*	.3229	-0.818	20.874 (20.767)	-0.706	-19.402 (-19.352)
Life satisfaction principal component **	0.9751	0.1781	23.856 (21.251)	0.377	-19.821 (-17.577)
Life satisfaction principal component +no illness	1.1356	0.414	18.346 (17.755)	0.527	-16.441 (-16.039)

Happy predicted: predicted subjective wellbeing indicator by regressing the standard life satisfaction variables on the following 11 questions: i)how often do you think your age prevents from doing the things you would like to do?; ii) how often do you feel that what happens to you is out of control?; iii) how often do you feel left out of things?; iv) how often do you feel that you can do the things that you want to do?; v) how often do you feel that family responsibilities prevent you from doing what you want to do?; vi) how often do you feel that shortage of money stops you from doing the things that you want to do?; vii) how often do you look forward to another day?; viii) how often do you feel that your life has meaning?; ix) how often on balance, do you look back to your life with a sense of happiness?; x) how often do you feel full of energies these days?; xi) how often do you fell that life is full of opportunities? For each item answers are given on a 1-4 scale with an adjective (often, sometimes, rarely, never) being matched to any value. Life satisfaction Items' unweighted average: unweighted average of the answers to the 11 items. Life satisfaction principal component: first principal component of the 11 items. *NUTS1 regions with below median average social regarding activities performed with other regarding motivations (considering the SHARE survey as the reference distribution). **NUTS1 regions with above median average social regarding activities performed with other regarding motivations (considering the SHARE survey as the reference distribution). Non parametric test in parenthesis.

Table 8. Subsample non reporting illness controlling for endogeneity

	Other regarding sociable (1)	Non sociable (2)	Test (1) vs (2)	Non sociable+non other regarding sociable (3)	Test (1) vs (3)
Residual Education years	0.750	-0.054	9.256	0.081	-8.154
			(9.441)		(-8.231)
Residual Education years*	1.115	0.170	5.466	0.258	-5.038
			(5.526)		(-5.134)
Residual Education years**	0.636	-0.4331	9.466	8.098	-5.923
			(9.270)		(-5.112)

Residual education years= [education years] – [predicted education years] where the latter are obtained regressing the observed education variable on country dummies, gender, income, age class and place of living (suburb, big city, large town, small town).

Table 9. Education years and life satisfaction for the subsamples corresponding to the top and the bottom tercile of the distribution of the residual propensity variable.

	Residual other regarding sociability with other regarding motivation=0	Residual other regarding sociability with other regarding motivation=1	Test (1) vs (2)
Education years	11.537	10.421	19.514
			(18.452)
Life satisfaction	7.872	7.603	11.736
			(9.871)
Education years (low social norm areas)*	11.204	8.053	25.218
			(25.676)
Life satisfaction (low social norm areas)*	7.708	6.918	14.368
			(14.664)

Residual other regarding sociability with other regarding motivations= [other regarding sociability with other regarding motivations] – [predicted other regarding sociability with other regarding motivations] where the latter is obtained regressing the observed variable on country dummies, gender, income, age class and place of living (suburb, big city, large town, small town).

Table 10. Determinants of the probability of performing at least one other regarding activities with at least one other regarding motivation – probit estimates

		(1)	(2)	(3)	(4)
Female		0.008	-0.007	0.031	-0.048*
		(0.01)	(0.02)	(0.02)	(0.02)
Logincome		0.064**	0.053	0.086***	0.057
		(0.02)	(0.03)	(0.02)	(0.04)
Education years		0.034***	0.04***	0.035***	0.043***
		(0.01)	(0.01)	(0.01)	(0.01)
Household size		-0.032**	-0.019	-0.034*	-0.019
		(0.01)	(0.02)	(0.02)	(0.03)
Age class					
	55-59	-0.027	-0.028	0.164	0.351
		(0.03)	(0.05)	(0.11)	(0.18)
	60-64	0.009	0	0.122	0.196
		(0.03)	(0.05)	(0.09)	(0.15)
	65-69	0.022	0.055	0.141	0.18
		(0.04)	(0.05)	(0.11)	(0.15)
	70-74	-0.011**	-0.014*	0.08	0.079
		(0.05)	(0.07)	(0.1)	(0.17)
	75-79	-0.162**	-0.116*	-0.059	-0.008
		(0.05)	(0.06)	(0.13)	(0.18)
	above 80	-0.392***	-0.341**	-0.319**	-0.339
		(0.06)	(0.11)	(0.11)	(0.18)
Widowed		0.041	0.002	0.12	0.162
		(0.07)	(0.11)	(0.07)	(0.11)
Divorced		0.009	-0.042	0.083	0.197
		0.06	0.08	0.06	0.13
Separated		-0.027	-0.087	0.174	-0.011
		(0.07)	(0.08)	(0.16)	(0.17)
Regular partner		-0.103	-0.19	-0.128	-0.274
		(0.12)	(0.12)	(0.16)	(0.19)
Married		-0.022	-0.053	0.053	0.057
		(0.07)	(0.07)	(0.07)	(0.08)
Number of children		-0.004	-0.003	-0.018*	-0.004
		(0.01)	(0.01)	(0.01)	(0.02)
Number of grandchildren		0.00	0.001	0.009	0.013
		(0.00)	(0.01)	(0.01)	(0.01)
Number of rooms		0.039***	0.038*	0.036***	0.037
		(0.01)	(0.02)	(0.01)	(0.02)
Big city		-0.103*	-0.164**	-0.106*	-0.184
		(0.05)	(0.06)	(0.06)	(0.09)
Suburbs		-0.092*	-0.156**	-0.032	-0.103
		(0.04)	(0.06)	(0.05)	(0.07)
Large town		-0.034	-0.033	-0.064	-0.106
		(0.05)	(0.06)	(0.08)	(0.10)
Small town		-0.009	-0.046	-0.022	-0.069
		(0.05)	(0.05)	(0.06)	(0.08)
Long term illness		0.08***	0.124***	0.035	0.097
		(0.02)	(0.04)	(0.03)	(0.08)
Limited activities		-0.198***	-0.15***	-0.237***	-0.175**
		(0.02)	(0.03)	(0.03)	(0.06)
Number of illnesses		-0.004		-0.016	
		(0.01)		(0.01)	
Constant		-1.023***	-0.811**	-1.365***	-1.100**
		(0.22)	(0.29)	(0.22)	(0.35)
Country dummies		Yes	Yes	Yes	Yes
N. of observations		31758	10278	16078	3616
Pseudo Log L.		-19604.8	-6330.7	-9788.5	-2208.8
Pseudo_r2		10.5	11.1	11.0	11.9

(1) All sample; (2) retired only;(3) individuals reporting no illnesses; (4) retired individuals reporting no illnesses.