EconomEtica

Centro interuniversitario per l'etica economica
e la responsabilità sociale di impresa
promosso dalla Fondazione Italiana Accenture

N.7 February 2009

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

Working papers

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Abstract

The nexus between relational life and life satisfaction is riddled with endogeneity problems. By investigating the causal relationship going from the first to the second variable we consider that retirement is a shock which increases the time investable in (outside job) relational life. As a consequence we instrument investment in relational goods with the aggregate exogenous age-retirement pattern. With such approach we document that investment in relational life has a positive and significant effect on life satisfaction. Consequences of our findings in terms of retirement effects and age-happiness pattern 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.

Aristotele[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). This is not surprising since well-being has been seen as the ultimate goal of human endeavors in a long tradition of thought from Aristotle to John Stuart Mill. However only in recent years psychologists, economists and others began to show that subjective well-being can be measured with reliability and validity, using relatively simple self-rating questions about 'happiness' and 'life satisfaction'. 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

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

measure longer-term, more stable evaluations, but both have been shown to produce broadly consistent findings (see Helliwell 2006 and Krueger 2008).

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, 2006), airport noise (Van Praag and Baarsma 2005), terrorism (Frey et. al. 2007), the fear of crime (Moore and Shepherd 2006), marriage (Clark and Oswald 2002; Johnson-Wu, 2002; Blanchflower-Oswald, 2004; Frey and Stutzer, 2002a, b, 2006) and unemployment (Clark and Oswald, 1994; Gallie and Russell, 1998; Di Tella et al., 2001, 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 in general, not just marriage, 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 shed light on the monetary cost of 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. (2008a and b), Corrado and Aslam (2007), Becchetti et al. (2008), Bruni and Stanca (2008), Meier and Stutzer (2008), Powdathvee (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 good 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. 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 to find the right partner. In the same way, the significant relationship between money and happiness may also be determined by unobserved individual traits (assertivity, optimism, a well balanced personality) which positively affect both subjective well being 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.

[2]Interestingly Bartolini et al. (2008) 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.

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 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 Powdatvee (2008), show that the link between happiness and social life survives to 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 is quite obvious to us that not only our personality, but also our mood and transient feelings affect our propensity to meet people and participate in social events.

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 at the individual level but that is correlated with the endogenous regressor, in the absence of natural experiments.[3]

Our instrumentation strategy hinges on retirement. Retirement may be conceived as a permanent change in the individual organization of time which leads to a deep rescheduling of one's own agenda, i.e. a dramatic fall in hours worked (not necessarily leading to zero worked hours since many retired individuals keep some informal working activities also after retiring) and a corresponding large increase in leisure, i.e. in time potentially investable in relational and 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 partially a choice influenced by one's wellbeing. Retirement age is often fixed

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

by law but several flexibility clauses generally exist. In Germany the mandatory age is 65 but the law creates a wide window of opportunities for retirement decisions around the official retirement date.

We therefore need a factor, correlated with the individual retirement decision and with the increase in time investable in relational goods, which cannot be suspected of being a choice variable at the individual level. We find such variable in an age-retirement function which maps each individual-age observation in the sample into the share of the retired population for that age.[4] This function may be regarded as the probability of being retired at a certain age based on the sample distribution of retirement decisions. This variable is then used as an instrument for a relational-life-investment indicator.

Summing up, we create value added in the happiness literature by improved identification of the causal effect of relational goods 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 of policies are of crucial importance.

The paper is divided into five sections (including introduction and conclusions). The second section outlines the concept of relational goods and the related theoretical literature. The third and the fourth present and comment our descriptive and econometric findings. The fifth section concludes.

2. Relational goods: an overview of theoretical background

[4] It would be possible to use the age-retirement pattern of the entire German population. Given the large size of our sample we argue that the sample age-retirement pattern 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 contribute to the sample average but, given the large number of observations, its contribution is negligible.

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

According to Gui (1987) and (2005) and Ulhaner (1989) 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 the agent devotes to socializing as well as with the socializing effort expended by other agents. Indeed, the fact that, by definition, relational goods can only jointly and simultaneously be produced and consumed makes them better defined as *anti-rival* than as simply non rival. Another 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 means 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 in 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 leads 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 brings us back to the local public goods characteristic of relational goods, which means they 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) and Jenkins and Osberg (2003) Antoci at al. (2005), Bruni et. Al. (2008) develop models starting from the this premise that one cannot have a social life unilaterally. Various types of external effects concerning relational goods can be distinguished: there is an externality 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. Merz and Osberg (2006) find that the proportion of leisure time devoted to social leisure is higher in Lander with more public holidays. A second type of externality concerns the efforts by the agent and the potential partners in cultivating their skills as partners. There are externalities at the aggregate level: it is easier and more rewarding to participate in an association in a social context characterized by a rich network of associative opportunities. Likewise, high social participation may lead to the formation of new associations, while continuing to feed the existing ones.

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.[5]

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 different equilibria.[6] 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 a 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 its positive impact on the productivity of traditional private goods.

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

[6] According to these authors one of the strongest pieces of evidence in favor of complementarities across either leisure or work 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.

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.[7]

This implies that disregard for effects of economic policies on relational goods may negatively affect not only individual life satisfaction but also the prerequisites which make economic prosperity possible.

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 social 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. If it is reasonable to assume that the quality of relational life has a favourable impact on happiness, it is all the more so that happier individuals are highly likely to be more willing, or in the right mood, to cultivate their relational life. To solve the puzzle we should identify factors which determine an exogenous shock in time invested in relational goods in personal life. We find one of these factors in an event which occurs in every worker's life: retirement. What we illustrate in this first descriptive analysis is that: i) retirement (voluntary or involuntary) events are concentrated in the early 60es; ii) retirement causes a sharp reduction (increase) in working (leisure) time; iii) a significant increase in time invested in relational life occurs in the early 60es; iv) in the same period we observe a rise in life and, even more, in leisure satisfaction.

We perform our empirical analysis on the GSOEP[8] using waves from 1984 to 2007.

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

If we look at the share of retired individuals by age in our GSOEP sample we find a sharp jump at 60 (from 30 to 50 percent) and at 65 (from 80 to 93) (Figure 1). As a consequence, the largest part of individuals in our sample retire between 60 and 65. If we restrict the analysis to the subset of individuals getting retired 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 (Figure 2).

It is therefore not strange that, in the same age cohorts, we observe a sharp change in daily worked hours during the working week (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) (Figure 3). Note that, even though the difference between retired and non retired individuals in these cohorts is sharp, we also observe a clear decline in worked hours of non retired individuals in the same age intervals. A similar drop is observed on hours worked on Saturdays and Sundays.

To verify the correspondence between retirement age and time invested in relational life we build a "relational time index" (RTI) using information gathered in the GSOEP on time dedicated to the production of relational goods. In five questions, 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 reclassify answers on these points in a variable which can take values from 3 to 0, depending on how much time is devoted to each particular relational activity (0=Never, 1=Less Frequently, 2=Every Month, 3=Every Week).[9]

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[8] 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). It has the advantage of being one of the very few longitudinal sources (together with BHPS) containing information on life satisfaction for a long number of years for the same individual. We are grateful to these institutes and the project director Dr. G. Wagner for making this dataset available.

[9] We use this scale since survey answers do not allow us to infer exactly a per month or per week frequency in presence of the "less frequently" response. Given the more than proportional increase in intensity between "each month" and "each week" 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 to the "less frequently answer) has been performed. Results are substantially unchanged and available from the authors upon request.

All the above mentioned activities produce relational goods in the way we defined them in the previous section. Social gatherings generate local public goods of the kind described by Gui (1989). Indeed, any individual who decides to participate to them, creates a positive externality for other participants: being in larger numbers reinforces the emotional effect of the common consent, it provides positive feedback to the decision to participate to the gatherings and increases their enjoyment. Cultural events display similar characteristics even though the "production" activity on behalf of participants is much weaker (the event is produced anyway, even with very few participants, but high participation increases the value of the good and some of its peculiar aspects, for instance an applause or a laughter in a theatre). Participants to sport events produce and consume relational goods stimulated by the fact of sharing the same emotions when supporting the same team or champion. The interpersonal dimension is essential in church or religious events which are partially produced and consumed by community members and stimulate those "fellow feelings" which, according to Adam Smith (1759), strengthen ties among participants.[10] Finally, voluntary work is, in general, jointly performed by individuals with similar intrinsic motivations. The gratuitous and gift-giving nature of this activity has also the effect of reinforcing ties not only among volunteers but also between the volunteers and the beneficiaries of their unpaid job. The "fellow feeling" argument therefore applies also here.

Using these five different indicators, and following Becchetti et al. (2008), we build a "*Relational Time Index*" (from now on RTI) as an unweighted average of the points given to the five questions by each respondent. Our choice is motivated by two main reasons.

First, we are interested in a synthetic indicator on the relational investment by individuals which goes beyond the information provided by a single component. Second, this synthetic indicator 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

[10] Adam Smith arguably notes that "fellow feelings" (common consent) may be equally fuelled by pleasant and unpleasant joint experiences and that emotionally unpleasant joint experiences (i.e. attending a funeral of a beloved person with other friends) have a strong impact on the formation of a common consent among people.

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 during the retirement period after controlling for socio demographic variables (employment status, marital status, health) 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).

From this first inspection of data it is evident that retirement is a shock on the organisation of time which determines a sharp rise in leisure and in time investable in relational goods.

Since most compulsory or voluntary retirement decisions occur in the 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 60es. Average life satisfaction levels for a given age exhibit the well known U-shaped relationship: 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 95 percent level. The U-shape in life satisfaction is paralleled by a similar, but more pronounced, U-shape in leisure satisfaction (see Figure 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. *What is impressive is the dramatic jump in the indicator between 59 and 63. During this period average leisure satisfaction is significantly higher at 95 percent each year vis-à-vis the previous one.*

Descriptive findings therefore highlight a sharp change in the work/leisure ratio between late 50es and early 60es or around a threshold which roughly corresponds to the retirement event. In parallel, we find a significant rise in life and a more pronounced rise in leisure satisfaction. The observed changes may definitely help us to build the instrument necessary to test the effect of relational goods on happiness.

4. Econometric findings

Based on descriptive findings we intend to test the relational good-happiness nexus through the following steps: i) a base specification including fixed effects, time dummies and age categories built in a way which avoids serious multicollinearity problems; ii) the inclusion of a relational investment index in the base specification; iii) an IV estimate in which the relational investment index is instrumented by an exogenous aggregate age-retirement pattern; iv) robustness checks with various subsamples and with modified models which combine in different ways fixed effects, time dummies and age effects; v) tests on survivorship and entry bias; vi) an alternative test of the hypothesis with a fuzzy discontinuity design in an ordered probit model with Mundlak corrected random effects.

We start from a standard specification which includes as regressors marital and employment status, gender, education, health status, number of children, log of equivalised real household income per capita, East/West dummy, house ownership. Following a standard approach in the literature we also add changes in employment and marital status.[11]

In order to minimise the omitted variable bias we choose a benchmark model which incorporates fixed effects, time dummies capturing socioeconomic countrywide shocks and age categories, avoiding to impose too restrictive functional forms on the age effect. Opinions on the inclusion of year dummies in these types of estimates are mixed. On the one side, it is observed that the latter capture aggregate year shocks (macroeconomic performance, legal or regulatory changes) so that their missed consideration would cause serious omitted variable bias. On the other side, it is observed that, even when not using the linear age variable, the three (age, time and fixed) effects

[11] 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 in Frijters et al., 2008) and do not work only on the balanced panel (as in Van Landeghem, 2008). This is because, on our opinion, the balanced panel sacrifices an incredible amount of precious information and, while eliminating the entry bias, it worsens the survivorship bias. Our main results are however supported also in these two specific subsamples. Results are omitted for reasons of space and available upon request.

could create collinearity. To overcome the problem in our estimates, we progressively eliminate time dummies which determine the stronger reduction of the variance inflation factor (VIF),[12] until we reach the acceptable threshold of 5.

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) a 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.[13]

Empirical findings confirm the "almost stylised facts" of the happiness literature. The positive and significant effect of household income, marriage status and 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,[14] together with the number of children variable. This makes the children variable positive and significant. In this way we disentangle two children effects: a negative one represented by the reduction of per capita income within the household and a positive one represented by the value of having them.

The selection process to avoid multicollinearity leads us to drop a few time dummies. We omit for reasons of space results for the remaining year dummies with the exception of the post reunification year 1992 which has the highest positive and significant coefficient among year effects.

[12] The VIF (variance inflation factor) formula is 1/1-R(x) where R(x) is the R squared when the independent variable is regressed on all other independent variables (Marquardt, 1970). If R(x) is low (tends to zero) the VIF test is low (equal to one). A VIF value below 10 (or, more restrictively, five) is considered acceptable by rules of thumb standardly adopted in the literature.

[13] The base equation (Table 1, column 1) with a limited 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.

[14] 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".

Both the retirement and the relational good 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, people may enjoy retirement in proportion of their previous job dissatisfaction. In parallel to this, what may occur in the 50/60 turnaround is the reorganisation of time (retired individuals are back in control of their agenda) and the increased investment in relational goods due to the work/leisure change. The age categories and the RTI variable may capture this last effect, while the retirement variable the first one.

The puzzle is that, the significance of the age cohorts from 59 to 61 and over does not disappear even when we include the RTI and retirement variables. Therefore, the life satisfaction revolution at 60s may not be interpreted as solely determined by the retirement shock. There are two plausible arguments reconciling such findings with the hypothesis of retirement-relational good nexus: i) if hours worked are reduced in this age category even for those who are not retired (as it is evident from Figure 3), we may think that the disutility of work is reduced also for them; ii) if the consumption of relational goods increases even for non-retired, one could argue that, since the peers of non retired are retired, it is easier for this group of people to avoid the relational poverty trap. Individuals work more than socially optimal because of status race and consumption of positional goods, but when their reference group starts to retire they also are better off whether or not they retire.

4.1 Tackling the endogeneity problem: the IV estimates

In the first four estimates we observed that the relational time indicator effect on life satisfaction is positive, significant and robust (Table 1, columns 1-4). We however clarified in the introduction that the problem of endogeneity related to this variable is serious and cannot be solved uniquely by controlling for fixed effects.

Descriptive evidence documented that retirement generates a significant shock on time investable in (outside the job) relational goods (Figure 4). Since retirement is however partially endogenous we use as a proxy for the retirement shock: the retirement-age pattern of the sample. This variable may be read as the probability that an individual of a given age is retired (or that his close peers are retired) and therefore that she may benefit from the additional time investable in relational goods. The variable cannot definitely be suspected of reverse causality since it cannot be significantly affected by the happiness of the observed individual. This leads us to use it as an instrument for the relational time index in a standard panel IV estimate.

When estimating the model with this approach, we find that the relational time index is significant, irrespective of the introduction or not of the retirement variable (Table 1, columns 5-6). As it is well known the quality of an instrument and its exogeneity is a statistical matter. To this purpose, we use the standard approach of verifying whether the residual - from a "modified specification" in which instruments replace selected endogenous regressors - has significant effects when introduced in the standard non instrumented equation. As it is well known, instruments are exogenous if the null of the insignificance of the added variable (the residual from the "modified specification") in the standard non instrumented equation is not rejected. To see whether this is true or not, we compute the Davidson-McKinnon (1993) test on exogeneity in panel data with instrumental variables and find that the null of non endogeneity is not rejected. Note that the significance of the 59-61 up to 55-57 age categories disappears (and no other age categories are significant) in the IV estimates, a finding which is not at odd with the hypothesis that the bump of the age-happiness during the early 60es may be determined by the retirement-relational good shock.

4.2 Robustness in subsample splits

Table 2 shows that our finding works separately in different subsamples. The retirement effect on life satisfaction is almost three 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 loss is much stronger for males who use to work more hours and have a higher share of full time jobs. Being retired is significant for both employed and disabled workers.[15]

The RTI variable is always significant in the observed subsamples even when we introduce the retirement variable. When we instrument it with the age-retirement pattern, it remains significant in the male, employed and 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 whenever we modify the choice on how to include age, time and individual fixed effects. As described above (see section 4), the benchmark model is estimated with a panel 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 choice.

The first choice made was on age specification: nearly all recent papers assume a U-shape relation between happiness and age. Frijters and al. (2008) show that in most of these studies the effect of linear 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 to age. Following Clark (2006) and Van Landeghem (2008), we use dummies representing age-bounded categories. Age categories comprise 3 years: 17-19, 20-22 . . . 77-79, and

[15] Besides old age pensions the German welfare system provides d*isability 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.

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 model where we compare two possible age specifications: the quadratic functional form and the dummy categories. The relational time index is strongly significant and positive over all subsamples and it maintains almost the same coefficient regardless the age specification, even when we introduce the retirement variable. On the contrary, the retirement variable behaves differently when age is expressed in the quadratic form (positive impact) or when we use categories (negative impact). The possible omitted variable bias due to the exclusion of fixed effects leads us to prefer the panel analysis.

In Table 3.b we estimate our model using fixed individual effects. 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. Taking into account the individual personal traits allows us to observe a positive effect of retirement on life satisfaction. All other regressors, here omitted for reasons of space, maintain the same sign and effect as the one expected 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[16], 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 member". On the other side, households may leave the survey for

[16] 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).

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. Kron 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 undermine our estimation of life satisfaction: survivorship bias and entry bias. For 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 case we should observe a spurious effect on the increased happiness of the elders. Note, however, that the early 60es 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 are in presence of an abnormally high rate of exits at the 50/60 turnaround and a subsequent fall after 75.

For entry bias affecting our results, we refer to the assumption of Frijters et al. (2008). They argue 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 be a spurious explanation of our findings.

Based on the description of these two biases 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 further test 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, we can state that our results are not affected by survivorship bias. The same procedure applies to verify for the presence of entry bias on our dependent variable. In our base regression the predicted entry probability does not significantly differ from zero.

4.6 Fuzzy discontinuity design with random effect ordered probit

An important limit to our previous findings is the approximation of the categorical life satisfaction variable to a continuous one. Even though this is common in the happiness literature, we want to verify whether our results on relational life are confirmed when accounting for the discrete qualitative nature of our dependent variable.

To do so we combine a random effect ordered probit estimate[17] with an alternative methodology for tackling endogeneity: the fuzzy discontinuity approach.

As it is well known it is possible to implement a discontinuity design[18] when the beneficiaries/non-beneficiaries of a treatment can be ordered along a quantifiable dimension and the latter can be used to compute a well-defined index or parameter. The crucial point is that the

[17] One problem of the random effect approach is the restrictive assumption of an individual random effect uncorrelated with the explanatory variables. In order to deal with the endogeneity problem, we follow the Mundlak (1978) approach. We incorporate as correction factors individual intertemporal means of the socio demographic regressors. Their coefficients capture the correlation with the individual effects of persistent personality traits and are assumed to be constant across time.

[18] For a theoretical treatment see van der Klaauw et al. (2001). For other prominent examples of this approach, see, among others, Angrist and Levy (1999), van der Klaauw (2002), Jacob and Lefgren (2004), or Ludwig and Miller (2007).

index/parameter must have a cut-off point for eligibility and must be what decides the assignment of a potential beneficiary to the treatment (or to non-treatment).

The main intuition of this approach is that, around the cut-off point, treatment and control sample individuals must be very similar to each other. Discontinuity designs may be sharp or fuzzy. They are sharp when a unique cut off univocally divides treatment from control sample. They are fuzzy when the discontinuity may be correlated with the treatment and the cut off is not univocal. More formally, if retirement was entirely exogenous and fixed at 60 for all individuals, we could use the following standard specification for a sharp discontinuity design

$$LS_{it} = \alpha_0 + \sum_l \beta_l Dtime_l + \sum_j \gamma_j Agecat_j + \sum_k \delta_k Controls_k + \theta * 1(T, Age > \overline{\text{Re}tage}) + u_i + \varepsilon_{it}$$

where $\overline{\text{Re}tage}$ is aN age threshold common to every individuals (i.e. 60). In this case, the test on the significance of the treatment would be based on the significance of the θ coefficient.

Since large part of retirement decisions are agglomerated around 60-63 years, the age of retirement is partly endogenous and it may be, in turn, correlated with its effects on happiness. We therefore device a "fuzzy" discontinuity design in which we instrument the treatment with the age-retirement function *f(RA)*. The function takes the value of the share of retired individuals for each individual age observation. It cannot be affected by a single individual and has the advantage of being uncorrelated with age dummies. As a consequence we estimate

$$LS_{it} = \alpha_0 + \sum_l \beta_l Dtime_l + \sum_j \gamma_j Agecat_j + \sum_k \delta_k Controls_k + \theta[f(RA)] + u_i + \varepsilon_{it}$$

where *f(RA)* is the retirement age function. To avoid that the function captures also the retirement effects not related to the relational good effects, we add the retirement dummy among the regressors.

The estimates presented in Table 4 show that the θ coefficient for the retirement age function is strongly significant both in the overall sample and in the restricted subsample that includes individuals in a limited interval around the 60 threshold (those aged from 50 to 70).

5. Conclusions

Common sense tells us that relational life should play an important role in life satisfaction. As human beings we are both *individua substantia rationalis* (in the Boetius acception) but also "knots of relationships", dramatically influenced by our recognition, appreciation and acceptance by others.

With the Meier and Stutzer (2008) exception, the few empirical contributions investigating the relational good-happiness nexus have not solved the endogeneity problem. If the links between almost all potential determinants and life satisfaction tend to be endogenous and suffer from biunivocal causation, this is all the more true for investment in relational goods.

In this paper we devise an original approach to tackle the endogeneity issue. We consider that the retirement event allows individuals to re-master their own agenda and to invest the hours worked before retiring in time dedicated to social and relational activities. Since retirement is a partially endogenous phenomenon, we observe the age pattern behind retirement decisions and use it to create an exogenous instrument. Our findings document that relational goods have a significant effect on life satisfaction which is quite robust under different models and specifications.

Our paper may also be read as providing a rationale and an explanation to part of the age-happiness mystery. In fact, we show that behind the quadratic approximation, which captures the well known U-shaped relationship between age and happiness, the rising part of such relationship may be explained by the retirement/relational good 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.

Our findings document that the impact on the quality of relational goods is one of the important indirect and unintended consequences which need to be cautiously evaluated when formulating economic policies. Economic models based on standard utility functions tend

structurally to neglect this aspect since relational arguments do not appear in agents' satisfaction. Our findings suggest that this omission is important, not only for its consequences on trust and creation of economic value, but also on individual life satisfaction. Care for policy measures' collateral effects on relational life may help to strengthen mechanisms for the creation of economic value, reinforce consensus on them and reconcile the latter with a broader concept of individual wellbeing.

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

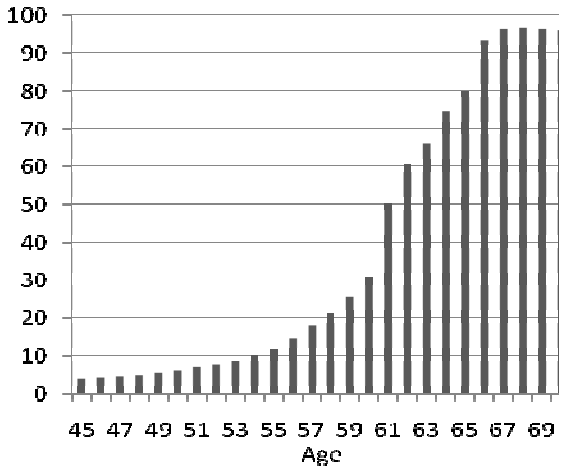

Figure 2. Cumulative distribution function of retirement age in the GSOEP during the sample period

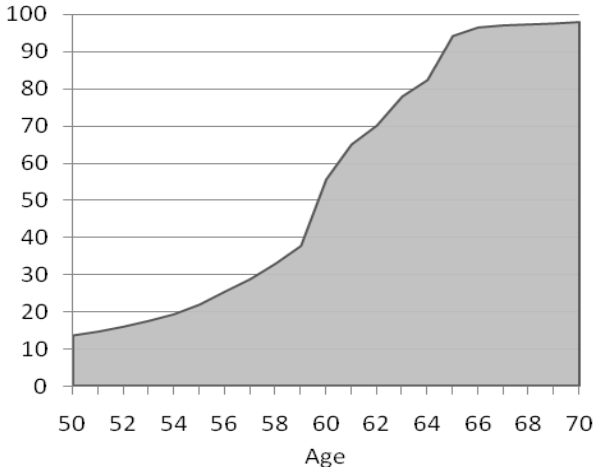

Figure 3. Daily average worked hours for retired and non retired individuals in different age categories (working week, Saturdays and Sundays)

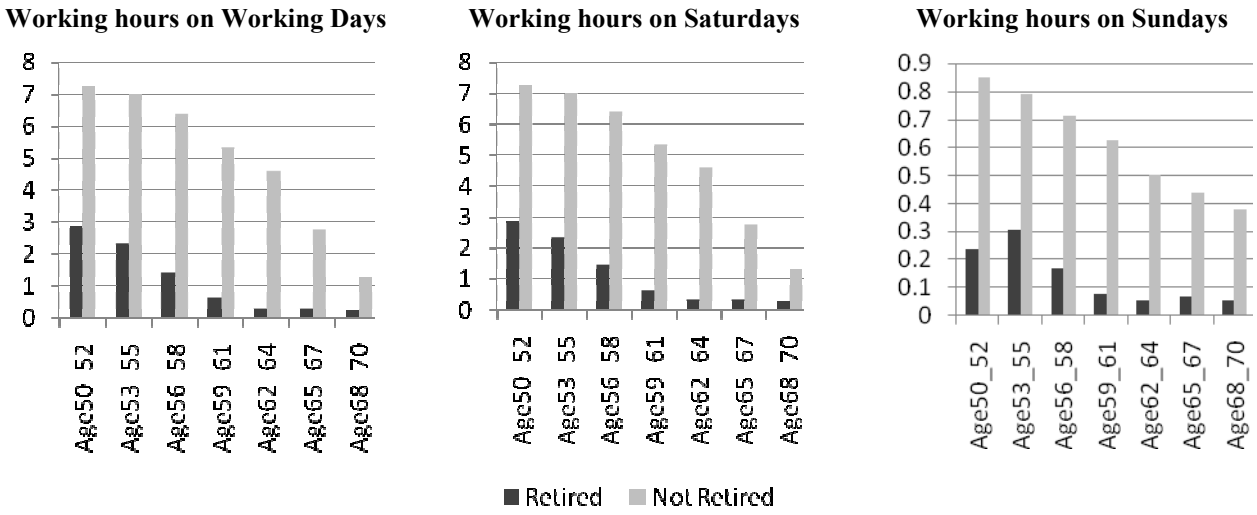

Figure 4. Predicted age effects on time spent in relational life events such as Social Gathering, Volunteering, Sport, Cultural events, Religion, after controlling for socio demographic variables (employment status, marital status, health) and time dummies in a fixed effect panel estimate. Range of variation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

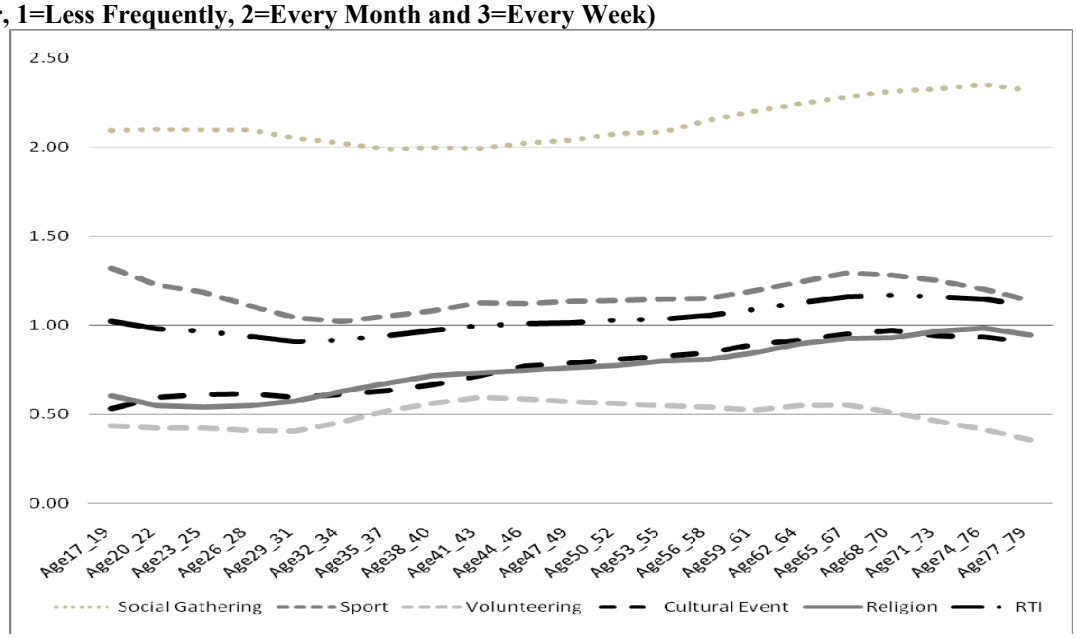

Figure 5. Average Life Satisfaction levels by Age

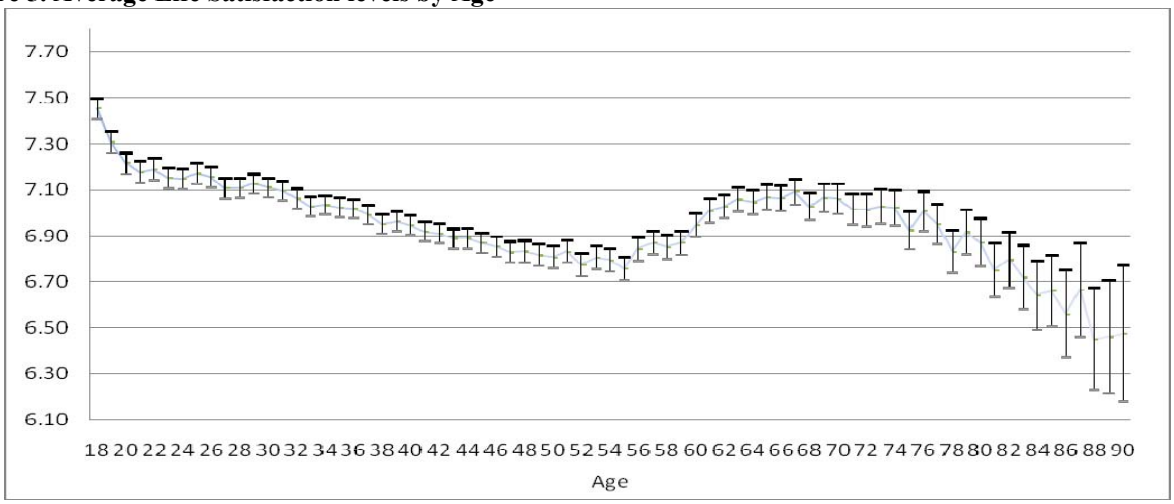

Figure 6. Average Leisure Satisfaction levels by Age

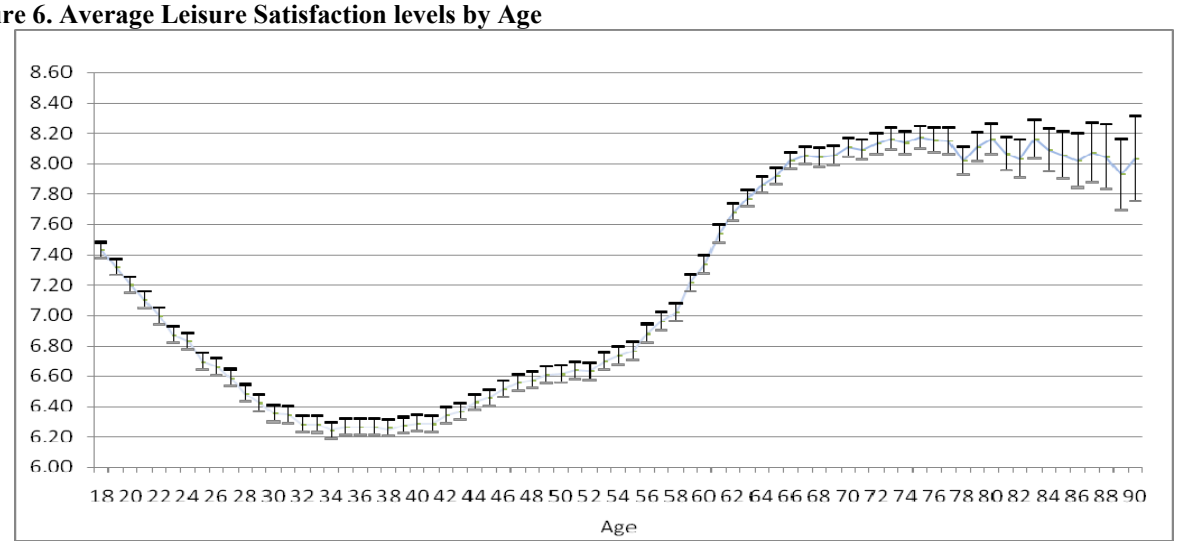

Table 1. The effect of relational goods on Life Satisfaction: GSOEP, 1984 – 2007 (fixed effects regression)

Variable	Base	Base Retired	Base RTI	Base Retired RTI	IV Base	IV Retired
Age17_19	-0.273	-0.259	0.112	0.124	0.316	0.305
	(-1.32)	(-1.26)	(0.42)	(0.47)	(1.04)	(1.04)
Age20_22	-0.424**	-0.413**	-0.028	-0.019	0.230	0.212
	(-2.14)	(-2.09)	(-0.11)	(-0.08)	(0.78)	(0.74)
Age23_25	-0.414**	-0.402**	-0.064	-0.055	0.176	0.160
	(-2.19)	(-2.13)	(-0.26)	(-0.23)	(0.63)	(0.59)
Age26_28	-0.409**	-0.395**	-0.050	-0.038	0.184	0.171
	(-2.28)	(-2.20)	(-0.22)	(-0.17)	(0.69)	(0.66)
Age29_31	-0.364**	-0.346**	-0.032	-0.017	0.216	0.203
	(-2.13)	(-2.03)	(-0.14)	(-0.08)	(0.84)	(0.81)
Age32_34	-0.352**	-0.331**	-0.033	-0.015	0.152	0.150
	(-2.18)	(-2.05)	(-0.16)	(-0.07)	(0.64)	(0.66)
Age35_37	-0.299	-0.274	-0.016	0.005	0.071	0.082
	(-1.96)	(-1.80)	(-0.08)	(0.03)	(0.33)	(0.39)
Age38_40	-0.257	-0.229	0.013	0.037	0.015	0.040
	(-1.79)	(-1.59)	(0.07)	(0.20)	(0.07)	(0.20)
Age41_43	-0.213	-0.181	0.017	0.044	-0.046	-0.012
	(-1.58)	(-1.34)	(0.10)	(0.25)	(-0.23)	(-0.06)
Age44_46	-0.174	-0.139	0.037	0.067	-0.052	-0.013
	(-1.38)	(-1.11)	(0.23)	(0.42)	(-0.27)	(-0.07)
Age47_49	-0.143	-0.105	0.033	0.065	-0.053	-0.011
	(-1.23)	(-0.90)	(0.22)	(0.43)	(-0.29)	(-0.06)
Age50_52	-0.117	-0.076	0.035	0.070	-0.072	-0.026
	(-1.08)	(-0.70)	(0.25)	(0.50)	(-0.42)	(-0.15)
Age53_55	-0.086	-0.044	0.027	0.064	-0.098	-0.051
	(-0.87)	(-0.44)	(0.21)	(0.50)	(-0.61)	(-0.31)
Age56_58	0.042	0.082	0.114	0.149	-0.058	-0.006
	(0.46)	(0.90)	(0.97)	(1.27)	(-0.35)	(-0.04)
Age59_61	0.197**	0.225**	0.268**	0.291***	0.030	0.082
	(2.40)	(2.73)	(2.52)	(2.73)	(0.17)	(0.46)
Age62_64	0.312***	0.313***	0.354***	0.353***	0.024	0.069
	(4.22)	(4.24)	(3.71)	(3.70)	(0.12)	(0.35)
Age65_67	0.391***	0.375***	0.421***	0.405***	0.031	0.073
	(5.93)	(5.68)	(4.95)	(4.75)	(0.14)	(0.34)
Age68_70	0.349***	0.331***	0.363***	0.346***	-0.029	0.013
	(5.96)	(5.64)	(4.81)	(4.58)	(-0.14)	(0.06)
Age71_73	0.323***	0.309***	0.313***	0.300***	-0.051	-0.011
	(6.29)	(6.00)	(4.76)	(4.55)	(-0.26)	(-0.06)
Age74_76	0.250***	0.239***	0.248***	0.238***	-0.070	-0.034
	(5.53)	(5.29)	(4.26)	(4.09)	(-0.42)	(-0.20)
Age77_79	0.154***	0.148***	0.169***	0.163***	-0.019	0.003
	(4.01)	(3.83)	(3.38)	(3.26)	(-0.17)	(0.03)
lgERHInc	0.262***	0.261***	0.272***	0.271***	0.172***	0.181***
	(25.05)	(24.95)	(19.56)	(19.48)	(4.25)	(4.42)

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

Variable	Base	Base Retired	Base RTI	Base Retired RTI	IV Base	IV Retired
Unemp	-0.532***	-0.510***	-0.541***	-0.521***	-0.566***	-0.550***
	(-22.81)	(-21.57)	(-18.32)	(-17.43)	(-19.30)	(-18.56)
lossjob	-0.010	-0.015	0.011	0.007	0.023	0.021
	(-0.35)	(-0.56)	(0.33)	(0.20)	(0.67)	(0.63)
Emp	0.104***	0.124***	0.107***	0.126***	0.181***	0.185***
	(8.36)	(9.55)	(6.63)	(7.44)	(4.71)	(5.12)
WestDT	0.225***	0.226***	0.169**	0.171**	0.081	0.087
	(4.59)	(4.62)	(2.76)	(2.78)	(1.16)	(1.28)
Married	0.150***	0.153***	0.188***	0.191***	0.455***	0.421***
	(6.43)	(6.54)	(6.12)	(6.20)	(3.43)	(3.12)
getMar	0.224***	0.222***	0.195***	0.194***	0.185***	0.185***
	(8.85)	(8.77)	(5.84)	(5.80)	(4.90)	(5.09)
Separated	-0.166***	-0.163***	-0.136**	-0.133**	0.140	0.106
	(-3.38)	(-3.32)	(-2.11)	(-2.07)	(0.96)	(0.72)
getSep	-0.293***	-0.294***	-0.239***	-0.240***	-0.263***	-0.261***
	(-4.90)	(-4.91)	(-3.03)	(-3.05)	(-3.58)	(-3.68)
Divorced	0.068	0.069	0.104**	0.105**	0.370***	0.336**
	(1.91)	(1.95)	(2.21)	(2.24)	(2.68)	(2.39)
getDiv	-0.098**	-0.098**	-0.106	-0.106	-0.119	-0.117**
	(-2.11)	(-2.12)	(-1.73)	(-1.74)	(-1.95)	(-1.98)
Widowed	-0.339***	-0.355***	-0.313***	-0.327***	-0.273***	-0.289***
	(-7.58)	(-7.91)	(-5.38)	(-5.61)	(-4.39)	(-4.69)
NKid	0.096***	0.096***	0.093***	0.094***	0.097***	0.096***
	(12.40)	(12.46)	(9.24)	(9.28)	(8.24)	(8.42)
nEdYear	0.010**	0.009	0.012**	0.012**	0.031***	0.028***
	(2.12)	(1.89)	(2.10)	(1.94)	(3.01)	(2.70)
Owner	0.115***	0.115	0.127***	0.128***	0.103***	0.105***
	(8.61)	(8.66)	(7.37)	(7.40)	(5.00)	(5.25)
HospStay	-0.186***	-0.185***	-0.184***	-0.183***	-0.114***	-0.122***
	(-17.86)	(-17.78)	(-13.56)	(-13.51)	(-3.19)	(-3.38)
OccupDis	-0.300***	-0.310***	-0.275***	-0.285***	-0.201***	-0.217***
	(-15.48)	(-15.98)	(-10.92)	(-11.30)	(-5.00)	(-5.17)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Dummy for 1992	0.579***	0.601***	0.486***	0.506***	0.557***	0.577***
	(11.19)	(11.57)	(7.44)	(7.71)	(7.32)	(7.66)
Retired		0.120***		0.109***		0.076**
		(5.53)		(3.91)		(2.13)
RTI			0.209***	0.208***	2.649**	2.336**
			(17.84)	(17.8)	(2.31)	(1.99)
Constant	4.808***	4.755***	4.341***	4.295***	1.997	2.279
	(37.66)	(37.14)	(26.28)	(25.9)	(1.71)	(1.92)
Observations	241938	241933	155473	155468	152134	152129
Davidson-MacKinnon test of exogeneity (F – Test)					6.481 (1,119312)**	4.338 (1,119306)**

***Note*: *t*- statistics are in parenthesis, stars for significance levels : **<5%, ***<1%. Standard errors are robust. Omitted age category: >79. IV estimates RTI instrumented by the age-retirement pattern

Table 2. Robustness in subsample splits

	Men	Women	West	East	Not Unemp	Unemp	Not OccDis	OccDis
Base Retired								
Retired	0.217***	0.083***	0.122***	0.147***	0.107***	0.221	0.102***	0.248***
	(6.64)	(2.74)	(4.86)	(3.31)	(4.66)	(1.28)	(4.17)	(4.23)
Observations	117054	124879	186497	55436	224982	16951	213715	28218
Base RTI								
RTI	0.193***	0.226***	0.205***	0.202***	0.203***	0.088	0.175***	0.364***
	(11.74)	(13.56)	(15.40)	(8.03)	(16.96)	(1.09)	(14.26)	(8.58)
Observations	75078	80395	116105	39368	143983	11490	137575	17898
Base Retired RTI								
RTI	0.193***	0.226***	0.204***	0.201***	0.203***	0.087	0.175***	0.361***
	(11.71)	(13.54)	(15.38)	(7.96)	(16.93)	(1.08)	(14.23)	(8.51)
Retired	0.210***	0.058	0.112***	0.137**	0.084***	0.350	0.100***	0.202***
	(5.02)	(1.50)	(3.42)	(2.51)	(2.83)	(1.56)	(3.12)	(2.65)
Observations	75073	80395	116100	39368	143978	11490	137572	17896
IV Base								
RTI	4.054**	1.171	2.192**	4.864	2.664**	-15.750	3.548	2.778**
	(2.32)	(0.74)	(2.03)	(1.58)	(2.43)	(-0.28)	(1.76)	(2.54)
Davidson-MacKinnon test of exogeneity	10.307	no	4.421	no	0.007	no	no	0.011
F – Test	(1,57461)		(1,90212)		(1,109084)			(1,12406)
P – Value	0.001		0.036		7.329			6.505
Observations	73499	78635	116037	36097	141120	11014	134495	17639
IV Retired								
RTI	3.454**	1.001	1.857	5.255	2.475**	-16.982	3.295	2.721**
	(2.10)	(0.57)	(1.74)	(1.37)	(2.18)	(-0.28)	(1.49)	(2.46)
Retired	0.184***	0.039	0.095***	-0.135	0.050	0.509	0.039	0.110
	(3.49)	(0.66)	(2.82)	(-0.58)	(1.34)	(0.68)	(0.66)	(1.19)
Davidson-MacKinnon test of exogeneity	7.060	no	no	no	5.576	no	no	6.019
F – Test	(1,57455)				(1,109078)			(1,12403)
P – Value	0.008				0.018			0.014
Observations	73494	78635	116032	36097	141115	11014	134492	17637

Notes: Sub samples are Male vs Female, West vs East Germans, Registered as unemployed vs not registered, reporting occupational disability vs not reporting. *t* – statistics in parenthesis. Stars for significance levels : **<5%, ***<1%. Standard errors are robust.

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.

	All sample	Men	Women	West	East	Not Unemp	Unemp	Not OccupDis	OccupDis
Pooled 1									
Retired	0.064***	0.121***	0.048**	0.068***	0.133***	0.065***	0.222***	0.110***	-0.027
	(4.53)	(5.34)	(2.52)	(4.22)	(4.47)	(4.50)	(3.61)	(7.18)	(-0.70)
Observations	241933	117054	124879	186497	55436	224982	16951	213715	28218
Pooled 2									
Retired	-0.087***	0.037	-0.105***	-0.061***	-0.084**	-0.098***	0.198***	-0.025	-0.106***
	(-5.52)	(1.50)	(-4.84)	(-3.38)	(-2.48)	(-6.00)	(3.23)	(-1.40)	(-2.73)
Observations	241933	117054	124879	186497	55436	224982	16951	213715	28218
Pooled 1									
RTI	0.436***	0.415***	0.458***	0.429***	0.441***	0.427***	0.505***	0.393***	0.706***
	(52.98)	(35.69)	(39.18)	(46.20)	(24.68)	(51.02)	(13.09)	(46.16)	(25.30)
Observations	155647	75166	80481	116232	39415	144140	11507	137722	17925
Pooled 2									
RTI	0.420***	0.397***	0.446***	0.413***	0.429***	0.413***	0.498***	0.380***	0.682***
	(51.06)	(34.13)	(38.12)	(44.45)	(23.94)	(49.28)	(12.94)	(44.63)	(24.38)
Observations	155647	75166	80481	116232	39415	144140	11507	137722	17925
Pooled 1									
RTI	0.436***	0.415***	0.458***	0.429***	0.442***	0.428***	0.503***	0.393***	0.706***
	(53.00)	(35.72)	(39.22)	(46.19)	(24.73)	(51.04)	(13.05)	(46.13)	(25.26)
Retired	0.064***	0.102***	0.069***	0.059***	0.133***	0.064***	0.188**	0.105***	-0.003
	(3.72)	(3.67)	(2.93)	(2.96)	(3.76)	(3.63)	(2.50)	(5.58)	(-0.07)
Observations	155642	75161	80481	116227	39415	144135	11507	137719	17923
Pooled 2									
RTI	0.420***	0.397***	0.445***	0.413***	0.428***	0.413***	0.497***	0.380***	0.679***
	(50.97)	(34.14)	(38.02)	(44.42)	(23.88)	(49.18)	(12.91)	(44.62)	(24.23)
Retired	-0.073***	0.021	-0.069**	-0.058**	-0.059	-0.083***	0.170**	-0.021	-0.072
	(-3.75)	(0.69)	(-2.59)	(-2.59)	(-1.48)	(-4.15)	(2.25)	(-0.95)	(-1.51)
Observations	155642	75161	80481	116227	39415	144135	11507	137719	17923

***Notes**: t* - statistics in parenthesis. Stars for significance levels : **<5%, ***<1%. Standard errors are robust.

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	Men	Women	West	East	Not Unemp	Unemp	Not OccupDis	OccupDis
Fixed effect 1									
Retired	0.222***	0.297***	0.191***	0.205***	0.306***	0.224***	0.217	0.200***	0.304***
	(11.41)	(9.96)	(7.04)	(9.22)	(7.55)	(10.88)	(1.27)	(9.23)	(5.30)
Observations	241933	117054	124879	186497	55436	224982	16951	213715	28218
Fixed effect 2									
Retired	0.097***	0.199***	0.058	0.097***	0.135***	0.084***	0.210	0.078***	0.232***
	(4.51)	(6.12)	(1.91)	(3.87)	(3.05)	(3.69)	(1.23)	(3.19)	(3.96)
Observations	241933	117054	124879	186497	55436	224982	16951	213715	28218
Fixed effect 1									
RTI	0.184***	0.168***	0.200***	0.180***	0.172***	0.180***	0.056	0.154***	0.326***
	(16.96)	(10.94)	(12.99)	(14.70)	(7.27)	(16.20)	(0.77)	(13.50)	(8.18)
Observations	155647	75166	80481	116232	39415	144140	11507	137722	17925
Fixed effect 2									
RTI	0.177***	0.160***	0.193***	0.175***	0.159***	0.173***	0.052	0.148***	0.315***
	(16.29)	(10.45)	(12.55)	(14.24)	(6.69)	(15.62)	(0.71)	(12.97)	(7.91)
Observations	155647	75166	80481	116232	39415	144140	11507	137722	17925
Fixed effect 1									
RTI	0.183***	0.167***	0.198***	0.179***	0.167***	0.178***	0.056	0.153***	0.322***
	(16.81)	(10.86)	(12.88)	(14.62)	(7.05)	(16.07)	(0.77)	(13.38)	(8.08)
Retired	0.210***	0.289***	0.164***	0.189***	0.299***	0.203***	0.334	0.198***	0.258***
	(8.32)	(7.56)	(4.67)	(6.43)	(5.98)	(7.61)	(1.50)	(6.94)	(3.49)
Observations	155642	75161	80481	116227	39415	144135	11507	137719	17923
Fixed effect 2									
RTI	0.177***	0.160***	0.193***	0.175***	0.157***	0.173***	0.052	0.148***	0.313***
	(16.28)	(10.44)	(12.54)	(14.23)	(6.64)	(15.61)	(0.71)	(12.96)	(7.86)
Retired	0.093***	0.198***	0.039	0.092***	0.134**	0.069**	0.324	0.082**	0.193**
	(3.36)	(4.78)	(1.00)	(2.81)	(2.45)	(2.33)	(1.45)	(2.57)	(2.55)
Observations	155642	75161	80481	116227	39415	144135	11507	137719	17923

***Notes**: t* - statistics in parenthesis. Stars for significance levels : **<5%, ***<1%. Standard errors are robust.

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., Baqir, R., Easterly, W. (1999). Public Goods and Ethnic Divisions. Quarterly Journal of Economics, 114 (4), 1243–1284.

Alesina, A.F., Glaeser, E. L., Sacerdote, B. (2005). Work and Leisure in the U.S. and Europe: Why So Different? CEPR Discussion Paper No. 5140.

Angrist, D.J., Levy, V. (1999). Using Maimonides' Rule to Estimate The Effect of Class Size on Scholastic Achievement. Quarterly Journal of Economics, 114 (2), 533–575.

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

Apel, K.O. (1990). Is the ethics of the ideal communication community a Utopia? On the relationship between ethics, Utopia, and the critique of Utopia. In S. Benhabib, F. Dallmayr (Ed.), The communicative ethics controversy. Cambridge: MIT Press.

Argyle, M. (1999). Causes and correlates of happiness. In: D. Kahneman, E. Diener, N. Schwartz (Ed.), Well being: the hedonic psychology (pp. 353-373). New York: Russel Sage Foundation.

Aslam, A., 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.

Bardsleya, N., 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. and Bonatti, L. (2008a). Endogenous growth, decline in social capital and expansion of market activities. Journal of Economic Behavior & Organization, 67(3-4), 917–926.

Bartolini, S., Bilancini, E., Pugno, M. (2008b). Did the Decline in Social Capital Depress Americans' Happiness? Available at SSRN: http://ssrn.com/abstract=1210118.

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

Becchetti, L., Rosati, F. (2007). Global Social Preferences and the Demand for Socially Responsible Products: Empirical Evidence from a Pilot Study on Fair Trade Consumers. World Economy, 30 (5), 807–836.

Becchetti, L., Rossetti, F. (2009). When money does not buy happiness: The case of "frustrated achievers". Journal of Socio – Economics, 38 (1),159–167.

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

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

Bruni, L., 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., Weil, P. (2008).The Distribution of Total Work in the Us and EU. In: Are Europeans Lazy or Americans Crazy? (Oxford university Press, forthcoming).

Clark, A. E., Frijters P., Shields, M. (2006). Income and Happiness. Evidence, Explanations and Economic Implications. Working Paper No. 24, Paris Jourdan Science Economiques.

Clark, A.E., Etilé, F., Postel-Vinay, F., Senik, C.,Van der Straeten, K. (2005). Heterogeneity in reported well-being: evidence from twelve European countries. Economic Journal, 115 (502),118–132.

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

Clark, A.J., 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., MacKinnon, J. G. (1993). Estimation and Inference in Econometrics. New York: Oxford University Press.

Di Tella R., MacCulloch, R. (2005). Partisan Social Happiness. Review of Economic Studies, 72 (2), 367–393.

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

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

Earleya, J., Konow, J., (2008). The Hedonistic Paradox: Is homo economicus happier? Journal of Public Economics, 92 (1-2), 1-33.

Easterlin, R.A. (1995). Will raising the incomes of all increase the happiness of all? Journal of Economic Behavior and Organization, 27 (1), 35-47.

Easterlin, R.A. (2000). The Worldwide Standard of Living since 1800. Journal of Economic Perspectives, 14 (1),7-26.

Fehr, E. and Schmidt, K. M. (1999). A Theory of Fairness, Competition and Cooperation. Quarterly Journal of Economics, 114 (3), 817-868.

Fehr, E., Falk, A. (2002). Psychological foundations of incentives, European Economic Review, 46 (4-5), 687–724.

Fehr, E., Schmidt, K.M. (1999). A Theory of Fairness, Competition and Cooperation, Quarterly Journal of Economics, 114 (3), 817–868.

Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. Journal of Public Economics, 89 (5-6), 997–1019.

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

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

Frey, B. S., Stutzer, A. (2000). Happiness, Economy and Institutions. Economic Journal, 110 (466), 918–938.

Frey, B. S., Stutzer, A. (2002a). Happiness and Economics. How the economy and institutions affect well-being. Princeton: Princeton University Press.

Frey, B.S., Stutzer, A. (2002b). What Can Economists Learn from Happiness Research? Journal of Economic Literature, 40 (2), 402–435.

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

Frey, B.S., Stutzer, A. (2006). What Happiness Research Can Tell Us About Self-Control Problems And Utility Misprediction, IEW - Working Papers iewwp267, Institute for Empirical Research in Economics - IEW.

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.

Frijters, P., Geishecker, I., Shields, M.A. and Haisken-DeNew, J.P. (2006). Can the large swings in Russian life satisfaction be explained by ups and downs in real incomes? Scandinavian Journal of Economics, 108, 433–458.

Frijters, P., Shields, M.A., Haisken-DeNew, J.P. (2004a). Money does matter! Evidence from increasing real incomes in East Germany following reunification. American Economic Review, 94 (3),730–740.

Frijters, P., Shields, M.A., and Haisken-DeNew, J.P. (2004b). Investigating the patterns and determinants of life satisfaction in Germany following reunification. Journal of Human Resources, 39 (3), 649–674.

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

Gardner, J., Oswald, A. J. (2007). Money and mental wellbeing: A longitudinal study of medium-sized lottery wins. Journal of Health Economics, 26 (1), 49–60.

Gui, B. & Sugden, R. (Ed.) (2005). Economics and Social Interaction: Accounting for Interpersonal Relations. Cambridge: Cambridge University Press.

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.

Habermas, J. (1990). Discourse ethics: notes on a program of philosophical justification. In: Benhabib, S., Dallmayr, F. (Ed.), The communicative ethics controversy. Cambridge: MIT Press.

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.

Jacob, B.A., Lefgren, L. (2004). Remedial Education and Student Achievement: A Regression - Discontinuity Analysis, Review of Economics and Statistics, 86 (1), 226–244.

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.

Knack, S., Keefer, P. (1997). Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. Quarterly Journal of Economics 112 (4), 1251–1288.

Knack, S., Zak, P.J. (2001). Trust and Growth. Economic Journal, 111(470), 295–321.

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

Ludwig, J., Miller, D. L. (2007). Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design. Quarterly Journal of Economics, 122 (1),159–208.

Marquardt, D. W. (1970). Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation, Technometrics 12,591–612.

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

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.

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

Oswald, A.J., N. Powdthavee (2007a). Obesity, Unhappiness and the Challenge of Affluence: Theory and Evidence. Economic Journal, 117 (521), 441–54.

Oswald, A.J., Powdthavee, N. (2007b). Death, Happiness, and the Calculation of Compensatory Damages. IZA Discussion Papers No. 3159, Institute for the Study of Labor (IZA).

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.

Ravallion, M., Lokshin, M. (2001). Identifying Welfare Effects from Subjective Questions. Economica, 68 (271), 335–357.

Sen, A. K. (1976). Liberty, Unanimity and Rights. Economica, 43 (171), 217–245.

Sobel, J. (2002). Can we trust Social Capital? Journal of Economic Literature Vol.XL,139–154.

Sugden, R. (2005).Why rationality is not a consequence of Hume's theory of choice. The European Journal of the History of Economic Thought,12(1), 113–118.

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

Van der Klaauw, W. (2002). Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression Discontinuity Approach. Internationl Economic Review, 43 (4),1249–1287.

Van der Klaauw, W., Hahn, J., Todd, P. (2001). Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design. Econometrica, 69 (1), 201–209.

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.

Van Praag, B.M.S., Frijters, P., Ferrer-i-Carbonell, A. (2000). A structural model of well-being. Tinbergen Institute Discussion paper TI 2000-053/3.

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.

Winkelmann, L., Winkelmann, R. (1998). Why are the unemployed so unhappy? Evidence from Panel Data. Economica, 65 (257),1–15.

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 post government income 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.