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We study the effect of relational goods on life satisfaction. We consider that retirement is an event after which the time investable in personal relationships increases so we instrument social life, which we suspect of being endogenous, with the sample proportion of retired by year. With such approach we document that relational goods have a positive and significant effect on life satisfaction. [JEL Classification: I 30, D61 A11, A13].

Keywords: life satisfaction, relational goods, social capital.

1. - Introduction

The happiness literature is one of the most rapidly growing areas of the itself expanding intersection between economics and psychology (see Clark et al., 2008 and Frey 2008). This literature shows that subjective well-being can be measured with reliability and validity, using relatively simple self-rating questions about 'happiness' and 'life satisfaction'.[1]

To be sure, well-being has been seen as the ultimate goal of human endeavours in a long tradition of thought from Aristotle to John Stuart Mill. The fact that economic indicators like GDP growth have traditionally been singled out as a measure for good policymaking can be at least partly explained by the assumption that they are a reasonable approximation to well-being at the individual and societal levels. However, at least in today's developed countries, money does not

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[1] Generally speaking, self-ratings of 'happiness' turn out to reflect relatively short-term, situation- dependent expressions of mood, whereas self-ratings of 'life satisfaction' appear to measure longer-term, more stable evaluations, but both have been shown to produce broadly consistent findings.

appear to be a good proxy for welfare any longer: this is the famous Easterlin paradox, one of the most striking and debated results in the happiness literature[2].

One of the limits of GDP as a measure for welfare is that it cannot reckon with anything that individuals provide to themselves or others for free, for instance home- work, voluntary work or leisure.[3]

Gratuitousness is a defining property of non instrumental social relationships or "relational goods'', a concept introduced almost simultaneously by Gui (1987), Nussbaum (1986) and Uhlaner (1989) to describe the expressive/affective side of social interactions, for instance time spent with friends and family, in meetings of associations or communities etc. The above mentioned property implies the impact on welfare of this kind of activities is not captured by GDP figures, even if there is evidence that they are essential for psychological well being.

The Life Satisfaction Approach has been used to evaluate many goods (and bads) for which the realm of monetized exchange expresses no metric, from the environment to terrorism. Indeed with reported subjective well-being as a proxy measure for utility, all public goods can be directly evaluated in utility term.

In the case of relational goods this has been done by Aslam and Corrado (2007), Bartolini et al. (2009), Becchetti et al. (2008), Bruni and Stanca (2008), Helliwell and Putnam (2004), Meier and Stutzer (2008) and Powdthavee (2008). All these works confirm that relational goods consumption is positively associated with SWB.

[2] See Easterlin (1974). For recent contrary evidence see Stevenson and Wolfers (2008).

[3] A first reaction to the use of economic data as the only measure of well-being led to the Human Development Index, combining normalized measures of life expectancy, educational attainment, and GDP per capita for countries worldwide. More recently, the building of indicators offering a comprehensive picture of how our world is really performing is the focus of the OECD Global Project on Measuring the Progress of Societies and of the closely linked "Commission on the Measurement of Economic Performance and Social Progress" launched in 2008 by French President Nicolas Sarkozy chaired by Joseph Stiglitz and including the other four Nobel laureates, Kenneth Arrow, James Heckman, Daniel Kahneman and Amartya Sen.

An important question not yet settled in this literature is whether the direction of causality goes from sociality to well-being or the other way round: this paper aims at assessing whether relational goods can be said to induce happiness rather than simply associate with it.

The problem of causality is pervasive in all fields of economics and the happiness literature is no exception: some of us just have a happier personality, which makes estimation of causal effects on wellbeing more difficult. To provide just an example: the observed positive relationship between marriage and life satisfaction may depend on the higher probability for individuals with a happier nature of finding the right partner.

One way to deal with such endogeneity issues is the use of longitudinal data. We work with data from the German Socio Economic Panel (GSOEP) which follows a large sample of individuals from 1984 to 2007, providing information on a very wide range of variables one of which is life satisfaction.[4]

In fact, having repeated observations on the same individuals makes it possible to neutralize all the unobserved personal heterogeneity among them, provided the heterogeneity is not time-varying. Becchetti et al. (2008), using GSOEP data, and Powdathvee (2008) using British data (BHPS) both show that the positive association between happiness and social contacts is robust to the elimination of fixed personality traits.

However, it is very likely that transitory components in our well-being have effects on our consumption of relational goods: for instance, social withdrawal is a common symptom of psychological depression. This kind of covariance between error and regressor cannot be circumvented by the use of time-demeaned data. We have to resort instead to instrumental variable estimation.

To find a good instrument in the case at hand is particularly challenging because, besides respecting the usual instrument requirements of relevance (correlation with the troublesome

[4]The GSOEP is 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).

explanator, in our case social leisure) and validity (no influence on the dependent variable but through the explanator) we must restrict our search to time varying variables since, for the reasons given above, we do not want to give up fixed effect estimation.

The instrument we use is the ratio of retired individuals in our sample, by gender, year, and region of residence (East vs West Germany). The rationale behind our choice is that when someone retires he/she will have more time to spend with others, so making their relational life easier, as we will see in the next section. Indeed our indicator of relational goods consumptions turns out to be strongly correlated with this ratio.

To give a preview of our results we confirm that the consumption of relational goods has a remarkable and robust effect on happiness. While relational goods cannot directly be produced by the state, a vast range of policies from urban planning to labour market institutions may influence their consumption. The implications for public action of our findings are therefore potentially vast.

The paper contains four sections, besides the current one. The next section relates our work to the existing theoretical and empirical literature, the third presents some descriptive statistics while the fourth reports on our econometric analysis and results. The fifth section concludes.

2. - An Overview of the Literature on Relational Goods

Personal interactions qualify as relational goods if they are intrinsically rather than extrinsically motivated, i.e. if the interaction is not a means to an end but an end in itself. [5] Several investigators among psychologists have documented the impact of such relationships on life satisfaction. To quote Cacioppo et al.(2008): "individual difference in happiness appear to be solidly anchored in the invisible threads of connection to others''. Self-determination theory (SDT) maintains that people are naturally inclined to seek close and intimate relationships and to work toward a sense of belonging within social groups. In fact, according to SDT the need for relatedness—that is, caring for and feeling cared for —is one of the three basic psychological needs of human beings.[6]

Even though a tendency toward more realism in behavioural assumptions in economics has certainly being gaining momentum recently, human relationships do not generally appear as arguments in the standard utility function and are therefore not taken into account when evaluating policies. However the economic structure of society has an obvious influence on their consumption, and the evidence on the qualitative importance of relational goods for wellbeing in the psychological literature suggests that it could be important for welfare analysis of economic policies to gauge their quantitative impact.

Bruni and Zamagni (2004) and Bruni(2006) argue that political economy in the 18th century was the science of public happiness in general, only later to become the science of material wealth and finally, with the neoclassical thinkers, the science of rational choice, focusing on means and

[5] To be precise according to Gui (1987) and Uhlaner (1989), relational goods are the outcomes of a relationship, not the relationship itself: for instance a friendship consists of repeated meetings during which relational goods, such as sense of closeness etc., are produced. Bruni(2008) proposes to consider them emerging facts: relational goods ''emerge'' within a relationship. See also Gui (2005).

[6] The other two basic needs are the need for competence, i.e. the ability to manipulate the environment, and the need for autonomy, i.e. the ability to choose. See Vansteenkiste et al. (2008)

indifferent to ends of human activity. In this way relational goods gradually disappeared from the domain of economics.[7]

Their reintroduction in this domain starts with Gui (1987) and Ulhaner (1989) according to whom relational goods are a *specific kind of local public goods.* They are local *public* goods because an agent's consumption of those goods increases with the amount of time both the agent and his/her partners devote to socializing. Indeed, the fact that, by definition, they cannot be consumed by a single agent makes them better defined as *anti-rival* than as simply non rival.

Since the motivations of the people involved cannot be instrumental they cannot be produced by paid work (either in the public or private sector). As a consequence they do not have a price and a metric capturing their contribution to welfare has to be developed.

Under the joint assumptions of absence of market imperfections and of individual rationality the metric could be given by the opportunity cost of consuming them, for instance the cost represented by working shorter hours, and there would be no need of gathering information on their shadow value, as we do in this paper.

However both assumptions are problematic in general and specifically in the case of relational goods. The absence of market imperfections was of course contradicted by classifying relational goods as public goods. Variously articulating the premise that an individual's time allocation depends on the same allocation by others Antoci et al. (2007), Corneo (2005), Jenkins and Osberg (2003) and Randon et al. (2008) develop models in which the effect of various kinds of externalities are studied: externalities in the formation of local social networks, both when looking for partners and when cultivating skills as partners, and externalities of at a more aggregate level, as it can be more beneficial to participate in an association if there are many such associations and a public ethos encouraging such participation.

[7] Magliulo (2008) stresses that both Menger and Bohm-_Bowerk, two founding fathers of marginalism openly consider the question whether human relationships including family connections, friendship, love, religious and scientific fellowships are economic goods and give a positive answer. It is only with Wicksteed that the subject-matter of economics is reduced to the market.

A common prediction of these models is that 'relational poverty traps' may arise both for individuals and for entire societies. A further possibility of multiple, Pareto rankable equilibria arises if economic efficiency is itself influenced by relational goods, for instance because trust may be reinforced and generalised through social interactions.

Coming to the second hypothesis, the whole field of behavioural economics consists in the relaxation of the axiom of perfect rationality, according to leading figures of the field: see Camerer et al. (2003). If individual decision-making is only boundedly rational there can be systematic deviations between the ex ante judgments that precede choices and the ex post experiences that result from those choices, i.e. between decision utility and experienced utility to use the terms introduced by Kahneman (see for instance Kahneman 2000).

Particularly relevant for our purposes is that many studies report that the pursuit of materialistic values tends to associate with lower well-being and higher ill being than the goals of personal growth and good relationships: see Bauer et al. (2005), Kasser and Kanner, (2004), Kesebir and Diener (2008) and Sheldon at al. (2002), among many others.[8]

Summing up, there are reasons to doubt that in today's market societies the welfare maximizing level of socializing is attained, due to wide-spread and multi-level coordination and cognitive failures. As cultures and institutions can themselves be more or less oriented toward intrinsic versus extrinsic aspirations and goals,. evidence on what we are possibly loosing due to those failures could then be an important input to offer to the public debate.

[8] For many decades psychology was dominated by behaviorism, according to which people are largely driven by external rewards. This was gradually replaced by social-cognitive models according to which people do well whenever they feel efficacious with respect to their goals, irrespective of the contents of their goals. However the cited research suggests that investment in intrinsic goals such as self-development, affiliation, and community contribution reliably enhance well-being. In contrast, the pursuit of, and even success at, extrinsic goals such as wealth , appearance and fame do not reliably enhance wellness, and can diminish it. This evidence shed doubts on the use of preference-satisfaction as the standard of individual well-being.

3. - Descriptive Empirical Findings

The evidence described above does not allow us to know specify whether satisfying social relationships make people happy, happy people are more likely to develop satisfying relationships or a third variable (e.g. optimism) contributes to relationships and happiness.

To shed light on the issue we should isolate factors which determine an exogenous shock in individual 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, in 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 Graph 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 probability function, we observe that 50 percent of the sample get retired before 60, while 45 percent of the sample get retired between 60 and 63, as Graph 2 shows.

Graph 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 age groups there is a decline in hours worked even for the non retired.

To start our analysis we 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

[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.

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 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 (Graph 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

[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.

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 Graph 6). Average leisure 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 a 95 percent level of confidence.

To sum 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 retirement and 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 ‘‘usual suspects’’ 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 as a proxy for wealth,[11] as well as changes in employment and marital status. We also include time dummies and age categories. Many papers enter terms in age and age squared in happiness regressions (see again Frijters and Beatton 2008 or Blanchflower and Oswald 2008). However we prefer not to impose a rigid functional form on age and following Clark (2007) and Van Landeghem (2008), we use instead dummies representing age-bounded categories. Each age category comprises 3 years: 17-19, 20-22 . . . 77-79, and the omitted

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

category is the age group containing individuals in their eighties. The biggest advantage in doing so is that we can then enter year dummies in the regression, which would be impossible if we also entered a linear term in age, because the regressors would be perfectly collinear, when time-demeaned. Year dummies capture aggregate shocks to macroeconomic performance, political events etc. whose influence can be important so that excluding them would cause serious omitted variable bias. In the case of Germany, given the historical change the country underwent in the reunification years, this problem is particularly serious.

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.

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), while the happiness- age relationship is U-shaped, also a common finding, as already mentioned.

A distinctive element with respect to most papers in the literature is our use of equivalised household income computed following the OECD equivalence scale,[12] together with the number of children.

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 explanation 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

[12] 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".

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. This is the premise of the identification strategy described in the next sub-section.

4.1 *Tackling the Endogeneity Problem: the IV Estimates*

We observed that our estimates of the coefficient of the relational time indicator are 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).

However, to repeat, the direction of causality could run from time-demeaned subjective well being to time-demeaned intensity of social contacts. this is why we run a within group instrumental variable (IV) regression: the results are presented in Table 1, column 5 – 6.

Retirement can be conceived as a sort of positive shock to the individual production function of relational leisure. However we do not use individual retirement per se as an instrument because our analysis in section 3 strongly suggests that an exclusion restriction for this variable is not possible. However due to the complementarities and externalities in leisure, sketched in section 2, the amount of socializing depends not only on the individual time availability but also on the time availability of his actual and potential partners. But then retirement can be conceived as a positive shock not only for the production function of relational leisure of those who retire but also for the production function of relational leisure of others. Therefore, we adopt as instrumental variable the proportion of people retired according to their gender and residence (East or West Germany) in each year. This proportion is generated from the SOEP sample. Given the large number of observations available we are quite confident that the sample statistics does conveniently

approximate the national statistics. Moreover this proportion is not influenced by the individual status of being retired because during the variable design we excluded the individual information.

Our unique instrument is strongly correlated with time variations at the individual level of RTI so that it is very relevant in predicting our endogenous regressor: our guess that retirement increases socializing not only of the retired is confirmed by the data.

At the same time there are good arguments for its validity, i.e. its lack of correlation with the structural equation error. In a just identified model as our own, it is impossible to test for this condition. The plausibility of our instrument has to come from intuition instead. We also recall that in a just identified model estimates are median unbiased. We argue that it is reasonable that the proportion of people who are retired according to their gender and region in each year does not affect directly individual SWB (on top of one's own retirement) but only indirectly by facilitating relational leisure. We also observe that this proportion 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.

As anticipated the correlation between this variable and RTI is extremely strong (F-test for the first stage is 433.0 when we are accounting for the individual retirement; see Table 1, column 6), so we definitely do not incur in a weak instrument problem.

A test commonly performed in the presence of endogenous variables is the Anderson – Rubin (1949) test. The Anderson – Rubin (1949) statistic is a Wald test. The null hypothesis tested is that the coefficient of the endogenous regressor in the structural equation is equal to zero. The Anderson – Rubin (1949) test rejects the null hypothesis that the coefficient on the RTI indicator is zero (F – statistics is 5.29 - see Table.1, column 6).

We finally compute the Davidson – MacKinnon (1993) test of exogeneity for a fixed-effect regression estimated via instrumental variables. The null hypothesis for this test states that an ordinary least squares (OLS) estimator of the same equation would yield consistent estimates. Our F statistics is 1.53 and we cannot reject the null of exogeneity. This means that the ordinary least

squares (OLS) estimator would yield consistent estimates. In other words, the presumed endogeneity of RTI would have not deleterious effects on the OLS estimates.

To sum up, the results of this battery of tests seem to support the conclusion that increasing the consumption of relational goods does cause an increase in life satisfaction. The fixed effect IV coefficient is even higher than the fixed effect OLS coefficient.

4.2 *Robustness in Subsample Splits*

Table 2 shows that our finding replicate in different subsamples (women, men, East and West Germans, occupationally disabled[13] 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. In particular, among those who were registered as 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 ratio of retired, it remains significant across genders for the East, the employed and the not disabled subsamples.

4.3 *Robustness in Estimation Methods*

[13]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 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).

In this sub-section we want to check whether the effect of relational goods on happiness remains significant in relevant subsamples if we modify the choice on how to deal with age, time and individual fixed effects. As described above, the benchmark model is estimated with a fixed effect regression including time dummies and age categories. In Table 3a we report results for the base model + retirement , the base model +RTI and the base model + retirement +RTI with fixed effects estimation, when entering age either as age and age squared or alternatively using the same age categories seen before, but in both cases excluding time dummies so that the comparison between results is meaningful. In fact, the choice on how to model the effect of age is crucial for estimating the relationship between age itself 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.[14] 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 waves. Those were happy years for Germany, presumably because of the reunification, so that excluding year dummies from the regression biases the coefficient on age.

The coefficient on retirement is in general much higher when age and age squared are used to capture the effect of age on happiness, but the effect of relational goods is quite stable across the different within regressions.

In Table 3.b we present the pooled regression results where again we compare the two alternative 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 quadratic form and the opposite when we use age categories (negative impact).

[14] Results were not included for reasons of space but are available on request from the authors.

4.5 *Survivorship and Entry Bias*

In our analysis we use the entire SOEP dataset, including all the subsamples from A through H[15], waves 1 to 24. The dataset evolves over time because of new subsamples being introduced. In each subsample, new entrants are due to households splits (i.e., individuals who move out and form their own households) and to individuals who become part of an original household because of marriage or birth. 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 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 survivors 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 share of retired. In such a case we would in fact observe a spurious effect on the increased happiness of the elders, detected when using age categories. 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

[15] 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).

while 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 in the this age group.

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

There is ample evidence on the positive association between relational leisure and life satisfaction. However, 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.

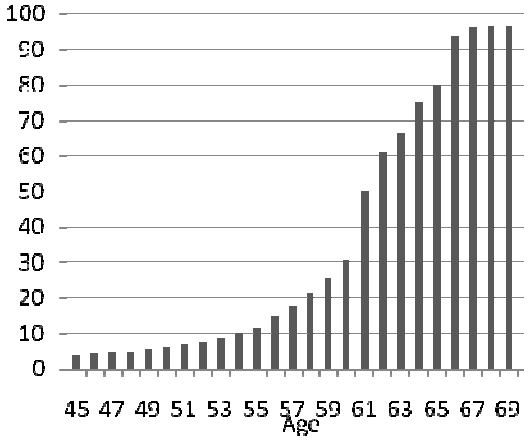
In this paper we devise a new identification approach. We consider that retirement allows individuals to invest more time in relational activities. As a consequence the social life not only of the retired may increase: in fact the correlation between our relational goods indicator and the

proportion of retired people in our sample, by year, gender and region of residence turns out to be high. On this basis, we use the ratio of retired as an instrumental variable for our social life indicators. Our findings document that relational goods have a significant effect on life satisfaction which is quite robust under different model specifications, subsamples and methods of estimation.

The individual consumption of relational goods can be influenced by public interventions in many different ways (from providing meeting places, to regulating working hours, to allowing a better coordination of leisure through public holidays etc.). The robust evidence on the shadow value of these goods that we offer in this paper could then be conducive to a better informed discourse among citizens and politicians on a wide range of problems. Indeed if the hidden negative social costs of policies aimed at maximising economic growth are not taken seriously the final result may be lower growth than optimal, if these costs prevent the policies from gaining gain voters consensus. In this respect the advice stemming from our paper is that side measures aimed at preventing such externalities are of crucial importance.

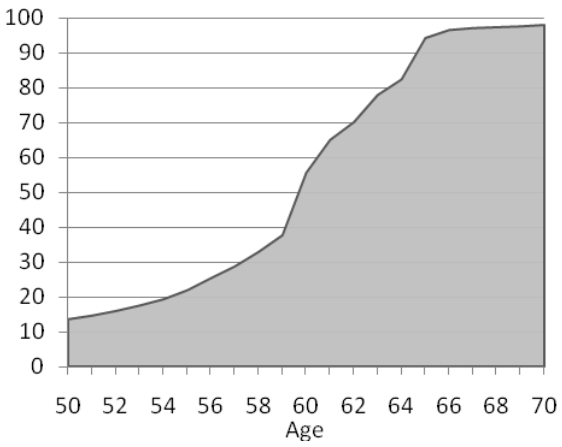
GRAPH 1

SHARE OF THE RETIRED POPULATION BY AGE IN THE GSOEP
1984 – 2007



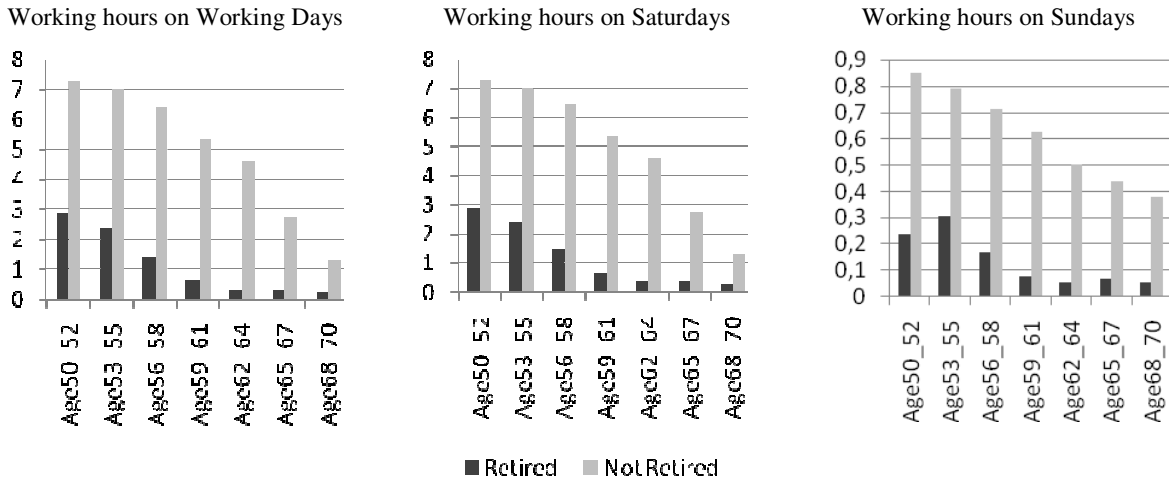
GRAPH 2

CUMULATIVE DISTRIBUTION FUNCTION OF RETIREMENT AGE IN THE GSOEP DURING THE SURVEY PERIOD



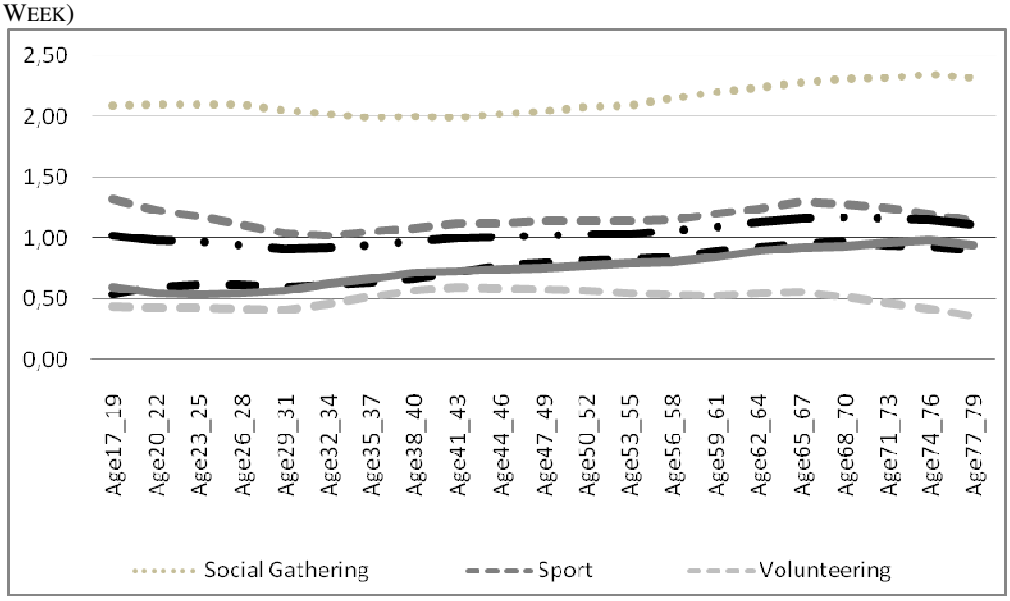
GRAPH 3

DAILY AVERAGE WORKED HOURS FOR RETIRED AND NON RETIRED INDIVIDUALS IN DIFFERENT AGE CATEGORIES (WORKING WEEK, SATURDAYS AND SUNDAYS)



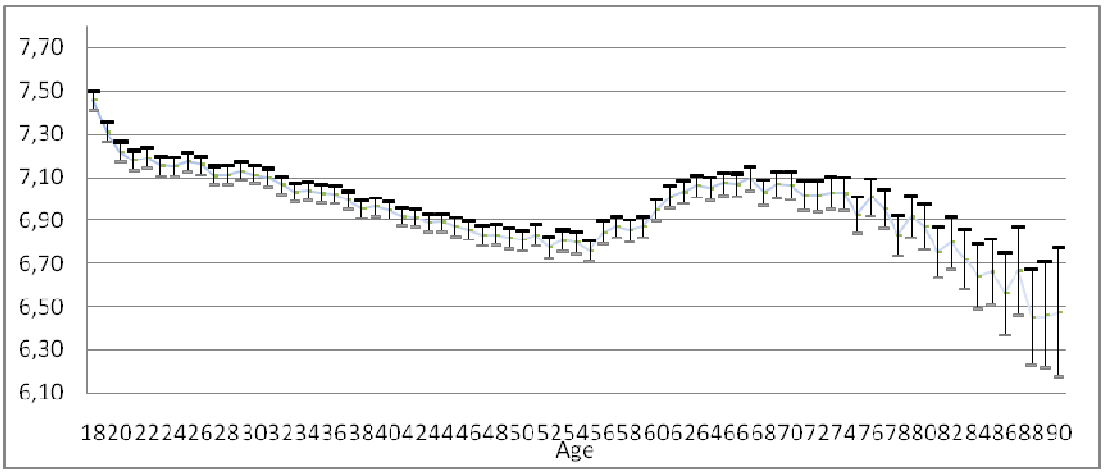
GRAPH 4

PREDICTED AGE EFFECTS ON TIME SPENT IN RELATIONAL LIFE CONTROLLING FOR SOCIO DEMOGRAPHIC VARIABLES AND TIME DUMMIES (FE ESTIMATE). RANGE ON THE VERTICAL AXIS: (0=NEVER, 1=LESS FREQUENTLY, 2=EVERY MONTH AND 3=EVERY WEEK)



GRAPH 5

AVERAGE LIFE SATISFACTION LEVELS BY AGE



GRAPH 6

AVERAGE LEISURE SATISFACTION LEVELS BY AGE

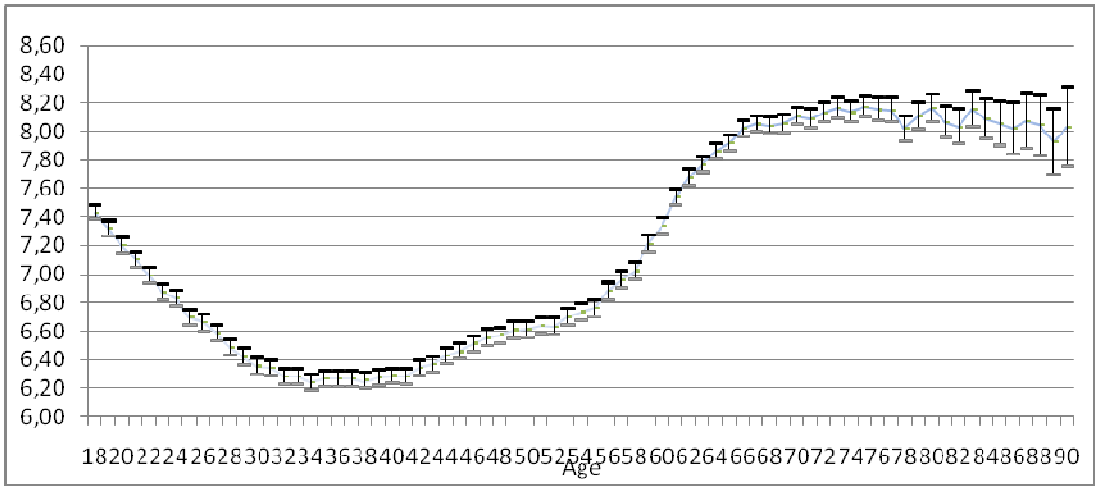


TABLE 1

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			0.210***	0.210***	0.396**	0.419**
			(0.012)	(0.012)	(0.182)	(0.182)
Retired		0.170***		0.174***		0.171***
		(0.028)		(0.032)		(0.029)
lgERHInc	0.204***	0.203***	0.217***	0.216***	0.215***	0.213***
	(0.013)	(0.013)	(0.015)	(0.015)	(0.014)	(0.014)
Unemp	-0.251***	-0.237***	-0.267***	-0.252***	-0.267***	-0.252***
	(0.021)	(0.021)	(0.024)	(0.024)	(0.022)	(0.022)
Loss job	-0.128***	-0.136***	-0.154***	-0.161***	-0.154***	-0.161***
	(0.024)	(0.024)	(0.030)	(0.030)	(0.030)	(0.030)
Emp	0.089***	0.124***	0.112***	0.148***	0.114***	0.150***
	(0.014)	(0.015)	(0.017)	(0.018)	(0.015)	(0.016)
Married	0.121***	0.125***	0.155***	0.159***	0.176***	0.182***
	(0.028)	(0.028)	(0.032)	(0.032)	(0.035)	(0.035)
getMar	0.252***	0.249***	0.225***	0.221***	0.222***	0.219***
	(0.025)	(0.025)	(0.031)	(0.031)	(0.031)	(0.031)
Separated	-0.111**	-0.108**	-0.061	-0.059	-0.040	-0.035
	(0.055)	(0.055)	(0.064)	(0.064)	(0.064)	(0.064)
getSep	-0.330***	-0.330***	-0.320***	-0.320***	-0.323***	-0.323***
	(0.059)	(0.058)	(0.077)	(0.077)	(0.076)	(0.076)
Divorced	0.078*	0.080*	0.102**	0.103**	0.125**	0.130***
	(0.045)	(0.045)	(0.050)	(0.050)	(0.049)	(0.049)
getDiv	-0.084*	-0.085*	-0.087	-0.087	-0.092	-0.093
	(0.045)	(0.045)	(0.057)	(0.057)	(0.058)	(0.058)
Widowed	0.004	-0.010	0.034	0.019	0.029	0.013
	(0.059)	(0.059)	(0.064)	(0.065)	(0.055)	(0.055)
getti	-1.143***	-1.139***	-1.158***	-1.153***	-1.142***	-1.135***
	(0.071)	(0.071)	(0.087)	(0.087)	(0.088)	(0.088)
Nkid	0.027***	0.028***	0.023**	0.024**	0.026***	0.027***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)
nEdyear	0.015***	0.014**	0.016**	0.015**	0.018***	0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Owner	0.074***	0.075***	0.074***	0.075***	0.073***	0.074***
	(0.016)	(0.016)	(0.018)	(0.018)	(0.016)	(0.016)

HospStay	-0.188***	-0.187***	-0.183***	-0.183***	-0.178***	-0.177***
	(0.011)	(0.011)	(0.013)	(0.013)	(0.014)	(0.014)
OccupDis	-0.282***	-0.293***	-0.265***	-0.278***	-0.262***	-0.273***
	(0.023)	(0.023)	(0.026)	(0.026)	(0.024)	(0.024)
WestDT	0.293***	0.293***	0.253***	0.253***	0.246***	0.245***
	(0.065)	(0.065)	(0.074)	(0.074)	(0.064)	(0.064)
Age17_19	-0.280	-0.257	-0.141	-0.117	-0.119	-0.093
	(0.212)	(0.212)	(0.256)	(0.256)	(0.254)	(0.254)
Age20_22	-0.390*	-0.369*	-0.247	-0.225	-0.223	-0.199
	(0.204)	(0.204)	(0.246)	(0.246)	(0.244)	(0.244)
Age23_25	-0.348*	-0.322*	-0.232	-0.205	-0.210	-0.180
	(0.195)	(0.195)	(0.235)	(0.235)	(0.233)	(0.233)
Age26_28	-0.322*	-0.291	-0.188	-0.157	-0.166	-0.132
	(0.186)	(0.186)	(0.224)	(0.224)	(0.222)	(0.222)
Age29_31	-0.259	-0.223	-0.127	-0.091	-0.105	-0.066
	(0.177)	(0.177)	(0.213)	(0.213)	(0.211)	(0.211)
Age32_34	-0.238	-0.199	-0.108	-0.067	-0.090	-0.048
	(0.168)	(0.168)	(0.202)	(0.202)	(0.199)	(0.199)

TABLE 1

THE EFFECT OF RELATIONAL GOODS ON LIFE SATISFACTION: GSOEP, 1984 – 2007 (FIXED EFFECTS REGRESSION) (FOLLOWS)

Age35_37	-0.204	-0.160	-0.104	-0.060	-0.093	-0.048
	(0.159)	(0.159)	(0.191)	(0.191)	(0.188)	(0.188)
Age38_40	-0.176	-0.128	-0.071	-0.022	-0.066	-0.017
	(0.150)	(0.150)	(0.180)	(0.180)	(0.176)	(0.176)
Age41_43	-0.135	-0.083	-0.057	-0.004	-0.056	-0.004
	(0.141)	(0.141)	(0.169)	(0.169)	(0.165)	(0.165)
Age44_46	-0.110	-0.054	-0.039	0.019	-0.039	0.018
	(0.133)	(0.133)	(0.158)	(0.159)	(0.154)	(0.154)
Age47_49	-0.096	-0.035	-0.048	0.014	-0.048	0.012
	(0.124)	(0.124)	(0.148)	(0.148)	(0.143)	(0.144)
Age50_52	-0.075	-0.010	-0.025	0.041	-0.028	0.036
	(0.116)	(0.116)	(0.137)	(0.138)	(0.133)	(0.133)
Age53_55	-0.037	0.031	-0.013	0.056	-0.019	0.048
	(0.108)	(0.108)	(0.127)	(0.127)	(0.122)	(0.123)
Age56_58	0.068	0.135	0.060	0.128	0.051	0.117
	(0.099)	(0.099)	(0.116)	(0.117)	(0.112)	(0.112)
Age59_61	0.221**	0.273***	0.242**	0.294***	0.227**	0.276***
	(0.091)	(0.091)	(0.106)	(0.107)	(0.102)	(0.102)
Age62_64	0.364***	0.378***	0.374***	0.388***	0.353***	0.363***
	(0.083)	(0.083)	(0.096)	(0.096)	(0.093)	(0.093)
Age65_67	0.451***	0.438***	0.451***	0.437***	0.422***	0.405***
	(0.075)	(0.075)	(0.087)	(0.087)	(0.085)	(0.085)
Age68_70	0.414***	0.395***	0.404***	0.385***	0.374***	0.351***
	(0.068)	(0.068)	(0.077)	(0.077)	(0.077)	(0.077)
Age71_73	0.370***	0.355***	0.368***	0.352***	0.339***	0.320***
	(0.060)	(0.060)	(0.068)	(0.068)	(0.068)	(0.068)
Age74_76	0.297***	0.285***	0.313***	0.301***	0.289***	0.274***
	(0.052)	(0.052)	(0.060)	(0.060)	(0.059)	(0.059)
Age77_79	0.171***	0.164***	0.211***	0.203***	0.196***	0.187***
	(0.041)	(0.041)	(0.050)	(0.050)	(0.049)	(0.049)
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year 1992	0.851***	0.876***	0.822***	0.846***	0.813***	0.835***
	(0.055)	(0.055)	(0.064)	(0.064)	(0.063)	(0.063)
Constant	4.150***	4.063***	3.715***	3.628***		
	(0.176)	(0.176)	(0.207)	(0.207)		

Observations	264959	264959	175241	175241	168259	168259
Number of ID	36061	36061	35603	35603	28621	28621
R-squared	0.042	0.042	0.044	0.044	0.041	0.041
Test for IV Regression						
F-first-excluded					431.2	433.0
Anderson Rubin				*F-test*	4.71	5.29
				p-value	0.03	0.02
Davidson-MacKinnon				*F-test*	1.20	1.53
				p-value	0.27	0.22

***Note*:** Robust standard errors in parentheses, stars for significance levels: *** *p<0.01,* ** *p<0.05,* * *p<0.1,* Omitted age category: >79, in the intercept: single, year IV estimates: RTI instrumented by the sample proportion of people in pension by year, gender and East /West German region.

TABLE 2

ROBUSTNESS IN SUBSAMPLE SPLITS

	Women	**Men**	**East**	**West**	**Not Occup Dis**	**Occup Disable**	**Unemp**	**Not Unmep**
Base Retired								
Retired	0.090**	0.366***	0.368***	0.128***	0.146***	0.405***	0.314***	0.077**
	(0.038)	(0.045)	(0.056)	(0.032)	(0.031)	(0.079)	(0.067)	(0.032)
Observations	137432	127527	53169	211790	236397	28562	24789	240170
Number of ID	18475	17586	7588	28947	34501	5953	8706	34947
R-squared	0.040	0.048	0.041	0.044	0.036	0.047	0.036	0.040
Base RTI								
RTI	0.220***	0.205***	0.197***	0.209***	0.172***	0.387***	0.185***	0.212***
	(0.017)	(0.017)	(0.027)	(0.013)	(0.012)	(0.043)	(0.056)	(0.012)
Observations	90881	84360	36887	138354	156913	18328	16791	158450
Number of ID	18249	17354	7518	28518	33912	5516	7778	34320
R-squared	0.040	0.051	0.040	0.046	0.037	0.049	0.040	0.041
Base RTI Retired								
RTI	0.220***	0.205***	0.195***	0.209***	0.172***	0.382***	0.184***	0.212***
	(0.017)	(0.017)	(0.027)	(0.013)	(0.012)	(0.043)	(0.056)	(0.012)
Retired	0.071*	0.418***	0.376***	0.134***	0.158***	0.401***	0.390***	0.080**
	(0.043)	(0.053)	(0.069)	(0.037)	(0.036)	(0.092)	(0.096)	(0.037)
Observations	90881	84360	36887	138354	156913	18328	16791	158450
Number of ID	18249	17354	7518	28518	33912	5516	7778	34320
R-squared	0.040	0.053	0.041	0.046	0.037	0.051	0.042	0.041
IV								
RTI	3.443**	2.627***	1.242*	-0.146	0.399**	0.136	1.469	0.320*
	(1.382)	(0.610)	(0.733)	(0.203)	(0.187)	(1.214)	(1.192)	(0.187)
Retired	-0.007	0.417***	0.343***	0.139***	0.155***	0.415***	0.372***	0.077**
	(0.058)	(0.054)	(0.069)	(0.033)	(0.033)	(0.106)	(0.101)	(0.033)
Observations	87353	80906	35519	132480	149479	16329	12867	151175
Number of ID	14721	13900	6150	22644	26478	3517	3854	27045
R-squared	-0.627	-0.351	-0.016	0.037	0.034	0.048	-0.026	0.040

F-first-excluded	13.79	59.82	37.12	314.9	393.0	12.24	17.50	381.2	

Notes: 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 sample proportion of people in pension by year, gender and East /West German region.

TABLE 3A

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 3B

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.

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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	7.01	1.84	0	10	N = 353572
	between		1.50	0	10	n = 44842
	within		1.29	-2.15	14.75	T-bar = 7.88484
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	4.86	0.57	-3.05	9.49	N = 365652
	between		0.55	-2.02	8.67	n = 47278
	within		0.33	-2.46	8.82	T-bar = 7.73408
Unemp	*dummy for being registered as unemployed the previous year*					
	overall	0.09	0.29	0	1	N = 350843
	between		0.22	0	1	n = 44625
	within		0.22	-0.85	1.05	T-bar = 7.86203
lossjob	*dummy for becoming unemployed during the previous year*					
	overall	0.03	0.18	0	1	N = 301181
	between		0.11	0	1	n = 37679
	within		0.16	-0.63	0.99	T-bar = 7.99334
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	0.60	0.49	0	1	N = 364507
	between		0.43	0	1	n = 46671
	within		0.29	-0.36	1.56	T-bar = 7.81014
Married	*dummy for being married*					
	overall	0.63	0.48	0	1	N = 358722
	between		0.47	0	1	n = 45137
	within		0.21	-0.33	1.59	T-bar = 7.9474
getMar	*dummy for becoming married*					
	overall	0.02	0.12	0	1	N = 308230
	between		0.07	0	1	n = 38416
	within		0.12	-0.48	0.97	T-bar = 8.02348
Separated	*dummy for becoming separated*					
	overall	0.02	0.12	0	1	N = 358722

	between		0.10	0	1	n = 45137
	within		0.10	-0.90	0.97	T-bar = 7.9474
getSep						*dummy for being separated*
	overall	0.01	0.08	0	1	N = 308230
	between		0.05	0	1	n = 38416
	within		0.07	-0.49	0.96	T-bar = 8.02348
Divorced						*dummy for being divorced*
	overall	0.06	0.24	0	1	N = 358722
	between		0.21	0	1	n = 45137
	within		0.12	-0.90	1.02	T-bar = 7.9474
getDiv						*dummy for becoming divorced*
	overall	0.01	0.08	0	1	N = 308230
	between		0.05	0	1	n = 38416
	within		0.07	-0.49	0.96	T-bar = 8.02348
Widowed						*dummy for being widowed*
	overall	0.06	0.24	0	1	N = 358722
	between		0.23	0	1	n = 45137
	within		0.10	-0.90	1.02	T-bar = 7.9474
getWid						*dummy for becoming widowed*
	overall	0.00	0.06	0	1	N = 303916
	between		0.03	0	1	n = 38724
	within		0.05	-0.66	0.96	T-bar = 7.8487
childHH						*the number of children in the household*
	overall	0.64	0.97	0	10	N = 374167
	between		0.87	0	8.29	n = 47850
	within		0.53	-6.47	6.56	T-bar = 7.81958
nEdyear						*number of years of education*
	overall	11.48	2.58	7	18	N = 346801
	between		2.57	7	18	n = 43240
	within		0.72	2.04	20.05	T-bar = 8.02037
Owner						*dummy for being tenant or owner of the dwelling*
	overall	0.46	0.50	0	1	N = 374167
	between		0.46	0	1	n = 47850
	within		0.23	-0.49	1.42	T-bar = 7.81958
HospStay						*dummy for overnight stay in hospital during the previous year*
	overall	0.12	0.32	0	1	N = 328492
	between		0.21	0	1	n = 44517
	within		0.28	-0.82	1.07	T-bar = 7.37902
OccupDis						*dummy for being unable to work or severely handicapped*
	overall	0.09	0.29	0	1	N = 374167
	between		0.23	0	1	n = 47850
	within		0.18	-0.85	1.05	T-bar = 7.81958
WestDT						*dummy for living in a Federal Land of the former West Germany*
	overall	0.79	0.41	0	1	N = 374167

	between		0.40	0	1	n = 47850
	within		0.06	-0.17	1.73	T-bar = 7.81958
Retired	*dummy for being retired the previous year*					
	overall	0.20	0.40	0	1	N = 374167
	between		0.36	0	1	n = 47850
	within		0.20	-0.76	1.16	T-bar = 7.81958
Age	*age of respondent*					
	overall	44.62	17.30	17	102	N = 372818
	between		18.26	17	102	n = 47213
	within		4.47	29.8	59.2	T-bar = 7.89651
Age17_19	*dummies for age group : 3 years*					
	overall	0.05	0.23	0	1	N = 372818
	between		0.26	0	1	n = 47213
	within		0.16	-0.70	1.01	T-bar = 7.89651
Age20_22	overall	0.05	0.22	0	1	N = 372818
	between		0.17	0	1	n = 47213
	within		0.18	-0.70	1.01	T-bar = 7.89651
Age23_25	overall	0.05	0.22	0	1	N = 372818
	between		0.16	0	1	n = 47213
	within		0.19	-0.70	1.01	T-bar = 7.89651
Age26_28	overall	0.05	0.23	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.20	-0.70	1.01	T-bar = 7.89651
Age29_31	overall	0.06	0.23	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.20	-0.69	1.01	T-bar = 7.89651
Age32_34	overall	0.06	0.24	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.21	-0.69	1.02	T-bar = 7.89651
Age35_37	overall	0.06	0.24	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.21	-0.69	1.02	T-bar = 7.89651
Age38_40	overall	0.06	0.24	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.21	-0.69	1.02	T-bar = 7.89651
Age41_43	overall	0.06	0.24	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.21	-0.69	1.02	T-bar = 7.89651
Age44_46	overall	0.06	0.23	0	1	N = 372818
	between		0.15	0	1	n = 47213
	within		0.21	-0.69	1.02	T-bar = 7.89651
Age47_49	overall	0.05	0.23	0	1	N = 372818
	between		0.14	0	1	n = 47213
	within		0.20	-0.70	1.01	T-bar = 7.89651

Age50_52	overall	0.05	0.22	0	1	N = 372818
	between		0.14	0	1	n = 47213
	within		0.19	-0.70	1.01	T-bar = 7.89651
Age53_55	overall	0.05	0.21	0	1	N = 372818
	between		0.13	0	1	n = 47213
	within		0.19	-0.70	1.01	T-bar = 7.89651
Age56_58	overall	0.04	0.21	0	1	N = 372818
	between		0.13	0	1	n = 47213
	within		0.18	-0.71	1.00	T-bar = 7.89651
Age59_61	overall	0.04	0.20	0	1	N = 372818
	between		0.13	0	1	n = 47213
	within		0.18	-0.71	1.00	T-bar = 7.89651
Age62_64	overall	0.04	0.20	0	1	N = 372818
	between		0.13	0	1	n = 47213
	within		0.17	-0.71	1.00	T-bar = 7.89651
Age65_67	overall	0.04	0.19	0	1	N = 372818
	between		0.12	0	1	n = 47213
	within		0.16	-0.71	1.00	T-bar = 7.89651
Age68_70	overall	0.03	0.17	0	1	N = 372818
	between		0.11	0	1	n = 47213
	within		0.15	-0.72	0.99	T-bar = 7.89651
Age71_73	overall	0.02	0.15	0	1	N = 372818
	between		0.11	0	1	n = 47213
	within		0.13	-0.73	0.98	T-bar = 7.89651
Age74_76	overall	0.02	0.14	0	1	N = 372818
	between		0.10	0	1	n = 47213
	within		0.12	-0.73	0.98	T-bar = 7.89651
Age77_79	overall	0.02	0.12	0	1	N = 372818
	between		0.09	0	1	n = 47213
	within		0.10	-0.73	0.97	T-bar = 7.89651

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