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Age, Life-satisfaction, and Relative Income

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Abstract

We first confirm previous results with the German Socio-economic Panel, and obtain strong negative effects of comparison income. However, when we split the sample by age, we find quite different results for reference income. The effects on life-satisfaction are *positive and significant* for those under 46, consistent with Hirschman's (1973) 'tunnel effect', and only negative (and larger than in the full sample) for those over 46, when relative deprivation dominates. Thus for young respondents, reference income's signalling role, indicating potential future prospects, can outweigh relative deprivation effects. Own-income effects are also larger for the older sample, and of greater magnitude than the comparison income effect. In East Germany the reference income effects are insignificant for all age groups.

1. Introduction

Among the most important results in happiness research, which largely explain the Easterlin Paradox, are the negative effects of comparison or reference income (Layard et al., 2010; Clark et al. 2008). However as Hirschman (1973) observed, just before the beginning of modern research on subjective well-being by Easterlin (1974), comparison with a relevant reference group could have two very different effects. The relative income effect, which had already been discussed by a few economists, and more widely by sociologists as 'relative deprivation' (Runciman, 1966), refers to comparison of one's own current situation with that of the relevant reference group. However, Hirschman (1973) argued in the context of economic development and resulting inequality combined with rapid growth, that comparison could also indicate one's own future prospects. Thus a higher reference income in this context might be perceived as only a temporary 'relative deprivation', but also as an indicator of a better future, which he denoted 'the tunnel effect', with an inherently ambiguous net result on current subjective well-being (SWB).

While such inter-country differences are plausible, there is also a natural asymmetry in likely response to relative income across age groups, which has received much less attention. Young individuals everywhere are obviously more mobile and likely to see peer success as an indication of their own future prospects, (and perhaps be motivated to greater effort), than less flexible, older people. The careers of the latter group are fully determined at the latest by retirement, so expectations lose relevance and current perceptions of relative deprivation or success should dominate. This asymmetry suggests estimating the effects of relative income separately for young and old subsamples, which is our approach here, and does not seem to have been implemented previously.

If we consider comparisons between stable, developed countries, then it seems obvious that relative deprivation must be exacerbated by inequality of income distribution, but without the countervailing signalling effect that is plausible in development or during the social turmoil after transition. To test this hypothesis, we compare West Germany with the former GDR or East Germany, which is now (21 years after reunification) a region with high unemployment, poor career prospects for the young, and lower inequality than in the West, so we expect weaker effects of relative income for both the young and old samples.

Using the German Socio-economic Panel (GSOEP) we estimate life satisfaction separately for sub-samples between 18 and 45, and over 45, in both West and East, as well as for the complete samples with all ages. In West Germany we confirm the results of Layard et al. (2010), and Ferrer-i-Carbonell (2005), who also find strong negative effects of relative income with GSOEP data and use a quadratic in age and many controls. However, in contrast to all previous work that we are aware of, we actually find a *positive significant effect* of comparison income in West Germany for those under 46, and a *negative significant effect* for the older group, the absolute magnitude of which is larger than in the full sample, though less than the own income effect.

Another interesting result is that satisfaction declines for the oldest respondents with all controls, so is only U-shaped in age up to about 75. The widely used quadratic in age (Blanchflower and Oswald, 2008), actually changes sign for the older subsample, while the age effect for whole sample is captured by a cubic.

Regional effects for the German States (Laender), which proxy for many unobserved public goods (or bads such as pollution), were highly significant, and their omission (as in Senik's (2008) second-stage regressions) led to loss of significance of comparison income. In East Germany, relative income is insignificant for all age groups, though the sign of the coefficient remains positive for the young and negative for the old. Other noteworthy differences between the age groups are the much weaker effect of marriage – and the much stronger effect of own income – in the older group.

Thus a fundamental result of happiness research changes dramatically after disaggregating the complete sample, a change not captured by the usual quadratic in age: the robust negative effect of relative income turns positive in younger subsamples, a result quite consistent with Hirschman's (1973) pioneering analysis, though not directly predicted by him. And while Senik (2008) confirms Hirschman's (1973) hypothesis for transition economies, her finding of positive relative income effects for some major Western economies in samples containing all age groups are convincingly rejected by other studies, and hence raise concerns about her methodology.

A control variable which is often neglected is the potential for face-to-face interviewing to affect responses, and we find that use of interviews instead of a postal survey raises reported life satisfaction by more than marriage. This and other new controls provide much higher

explanatory power of our estimates than is usual in cross-sectional regressions. For data reasons we do not use the full panel with individual fixed effects, but Layard et al. (2010) show that fixed effects only reduce the size of the coefficients of own-income and relative income, but do not change signs or statistical significance. They also show that adaptation provides only small additional explanatory power in the GSOEP panel. We also control for employment, health and disability, which have strong effects, and in contrast to some studies we find positive direct effects of education, even after controlling for own household income and reference income. Another important variable which is not always included is social interaction, which has a powerful influence on life satisfaction.

Estimation of well-being in samples combining young and old respondents can thus generate serious bias, in spite of the customary quadratic in age. With the aging populations of many countries, the weight of the positive effects of income growth on younger people is likely to be further attenuated by the much weaker net effects for older groups suggested by our estimates.

The plan of the paper is to provide a brief review of some more relevant literature in section 2, followed by a discussion of the GSOEP data and descriptive statistics in section 3. The empirical analysis and results are presented in section 4. Conclusions are summarized in section 5, and tables of descriptive statistics and regression results are in the appendix.

2. Literature Review

While Hirschman's ideas have long been neglected, they were tested by Drichoutis et al. (2010), who found insignificant effects of reference income for the transition economies of Eastern Europe, and by Senik (2008, 2004), who found positive effects of relative income on life satisfaction or financial satisfaction for most transition economies and Russia. She ascribes this contrast with 'old' Europe, with mainly negative effects of reference income, to social and economic turmoil after transition and consequent high mobility. Much less plausibly, Senik (2008) also finds a strong *positive* effect of relative income on happiness in the US, attributed to high perceived mobility, but this result is directly contradicted by Layard et al. (2010), using the same GSS data, and by Luttmer (2005) and others with various data sets. Senik argues that Luttmer's neighbourhood mean income does not have the same informational content as comparison with an educational or professional peer-group, but this is questionable. Living in a more prosperous area surely also offers better career prospects

than being surrounded by poverty, with lower mobility costs, as well as probably providing various local public goods, better quality services, etc., which are likely to directly raise well-being. Thus Luttmer's negative comparison effect (for all ages) arises *in spite of* several underlying positive neighbourhood effects.

Senik (2008) omits regional effects, and most seriously, both employment status and health from her second-stage explanatory variables, which are generally found to be among the most important determinants of SWB, so these omissions could cause omitted variable bias. She also uses individual income instead of the more natural household income; thus some women with low or no income may be living in affluent households, but the precise reasons for her anomalous results are unclear. Very surprisingly, Senik (2008) also reports *positive* significant relative income effects on financial satisfaction for Germany, Netherlands, Ireland and Spain in her Table 3, though she discusses these effects for only Ireland and Spain in the text. These results for stable western countries are clearly contradicted by studies mentioned above – and ours below – for West Germany at least.[1] She claims 'predominantly negative' relative income effects in her sample of 14 West European countries, but reports negative significant coefficients for only 6 countries.

In a previous version of the above paper, Senik (2006) reports quite different results for financial satisfaction in the same West European countries, with highly significant, negative effects of reference income in all cases, but she does not mention these differences in the later, published version.

A different kind of test of the signal effect of reference income has been carried out by Clark, Kristensen, and Westergard-Nielsen (2009), using Danish establishment wage data, with the plausible finding that job-satisfaction is higher in establishments with higher average pay, which signals one's own prospects. Interestingly in the light of our findings below, they find less effect for those near retirement. However, it is also likely that higher average pay will be correlated with work-place public goods as part of rent-sharing with workers, which may explain part of the observed influence.

By contrast, in an early study with UK data for employees, Clark and Oswald (1996) found a strong negative effect of reference income on job-satisfaction (which is generally an

[1] Senik (2008) uses 'jealousy' in her title and text, to refer to the relative deprivation effect of comparison (sometimes interpreted as preference for fairness, or as envy). In fact, jealousy refers to 'an anticipated loss' and 'is not to be confused with envy' (Wikipedia).

important component of life satisfaction), equal in magnitude and opposite in sign to the own-income effect. Separating subsamples of young and old does not seem to have been considered previously.[2]

3. Data & descriptive statistics

The data used comes from the German Socio-Economic Panel (GSOEP), which is a representative micro data set providing detailed information on persons, families and households in Germany. The GSOEP was started in 1984 and has become a widely used database for sociologists and economists. A major advantage is the comprehensive nature of the data set, which combines objective indicators (e.g. income, employment status, family structure), as well as subjective measures (e.g. life satisfaction, preferences, values). In our paper, we make use of the entire 2008 wave of the GSOEP and analyse the nexus between happiness, relative income and age based on 17,865 individual observations.

Our dependent variable is an individual's self-reported, current life satisfaction which is measured on an 11 point scale, 0 being the lowest value, while 10 is reported by individuals who are very satisfied with their actual life. Our main explanatory variables of interest are own and reference income, which are both measured at the household level after deducting taxes and social insurance contributions. For the identification of the reference income, we follow Layard et al. (2010) and assume that an individual compares his/her own income with the average income of people in his/her own country, who are in the same age range, have the same gender and have attained a similar education level. We therefore define an individual's reference group by his/ her age (6 categories), education (2 categories) and gender. Additionally, we distinguish between the place of residence of an individual (West vs. East Germany). Moreover, we present our analysis separately for East and West Germany. This is motivated by large and persisting socio-economic and cultural differences between the two regions, which are highlighted in table 1. The table provides summary statistics and detailed definitions of all variables used in the analysis, including our dependent and main explanatory variables described above.

[2] Senik (2008) uses an age-interaction term to find stronger positive effects of reference income for younger respondents in Eastern Europe, and in the US, but reports no evidence of negative comparison effects for older individuals.

Initially, Table 1 shows that individuals in East Germany are on average less satisfied with their life than those living in West Germany. This corresponds to the fact, that East Germans are more affected by unemployment and have significantly lower household income then West Germans. Due to the construction of the variable, the latter also holds true for reference income. The well-known regional disparities in employment and income between West and East Germany are therefore clearly reflected in our data. However, the average life satisfaction score in East Germany is still about 6.6, which is fairly high compared to self-reported happiness in the US (Layard et al., 2010). Furthermore, the table shows distinct regional differences with respect to the ethnic composition of the population. While only 1% of the respondents in East Germany have no German citizenship, about 7% of the West German respondents have a foreign nationality. Finally, the large share of individuals with higher education qualifications in East Germany is striking.

Table 2 contains summary statistics of our dependent and independent variables broken down by age groups. It becomes obvious that the differences in happiness and economic outcomes between West and East Germany hold true when we compare people within age groups. However, the educational structure of individuals below the age of 46 is quite similar in West and East Germany. This indicates that individuals who have been fully educated in the former GDR mainly drive the superior qualification structure in East Germany. In particular, East German women are characterised by a high share of university graduates. Finally, the table shows that young adults in East and West Germany are on average more satisfied with their life than older individuals.

Detailed information on the relation between age and happiness is provided by Figure 1, which shows how life satisfaction changes over the life span in West Germany. The estimated age-life satisfaction profile is based on parameters taken from an OLS regression based on our whole sample with quadratic and cubic terms in age, the usual socio-economic controls and an east/west dummy.[3] It becomes obvious that life satisfaction decreases during young adulthood until the age of 41. After this age, life satisfaction starts to increase until it reaches its maximum around the age of 76. In the subsequent phase, life satisfaction declines with advancing age. Similar results are found by Wunder et al. (2011) who also find a three-phase age pattern using both parametric and semi-parametric regression techniques.

[3] We hold all individual characteristics apart from age constant at their sample means.

4. Empirical analysis

To test the influence of reference income on life satisfaction we estimate the following model:

$$(1) \qquad \boldsymbol{H = \beta_0 + \beta_1 Age + \beta_2 Age^2 + \beta_3 Age^3 + \beta_4 lnY + \beta_5 ln\overline{Y} + \alpha X + \varepsilon,}$$

where H measures self-reported life satisfaction on an 11-point scale, and X is a vector of individual covariates including individual characteristics like gender, employment status and self-reported health as well as dummies for federal states. Through the inclusion of a cubic in age, the specification allows life satisfaction to vary during the life cycle as described above. Y captures annual net household income of an individual, while $\overline{Y}$ describes the mean income of the corresponding reference group defined by age, gender, education and region.

Column (1) of table 3 reports the results of our benchmark specification for West Germany. Our positive and significant income coefficient has almost the same size as the one found by Layard et al. (2010) who exploit the panel aspect of the GSOEP and use individual fixed effects. [4] With respect to the role of relative income, we confirm the recent findings of Layard et al. (2010) and Ferrer-i-Carbonell (2005): reference income has a negative effect on individual well being. However, the positive influence of own income is still larger than the negative effect of reference income.

By estimating a simple OLS model, we treat life satisfaction scores as cardinal and comparable across respondents. This assumption is sometimes criticised in the economic literature, but estimates from an ordered probit model are qualitatively similar to the ones reported in table 3. This is in line with the findings of Ferrer-i-Carbonell and Frijters (2004) who demonstrate that the assumptions on cardinality or ordinality of answers to life satisfaction questions have no substantial impact on the empirical results. Our main findings are also similar if we weight our individual observations.

The other individual factors influence individual life satisfaction in the usual way: being married is positively associated with individual well-being, while respondents with a child in the household are less happy than the ones without children. The impact of health status and

[4] However they exclude immigrants and individuals under 30 and over 55. Due to the cross-sectional nature of the data used, we do not control for unobserved heterogeneity of the respondents. Layard et al (2010) find that individual fixed effects preserve a highly significant, negative reference income effect, nearly as large in magnitude as the own income effect.

work status is as expected positive. It is noteworthy that, in contrast to some studies, we find a strong positive association between education and life satisfaction even after controlling for own and reference income. Furthermore, our results highlight the important role of social interactions and contacts (e.g. sport, friends, and voluntary services) for individual well-being. An interesting and unique result is that interview techniques have a substantial impact on self-reported life satisfaction. Respondents who use a written survey questionnaire, instead of a face-to-face interview, report significantly lower individual well-being scores. This finding has considerable implications for cross-country comparisons and the design of future happiness studies. Finally, regional dummies for the Federal States (Laender), which proxy for many unobserved regional factors and public goods were highly significant in the West.

The results for East Germany are presented in column (2). As expected, the income coefficient has a larger magnitude than the one found for West Germany. In regions that are characterized by low income and high unemployment levels, own income has a higher relevance for individual well-being. In addition to this, the results indicate that reference income does not matter for individuals in East Germany. Similar results are found by Drichoutis et al. (2010) for East European transition economies. The results in column (2) show a number of further differences with respect to West Germany. For example, being married in East Germany is not associated with higher well-being. On the other hand, the negative coefficient of having a child at home is twice as large as the one in the West German sample (in spite of better child-care facilities in the East). A similar relation holds true for the coefficient of the interview form. The negative effect of postal surveys (instead of a face-to-face interview with social interaction) is larger for East Germans. This result indicates that cultural norms and habits still differ between West and East Germany.

Table 4 provides estimates for West Germany stratified by age groups. For comparison, column (1) reports estimates from the full sample.[5] The results in column (2) highlight that reference income plays a positive role for individuals not older than 45. The standard negative relationship between reference income and individual well-being only holds true for individuals older than 45 (see column 3).[6] Thus a fundamental result of happiness research

[5] The results in column (1) are identical to those reported in column (1) of table 3.

[6] Our results are qualitatively similar if we change the age limits for the two subsamples. If we include a squared term in age in the subsample of young adults (column 2), the coefficient of the reference income stays positive, but loses significance, probably due to multicollinearity. We report results of a specification without squared age, because the inclusion of polynomials in age does not increase explanatory power of the regression for the young sample.

changes dramatically as soon as we disaggregate the sample into young and old individuals. Our findings suggest that the positive signalling effect dominates the negative deprivation effect for young adults: during early career phases with high job and income mobility, the income of people with same sex and similar education and age functions as a signal for future prospects. In other words, reference income suggests own future earnings and therefore positively effects own satisfaction. Only when an individual has reached a stable position within his/her career, does comparison with reference income signal lasting positive status or relative deprivation in the usual manner, so that higher comparison income reduces corresponding well-being. As an additional result, we find that the positive influence of being married is less pronounced for older people.

The results for age groups in East Germany in table 4 support our previous result that own income has greater importance for individual well-being in the Eastern part of Germany. Reference income matters neither for young adults nor for people older than 45. This may be related to lower average incomes and less inequality, and to the fact that the best career opportunities for young adults in the East are widely perceived to result from moving to the West.

5. Conclusions

While the results from the entire sample for West Germany confirm previous findings that reference income has a strong negative effect on well-being, our subsample regressions show that the effect of comparison income on individual life satisfaction changes dramatically over the life-cycle, reversing sign, while increasing in magnitude. This confirmation of Hirschman's 'tunnel hypothesis' in the unexpected context of a stable, advanced economy with relatively low mobility clearly has major consequences for the interpretation of well-being, comparison, and relative optimism or deprivation over the life-cycle. We are not aware of any other such results in the literature on happiness and relative income.

Aggregating over age groups and relying on a quadratic in age has obscured this striking switch in the function of the comparison income, and also missed the downturn in life satisfaction among the oldest individuals, even after controlling for health and many other variables. Life satisfaction and other measures of well-being clearly need to be estimated separately for young and old in future research, and the role of expectations, mobility and inequality seem worth exploring for their relevance to well-being and social comparison.

References

Blanchflower, D. G., Oswald, A., 2008. Is well-being U-shaped over the life cycle? Social Science & Medicine 66, 1733 – 1749.

Clark, A. E., Frijters, P., Shields, M. A., 2008. Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. Journal of Economic Literature 46, 95-144.

Clark, A. E., Kristensen, N., Westergård-Nielsen, N., 2009. Job Satisfaction and Co-worker Wages: Status or Signal? Economic Journal 119, 430–447.

Clark, A. E., Oswald, A., 1996. Satisfaction and comparison income. Journal of Public Economics 61, 359–381.

Drichoutis, A. C., Nayga , R. M., Lazaridis, P., 2010. Do reference values matter? Some notes and extensions on income and happiness across Europe. Journal of Economic Psychology 31, 479–486.

Easterlin, R., 1974. Does Economic Growth Improve the Human Lot? In: David, P.A., Reder, M.W. (Eds.), Nations and Households in Economic Growth: Essays in Honour of Moses Abramowitz. Academic Press, New York, pp. 89–125.

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

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

Hirschman, A. O., with Rothschild, M., 1973. The Changing Tolerance for Income Inequality in the Course of Economic Development. The Quarterly Journal of Economics 87, 544 –566.

Layard, R., Mayraz, G., Nickell, S., 2010. Does Relative Income Matter? Are the Critics Right? Chapter 6. In: Diener, E., Helliwell, J. F., Kahneman, D., (Eds.), International Differences in Well-being, Oxford University Press.

Luttmer, R. F. P., 2005. Neighbors as Negatives: Relative Earnings and Well-Being. Quarterly Journal of Economics 30, 963-1002.

Runciman, W. G., 1966. Relative Deprivation and Social Justice. Routledge and Kegan Paul, London.

Senik, C., 2004. When Information Dominates Comparison: Learning from Russian Subjective Panel Data. Journal of Public Economics 88, 2099–2133.

Senik, C., 2006. Ambition and Jealousy: Income Interactions in the 'Old' Europe versus the 'New' Europe and the United States. IZA Discussion Paper No. 2083.

Senik, C., 2008. Ambition and Jealousy: Income Interactions in the 'Old' Europe versus the 'New' Europe and the United States. Economica 75, 495–513.

Wunder, C., Wiencierz, A., Schwarze, J., and Küchenhoff, H., 2011. Well-being over the lifespan: Semiparametric evidence from British and German longitudinal data. Review of Economics and Statistics (forthcoming).

Appendix – Tables and Figure

Table 1: West and East Germany, overall

	West Germany			East Germany		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Life Satisfaction	13071	7.11	1.73	4794	6.62	1.74
Age	13071	49.73	17.33	4794	50.03	17.62
Sex	13071	0.52	0.50	4794	0.52	0.50
Marriage	13071	0.62	0.48	4794	0.56	0.50
Child	13071	0.49	0.50	4794	0.44	0.50
Health	13071	0.49	0.50	4794	0.46	0.50
Disabled	13071	0.13	0.34	4794	0.12	0.32
German	13071	0.93	0.26	4794	0.99	0.09
Social	13071	0.84	0.36	4794	0.76	0.42
Education1	13071	0.19	0.39	4794	0.12	0.33
Education2	13071	0.47	0.50	4794	0.50	0.50
Education3	13071	0.13	0.34	4794	0.11	0.31
Education4	13071	0.20	0.40	4794	0.27	0.44
Unemployed	13071	0.04	0.20	4794	0.11	0.31
Not_working	13071	0.38	0.48	4794	0.37	0.48
Working	13071	0.58	0.49	4794	0.52	0.50
HH_income	13071	3026	2007	4794	2301	1353
RefIncome	13071	3022	783	4794	2300	521
No_interview	13071	0.39	0.49	4794	0.50	0.50

Life Satisfaction measures self-reported life satisfaction on an 11-point scale. Age describes the age of the respondent. Sex is coded as 1 if the respondent is female. Marriage is coded as 1 if the respondent is married and lives together with his/her partner. Child is coded as 1 if at least 1 child is living in the household. Health is coded as 1 if respondent describes his own health status as good or very good. Disabled is coded as 1 if the respondent is unable to work, because she/he is severely handicapped. German is coded a 1 if the respondent has German citizenship. Social is coded as 1 if the respondent undertakes any interactive social activity at least once per week. Education1 is coded as 1 if the respondent's education is not higher than ISCED level 2. Education2 is coded as 1 if the respondent has a middle vocational education (ISCED 3). Education3 is coded as 1 if the respondent has Abitur and a vocational education or a higher vocational education *(*ISCED 4 +5). Education4 is coded a 1 if the individual has higher education (ISCED 6). Unemployed is a dummy that takes the value 1 if the respondent is registered as unemployed. Not_working is coded as 1 if the respondent is not working but not registered unemployed. Working takes the value 1 if the respondent is working. HH_income measures the net monthly household income of the respondent. RefIncome measures the average net monthly household income within the skill group (Age (6 categories), Sex, Education (2 categories), Region (East vs. West)) to which the respondent belongs. No_interview is coded as 1 if the interview was carried out using a written questionnaire.
Source: GSOEP, 2008

Table 2: Summary Statistics, West and East Germany, by Age Groups

	West Germany				East Germany			
	<=45		>45		<=45		>45	
Variable	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean
Life Satisfaction	5654	7.19	7417	7.06	1929	6.90	2865	6.44
Age	5654	33.42	7417	62.16	1929	32.17	2865	62.06
Sex	5654	0.53	7417	0.52	1929	0.51	2865	0.53
Marriage	5654	0.49	7417	0.73	1929	0.34	2865	0.70
Child	5654	0.70	7417	0.33	1929	0.73	2865	0.24
Health	5654	0.66	7417	0.36	1929	0.65	2865	0.32
Disabled	5654	0.04	7417	0.20	1929	0.03	2865	0.17
German	5654	0.91	7417	0.94	1929	0.99	2865	0.99
Social	5654	0.88	7417	0.82	1929	0.84	2865	0.71
Education1	5654	0.19	7417	0.19	1929	0.17	2865	0.09
Education2	5654	0.47	7417	0.48	1929	0.52	2865	0.49
Education3	5654	0.16	7417	0.11	1929	0.12	2865	0.10
Education4	5654	0.18	7417	0.22	1929	0.19	2865	0.31
Unemployed	5654	0.06	7417	0.03	1929	0.13	2865	0.09
Not_working	5654	0.18	7417	0.53	1929	0.15	2865	0.52
Working	5654	0.76	7417	0.44	1929	0.71	2865	0.39
HH_income	5654	3023	7417	3028	1929	2466	2865	2191
RefIncome	5654	3053	7417	2999	1929	2441	2865	2205
No_interview	5654	0.47	7417	0.33	1929	0.59	2865	0.44

For a description of the variables, see table 1.
Source: GSOEP, 2008

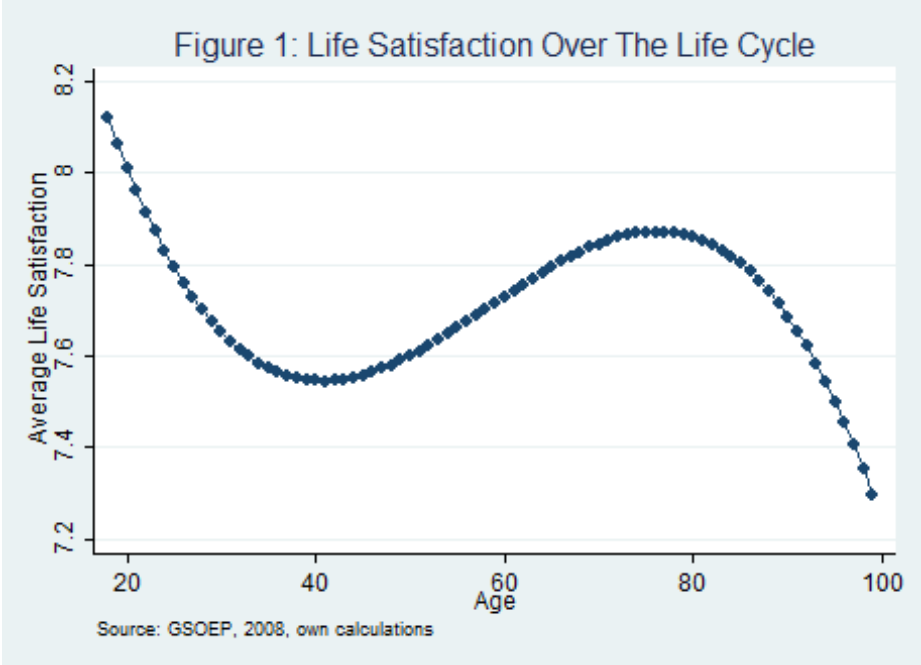

Table 3, Benchmark Regressions		
	West Germany	East Germany
Age	-0.13***	-0.07**
	(0.019)	(0.034)
Age^2	0.0025***	0.0010
	(0.0004)	(0.0007)
Age^3	-0.000015***	-0.000000
	(0.000000)	(0.000000)
Sex	0.04	0.04
	(0.028)	(0.045)
Marriage	0.25***	0.08
	(0.035)	(0.058)
Child	-0.15***	-0.29***
	(0.033)	(0.058)
Health	1.13***	0.92***
	(0.029)	(0.049)
Disabled	-0.50***	-0.47***
	(0.050)	(0.084)
German	0.26***	-0.18
	(0.058)	(0.255)
Social	0.44***	0.39***
	(0.042)	(0.058)
Education2	0.11***	0.07
	(0.041)	(0.083)
Education3	0.12**	0.23**
	(0.054)	(0.098)
Education4	0.33***	0.18**
	(0.053)	(0.093)
Not_working	0.71***	0.71***
	(0.089)	(0.103)
Working	0.70***	0.63***
	(0.085)	(0.090)
Log HH_income	0.48***	0.76***
	(0.030)	(0.054)
Log RefIncome	-0.38***	-0.09
	(0.082)	(0.159)
Interview	-0.27***	-0.43***
	(0.029)	(0.047)
Observations	13,071	4,794
Adjusted R-squared	0.218	0.222

Results from OLS regressions. Dependent variable: Life Satisfaction. Controls for federal states are included. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4, West Germany			
	All	<=45	>45
Age	-0.13***	-0.02***	0.10***
	(0.019)	(0.003)	(0.022)
Age^2	0.0025***		-0.0007***
	(0.0004)		(0.0002)
Age^3	-0.000015***		
	(0.000000)		
Marriage	0.25***	0.37***	0.11**
	(0.035)	(0.051)	(0.049)
Log HH_income	0.48***	0.33***	0.62***
	(0.030)	(0.044)	(0.041)
Log RefIncome	-0.38***	0.32**	-0.52***
	(0.082)	(0.155)	(0.108)
Observations	13,071	5,654	7,417
Adjusted R-squared	0.218	0.204	0.229

Results from OLS regressions. Dependent variable: Life Satisfaction. Controls for gender, children, health status, citizenship, social activities, education, work status, interview form and federal states are included. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5, East Germany			
	All	<=45	>45
Age	-0.07**	-0.03***	0.03
	(0.034)	(0.006)	(0.038)
Age^2	0.0010		-0.0002
	(0.0007)		(0.0003)
Age^3	-0.000000		
	(0.000000)		
Marriage	0.08	0.23**	-0.06
	(0.058)	(0.088)	(0.079)
Log HH_income	0.76***	0.58***	0.95***
	(0.054)	(0.076)	(0.080)
Log RefIncome	-0.09	0.35	-0.11
	(0.159)	(0.277)	(0.218)
Observations	4,794	1,929	2,865
Adjusted R-squared	0.222	0.223	0.206

Results from OLS regressions. Dependent variable: Life Satisfaction. Controls for gender, children, health status, citizenship, social activities, education, work status, interview form and federal states are included. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

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