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The 60s turnaround as a test on the causal relationship between sociability and happiness

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The 60s turnaround as a test on the causal relationship between sociability and happiness

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Abstract

The nexus between social leisure and life satisfaction is riddled with endogeneity problems. In investigating the causal relationship going from the first to the second variable we start from considering that retirement is an event after which the time investable in (the outside job) relational life increases. We instrument social leisure with the probability of retirement of the three and four years younger cohorts. With such approach we document that social leisure has a positive and significant effect on life satisfaction. Our findings shed some light on the age-happiness pattern. Policy implications are also discussed.

Keywords: life satisfaction, relational goods, social capital.
JEL Numbers: I 30, D61 A11, A13.

1. Introduction

Anyone who cannot belong to a community, or has no need to do so in view of his self-sufficiency is a beast or a god.

Aristotle[1]

The number of papers investigating the determinants of life satisfaction published in economic journals has been dramatically growing in the last decade (see Clark et al. 2008 and Frey 2008). In fact in recent years psychologists and economists and other social scientists began to agree that subjective well-being can be measured with reliability and validity, using relatively simple self-rating questions about "happiness" and "life satisfaction"(see Helliwell 2006 and Krueger 2008).

[1] *Politics,* I, 2, 1253a 28-30.

A key motivation for the use of subjective well-being data in economics has been the desire to study the welfare implications of non-traded goods. The Life Satisfaction Approach (Frey et al. 2004) can in fact be seen as an alternative to the traditional methods of measurement based on contingent valuation or revealed preferences.

Subjective assessments of well-being have been used to estimate the shadow value of a wide range of environmental and social conditions, such as air quality and pollution (Welsch, 2002 and 2006), airport noise (Van Praag and Baarsma, 2005), terrorism (Frey et. al., 2007), the fear of crime (Moore and Shepherd 2006), marriage (Johnson and Wu 2002; Blanchflower and Oswald 2004; Frey and Stutzer 2002a, 2002b and 2006) and unemployment (Clark and Oswald 1994; Gallie and Russell 1998; Di Tella et al. 2001 and 2003).

An important class of non traded goods is represented by non instrumental social relationships or "relational goods", as they are often defined in the literature: relational goods are the outcome of social activities such as interactions with friends, participation in the life of clubs, religious bodies, political parties, unions and civic and cultural organizations etc.

Many studies in psychology support the conclusion that social relationships are essential to well-being: we refer the interested reader to the comprehensive overview in Diener and Seligman (2004). However in standard economic models individuals maximize the utility they derive from consumption of market goods and non-work time, while the choice between solitary and 'relational' leisure is left in the background. As we will see in more detail in the next section, both choices are obviously influenced not only by the price system but by the social environment and can be affected by a wide range of policies. In particular we shall see how due to coordination failure and /or to bounded rationality, consumption of relational goods may be inefficiently low at the individual level and even that society as a whole may get stuck in a Pareto-dominated equilibrium, which may be called a "social poverty trap".

If economic indicators do not correlate well with the quality of social relationships a key contribution to well-being is omitted in standard analyses of policies. The happiness data offer us a

way to quantify such an omission, and thus open a way towards a better evaluation of the equivalent variations of policies.

The Life Satisfaction Approach has been used to evaluate social relationships by Helliwell and Putnam (2004), Bartolini et al. (2009), Aslam and Corrado (2007), Becchetti et al. (2008), Bruni and Stanca (2008), Meier and Stutzer (2008) and Powdthavee (2008) among others. All these works confirm the findings by psychologists that relational goods are positively associated with SWB. However association does not imply causation: an important question still open in this literature is whether the direction of causality goes from social relationships to well-being as the idea that high well-being leads to more and better relationships is also plausible.[2]

The problem of biunivocal causality and endogeneity is pervasive in economics but particularly severe in the field of happiness. Beyond age (but not longevity!) almost all other variables introduced as regressors in life satisfaction equations may both cause and be caused by life satisfaction. For instance, the significant relationship between money and happiness may also be determined by unobserved individual traits (optimism, a well balanced personality etc.) which positively affect both subjective well being (SWB) and professional success.

A first important opportunity of reducing the endogeneity problem is offered by the availability of panel data. We exploit this possibility by conducting our analysis using the German Socio Economic Panel (GSOEP) which contains both cross-sectional and longitudinal information (from 1984 to 2007) on many variables, including self declared happiness and indicators of relational life, for a large sample of individuals.[3]

In fact, fixed effect estimation makes it possible to control for the confounding role of personality differences by which optimists will always say they are happy with their life: in many

[2]Interestingly Bartolini et al. (2009) working on US cross-sectional data (US General Social Survey) find that intrinsically motivated group membership ('Putnam group' memberships) is positively associated with well-being, while for membership in 'Olson' groups , i.e. instrumentally motivated, the opposite is true.

[3] The GSOEP is a longitudinal household survey sponsored by the Deutsche Forschungsgemeinschaft and organized by the German Institute for Economic Research (Berlin) and the Center for Demography and Economics of Aging (Syracuse University). We are grateful to these institutes and to he project director Dr. G. Wagner for making this data set available.

instances a self-fulfilling expectation. In studying personal relationships it is quite obvious that a cheerful nature, whether due to genes or to upbringing, will make one's social life easier and more rewarding: it is therefore doubly important in this case to control for permanent psychological traits by using panel data: Becchetti et. al (2008) and Powdthavee (2008), show that the link between happiness and social life survives the elimination of this fixed component by using respectively German and British panel data.

However even when using panel data techniques the problem remains that time variations in SWB for the same individual may affect potential happiness determinants.

This time varying dimension of the endogeneity problem is particularly severe when we consider the relational goods - well being nexus. Just by introspection, it seems quite obvious that not only personality, but also more transient feelings affect our propensity to meet people.

To deal with this form of reverse causality, which cannot be taken care of by fixed effects estimation, we have to find a proper instrument, i.e. a variable which is exogenous but that is correlated with the endogenous regressor, in the absence of natural experiments.[4]

Our instrumentation strategy hinges on retirement. Retirement may be conceived as a permanent change in the individual organization of time. The fall in hours worked (not necessarily leading to zero worked hours since many retired individuals keep some informal working activities) corresponds to a large increase in leisure, potentially investable in social activities. However, even if it possesses important properties for the solution of the problem, retirement cannot instrument as such the relational goods indicator we use because the timing of retirement may be a choice influenced by one's wellbeing. In Germany the mandatory age for retirement is 65 but the law creates a wide window of opportunities for retirement decisions around this age. Moreover we find that retirement belongs to the equation as a regressor, as it can have a direct positive effect on SWB, through for instance the ceasing or diminishing disutility of work.

[4] Meier and Stutzer (2008), who concentrate on volunteering, tackle the causality problem by using the collapse of the East Germany volunteering infrastructure.

We want a factor, correlated with the time spent in social life, which cannot be suspected of endogeneity at the individual level. We find such a variable in the ratio between those who are retired and those who are not, among people three and four years younger than the individual.[5] This ratio may be regarded as the probability of being retired at a certain age based on the sample distribution of retirement decisions.

Summing up, we create value added in the happiness literature by improved identification of the causal effect of social leisure on life satisfaction.

Our results emphasize that relational consequences of economic policies need to be carefully taken into account when pursuing the goal of maximising social welfare. The advice stemming from our paper is that measures aimed at stimulating social life and at preventing negative side-effects on it of policies are of crucial importance.

The paper is divided into five sections (including introduction and conclusions). The second section reviews some theoretical analyses on relational goods. The third and the fourth present and comment our descriptive and econometric findings. The fifth section concludes.

2. Relational goods: an overview of the theoretical background

The concept of "relational goods" was introduced by Gui (1987) and Uhlaner (1989) to define a set of intangibles from companionship, sympathy and intimacy, to feeling part of a community with same values or tastes etc. Bardsley and Sugden (2006) borrows from Adam Smith's Theory of Moral Sentiments the term "fellow-feelings", to describe the mental states produced during such non instrumental social interactions. The production process of these goods is the meeting - "encounter" in Gui (2005)'s definition - with family and friends or with a wider net of partners, i.e.

[5] It would be possible to calculate this probability for the entire German population. Given the large size of our sample we argue that the sample statistic conveniently approximates that of the entire population and retains as well the characteristics of not being influenced by the observed individual retirement decision. To be more precise, strictly speaking, the individual retirement observation obviously contributes to the sample average but, given the large number of observations, its contribution is negligible.

many kinds of social events (association gatherings, cultural or sport events, etc.). Participating in a political debate, volunteering, applauding at a theatre are examples of relational goods produced on this larger scale.

A defining feature of relational goods is that their value crucially depends on the sincerity and genuineness of the people involved. This implies that they can be generated as a by product of some instrumental activity but not exchanged through the market or indeed produced by state, which of course implies they don't have a price and that their value has instead to be estimated. Nor can the estimation be done just by looking at their opportunity cost in terms of labour income given up by choosing leisure. Indeed leisure includes many heterogeneous activities which can be relational, pseudo-relational (second life on the internet) or utterly non relational (hours spent alone on TV). Interestingly, life satisfaction has been found to be negatively correlated with TV viewing, directly in Frey et. al. (2007) and indirectly by reducing time spent in relational activities in Bruni and Stanca (2008). Frey et al. (2007) find this evidence difficult to reconcile with the theory of revealed preference, by which any observed choice is utility maximizing, and interpret the finding as suggesting that people do not always act rationally, but often just follow habits and impulses. Indeed Frey et al. (2006) argue that individuals are prone to mispredict utility, through underestimation of adaptation, distorted memories of past experiences, materialistic beliefs fostered by institutions (e.g. marketing) and that these cognitive limits lead to overconsume goods satisfying extrinsic needs (material goods beside basic necessities) and underconsume goods satisfying intrinsic needs, relational goods among them. Empirical evidence on this distorted choices is offered by these authors by studying commuting. On the other hand, evidence on the association between well-being and generosity (measured in experiments) is found in Konow and Earley (2008).

A different explanation, by no means alternative to the "behavioral" one put forward by Frey et al. (2007) for the opposite signs of the correlation of happiness with solo and social leisure-time hinges on the fact that relational goods, by definition, are not an option freely available at the

individual level. An individual's time use choices may be contingent on the time use choices of others, because the utility derived from leisure time often benefits from the presence of companionable others. Corneo (2005), Jenkins and Osberg (2003) Antoci et al. (2005) and Randon et al. (2008) develop models starting from this premise that one cannot have a social life unilaterally. Various types of external effects concerning relational goods can be distinguished: there are externalities in the formation of an agent's social network as the probability of a successful match with a partner increases with the time the agent and the potential partners devote to searching, while a second type of externality concerns the efforts by the agent and the potential partners in cultivating their skills as partners. Finally there are externalities at the aggregate level: Merz and Osberg (2006) find that the proportion of leisure time devoted to social leisure is higher in Lander with more public holidays. The result is interpreted by arguing that it is easier and more rewarding to participate in an association in a social context characterized by a rich network of associative opportunities.

Due to these multi-level net of externalities equilibria with low socializing may coexist with equilibria with high socializing for groups of individuals as well as for nations as a whole.[6]

The consumption of relational goods will affect labour supply decisions: when *other* persons increase their hours of paid work, the probability of a feasible and desirable leisure match falls, which decreases the personal utility of non-work time. The consequences of such strategic complementarities in the enjoyment of leisure are considered in Alesina et. al. (2005) and Burda et al. (2008) in analyzing the difference in hours worked between Europe and the US, which has emerged in the 1970's and has been increasing since then. This difference might not be due to a difference in the tax system, as maintained by Prescott (2004), or in tastes as suggested by Blanchard (2006), instead history (e.g., the first oil shock) and institutions (labor-market regulations) might have simply led otherwise identical Americans and Europeans to coordinate on

[6] Antoci et. al (2007) show how bounded individual rationality and externalities combine in producing social poverty traps.

different equilibria.[7] In the "US" equilibrium, individuals work a lot, consume a lot, and have little time for communal activities. In the "European" equilibrium, consumers work less and consume less, but enjoy more common leisure. The European equilibrium Pareto dominates the US outcome in which individuals "bowl alone," as deplored by Putnam (2000)

Indeed Alesina et al. (2005) find that happiness is higher in countries with lower working hours. We can add that for the European countries there is an upward-sloping trend in happiness and a downward sloping trend in hours worked while for the US there is no trend in happiness and a upward sloping trend in hours worked as shown by Wolfers and Stevenson (2008).

Finally the theme of relational goods is at least implicitly present in the vast literature on social capital, which studies the impact of social ties on the productivity of traditional private goods.

Higher social participation may bring about social capital accumulation as a by-product. For instance, trust (or empathy) may be reinforced and generalised through social interactions.[8]

This rhapsodic overview of the recent economic literature on relational goods is far from complete. However we hope it is enough to convince the reader that the empirical study of the hypothesis that less common leisure leads to lower lifetime utility, on which we report in the following sections, has vast implications for the study of contemporary society.

3. Descriptive empirical findings

The obvious problem in identifying a positive relationship from relational goods to life satisfaction is that the hypothesis of a reverse causality link is equally convincing. To solve the puzzle we

[7] According to these authors one of the strongest pieces of evidence in favor of complementarities across leisure is that an overwhelming share of the population both in Europe and the US takes its two days of leisure during Saturday and Sunday. There would be huge benefits from staggering work so that different people take different days off during the week: this could reduce commuting time and would allow capital to be spread over more workers: the fact that this is not done suggest that the costs in terms of forgone welfare due to less coordinated leisure would be sizable as well. However the relevant complementarities could be across work, rather than leisure.

[8] We notice however that the econometric techniques we use are unable to capture these more universal benefits of relational goods.

should isolate factors which determine an exogenous shock in time used in social life. To this purpose we thought of an event which occurs in every worker's life: retirement. At a descriptive level we find that: i) retirement (voluntary or involuntary) mainly occurs in the early 60s in our sample; ii) retirement (unsurprisingly!) causes a sharp reduction in working time; iii) a significant increase in time spent in social life occurs in the early 60s; iv) in that same age category we observe a rise in life and, even more, leisure satisfaction.

More specifically, using GSOEP waves from 1984 to 2007,[9] we notice that the share of retired individuals by age jumps up at 60 (from 30 to 50 percent) and at 65 (from 80 to 93): see Figure 1. In fact most individuals in our sample retire between 60 and 65. If we restrict the analysis to the subset of individuals retiring during the survey (4,580 observations) and look at the cumulative density function, we observe that 50 percent of the sample gets retired before 60, while 45 percent of the sample gets retired between 60 and 63, as Figure 2 shows.

Figure 3 shows that the retired work much less than the non retired of the same age (the average difference is 4.3 hours between 50 and 52, 4.9 between 56 and 58, while dropping to 2.4 between 65 and 67), but in these cohorts there is a decline in hours worked even for the non retired.

To start our analysis we first have to build a *"Relational Time Index"* (RTI). To this purpose we use five relevant variables available in the GSOEP. Individuals are asked about the intensity with which they: i) "*attend social gatherings*"; ii) "*attend cultural events*"; iii) "*participate in sports*"; iv) "*perform volunteer work*"; v) "*attend church or religious events*". We combine answers to these questions in a variable which can take values from 3 to 0, depending on how much time is devoted to each particular activity (0=Never, 1=Less Frequently, 2=Every Month, 3=Every

[9] The data used in this paper was extracted using the Add-On package PanelWhiz for Stata®. PanelWhiz (http://www.PanelWhiz.eu) was written by Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz generated DO file to retrieve the data used here is available from us upon request. Any data or computational errors in this paper are our own responsibility.

Week).[10] Our relational time index is simply an un-weighted average of the points given to the five questions by each respondent.

Our choice is motivated by two main reasons: first, all the above mentioned activities produce relational goods of the kind described in the previous section, even if the degree of their productivity in creating or strengthening ties among participants may vary, i.e. our synthetic indicator goes beyond the information that each single component could provide. Second, our measure allows us to reduce the problem of missing data since none of the five variables above is surveyed along the 24 waves. In order to have a higher number of observations and cover more years we calculate the RTI index on the basis of non missing relational variables for each individual-year.

By looking at the RTI indicator and at its individual components we find that the time spent in relational activities becomes significantly higher after retirement, controlling for socio demographic variables and time dummies in a fixed effect panel estimate. The result holds when we plot estimated age effects on attending sport events, time spent with friends in religious circles, in volunteering activities, in attending cultural events and social gatherings (Figure 4).

Since most workers retire in their early sixties, we inspect the age-happiness pattern and find that the increase in life and leisure satisfaction is well visible in the first part of the 60s. Average life satisfaction as a function of age exhibits the U-shape found in many previous studies, summarised in Frijters and Beatton 2008: at 29 average life satisfaction is 7.13, it falls to a minimum of 6.76 at 55, and rises up to 7.07 for the 65 years old respondents (see Figure 5). The difference between the three levels is significant at the 95 percent level. The U-shape in life satisfaction is paralleled by a similar, and more pronounced, U-shape in leisure satisfaction (see Figure 6). Average leisure

[10] We use this scale since answers do not allow us to infer an exact per month or per week frequency when "less frequently" is the response. It is likely that the distance from "every month" to "every week" corresponds to a more than proportional increase in sociability than the distance between "less frequently" and "every month". If that is the case, our unweighted average flattens high intensity responses and may be conceived as a sort of log transform of the true unobserved frequency of relational activity. A robustness check in which we impute the presumed actual (per month) frequencies on the basis of qualitative responses (and, more specifically, one every two months is equated to the "less frequently answer") has been performed. Results are substantially unchanged and available from the authors upon request.

satisfaction is 6.42 at 29 years, drops to a minimum (6.24) at 34 and rises up to 8.05 at 67. There is a spike in the indicator between 59 and 63. During this period average leisure satisfaction is significantly higher each year vis-à-vis the previous one at 95 percent.

Summing up: people experience a sharp change in their work/leisure ratio between their late 50s and early 60s, i.e. around a threshold which roughly corresponds to retirement. In parallel, we find a significant rise in social life and life and leisure satisfaction.

4. Econometric findings

Based on these descriptive findings we go on to test the relational goods-happiness nexus through the following steps: i) we start with a base specification ii) we add our relational index to this base specification; iii) we perform an IV estimate in which the relational index is instrumented; iv) we do robustness checks with various subsamples and modified models; v) we test for survivorship and entry bias.

Our base specification includes the explanators typically found in happiness regressions: marital and employment status, education, health status, number of children, log of equivalised real household income, an East/West dummy, house ownership,[11] changes in employment and marital status. We also include time dummies and age categories.[12] Opinions on the inclusion of year dummies in these types of estimates are mixed. On the one side, it is observed that they capture aggregate shocks to macroeconomic performance, political events etc. whose influence can be important so that excluding them would cause serious omitted variable bias. On the other side, when fixed effects are included and age and age squared are entered as regressors, including years

[11] For a detailed description of the variables see the Appendix, Table A1.

[12] Differently from two previous studies which investigate the age-happiness relationship on the same data (Frijters and Beaton 2008; Van Landeghem 2008), we do not restrict the analysis to West Germans, as Frijters and Beatton (2008) and do not work only on the balanced panel, as Van Landeghem (2008). In our opinion, the balanced panel sacrifices an incredible amount of precious information. Our main results are however supported also in these two specific subsamples. Results are omitted for reasons of space and available upon request. In subsection 4.2 we discuss some further advantages and disadvantages of using the unbalanced panel.

dummies would create perfect collinearity: this is why, following Clark (2007) we use age categories instead.[13] In fact, this choice is crucial for estimating the GSOEP data as regards the relationship between age and SWB: if year dummies are not included, as in Frijters and Beatton (2008) the U-shaped relationship found when using age categories disappears and SWB is monotonically decreasing in age. This is in our opinion due to the fact that the panel, even the unbalanced one, ages, so that a disproportionate number of observations on the young come from the first years. These were happy years for Germany, presumably because of the reunification, so that excluding years dummies from the regression biases the coefficient on age.[14]

In the first four columns of Table 1 we present the following specifications: i) the base equation; ii) the base equation plus the retirement variable; iii) the base equation plus the RTI variable; iv) the base equation plus the retirement and RTI variables. Since the RTI variable is present only in a limited number of waves the number of observations in columns 3 and 4 falls considerably.[15]

Our findings confirm the "almost stylised facts" of the happiness literature, from the positive and significant effect of household income and marriage status to the negative and significant effect of separation, unemployment and health status (Table 1, column 1).

A distinctive element with respect to most papers in the literature is our use of equivalised household income computed following the OECD equivalence scale,[16] together with the number of children coefficient. This makes the children variable positive and significant. In this way we are able to disentangle two children effects: a negative one represented by the reduction of per capita

[13] However, in the presence of missing observations on some variables, age categories end up being collinear with year dummies, which leads Stata to dropping many of the latter.
[14] For a different opinion, focused on entry and survivorship bias, see Frijters and Beatton (2008).
[15] The base equation (Table 1, column 1) limiting the number of observations coinciding with those of the RTI augmented estimate does not change significantly our findings. It is omitted for reasons of space and available upon request.
[16] Equivalised income is household income which is adjusted by using an equivalence scale to take into account the size and composition of the household. Here we used the "OECD equivalence scale". This assigns a value of 1 to the first household member, of 0.7 to each additional adult and of 0.5 to each child. This scale (also called "Oxford scale") was mentioned by OECD (1982) for possible use in "countries which have not established their own equivalence scale". For this reason, this scale is sometimes labelled "(old) OECD scale".

income within the household and a positive one represented by the psychological value of having them.

Both the retirement and the relational goods variables are positive and significant when separately considered and when jointly introduced in the estimates (Table 1, columns 2-4). The rationale for the retirement effect is twofold. On the one side, consistently with the standard assumption in economics that leisure is a good, people will enjoy retirement as the disutility from work ceases. However another complementary explanation is that with retirement an increase in the quantity and quality of social life is possible, and as we have seen in the previous section does indeed take place. We notice that coefficients of the age cohorts from 59 to 61 are still positive and significant even when we include the RTI and retirement variables. We thought of two plausible arguments reconciling such findings with the hypothesis that what explains the surge in SWB at the age of retirement is indeed retirement: i) hours worked are reduced in this age category even for those still working, as emerges from Figure 3, so the disutility of work is reduced for them, even if to a lower degree than for the retired; ii) if the consumption of relational goods increases even for those still working, one could argue that, when many in the peers of the non retired are retired, it is easier for all in this cohort to avoid the relational poverty trap. People are better off when their reference group starts to retire, whether or not they themselves retire[17]

4.1 Tackling the endogeneity problem: the IV estimates

We observed that our estimates of the coefficient of the relational time indicator is significant and strongly positive, even when permanent personality traits are netted out by fixed effect estimation. This result will be found to be robust to different subsamples and estimation models (see section 4.2).

[17]Of course it is not difficult to think of other (concurrent)explanations: it is possible that those who retire later hold particularly psychologically rewarding jobs, or due to a relatively strong work ethics and competitive attitude take pride from working at a later age, etc. However we have not attempted to disentangle these various possible effects.

However the direction of causality could run from time-demeaned subjective well being to time-demeaned intensity of social contacts. Our attempt here is to deal with this two ways causation type of endogeneity. We estimate a within group instrumental variable (IV) regression: the results are presented in Table 1, column 5 – 6.

As anticipated in the introduction, our identification strategy hinges on retirement. However we do not use retirement as an instrument because our analysis in the previous section strongly suggests that an exclusion restriction for retirement is not possible. The same holds for the population probability of being retired at the age of the individual, even if these two variables are too collinear to be both included in the regression.

We adopt as our instrument the probability that people 3 to 4 years younger than the individual may retire. In fact the retirement age pattern of the sample seems to be a reasonably valid instrument since it is only indirectly associated with the individual satisfaction of life. At the same time, it is enough correlated to the individual level of RTI to be fairly relevant in predicting the endogenous regressor.

Validity means lack of correlation of the instrumental variable with the structural equation error. In a just identified model as our own, it is impossible to test for this condition, whose plausibility has to come from intuition instead. We argue that it is plausible that the probability that people 3 to 4 years younger may retire does not affect directly the SWB of an individual as 1) this probability is not a choice variable for the individual and therefore cannot be related to the time-varying psychological factors captured in the error of our structural equation 2) the peer effect on SWB linked to others' retirement choices is presumably linked to the behavior of an individual's reference group. One characteristic generally assumed in the literature as regards reference groups is common age. The reason why we introduce at least three years' difference between the individual age and the age of the individuals in the sample from which the probability is calculated is therefore to reduce as much as possible the force of a possible peer effect. We cannot consider an even larger

difference in age, because that would create a problem of relevance, the requirement by which the instrument must account for a significant variation of the endogenous regressor.

Our model is a just identified IV so our estimates of coefficients are median unbiased. However the estimated variance of two-stage least squares is generally biased downward in finite samples, which means that the significance levels usually claimed for tests based upon two-stage least squares— null hypotheses are too often rejected. Stock et al. (2002) stress that the definition of weak instruments depends on the purpose to which the instruments are put, combined with the researcher's tolerance for departures from the usual standards of inference (i.e., bias, size of tests). This means that, even for a just identified model, a researcher can decide to define an instrument weak if, say, the usual nominal 5% TSLS *t* test of the hypothesis on the significance of the coefficient of interest in the structural equation has size potentially exceeding 15%. In the case, which is our case of one instrument and a single troublesome explanator, Stock and Yogo (2005) report that the critical value of the classic *F*-statistic is 16.38 for their test of this hypothesis.

In other words, if the upper bound on the tolerated distortion of the Wald test based on the TSLS estimator is 15% , so that the true size of the test can be at most 10%, then we reject at the 5% level of confidence the null hypothesis of weak instrument if the F test statistic of the coefficient of the instrument in the reduced form equation exceeds 16.38. In our case this F-statistic is 15.11. However if we accept that the true size of the test can be at most 15%, the critical value drops to 8.96 and we can reject the null hypothesis of weak instrument.

Given these results, we decide to perform the Anderson – Rubin (1949) test. The Anderson – Rubin (1949) statistic is a Wald test robust to the presence of weak instruments when the sample size is large, where the null hypothesis tested is that the coefficient of the endogenous regressor in the structural equation is equal to zero. Anderson – Rubin (1949) test rejects the null hypothesis that the coefficient of the RTI indicator is zero (F – statistics is 4.30).

We finally compute the Davidson – MacKinnon (1993) test of exogeneity for a fixed-effect regression estimated via instrumental variables, where the null hypothesis states that an ordinary

least squares (OLS) estimator of the same equation would yield consistent estimates. Our F statistics is 3.45: this rejects the null of exogeneity with a p – value of 0.06.

The results of this battery of tests seem to support our choice of using IV estimation so we conclude that increasing the consumption of relational goods does cause an increase in life satisfaction. The fixed effect IV coefficient is much higher than the fixed effect OLS coefficient, which might be due to the inference problems seen above, but actually our principal aim at this stage of research is not to quantify the shadow value of social leisure but rather to establish and sign a causal effect of social leasure on SWB, and our results are not inconsistent with the possibility that such effect exists and it is positive.

Note that the significance of the 59-61 up to 55-57 age categories disappears (and no other age categories become significant) in the IV estimates, a finding not in contradiction with the hypothesis that the upward bump in happiness as a function of age during the early 60s may be determined by the retirement-increase in social leisure combo.

4.2 Robustness in subsample splits

Table 2 shows that our finding replicate in different subsamples (women, men, East and West Germans, occupationally disabled[18] and not, registered as unemployed and not). The retirement effect on life satisfaction is almost four times larger for males than for females, while the enjoyment of relational life is similar for the two sexes. This may be interpreted in the sense that job-induced relational poverty during their working years is much stronger for males, who work longer hours and have full time jobs more often than women. Being retired attracts a significant coefficient for both employed and disabled workers[19]. In particular, among those who were registered as

[18] Any person whose capacity for social and/or occupational integration is severely restricted by an impairment or reduction of their physical and/or mental capacity is eligible for the aid awarded by the social assistance.

[19] Besides old age pensions the German welfare system provides *disability benefits* to workers of all ages not able to carry on a regular employment. If this inability is complete they receive full old age benefits, the so called disability

unemployed, the retirement effect is much higher than for those who were not: it seems likely that this is due to the end of a condition carrying a social stigma, and indeed shown to be very detrimental to SWB in many studies.

The RTI variable is always significant in the observed subsamples even when we introduce the retirement variable. When instrumented with the age-retirement pattern, it remains significant for the male, the employed and the not occupationally disabled subsamples.

4.3 Robustness in estimation methods

In this section we want to check whether the effect of relational goods on happiness remains significant in relevant subsamples if we modify the choices on how to include age, time and individual fixed effects. As described above (see section 4), the benchmark model is estimated with a fixed effect regression including time dummies and age categories. Analysing here the possible alternative specifications with their drawbacks and advantages allows us to better justify our estimation choices.

The first choice to make was about how to introduce age in the regression: nearly all recent papers enter terms in age and age squared. Frijters and Beatton (2008) show that in most of these studies the effect of the linear term in age is always negative, whilst that of age-squared is positive, indicating a U-shape. Although this seems to be a typical finding in happiness regressions, we prefer not to impose a rigid functional form on age. Following Clark (2007) and Van Landeghem (2008), we use dummies representing age-bounded categories. Each age category comprises 3

pension ("Erwerbsunfähigkeitsrente", EU). A person that can work only half of the time or less compared to a healthy person received two-thirds of old age benefits ("Berufsunfähigkeitsrente", BU). In the 1970s and early 1980s, the German jurisdiction has interpreted the rules on disability very broadly, in particular the applicability of the first rule. Disability is the most important pathway to retirement for civil servants: 47% of those who retired in the year 1999 used disability retirement. Hence we may consider the disabled group as a hybrid set (of not fully- irregularly employed partially subsidized workers) which stands between full employment and straight unemployment. See Borsch-Supan and Wilke (2004).

years: 17-19, 20-22 . . . 77-79, and the omitted category is the age group containing individuals in their eighties.

Another issue is whether to estimate a pooled cross-sectional or a fixed effects regression.

In Table 3.a we present the pooled regression results where we compare the two possible ways to enter age. The relational time index is strongly significant and positive over all subsamples and it maintains almost the same coefficient regardless of the way age enters the regression, even when we introduce the retirement variable. On the contrary, the retirement variable has a positive effect when age is entered in a linear form and the opposite when we use age categories (negative impact).

In Table 3.b we show the results with fixed effects estimation. We did not include time dummies because of the perfect multicollinearity that relates them to age in its quadratic form. The RTI variable maintains a strongly significant effect on life satisfaction. For all other regressors, here omitted for reasons of space, we confirm the standard results in the literature. However, both these models suffer from a possible omitted variable bias due to the exclusion of time dummies.

4.5 Survivorship and entry bias

In our analysis we use the entire SOEP dataset, including all the subsamples from A through H[20], waves 1 to 24. The dataset evolves over time because of new subsamples being introduced. In each subsample, new entrants are limited to households split (i.e., individuals who move out and form their own households), and to individuals who moved into an original household because of marriage or to new "born sample members". On the other side, households may leave the survey for several reasons. If the panel attrition due to respondents moving abroad or dying can be ignored, the one due to survey related reasons is an issue. Kroh and Spieß (2008) provide evidence on the risk of

[20] Subsample A: Individuals and Household Residents in West Germany (1984 – 2007), Subsample B: Foreigners in West Germany (1984 – 2007), Subsample C: Residents in East Germany (1990 – 2007), Subsample D: Immigrants (1995 – 2007), Subsample E: Refreshment (1998 – 2007), Subsample F: Innovation (2000 – 2007), Subsample G: Oversampling of High Income (2002 – 2007), Subsample H: Refreshment (2006 – 2007).

survey-related panel attrition in different groups of the original sample units (e.g., in different sub-samples, age, educational, and income groups).

Observing both the entire GSOEP and the single subsamples, the share of non responses is very high. Attrition in the panel generates two potential problems which could undermine our estimation of life satisfaction: survivorship bias and entry bias. By survivorship bias we mean the possibility that our findings could be the spurious result of a selection process by which the characteristics of those who survive in the questionnaire are heterogeneous with respect to those of exitors. If happier individuals have a higher probability of surviving across waves, the survivorship bias could be the driving force behind the relational good effect instrumented by the age-retirement pattern. In such a case we would in fact observe a spurious effect on the increased happiness of the elders. Note, however, that the early 60s bump and the decreasing part of the happiness-age relationship after 75 would be difficult to reconcile with the idea of happier survivors unless we were in presence of an abnormally high rate of exit at the 50/60 turnaround and a subsequent fall of this rate after 75.

The possibility of entry bias affecting our results is considered by Frijters and Beatton (2008), who observe that individuals entering the survey declare very high life satisfaction values while, gradually over time, their responses tend to be more sincere and their life satisfaction evaluation tends to go down. In this case a significantly larger share of entries of over-60 individuals could lead to doubt our findings of a positive link between retirement, social life and happiness.

So we preliminarily check whether we have an abnormal exit rate around the 50/60 turnaround. The data clearly show that this is not the case. On average exits amount to 2.2 percent of our observations and there is no significant change in the early sixties. In the same way we do not observe an abnormal share of entries concentrated in the same age cohort.

We then test formally for the existence of survivorship bias. As suggested by Wooldridge (2002), we estimate the determinants of exit with a probit regression. The exit dummy for the

response to our dependent variable (life satisfaction) is regressed on the usual socio demographic controls, age categories and time dummies. We also introduce time invariant effects: following Mundlak (1978), we create time averages of all the socio demographic explanatory variables. In the second stage, we introduce in the baseline equation the predicted value of the probit equation. Given the lack of significance of the introduced variable, the null of no survivorship bias is not rejected. The same procedure applies to verify for the presence of entry bias on our dependent variable. Again, in our base regression the predicted entry probability does not significantly differ from zero.

5. Conclusions

Common sense tells us that relational life plays an important role in life satisfaction. As human beings we are dramatically influenced by recognition, appreciation and acceptance by others.

With the Meier and Stutzer (2008) exception, the empirical contributions investigating the relational goods-happiness nexus have not solved the endogeneity problem. If the links between life satisfaction and almost all its potential determinants could go both ways, this is all the more true for social life.

In this paper we devise a new approach to tackle the endogeneity issue. We consider that the retirement event allows individuals to re-master their own agenda and to invest more time in social and relational activities. However retirement is partially endogenous so, we observe the age pattern behind retirement decisions and use it to create a valid instrument. Our findings document that relational goods have a significant effect on life satisfaction which is quite robust under different specifications and subsamples.

Our paper may also shed some light on the U-shaped relationship between age and happiness, which has become one of the stylised facts in the happiness literature. In fact we find that the rising part of the parabola may be explained by the retirement/ increase in social leisure

effect. An indirect proof of that is given by the fact that when we restrict our sample to unemployed individuals or when we instrument with the exogenous retirement age pattern our relational good index, we do not observe the strong effect of the sixties on happiness.

Figures

Figure 1. Share of the retired population by age in the GSOEP 24 wave sample

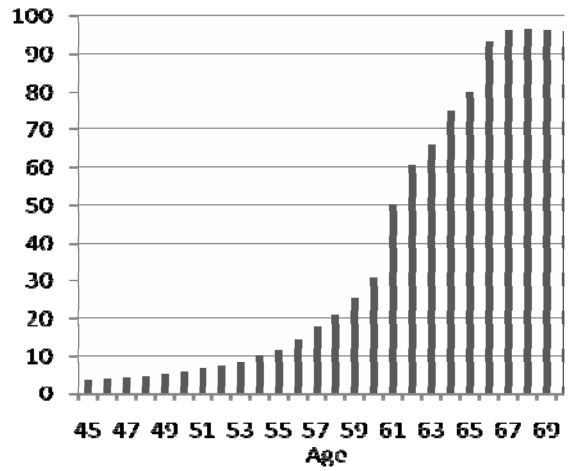

Figure 2. Cumulative distribution function of retirement age in the GSOEP during the sample period

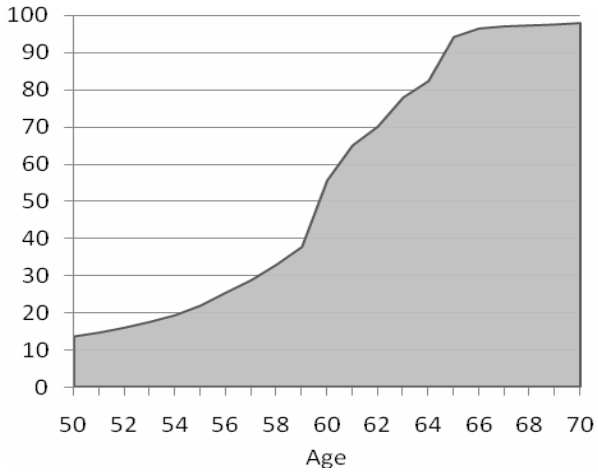

Figure 3. Daily average worked hours for retired and non retired individuals in different age categories (working week, Saturdays and Sundays)

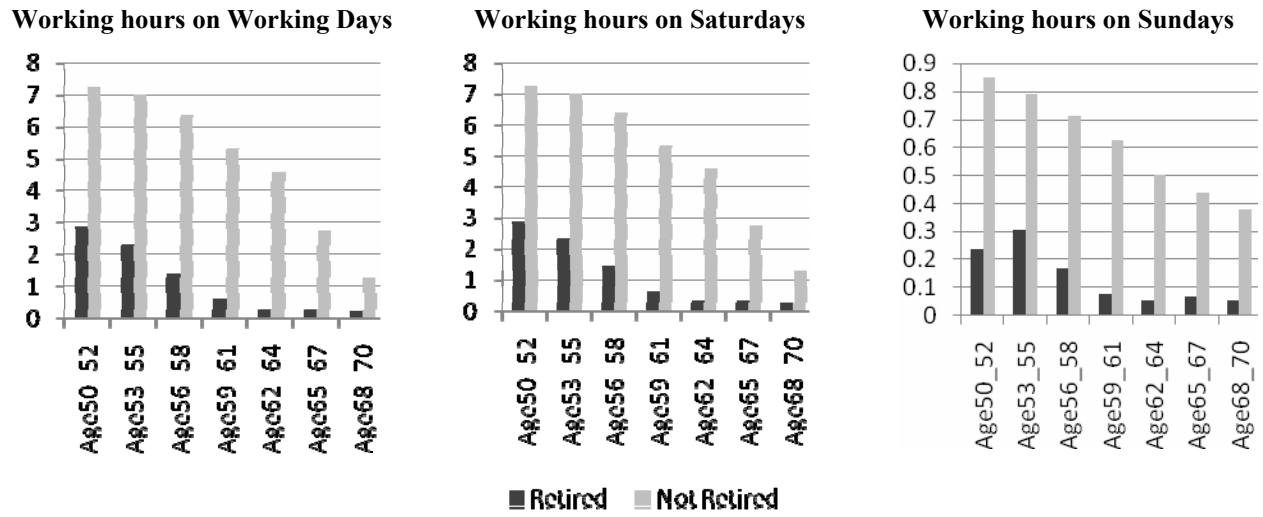

Figure 4. Predicted age effects on time spent in relational life events such as Social Gathering, Volunteering, Sport, Cultural events, Religion, after controlling for socio demographic variables (income, employment status, marital status, health) and time dummies in a fixed effect panel estimate. Range of variation on the vertical axis: (0=Never, 1=Less Frequently, 2=Every Month and 3=Every Week)

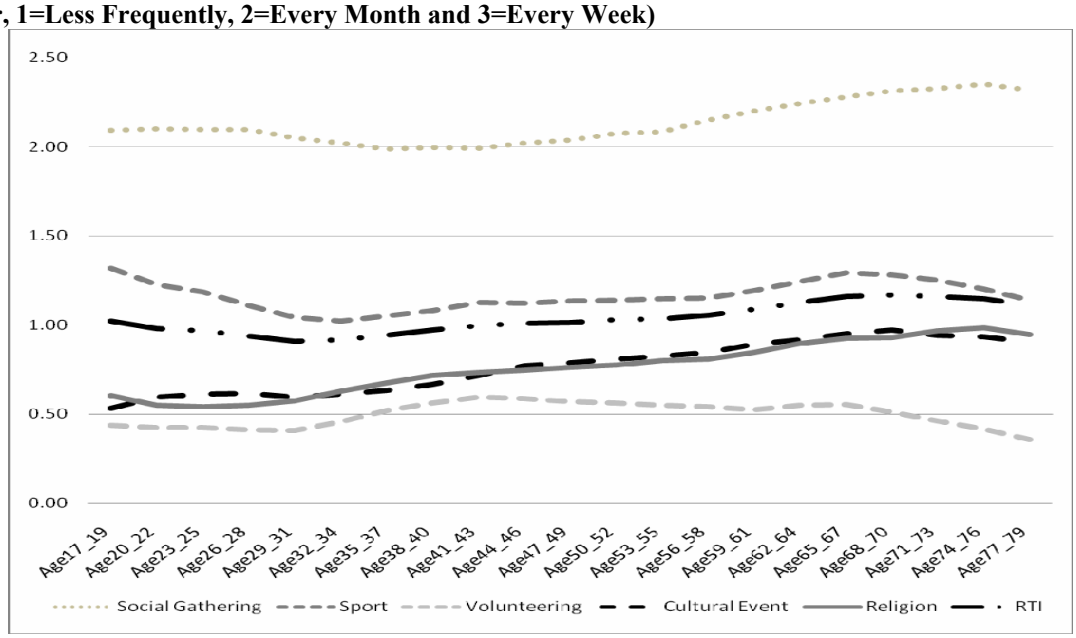

Figure 5. Average Life Satisfaction levels by Age

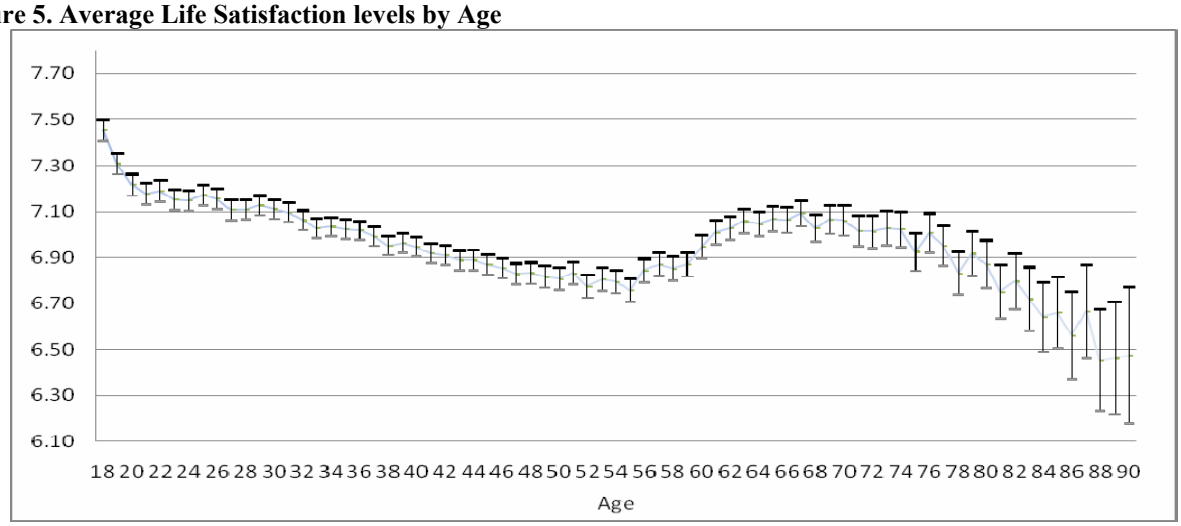

Figure 6. Average Leisure Satisfaction levels by Age

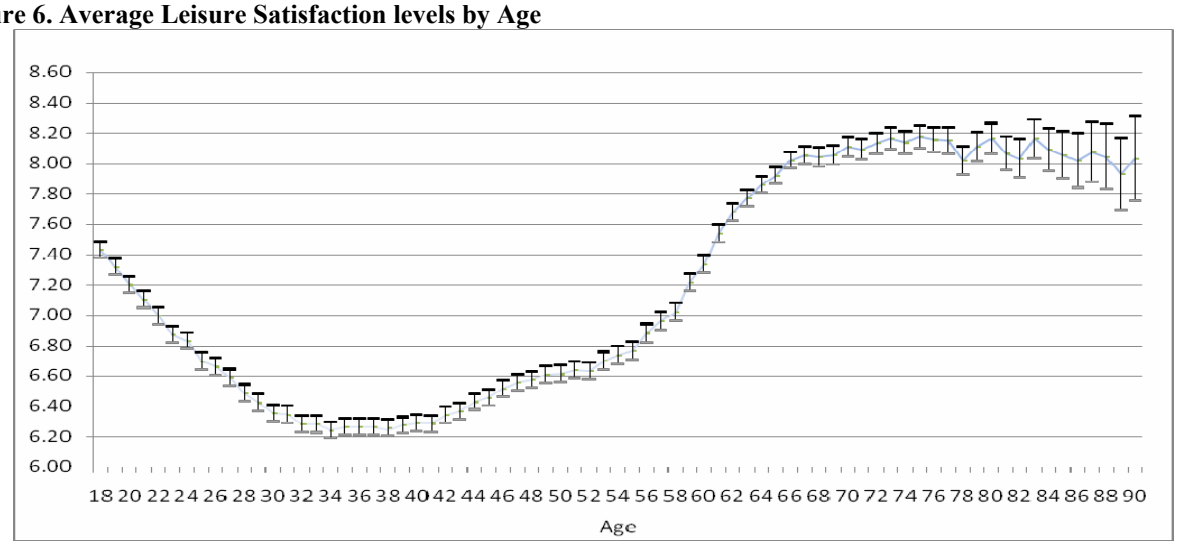

Table 1. The effect of relational goods on Life Satisfaction: GSOEP, 1984 – 2007 (fixed effects regression)

Variables	Base	Base Retired	Base RTI	Base Retired RTI	IV Base	IV Retired
RTI			0.213***	0.213***	2.330**	2.002*
			(0.011)	(0.011)	(1.012)	(1.057)
Retired		0.133***		0.133***		0.095**
		(0.019)		(0.024)		(0.038)
lgERHInc	0.216***	0.215***	0.229***	0.228***	0.188***	0.194***
	(0.011)	(0.011)	(0.014)	(0.014)	(0.025)	(0.025)
Unemp	-0.253***	-0.242***	-0.266***	-0.256***	-0.236***	-0.227***
	(0.018)	(0.018)	(0.022)	(0.022)	(0.026)	(0.026)
lossjob	-0.129***	-0.134***	-0.158***	-0.163***	-0.198***	-0.201***
	(0.024)	(0.024)	(0.030)	(0.030)	(0.036)	(0.035)
Emp	0.089***	0.109***	0.110***	0.131***	0.138***	0.150***
	(0.011)	(0.012)	(0.015)	(0.015)	(0.023)	(0.021)
Married	0.119***	0.122***	0.154***	0.157***	0.441***	0.401***
	(0.022)	(0.022)	(0.028)	(0.028)	(0.135)	(0.140)
getMar	0.256***	0.254***	0.232***	0.230***	0.169***	0.169***
	(0.024)	(0.024)	(0.031)	(0.031)	(0.042)	(0.040)
getSep	-0.320***	-0.320***	-0.307***	-0.308***	-0.267***	-0.263***
	(0.059)	(0.059)	(0.077)	(0.077)	(0.091)	(0.089)
Separated	-0.113**	-0.111**	-0.060	-0.059	0.176	0.135
	(0.048)	(0.047)	(0.061)	(0.061)	(0.150)	(0.154)
Divorced	0.079**	0.081**	0.103**	0.104**	0.373***	0.332**
	(0.034)	(0.034)	(0.044)	(0.044)	(0.138)	(0.142)
getDiv	-0.079*	-0.079*	-0.079	-0.079	-0.136*	-0.132*
	(0.045)	(0.045)	(0.059)	(0.059)	(0.071)	(0.070)
Widowed	-0.248***	-0.264***	-0.218***	-0.235***	-0.190***	-0.207***
	(0.042)	(0.042)	(0.053)	(0.053)	(0.070)	(0.069)
childHH	0.032***	0.032***	0.029***	0.029***	0.061***	0.057***
	(0.007)	(0.007)	(0.009)	(0.009)	(0.016)	(0.016)
nEdyear	0.016***	0.015***	0.017***	0.016***	0.031***	0.029***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.010)	(0.010)
Owner	0.069***	0.070***	0.069***	0.070***	0.099***	0.099***
	(0.013)	(0.013)	(0.016)	(0.016)	(0.021)	(0.020)
HospStay	-0.194***	-0.193***	-0.190***	-0.190***	-0.132***	-0.141***
	(0.010)	(0.010)	(0.013)	(0.013)	(0.033)	(0.033)
OccupDis	-0.283***	-0.294***	-0.259***	-0.270***	-0.217***	-0.234***
	(0.018)	(0.018)	(0.023)	(0.023)	(0.038)	(0.039)
WestDT	0.294***	0.294***	0.251***	0.252***	0.169*	0.180**
	(0.051)	(0.051)	(0.064)	(0.064)	(0.086)	(0.085)
Age17_19	-0.217	-0.210	-0.008	-0.001		
	(0.200)	(0.200)	(0.255)	(0.255)		
Age20_22	-0.332*	-0.325*	-0.114	-0.107	0.350	0.307
	(0.192)	(0.192)	(0.245)	(0.245)	(0.317)	(0.310)
Age23_25	-0.299	-0.287	-0.116	-0.104	0.319	0.281
	(0.183)	(0.183)	(0.234)	(0.234)	(0.302)	(0.295)
Age26_28	-0.282	-0.265	-0.085	-0.069	0.354	0.320
	(0.174)	(0.174)	(0.222)	(0.222)	(0.289)	(0.282)
Age29_31	-0.228	-0.207	-0.037	-0.016	0.378	0.347
	(0.165)	(0.165)	(0.211)	(0.211)	(0.277)	(0.271)

Table 1. The effect of relational goods on Life Satisfaction: GSOEP, 1984 – 2007 (fixed effects regression) (follows)

Age32_34	-0.218	-0.193	-0.031	-0.007	0.301	0.283
	(0.156)	(0.156)	(0.200)	(0.200)	(0.253)	(0.246)
Age35_37	-0.191	-0.162	-0.038	-0.010	0.200	0.199
	(0.148)	(0.148)	(0.189)	(0.189)	(0.229)	(0.222)
Age38_40	-0.169	-0.137	-0.012	0.020	0.148	0.162
	(0.139)	(0.139)	(0.178)	(0.178)	(0.212)	(0.205)
Age41_43	-0.137	-0.100	-0.012	0.024	0.069	0.094
	(0.130)	(0.130)	(0.167)	(0.167)	(0.199)	(0.194)
Age44_46	-0.122	-0.082	-0.009	0.030	0.046	0.077
	(0.122)	(0.122)	(0.155)	(0.155)	(0.188)	(0.183)
Age47_49	-0.112	-0.067	-0.020	0.023	0.043	0.077
	(0.113)	(0.113)	(0.144)	(0.145)	(0.175)	(0.172)
Age50_52	-0.093	-0.046	-0.004	0.042	0.007	0.048
	(0.105)	(0.105)	(0.134)	(0.134)	(0.165)	(0.163)
Age53_55	-0.069	-0.020	-0.010	0.039	-0.010	0.037
	(0.096)	(0.096)	(0.123)	(0.123)	(0.155)	(0.155)
Age56_58	0.040	0.089	0.067	0.114	0.021	0.072
	(0.088)	(0.088)	(0.112)	(0.112)	(0.150)	(0.153)
Age59_61	0.186**	0.221***	0.232**	0.264***	0.112	0.165
	(0.079)	(0.079)	(0.101)	(0.102)	(0.159)	(0.163)
Age62_64	0.321***	0.325***	0.348***	0.351***	0.157	0.200
	(0.071)	(0.071)	(0.091)	(0.091)	(0.174)	(0.177)
Age65_67	0.407***	0.390***	0.428***	0.410***	0.136	0.176
	(0.063)	(0.063)	(0.081)	(0.081)	(0.193)	(0.195)
Age68_70	0.371***	0.352***	0.378***	0.359***	0.068	0.110
	(0.056)	(0.056)	(0.072)	(0.072)	(0.194)	(0.197)
Age71_73	0.333***	0.318***	0.337***	0.322***	0.030	0.070
	(0.049)	(0.049)	(0.063)	(0.063)	(0.175)	(0.178)
Age74_76	0.268***	0.257***	0.291***	0.280***	0.009	0.044
	(0.043)	(0.043)	(0.055)	(0.055)	(0.150)	(0.152)
Age77_79	0.154***	0.146***	0.198***	0.191***	0.037	0.058
	(0.037)	(0.037)	(0.047)	(0.047)	(0.098)	(0.099)
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes
year 1992	0.811***	0.831***	0.765***	0.786***	0.609***	0.641***
	(0.051)	(0.051)	(0.063)	(0.063)	(0.090)	(0.092)
Constant	5.061***	4.994***	4.654***	4.589***		
	(0.121)	(0.122)	(0.155)	(0.155)		
Observations	271280	271280	179458	179458	133525	133525
Number of ID	36250	36250	35818	35818	23487	23487
R-squared	0.040	0.040	0.041	0.042	-0.266	-0.180
Test for IV regression						
F-first-excluded					17.69	15.11
Anderson Rubin			*F* test		6.79	4.30
			p-value		0.01	0.04
Davidson Mac Kinnon			*F* test		5.63	3.45
			p-value		0.017	0 .06

***Note*:** Robust standard errors in parentheses, stars for significance levels: *** *p<0.01,* ** *p<0.05,* * *p<0.1,* Omitted age category: >79. IV estimates: RTI instrumented by the sample age-retirement pattern. The IV regressions drop Age17_19 because of collinearity.

Table 2. Robustness in subsample splits

	Women	Men	East	West	Not OccupDis	OccupDis	Unemp	Not Unemp
Base Retired								
Retired	0.064**	0.249***	0.250***	0.111***	0.113***	0.291***	0.271***	0.077***
	(0.026)	(0.029)	(0.043)	(0.022)	(0.022)	(0.048)	(0.068)	(0.021)
Observations	140233	131047	54231	217049	241011	30269	25184	246096
Number of ID	18548	17702	7611	29115	34720	6076	8778	35142
R-squared	0.037	0.046	0.037	0.041	0.033	0.045	0.035	0.037
Base RTI								
RTI	0.224***	0.205***	0.197***	0.212***	0.176***	0.378***	0.189***	0.215***
	(0.016)	(0.016)	(0.026)	(0.012)	(0.011)	(0.042)	(0.063)	(0.011)
Observations	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	18337	17481	7546	28707	34155	5651	7859	34544
R-squared	0.037	0.050	0.037	0.044	0.035	0.047	0.040	0.039
Base Retired RTI								
Retired	0.038	0.290***	0.254***	0.111***	0.125***	0.274***	0.300***	0.079***
	(0.034)	(0.037)	(0.055)	(0.028)	(0.028)	(0.063)	(0.101)	(0.027)
RTI	0.224***	0.204***	0.195***	0.212***	0.176***	0.372***	0.188***	0.215***
	(0.016)	(0.016)	(0.026)	(0.012)	(0.011)	(0.042)	(0.063)	(0.011)
Observations	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	18337	17481	7546	28707	34155	5651	7859	34544
R-squared	0.037	0.051	0.038	0.044	0.035	0.048	0.041	0.039
IV Base								
RTI	0.856	3.603**	9.804	1.374	2.518**	1.688	6.124	2.151**
	(1.400)	(1.487)	(9.357)	(0.944)	(1.216)	(1.749)	(6.469)	(1.030)
Observations	69442	64083	32651	100682	116456	15315	10783	119279
F-first-excluded	7.332	11.39	1.236	16.12	12.30	6.185	1.246	16.40
Number of ID	12130	11357	5678	17948	21212	3269	3185	21984
R-squared	0.008	-0.770	-4.763	-0.060	-0.357	-0.047	-1.453	-0.239
IV Retired								
RTI	0.778	2.889**	10.223	1.063	2.209*	1.537	1.953	2.115*
	(1.540)	(1.444)	(11.349)	(0.999)	(1.267)	(1.812)	(4.524)	(1.129)
Retired	0.022	0.234***	-0.102	0.091**	0.073*	0.175	0.307***	0.012
	(0.056)	(0.058)	(0.429)	(0.039)	(0.042)	(0.114)	(0.110)	(0.048)
Observations	69442	64083	32651	100682	116456	15315	10783	119279
Number of ID	12130	11357	5678	17948	21212	3269	3185	21984
R-squared	0.014	-0.465	-5.190	-0.014	-0.262	-0.026	-0.095	-0.229
F-first-excluded	6.011	10.03	0.904	13.77	10.46	5.657	1.006	13.52

No*tes*: Sub samples are Male vs Female, West vs East Germans, Registered as unemployed vs not registered, reporting occupational disability vs not reporting. Robust standard errors in parentheses, stars for significance levels: *** *p<0.01,* ** *p<0.05,* * *p<0.1.* Omitted age category: >79. IV estimates: RTI instrumented by the age-retirement pattern.

Table 3.a. Robustness check in alternative models: pooled regression with quadratic age specification (1) or age categories (2). Same controls as in the benchmark model with time dummies.

Pooled 1	All sample	Women	Men	East	West	Not OccupDis	OccupDis	Unemp	Not Unemp
Retired	0.171***	0.113***	0.330***	0.433***	0.152***	0.213***	0.155***	0.460***	0.121***
	(0.015)	(0.020)	(0.024)	(0.035)	(0.017)	(0.017)	(0.038)	(0.057)	(0.016)
Age AgeSquare	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	271280	140233	131047	54231	217049	241011	30269	25184	246096
Pooled 2									
Retired	-0.031*	-0.075***	0.121***	0.108***	-0.022	0.013	0.045	0.406***	-0.088***
	(0.017)	(0.023)	(0.028)	(0.041)	(0.019)	(0.020)	(0.039)	(0.057)	(0.018)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	271280	140233	131047	54231	217049	241011	30269	25184	246096
Pooled 1									
RTI	0.429***	0.462***	0.400***	0.458***	0.419***	0.388***	0.708***	0.443***	0.423***
	(0.008)	(0.011)	(0.011)	(0.019)	(0.009)	(0.008)	(0.027)	(0.031)	(0.008)
Age AgeSquare	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Pooled 2									
RTI	0.414***	0.450***	0.384***	0.438***	0.405***	0.377***	0.678***	0.435***	0.411***
	(0.008)	(0.011)	(0.011)	(0.019)	(0.009)	(0.008)	(0.027)	(0.031)	(0.008)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Pooled 1									
Retired	0.165***	0.112***	0.337***	0.414***	0.139***	0.200***	0.168***	0.428***	0.115***
	(0.018)	(0.024)	(0.030)	(0.042)	(0.021)	(0.020)	(0.047)	(0.069)	(0.019)
RTI	0.428***	0.461***	0.399***	0.454***	0.418***	0.386***	0.710***	0.440***	0.423***
	(0.008)	(0.011)	(0.011)	(0.019)	(0.009)	(0.008)	(0.027)	(0.031)	(0.008)
Age AgeSquare	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Pooled 2									
Retired	-0.013	-0.050*	0.148***	0.139***	-0.015	0.018	0.078	0.373***	-0.067***
	(0.021)	(0.028)	(0.034)	(0.048)	(0.024)	(0.024)	(0.048)	(0.070)	(0.022)
RTI	0.414***	0.449***	0.385***	0.439***	0.405***	0.377***	0.679***	0.433***	0.411***
	(0.008)	(0.011)	(0.011)	(0.019)	(0.009)	(0.008)	(0.027)	(0.031)	(0.008)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364

Notes: Robust standard errors in parentheses, stars for significance levels: *** p<0.01, ** p<0.05, * p<0.1.
Omitted age category: >79.

Table 3.b. Robustness check in alternative models: fixed effect regression with quadratic age specification (1) or age categories (2). Same controls as in the benchmark model, no time dummies.

	All sample	Women	Men	East	West	Not OccupDis	OccupDis	Unemp	Not Unemp
Fixed Effect 1									
Retired	0.250***	0.168***	0.381***	0.410***	0.218***	0.231***	0.355***	0.273***	0.201***
	(0.017)	(0.024)	(0.026)	(0.040)	(0.020)	(0.020)	(0.047)	(0.067)	(0.019)
Age Age Squared	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	271280	140233	131047	54231	217049	241011	30269	25184	246096
Number of ID	36250	18548	17702	7611	29115	34720	6076	8778	35142
Fixed Effect 2									
Retired	0.117***	0.045*	0.237***	0.217***	0.097***	0.093***	0.281***	0.236***	0.060***
	(0.019)	(0.026)	(0.029)	(0.043)	(0.022)	(0.022)	(0.048)	(0.067)	(0.021)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	271280	140233	131047	54231	217049	241011	30269	25184	246096
Number of ID	36250	18548	17702	7611	29115	34720	6076	8778	35142
Fixed Effect 1									
RTI	0.209***	0.220***	0.200***	0.218***	0.205***	0.176***	0.349***	0.192***	0.210***
	(0.010)	(0.014)	(0.014)	(0.024)	(0.011)	(0.011)	(0.039)	(0.057)	(0.011)
Age AgeSquared	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	35818	18337	17481	7546	28707	34155	5651	7859	34544
Fixed Effect 2									
RTI	0.202***	0.214***	0.192***	0.198***	0.200***	0.171***	0.338***	0.191***	0.204***
	(0.010)	(0.014)	(0.014)	(0.024)	(0.011)	(0.011)	(0.039)	(0.057)	(0.011)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	35818	18337	17481	7546	28707	34155	5651	7859	34544
Fixed Effect 1									
Retired	0.253***	0.148***	0.425***	0.424***	0.218***	0.250***	0.340***	0.306***	0.206***
	(0.022)	(0.031)	(0.034)	(0.051)	(0.025)	(0.025)	(0.061)	(0.099)	(0.024)
RTI	0.207***	0.218***	0.197***	0.210***	0.203***	0.174***	0.340***	0.191***	0.208***
	(0.010)	(0.014)	(0.014)	(0.024)	(0.011)	(0.011)	(0.039)	(0.057)	(0.011)
Age Age Squared	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	35818	18337	17481	7546	28707	34155	5651	7859	34544
Fixed Effect 2									
Retired	0.120***	0.021	0.283***	0.222***	0.101***	0.107***	0.275***	0.276***	0.066**
	(0.024)	(0.034)	(0.037)	(0.054)	(0.028)	(0.028)	(0.063)	(0.100)	(0.026)
RTI	0.202***	0.214***	0.192***	0.196***	0.200***	0.171***	0.333***	0.191***	0.204***
	(0.010)	(0.014)	(0.014)	(0.024)	(0.011)	(0.011)	(0.039)	(0.057)	(0.011)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	179458	92812	86646	37646	141812	160020	19438	17094	162364
Number of ID	35818	18337	17481	7546	28707	34155	5651	7859	34544

Notes: Robust standard errors in parentheses, stars for significance levels: *** p<0.01, ** p<0.05, * p<0.1.
Omitted age category: >79

Table 4. The effect of relational goods on Life Satisfaction: GSOEP, 1984 – 2007 (ordered probit regression with Mundlak correction)

Variable	Base	Base Retired	Base RTI	Base Retired RTI	Fuzzy Retired	Fuzzy Retired Turn Around
lgERHInc	0.240***	0.269***	0.260***	0.260***	0.241***	0.258***
	(32.39)	(28.35)	(27.45)	(27.44)	(34.80)	(18.84)
Unemp	-0.347***	-0.345***	-0.350***	-0.347***	-0.344***	-0.230***
	(-22.66)	(-17.98)	(-18.48)	(-18.12)	(-21.91)	(-8.95)
lossjob	-0.024	-0.013	-0.011	-0.011	-0.015	-0.010
	(-1.34)	(-0.57)	(-0.48)	(-0.51)	(-0.85)	(-0.30)
Emp	0.087***	0.089***	0.094***	0.096***	0.101***	0.085***
	(9.61)	(7.55)	(8.22)	(8.19)	(10.76)	(4.46)
WestDT	0.168***	0.134***	0.134***	0.135***	0.140***	0.034
	(4.86)	(3.18)	(3.19)	(3.19)	(3.91)	(0.32)
Married	0.128***	0.133***	0.155***	0.155***	0.101***	0.215
	(7.32)	(5.98)	(6.99)	(7.00)	(5.77)	(1.94)
getMar	0.218***	0.194***	0.193***	0.193***	0.226***	0.091
	(11.08)	(7.72)	(7.67)	(7.66)	(11.43)	(1.48)
Separated	-0.137***	-0.161***	-0.141***	-0.140***	-0.170***	-0.158
	(-4.10)	(-3.84)	(-3.35)	(-3.34)	(-5.05)	(-1.28)
getSep	-0.182***	-0.121**	-0.121**	-0.121**	-0.177***	-0.108
	(-4.80)	(-2.50)	(-2.49)	(-2.50)	(-4.64)	(-1.36)
Divorced	0.054**	0.039	0.062	0.062	0.016	0.071
	(2.17)	(1.22)	(1.95)	(1.95)	(0.63)	(0.61)
getDiv	-0.067**	-0.051	-0.052	-0.052	-0.058	-0.042
	(-2.17)	(-1.26)	(-1.29)	(-1.29)	(-1.87)	(-0.54)
Widowed	-0.356***	-0.373***	-0.368***	-0.370***	-0.427***	-0.331***
	(-12.11)	(-9.93)	(-9.80)	(-9.83)	(-14.56)	(-2.90)
Nkid	0.098***	0.104***	0.105***	0.105***	0.108***	0.163***
	(17.91)	(14.98)	(15.07)	(15.08)	(20.06)	(10.80)
nEdYear	0.010***	0.008	0.009**	0.009**	0.007	-0.002
	(2.99)	(1.83)	(2.08)	(2.04)	(2.03)	(-0.18)
Owner	0.087***	0.092***	0.091***	0.091***	0.073***	0.089***
	(8.66)	(7.30)	(7.26)	(7.26)	(7.19)	(3.41)
HospStay	-0.135	-0.140***	-0.134***	-0.134***	-0.135***	-0.213***
	(-18.19)	(-14.72)	(-14.09)	(-14.09)	(-18.01)	(-16.35)
OccupDis	-0.335***	-0.357***	-0.345***	-0.347***	-0.337***	-0.312***
	(-29.27)	(-25.47)	(-25.03)	(-24.88)	(-28.94)	(-19.18)
Retired		0.013		0.015	0.027	0.080***
		(0.77)		(0.87)	(1.88)	(4.36)
f(RA)					0.255***	0.181**
					(3.22)	(2.15)
RTI			0.229***	0.229***		
			(30.95)	(30.95)		

Table 4. The effect of relational goods on Life Satisfaction: GSOEP, 1984 – 2007 (ordered probit regression with Mundlak correction) (follows)

Variable	Base	Base Retired	Base RTI	Base Retired RTI	Fuzzy Retired	Fuzzy Retired Turn Around
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Dummy for 1992	0.044	0.015	0.045	0.045	0.096	0.135
	(2.75)	(0.92)	(2.75)	(2.74)	(7.27)	(5.44)
Age Categories	Yes	Yes	Yes	Yes	Yes	Yes
Mundlak correction terms	Yes	Yes	Yes	Yes	Yes	Yes
Constant						
Intercept term 1	-0.477	-0.516	-0.679	-0.664	0.032	0.196
	(-5.28)	(-5.17)	(-7.03)	(-6.77)	(0.28)	(1.13)
Intercept term 2	-0.155	-0.181	-0.343	-0.328	0.354	0.531
	(-1.73)	(-1.83)	(-3.57)	(-3.36)	(3.07)	(3.07)
Intercept term 3	0.319	0.298	0.140	0.154	0.828	1.007
	(3.56)	(3.02)	(1.46)	(1.59)	(7.19)	(5.84)
Intercept term 4	0.822	0.805	0.650	0.665	1.331	1.524
	(9.18)	(8.18)	(6.82)	(6.86)	(11.57)	(8.84)
Intercept term 5	1.228	1.210	1.056	1.071	1.736	1.962
	(13.71)	(12.29)	(11.08)	(11.06)	(15.09)	(11.38)
Intercept term 6	2.040	2.026	1.875	1.890	2.545	2.880
	(22.77)	(20.57)	(19.67)	(19.50)	(22.11)	(16.70)
Intercept term 7	2.565	2.553	2.403	2.418	3.071	3.447
	(28.63)	(25.91)	(25.19)	(24.94)	(26.67)	(19.98)
Intercept term 8	3.402	3.393	3.244	3.259	3.909	4.285
	(37.94)	(34.39)	(33.96)	(33.57)	(33.93)	(24.81)
Intercept term 9	4.692	4.688	4.540	4.554	5.200	5.650
	(52.19)	(47.36)	(47.37)	(46.77)	(45.05)	(32.63)
Intercept term 10	5.595	5.596	5.447	5.462	6.103	6.516
	(62.108)	(56.37)	(56.66)	(55.91)	(52.80)	(37.55)
Observations	241938	155468	155473	155468	238590	75998
Log likelihood	- 407413.3	-265596	-265127.65	-265119.59	-401462.89	-126994.87

***Note*: *Z* – statistics are in parenthesis, stars for significance levels : **<5%, ***<1%.**

Mundlak correction terms are the averages over time of the socio demographic variables. *f(RA)* is the age retirement function: share of the retired individuals for each individual age observation. Turn around: individuals aged from 50 to 70.

References

Alesina A.F., Glaeser, E. L. and Sacerdote, B. (2005). Work and Leisure in the U.S. and Europe: Why So Different? NBER Macroeconomics Annual 2005, Volume 20

Anderson, T. W., and Rubin, H. (1949). Estimation of the parameters of a single equation in a complete system of stochastic equations. Annals of Mathematical Statistics 20, 46–63.

Antoci A., Sacco P.L. and Vanin P. (2007). Social capital accumulation and the evolution of social participation. Journal of Socio-Economics, 36 (1), 128–143.

Aslam, A. and Corrado, L., 2007. No Man is an Island, the Inter-personal Determinants of Regional Well-Being in Europe, Cambridge Working Papers in Economics 0717, Faculty of Economics, University of Cambridge.

Bardsley, N. and Sugden, R. (2006). Human nature and sociality in economics. Handbook on the Economics of Giving, Reciprocity and Altruism, Volume 1, Pages 731-768.

Bartolini, S., Bilancini, E., and Pugno, M. (2009). American Decline in Social Capital and Happiness. Is there a Linkage?, mimeo University of Siena

Becchetti, L., Pelloni, A. and Rossetti, F. (2008). Happiness and sociability. Kyklos, 61 (3), 343–63.

Blanchard, O. (2006). European unemployment: the evolution of facts and ideas. Economic Policy, 21 (45), 5–59.

Blanchflower, D. G. And Oswald, A. J. (2004). Well-being over time in Britain and the USA. Journal of Public Economics, 88 (7-8),1359–1386.

Blanchflower, D. G. and Oswald, A. J. (2008). Is Well-Being U-shaped over the life cycle? Social Science and Medicine, 66 (8),1733–1749.

Borsch-Supan, A. and Wilke, C.B. (2004). The German Public Pension System: How it Was, How it Will Be, NBER Working Paper W10525

Bruni, L. and Stanca, L. (2008). Watching alone: Relational Goods, Television and Happiness. Journal of Economic Behavior and Organization, 65(3-4), 506–528.

Burda, M., Hamermesh D. and, Weil, P. (2008). The Distribution of Total Work in the US and EU. In Boeri, T., Burda, M., and Kramarz, F. (eds.). Are Europeans Lazy or Americans Crazy? Oxford, Oxford University Press.

Clark, A.J. (2007) Born To Be Mild? Cohort Effects Don't (Fully) Explain Why Well-Being Is U-Shaped in Age, Iza Discussion Paper 3170.

Clark, A.J., Frijters, P. and Shields, M. (2008). Relative Income, Happiness and Utility: An Explanation for the Easterlin Paradox and Other Puzzles, Journal of Economic Literature, Vol.46, no.1, pp.95-144.

Clark, A.E. and Oswald, A. J. (1994). Unhappiness and unemployment, Economic Journal, 104 (424), 648-59.

Clark, A.J. and Oswald, D.G. (2004). Well-being over time in Britain and the USA. Journal of Public Economics, 88 (7-8),1359-1386.

Corneo, G. (2005). Work and television. European Journal of Political Economy, 21 (1),99–113.

Davidson, R. and MacKinnon, J. G. (1993). Estimation and Inference in Econometrics. Oxford University Press.

Di Tella, R., Mac Culloch, R. and Oswald, A. (2001). Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness. American Economic Review, 91 (1), 335-341.

Di Tella, R., Mac Culloch, R. and Oswald, A. (2003). The Macroeconomics of Happiness, Review of Economics and Statistics, 85 (4), 809–827.

Diener, E. and Seligman, M.E.P. (2004). Beyond Money. Psychological Science in the Public Interest, 5 (1), 1-31.

Ferrer-i-Carbonell, A. and Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness? Economic Journal, 114 (497), 641–659.

Frey, B. S. (2008) Happiness. A Revolution in Economics, Cambridge, Mass. London England. MIT Press.

Frey, B. S., Luechinger, S., Stutzer, A. (2004). Valuing Public Goods: The Life Satisfaction Approach. CESifo Working Paper Series No. 1158.

Frey, B.S., Benesch, C., Stutzer, A. (2007). Does watching TV make us happy? Journal of Economic Psychology, 28 (3), 283–313.

Frey, B.S., Luechinger, S., Stutzer, A. (2007). Calculation tragedy: assessing the costs of terrorism. Journal of Economic Surveys, 21 (1), 1–24.

Frey, B.S., Stutzer, A. (2006a). Does marriage make people happy, or do happy people get married? Journal of Socio – Economics, 35 (2), 326–347.

Frey, B.S., Stutzer, A. (2006b). What Happiness Research Can Tell Us About Self-Control Problems And Utility Misprediction, IEW - Working Papers 267.

Frijters, P., Beatton, T. (2008). The mystery of the U-shaped relationship between happiness and age, National Centre for Econometric Research Working Paper Series No.26.

Gallie, D. , Russell, H. (1998). Unemployment and Life Satisfaction: A Cross-Cultural Comparison, Archives Européennes de Sociologie XXXIX, 248–280.

Gui, B. (1987). Éléments pour une definition d'économie communautaire, Notes et Documents de l'Institut International Jacques Maritain 19/20.

Gui, B. (1996). On "relational goods": strategic implications of investment in relationships. International Journal of Social Economic, 23,260–278.

Gui B. (2005). From transactions to encounters. The joint generation of relational goods and conventional values. in Gui, B. & Sugden, R. (Ed.) (2005). Economics and Social Interaction: Accounting for Interpersonal Relations. Cambridge: Cambridge University Press.

Haisken-DeNew, J. P, Hahn, M. (2006). PanelWhiz: A Menu-Driven Stata/SE Interface for Accessing Panel Data. mimeo, www.panelwhiz.eu

Helliwell, J. F. (2006). Well-Being, Social Capital and Public Policy: What's New? Economic Journal, 116 (510), C34-C45.

Helliwell, J.F., Putnam, R. D. (2004). The social context of well-being. Philosophical Transactions, 359 (1449), 1435–1446.

Jenkins, S.P., Osberg, L. (2003). Nobody to Play with?: The Implications of Leisure Coordination. Discussion Papers of DIW Berlin 368, DIW Berlin, German Institute for Economic Research.

Johnson, D. R., Wu, J. (2002). An empirical test of crisis, social selection, and role explanations of the relationship between marital disruption and psychological distress: A pooled time-series analysis of four-wave panel data. Journal of Marriage and the Family, 64, 211–224.

Kroh, M., Spieß, M. (2008). Documentation of Sample Sizes and Panel Attrition in the German Socio Economic Panel (SOEP) (1984 until 2007). Data Documentation 39. DIW Berlin.

Krueger, Alan B. and Schkade, David A., (2008). The reliability of subjective well-being measures, Journal of Public Economics, Elsevier, vol. 92(8-9), 1833-1845.

Meier, S., Stutzer, A. (2008). Is Volunteering Rewarding in Itself? Economica, 75 (297), 39–59.

Merz, J. Osberg, L. (2006). Keeping in Touch - A Benefit of Public Holidays. Working Papers 37, ECINEQ, Society for the Study of Economic Inequality.

Moore, S., Shepherd, J. P. (2006). The cost of fear: shadow pricing the intangible costs of crime. Applied Economics, 38, 293–300.

Mundlak, Y. (1978). On the Pooling of Time Series and Cross Section Data. Econometrica, 46 (1), 69–85.

Powdthavee, N. (2008). Putting a price tag on friends, relatives, and neighbours: Using surveys of life satisfaction to value social relationships, Journal of Socio – Economics, 37 (4),1459 –1480.

Prescott, E.C. (2004). Why do Americans work so much more than Europeans? Quarterly Review, Federal Reserve Bank of Minneapolis, issue Jul, 2–13.

Putnam, R. (2000). Bowling Alone: the Collapse and Revival of the American Community. New York: Publisher Simon & Schuster.

Randon, E., Bruni, L. and Naimzada, A.(2008). Dynamics of relational goods, International Review of Economics, Volume 55, Numbers 1-2, 113-125(13)

Stevenson B. and Wolfers, J. (2008) Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox. Brookings Papers on Economic Activity, 95–100.

Stock, J.H., Wright, J.H., Yogo, M. (2002). A survey of Weak Instruments and Weak Identification in Generalized Method of Moments. Journal of Business and Economic Statistics, 20 (4), 518 – 528.

Stock, J.H., and Yogo, M. (2005). Testing for Weak Instruments in Linear IV Regressions. in Andrews, D.W.K. and Stock, J.H. (eds.). Identification and Inference in Econometric Models: Essays in Honor of Thomas. J. Rothenberg. Cambridge University Press.

Uhlaner, C.J. (1989). Relational Goods and Participation: Incorporating Sociability into a Theory of Rational Action. Public Choice Journal, 62 (3), 253–285.

Van Landeghem, B.G.M. (2008). Human Well-Being over the Life Cycle: Longitudinal Evidence from a 20 -Year Panel. LICOS Centre for Institutions and Economic Performance, Discussion Paper 213/2008.

Van Praag, B. M. S., Baarsma, B. E. (2005). Using Happiness Surveys to Value Intangibles: The Case of Airport Noise. Economic Journal, 115 (500), 224–246.

Welsch, H. (2002). Preferences over Prosperity and Pollution: Environmental Valuation based on Happiness Surveys. Kyklos, 55 (4), 473-494.

Welsch, H. (2006). Environment and happiness: Valuation of air pollution using life satisfaction data. Ecological Economics, 58 (4), 801– 813.

Wagner, G. G., Frick, J. R., and Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements. Schmollers Jahrbuch (Proceedings of the 7th International Socio-Economic Panel User Conference (SOEP 2006), ed. by Ferrer-i-Carbonell, A.; Grabka, M. M. and Kroh, M.), 127 (1), 139-169.

Wooldridge, J. (2002). Econometric Analysis of Cross Section and Panel Data. Cambridge: MIT Press.

Appendix

Table A1. Summary statistics and variable description

Variable		Mean	Std. Dev.	Min	Max	Observations
LifeSat	*individual response to the question about overall life satisfaction on a scale from 0 (completely dissatisfied) to 10 (completely satisfied)*					
	overall	6.998687	1.843842	0	10	N = 359414
	between		1.497601	0	10	n = 45116
	within		1.298756	-2.155159	14.73782	T-bar = 7.96644
Age	*age of respondent*					
	overall	44.92886	17.27107	16	99	N = 360659
	between		18.11675	16.5	98.5	n = 45167
	within		4.501839	23.59553	73.72886	T-bar = 7.98501
lgERHInc	*logarithm of the real household income post government tax computed using the OECD equivalence scale which gives a value of 1 to the first household member, of 0.7 to each additional adult and of 0.5 to each child*					
	overall	5.71935	0.7368481	-0.2812348	10.31859	N = 450670
	between		0.6779744	2.535179	9.872525	n = 56284
	within		0.3958774	0.5154164	8.936131	T-bar = 8.00707
Unemp	*dummy for being registered as unemployed the previous year*					
	overall	0.0663784	0.2489427	0	1	N = 353323
	between		0.1822691	0	1	n = 44888
	within		0.1955424	-0.8780661	1.024712	T-bar = 7.87121
lossjob	*dummy for becoming unemployed during the previous year*					
	overall	0.0316941	0.1751847	0	1	N = 301034
	between		0.1041184	0	1	n = 37869
	within		0.1599804	-0.6349726	0.9882158	T-bar = 7.94935
Emp	*dummy for employment status, which takes the value of 1 if the individual is full-time employed. The base category is composed by the remaining employment status options: regular part time employment, vocational training, marginal employed, near retirement or zero working hours, military service, community service, disabled employed, not employed.*					
	overall	0.4346967	0.4957178	0	1	N = 360709
	between		0.4307905	0	1	n = 45180
	within		0.2879888	-0.5236367	1.39303	T-bar = 7.98382
WestDT	*dummy for living in a Federal Land of the former West Germany*					
	overall	0.7934599	0.404823	0	1	N = 521763
	between		0.3974125	0	1	n = 57832
	within		0.0676256	-0.1648735	1.737904	T-bar = 9.02205
Married	*dummy for being married*					
	overall	0.6253467	0.4840339	0	1	N = 360907
	between		0.4665301	0	1	n = 45167
	within		0.2137265	-0.3329866	1.58368	T-bar = 7.9905
getMar	*dummy for becoming married*					
	overall	0.0159117	0.125134	0	1	N = 310590
	between		0.0690619	0	1	n = 38498
	within		0.1171187	-0.4840883	0.9724334	T-bar = 8.06769

Table A1. Summary statistics and variable description (follows)

Variable		Mean	Std. Dev.	Min	Max	Observations
Separated	*dummy for being separated*					
	overall	0.0155303	0.1236494	0	1	N = 360907
	between		0.0948185	0	1	n = 45167
	within		0.0991693	-0.8935606	0.9738637	T-bar = 7.9905
getSep	*dummy for becoming separated*					
	overall	0.0067066	0.0816188	0	1	N = 310590
	between		0.0474313	0	1	n = 38498
	within		0.0757366	-0.4932934	0.9632283	T-bar = 8.06769
Divorced	*dummy for being divorced*					
	overall	0.0632601	0.2434305	0	1	N = 360907
	between		0.2137163	0	1	n = 45167
	within		0.1224026	-0.8950733	1.021593	T-bar = 7.9905
getDiv	*dummy for becoming divorced*					
	overall	0.0062365	0.0787251	0	1	N = 310590
	between		0.0472064	0	1	n = 38498
	within		0.0732374	-0.4937635	0.9627583	T-bar = 8.06769
Widowed	*dummy for being widoved*					
	overall	0.0634568	0.2437831	0	1	N = 360907
	between		0.2347744	0	1	n = 45167
	within		0.0958456	-0.8948765	1.02179	T-bar = 7.9905
NKid	*the number of children in the household*					
	overall	0.9414802	1.143354	0	10	N = 474284
	between		1.053981	0	8.285714	n = 57832
	within		0.578876	-6.915663	6.864557	T-bar = 8.20107
nEdYear	*years devoted to education*					
	overall	11.47531	2.581218	7	18	N = 348398
	between		2.566649	7	18	n = 43253
	within		0.7195988	2.040526	20.04674	T-bar = 8.05489
Owner	*dummy for being tenant or owner of the dwelling*					
	overall	0.4565155	0.498106	0	1	N = 477515
	between		0.4607174	0	1	n = 57832
	within		0.2329825	-0.5018178	1.414849	T-bar = 8.25693
HospStay	*a dummy for overnight stay in hospital during the previous year*					
	overall	0.1185592	0.3232696	0	1	N = 330046
	between		0.2066107	0	1	n = 44525
	within		0.283803	-0.8147741	1.073105	T-bar = 7.4126
OccupDis	*dummy for being unable to work or severely handicapped*					
	overall	0.1118429	0.3151736	0	1	N = 297158
	between		0.270461	0	1	n = 41574
	within		0.1618354	-0.8355256	1.059211	T-bar = 7.14769

Table A1. Summary statistics and variable description (follows)

Variable		Mean	Std. Dev.	Min	Max	Observations
RTI	*Relational Time Index, values: 0 "Never" 1 "Less Frequent" 2 "Every Month" 3 "Every Week"*					
	overall	1.001114	0.5912067	0	3	N = 228163
	between		0.5140423	0	3	n = 41578
	within		0.3546132	-1.158261	3.201114	T-bar = 5.48759
Age17_19	*dummies for age group : 3 years*					
	overall	0.0501915	0.2183401	0	1	N = 360659
	between		0.2470165	0	1	n = 45167
	within		0.1554439	-0.7498085	1.008525	T-bar = 7.98501
Age20_22	overall	0.0505796	0.219138	0	1	N = 360659
	between		0.1708795	0	1	n = 45167
	within		0.1813263	-0.7494204	1.008913	T-bar = 7.98501
Age23_25	overall	0.051514	0.2210441	0	1	N = 360659
	between		0.1598536	0	1	n = 45167
	within		0.1891186	-0.748486	1.009847	T-bar = 7.98501
Age26_28	overall	0.053308	0.2246472	0	1	N = 360659
	between		0.147811	0	1	n = 45167
	within		0.1960994	-0.696692	1.011641	T-bar = 7.98501
Age29_31	overall	0.055845	0.2296225	0	1	N = 360659
	between		0.1466251	0	1	n = 45167
	within		0.2026881	-0.694155	1.014178	T-bar = 7.98501
Age32_34	overall	0.058773	0.2351996	0	1	N = 360659
	between		0.1479322	0	1	n = 45167
	within		0.2086298	-0.691227	1.017106	T-bar = 7.98501
Age35_37	overall	0.0614098	0.2400808	0	1	N = 360659
	between		0.1507323	0	1	n = 45167
	within		0.2129521	-0.7385902	1.019743	T-bar = 7.98501
Age38_40	overall	0.0612739	0.2398325	0	1	N = 360659
	between		0.1500635	0	1	n = 45167
	within		0.2127596	-0.6887261	1.019607	T-bar = 7.98501
Age41_43	overall	0.0596852	0.236903	0	1	N = 360659
	between		0.1496233	0	1	n = 45167
	within		0.2097725	-0.7403148	1.018019	T-bar = 7.98501
Age44_46	overall	0.0575863	0.2329597	0	1	N = 360659
	between		0.1487377	0	1	n = 45167
	within		0.2061942	-0.6924137	1.01592	T-bar = 7.98501
Age47_49	overall	0.0547581	0.2275078	0	1	N = 360659
	between		0.1419028	0	1	n = 45167
	within		0.2012445	-0.6952419	1.013091	T-bar = 7.98501
Age50_52	overall	0.0516333	0.2212858	0	1	N = 360659
	between		0.1412822	0	1	n = 45167
	within		0.1952639	-0.6983667	1.009967	7.98501
Age53_55	overall	0.0479844	0.2137335	0	1	N = 360659
	between		0.1353563	0	1	n = 45167
	within		0.1886515	-0.7020156	1.006318	T-bar = 7.98501

Table A1. Summary statistics and variable description (follows)

Variable		Mean	Std. Dev.	Min	Max	Observations
Age56_58	overall	0.0454252	0.2082351	0	1	N = 360659
	between		0.1293696	0	1	n = 45167
	within		0.1843189	-0.7045748	1.003759	T-bar = 7.98501
Age59_61	overall	0.0436063	0.2042178	0	1	N = 360659
	between		0.1331331	0	1	n = 45167
	within		0.179259	-0.7063937	1.00194	T-bar = 7.98501
Age62_64	overall	0.0417846	0.2000969	0	1	N = 360659
	between		0.1274496	0	1	n = 45167
	within		0.1751416	-0.7082154	1.000118	T-bar = 7.98501
Age65_67	overall	0.0372429	0.1893568	0	1	N = 360659
	between		0.1217941	0	1	n = 45167
	within		0.164972	-0.7127571	0.9955763	T-bar = 7.98501
Age68_70	overall	0.0301809	0.1710849	0	1	N = 360659
	between		0.1119404	0	1	n = 45167
	within		0.14869	-0.7198191	0.9885142	T-bar = 7.98501
Age71_73	overall	0.024849	0.1556649	0	1	N = 360659
	between		0.1059698	0	1	n = 45167
	within		0.1339598	-0.725151	0.9831823	T-bar = 7.98501
Age74_76	overall	0.0202463	0.1408418	0	1	N = 360659
	between		0.0994959	0	1	n = 45167
	within		0.1201694	-0.7297537	0.9785796	T-bar = 7.98501
Age77_79	overall	0.0159264	0.125191	0	1	N = 360659
	between		0.0932999	0	1	n = 45167
	within		0.1056717	-0.7340736	0.9742597	T-bar = 7.98501

Note: N is the total number of observations; n is the total number of individuals; T is the number of waves.