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# There is a mid-life low in well-being in Germany

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ABSTRACT

Kassenboehmer and Haisken-DeNew (2012) claim that there is no well-being midlife low in Germany, when controlling for fixed effects, respondent experience and interviewer characteristics in the German Socio-Economic Panel, 1994–2006. We re-estimate with a longer run of years using their methods and find that well-being declines to a low in midlife and is neither flat nor trivial.



## 1. Introduction

This paper updates work by Kassenboehmer and Haisken-DeNew (2012) — henceforth KHD. In response to evidence presented in Blanchflower and Oswald (2008) the authors' central claim using the German Socio-Economic Panel (SOEP), 1994–2006, is that *"the otherwise seemingly robust age U-shape effect on life satisfaction in pooled OLS regressions is refuted with the German SOEP when controlling for panel fixed effects and respondent experience in the panel"* (p. 235).[1] We show below that midlife lows are found when all of the available data, 1984–2019, is used, even using KHD's exact methods. The midpoint of these lows is somewhat higher – at around age 55 versus an average of about fifty – than is found in other countries (Blanchflower, 2021). We also critique their methods, and the generalization from a special period in time. However, our aim is not simply to critique KHD, but rather to address an issue of relevance in the debate regarding the relationship between age and well-being.

KHD remains an influential article in this field of investigation, cited by scholars as evidence for the absence of any relationship between age and well-being when, as we show, the drop in well-being from youth to midlife is similar to the difference in well-being experienced by those who can climb stairs without difficulty and those who cannot: a substantial difference in quality of life. As current examples of the influence of KHD, the following papers – a selection of several from 2021 alone – cite it as evidence of no relationship between age and well-being. Examples include Bartram (2021), Toshkov (2021) and van Ours (2021). Galambos et al. (2020), for example, falsely argue that KHD "*documented the disappearance of the U shape in life satisfaction in the GSOEP after controls were introduced*" (p. 904). A similar comment is made by Neulinger and Radó (2018) who state that KHD show "*the U-shape vanishes after controlling for socio-demographic variables*" (p. 18). It does not.

Illustrative of the methodological issue, van Ours claims

> "*KHD introduce experience in the panel as an additional explanatory variable arguing that in the presence of an interviewer*

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[1] KHD present five separate OLS regressions, all of which find U-shapes.

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*a respondent answers more truthfully in later surveys. Using GSOEP-data they show that in pooled cross-sections it does not matter much but in a fixed effects panel analysis once experience in the panel – and its square – is introduced the U-shape relationship between life satisfaction and age disappears. In fact, there is no longer any significant age effect" (2021, p. 3564).*

As we show below this introduction of experience in the panel and its square is not central to the analysis; including them shows there is in fact a significant age and age squared effect when a fuller run of data is examined. Firstly though, KHD use an unusual period in modern German history, 1994–2006. Following the fall of the Berlin Wall and the reunification of East and West, Germany underwent a major and turbulent transition. Thus, this is not a period of time that should be generalized from to challenge a regularity in the data.[2] This important context is not referred to by the scholars who cite KHD as firm evidence against the existence of a U-shape for the age–well-being relationship. KHD's results do not hold in the longer run of years that is available to us from 1984–2019, or in most cases in the earlier or later periods.[3]

The second reason KHD's central claim is incorrect is that it stems from what we argue is an inappropriate way of controlling for respondent experience in the panel. When we make use of a slightly different way of measuring this experience there is always a U-shape, even in the special transition years they examine. In life satisfaction equations that include both age and age-squared, KHD also include years-in-panel and its square as additional controls. This is a problem because years-in-panel is a linear transformation of age and fixed effects estimation cannot obtain precisely estimated coefficients for both variables. Schwandt (2016), for example, noted that "*including age, calendar and individual (absorbing the cohort) effects at the same time causes multicollinearity problems, which is well known in other branches of economics and social sciences*" (p. 79).

KHD implicitly recognize this: their identification strategy relies on the fact that "*many persons drop out temporarily, then rejoin the sample. Thus, we can differentiate between whether (i) one has simply become one year older and (ii) one has one additional year of experience in taking part of the survey*" (p. 236).

In short, their analysis rests on people who are in the SOEP for more than one spell. Overall, 93% of the SOEP participants, both in the longer sweep of the data so far and the years that KHD use, are in the SOEP for only one spell. Thus, independent variation facilitating the calculation of coefficients for age rests on the remaining 7% of individuals. This is a massive, non-random loss of sample size and helps to explain why KHD find insignificant age coefficients. A finding that leads to their claim that well-being is flat in age. Furthermore, individuals who drop out and return to the sample may, for various reasons, be less representative of the national population.

This is not to dismiss taking account of survey experience entirely, only the way it has been implemented by KHD, which causes dramatic multicollinearity problems. It is enough, we argue, to capture the observation that life satisfaction is often higher in the first few years of being in a panel with a dummy variable. Capturing survey experience in this way would not restrict the independent variation for obtaining age coefficients with precision. However, as we show below, our preferred specification with different samples, as well as a specification including years-in-panel with a long enough time span, and hence a much larger sample size, indicates a mid-life low in well-being.[4]

## 2. Results

We extend the SOEP data series from 1984 through 2019 and, due to concerns of mortality selection bias (Hudomiet and Hurd, 2021), we restrict the data to the age range 18–69.[5] This results in an overall sample size of 506,418 versus 149,190 in KHD. In all of our equations reported below we include the typical controls of life satisfaction investigations: real household income; labor force status; marital status; education; children in the household; and region. This is similar to KHD though we do not include health as a control.[6]

In what follows in Tables 1–4 we report four sets of time estimates, first for the years 1984–1993, then for the KHD years of 1994–2006, then 2007–2019 and finally for the entire period 1984–2019. We everywhere find U-shapes in age using OLS for each of the four time periods, as KHD did, and as shown in our Table 1. We solve for a minimum which shows some evidence of increasing over time, from 42 in the first period to 45 in the second and 50 in the latest period, and 46 overall. It is unclear why this rise has occurred. Our results are entirely consistent with what KHD found using OLS: well-being in age has a midlife low and is not flat.

The crucial set of results are those using fixed effects, as reported in Table 2 for the three time periods and then for 1984–2019. There are midlife lows in age once again here in the third period and overall, with minima of 43 and 60 respectively. What stands out though, in columns 1 and 2, is even though the coefficient on the age term is significant and negative and that on the squared term is significant and positive, the minimum is in the mid-nineties and thus outside the range of our data for the first period and KHD's sample years. This suggests there is no mid-life low. These results support the argument that the SOEP data from the years 1994–2006 period examined by KHD is special and not representative of the sample as a whole, nor the later years.[7]

In Table 3, part (a) we replicate KHD's results in column 5 of their Table 2 (p. 237) by reporting fixed effect results only for those approximately 20% of individuals who had no interviewer present and sent in the completed questionnaire. KHD included years-in-panel and its square and did not find a significant U-shape although the age coefficient was insignificantly negative ($-.0288$, $t = .7$) and the age squared coefficient was significant and positive ($.00009$, $t = 4$). We repeated this exercise first in part (a) without the years-in-panel variables and there were U-shapes in all four periods with the minimum being at 48 years old

[2] Blanchflower and Graham (2021a,b) counter claims that the evidence on U-shapes is mixed and report more than 425 published papers that find them. That list has now been updated to 578 papers that find U-shapes https://cpb-us-e1.wpmucdn.com/sites.dartmouth.edu/dist/5/2216/files/2021/11/575-u-shapes.pdf. Blanchflower (2021) finds U-shapes in 146 countries. Blanchflower (2020) finds a similar hump shaped pattern across countries in unhappiness.

[3] A number of subsequent studies published since 2012 have also used the SOEP panel data for Germany to find U-shapes. These include: Baetschmann (2013); Bartolini et al. (2013); Cheng et al. (2017); Ferrer-i-Carbonell and Frijters (2004); Mertens and Beblo (2016); Obućina (2013); Piper (2021); and Wunder et al. (2013).

[4] Bond and Lang's (2019) work challenges this sort of happiness work arguing that results may hinge on the cardinalization of ordinal data. However, recent research has described the circumstances in which the issues raised by Bond and Lang may arise as implausible and impossible (Kaiser and Vendrik, 2020). Blanchflower and Oswald (2016) show that the findings of an inverted U-shape in happiness data is validated in the taking of prescription anti-depressants.

[5] When individuals reach age 70, they leave our sample, regardless of when they joined. We understand that KHD used the age range 20–64 although it does not report that in the paper.

[6] We do not control for health because it is controversial as a right-hand side variable in age–life satisfaction regressions (Blanchflower and Oswald, 2008; Clark, 2019), however when we additionally control for objective health our findings are substantively unchanged.

[7] Given the reunification of 1990, the earlier ten-year period 1984–1993 is also special in German modern history.

**Table 1**
OLS life satisfaction equation with controls, age < 70.

| | 1984–1993 | 1994–2006 | 2007–2019 | 1984–2019 |
|---|---|---|---|---|
| Age | −.0902 (22.37) | −.1280 (46.71) | −.1040 (46.45) | −.0988 (63.13) |
| Age$^2$*100 | .1083 (22.29) | .1423 (44.92) | .1041 (4.96) | .1055 (58.36) |
| Adjusted $R^2$ | .0813 | .0996 | .0808 | .0888 |
| *N* | 92,330 | 178,096 | 235,992 | 506,418 |

Notes: Controls are labor force and marital status, log real household income, years of education, number of children and region and wave dummies. T-statistics in parentheses.

**Table 2**
Individual fixed effects life satisfaction equation with controls, age < 70.

| | 1984–1993 | 1994–2006 | 2007–2019 | 1984–2019 |
|---|---|---|---|---|
| Age | −.0628 (7.47) | −.0787 (16.41) | −.0739 (15.78) | −.0704 (33.87) |
| Age$^2$*100 | .0327 (3.29) | .0415 (7.53) | .0865 (17.36) | .0589 (25.19) |
| Overall $R^2$ | .0290 | .0279 | .0361 | .0490 |
| *N* | 92,330 | 178,096 | 235,992 | 506,418 |

Controls as in Table 1 minus wave dummies. T-statistics in parentheses.

**Table 3**
Individual fixed effects life satisfaction for those with no interviewer, age < 70.

(a) Without years in panel variables

| | 1984–1993 | 1994–2006 | 2007–2019 | 1984–2019 |
|---|---|---|---|---|
| Age | −.1370 (2.94) | −.1233 (7.78) | −.0668 (4.90) | −.1008 (14.22) |
| Age$^2$*100 | .1726 (3.05) | .0988 (5.35) | .0833 (5.81) | .1052 (13.29) |
| Overall $R^2$ | .0046 | .0412 | .0092 | .0515 |
| N | 5,630 | 22,025 | 32,478 | 60,113 |

(b) With years in panel variables

| | 1984–1993 | 1994–2006 | 2007–2019 | 1984–2019 |
|---|---|---|---|---|
| Age | −.0997 (.80) | −.1176 (2.47) | −.0269 (.72) | −.0834 (3.75) |
| Age$^2$*100 | .1845 (3.24) | .0915 (4.84) | .0789 (5.43) | .0977 (12.16) |
| Years in panel | .0327 (.23) | .0196 (.41) | −.0557 (1.48) | −.0332 (1.47) |
| (Years in panel)$^2$ | −.0065 (1.49) | .0008 (2.01) | .0005 (3.19) | .0007 (6.55) |
| Overall $R^2$ | .0031 | .0416 | .0004 | .0597 |
| N | 5,630 | 22,025 | 32,478 | 57,622 |

Controls as in Table 2. T-statistics in parentheses.

**Table 4**
Individual fixed effects life satisfaction for those with an interviewer, age < 70.

| | 1984–1993 | 1994–2006 | 2007–2019 | 1984–2019 |
|---|---|---|---|---|
| Age | −.0259 (.35) | −.1103 (2.87) | −.0555 (2.90) | −.0452 (3.61) |
| Age$^2$*100 | .0441 (3.77) | .0300 (4.94) | .0741 (13.52) | .0539 (2.80) |
| Interviewer experience | .0054 (1.08) | −.0046 (3.71) | −.0033 (4.58) | −.0042 (7.55) |
| Interviewer male | .0460 (1.95) | −.0245 (1.66) | −.0253 (2.04) | −.0100 (1.30) |
| Years in panel | −.1315 (1.77) | .0194 (.64) | −.0163 (.85) | −.0361 (2.87) |
| (Years in panel)$^2$ | .0087 (9.26) | .0011 (9.85) | .0006 (9.55) | .0007 (19.68) |
| *N* | 71,561 | 155,032 | 200,781 | 427,374 |
| Overall $R^2$ | .0270 | .0082 | .0274 | .0638 |

Controls as in Table 2. T-statistics in parentheses.

for the overall sample. In part (b) we included the two years-in-panel variables and there is in fact a U-shape in the middle period although it minimizes at age 64. The total sample result in column 4 gives a clear U-shape with a minimum at 43 for those with no interviewer.

In our Table 4 we restrict the sample to those who had an interviewer and included both years of experience and the interviewer's gender as controls as KHD did in their Table 3 (p. 237). They found significant mid-life lows as noted above in columns 3 and 4 using OLS. However, they found the age coefficient to be insignificant and positive in both cases while only the age squared term was significant and positive in column 2, when the years in survey squared variable was omitted. We broadly replicate their result in column 2 for the 1994–2006 period: there is an insignificant age coefficient in column 2 and the minimum is out of sample. But columns 1, 3 and 4, for the earlier and later periods and then the whole period, with many more observations, is different: we find well defined U-shape in age with a minimum at age 29, 37 and 42 respectively. We would argue against the inclusion of these years-in-panel variables but crucially here even when we do include them, we find a midlife low in the long sample as well as in the latest period.[8]

Additionally, in Appendix Table 1a we report OLS estimates with and without controls, and fixed effects estimates with and

[8] Kratz and Brüderl (2021) use data from the SOEP, 1984–2017 and have shown that estimates can be sensitive to a number of choices of specification, conditioning variables, and sample definition but still report substantive evidence of a midlife low in the late fifties, for example using a full set of year dummies (Figure 2a).

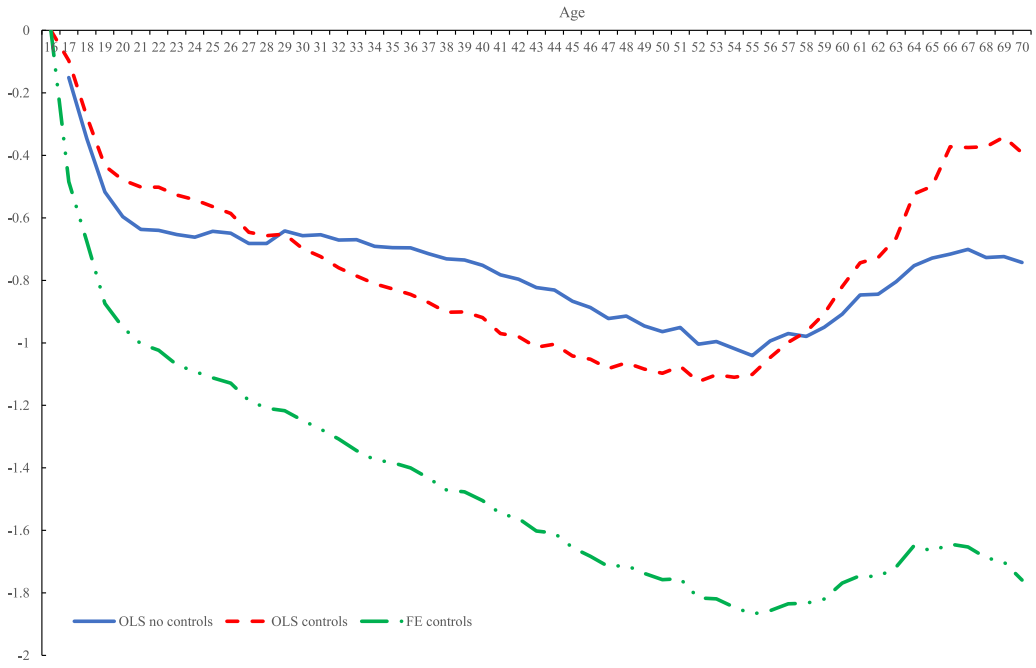


**Chart 1.** Life satisfaction age dummies — OLS and fixed effects.

without controls that replace the quadratic in age with a full set of age dummies for ages 16–69. In column 5 of this table, we also include a separate fixed effects analysis with controls for those ages 20–64 as requested by a referee. We plot three of these in Chart 1. It turns out that with fixed effects there is a midlife low around age 55. The wellbeing of those aged 65–69 is lower than that of the young; a result which contrasts with the findings in many other countries where the wellbeing of this group is higher, which makes for a more obvious U-shape.[9] However, there is an obvious midlife low. Finally, in Appendix Table 1b we also report the estimates considering the quadratic in age, KHD's interviewer characteristics and years in panel variables as well as age minima. In each case we find a midlife low.[10]

## 3. Discussion

The oft-found midlife low in life satisfaction in pooled OLS regressions is found in the SOEP. It is also confirmed when controlling for panel fixed effects and respondent experience in the panel. Our results show that interviewer effects barely affect the finding of a midlife low in well-being. As a validation of the quadratic in age, which is used as a simplification, Chart 1 plots the coefficients on single year of age dummies using OLS with no controls, and OLS with them and with fixed effects including controls and all show the midlife low is reached in the mid-fifties. The plots look less like a U-shape than they often do in other countries. This is because the happiness levels of those around retirement age is below that of teenagers.

It also does not seem that the decline in well-being from youth to midlife, as Galambos et al. (2021, 2020) among others have claimed, is trivial (Blanchflower and Graham, 2021a). The decline in average life satisfaction by year of age is about .73 life satisfaction points from the young to the midlife minimum of the function pooled across the years 1984–2019. This is more than the difference between being married and divorced (.58), about the difference between being married and separated (.72), and about 60% of the difference between working and unemployment (1.25). The drop is almost as large as the difference in average life satisfaction between those who have trouble climbing up stairs and those who do not (.85).

*Prima facie,* the KHD (2012) challenge to the finding of a midlife low could indicate to the casual reader that the finding in cross-section studies disappears when individual fixed effects are controlled for. As we have shown, this is not the case. That the midlife low holds when fixed effects estimation is used indicates that this is a lifecycle, or aging effect, something that people, on average, go through, while not ruling out cohort effects.[11]

In summary, the relationship between age and well-being in Germany, whether estimated with OLS or using longitudinal data on the same individuals, and whether it includes years-in-panel and interviewer variables is non-trivial. We report large and robust midlife lows in well-being in age using the SOEP life satisfaction data over the period 1984–2019. We also find it in sub-periods within these years including the special transition period, as a consequence of German reunification, from 1994–2006, examined by KHD. All of these specifications and samples above indicate that the relationship between well-being and age in Germany is not flat.

[9] In contrast in the UK life satisfaction is higher at age 65–69 than among teenagers. Life satisfaction from Oct 2016–Sept 2017 was as follows: 16–19 = 7.86; 20–24 = 7.74; 25–29 = 7.76; 30–34 = 7.75; 35–39 = 7.65; 40–44 = 7.55; 45–49 = 7.47; 50–54 = 7.46; 55–59 =7.51; 60–64 = 7.69; 65–69 =7.96 https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/datasets/personalwellbeingestimatesbyageandsex.

[10] We also experimented using the whole sample data using fixed effects estimation, first using years-in-panel and then using a dummy variable for those who have been in the panel for at least four years and found there were also U-shapes by gender, education, and work status as reported in the Supplementary Appendix.

[11] Clark (2019) reached a similar conclusion with British panel data.

## Appendix A

**Table 1a**
Life satisfaction OLS and fixed effects with age dummies.
1. OLS, no controls.
2. OLS, controls.
3. Fixed effects, no controls.
4. Fixed effects, controls.
5. Fixed effect, controls ages 20-64.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| 17 years old | −.151 | −.097 | −.382 | −.484 | |
| | (.272) | (.429) | (.217) | (.353) | |
| 18 years old | −.347 | −.276 | −.566 | −.676 | |
| | (.271) | (.429) | (.217) | (.352) | |
| 19 years old | −.517 | −.434 | −.734 | −.874 | |
| | (.271) | (.429) | (.217) | (.352) | |
| 20 years old | −.596 | −.479 | −.814 | −.950 | |
| | (.271) | (.428) | (.217) | (.352) | |
| 21 years old | −.637 | −.501 | −.861 | −1.003 | −.064 |
| | (.271) | (.428) | (.217) | (.352) | (.022) |
| 22 years old | −.640 | −.502 | −.879 | −1.024 | −.093 |
| | (.271) | (.428) | (.217) | (.352) | (.023) |
| 23 years old | −.653 | −.527 | −.908 | −1.070 | −.150 |
| | (.271) | (.428) | (.217) | (.352) | (.023) |
| 24 years old | −.662 | −.542 | −.919 | −1.092 | −.173 |
| | (.271) | (.428) | (.217) | (.352) | (.024) |
| 25 years old | −.643 | −.564 | −.918 | −1.112 | −.194 |
| | (.271) | (.428) | (.217) | (.352) | (.024) |
| 26 years old | −.649 | −.586 | −.930 | −1.129 | −.212 |
| | (.271) | (.428) | (.217) | (.352) | (.024) |
| 27 years old | −.682 | −.646 | −.962 | −1.184 | −.270 |
| | (.271) | (.428) | (.217) | (.352) | (.025) |
| 28 years old | −.682 | −.657 | −.977 | −1.209 | −.296 |
| | (.271) | (.428) | (.217) | (.352) | (.025) |
| 29 years old | −.642 | −.652 | −.959 | −1.217 | −.305 |
| | (.271) | (.428) | (.217) | (.352) | (.025) |
| 30 years old | −.657 | −.698 | −.983 | −1.248 | −.337 |
| | (.271) | (.428) | (.217) | (.352) | (.025) |
| 31 years old | −.654 | −.724 | −.993 | −1.276 | −.365 |
| | (.271) | (.428) | (.217) | (.352) | (.025) |
| 32 years old | −.671 | −.760 | −1.022 | −1.308 | −.398 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 33 years old | −.670 | −.786 | −1.041 | −1.345 | −.435 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 34 years old | −.691 | −.811 | −1.070 | −1.374 | −.464 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 35 years old | −.695 | −.827 | −1.083 | −1.383 | −.473 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 36 years old | −.696 | −.845 | −1.086 | −1.400 | −.491 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 37 years old | −.715 | −.871 | −1.109 | −1.433 | −.524 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 38 years old | −.731 | −.902 | −1.138 | −1.471 | −.562 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 39 years old | −.735 | −.901 | −1.145 | −1.477 | −.568 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 40 years old | −.752 | −.919 | −1.170 | −1.505 | −.596 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 41 years old | −.782 | −.970 | −1.201 | −1.546 | −.637 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 42 years old | −.796 | −.980 | −1.218 | −1.562 | −.654 |
| | (.271) | (.428) | (.217) | (.352) | (.026) |
| 43 years old | −.823 | −1.014 | −1.253 | −1.602 | −.694 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 44 years old | −.831 | −1.004 | −1.266 | −1.609 | −.702 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 45 years old | −.867 | −1.042 | −1.305 | −1.655 | −.747 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 46 years old | −.887 | −1.052 | −1.328 | −1.683 | −.776 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 47 years old | −.922 | −1.082 | −1.357 | −1.716 | −.809 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 48 years old | −.914 | −1.064 | −1.358 | −1.712 | −.805 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 49 years old | −.946 | −1.084 | −1.393 | −1.738 | −.832 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 50 years old | −.964 | −1.097 | −1.413 | −1.758 | −.851 |
| | (.271) | (.428) | (.217) | (.352) | (.027) |
| 51 years old | −.951 | −1.075 | −1.410 | −1.755 | −.849 |
| | (.271) | (.428) | (.217) | (.352) | (.028) |
| 52 years old | −1.004 | −1.124 | −1.465 | −1.816 | −.911 |
| | (.271) | (.428) | (.217) | (.352) | (.028) |
| 53 years old | −.996 | −1.102 | −1.473 | −1.819 | −.914 |
| | (.271) | (.429) | (.217) | (.352) | (.028) |
| 54 years old | −1.018 | −1.110 | −1.504 | −1.846 | −.942 |
| | (.271) | (.429) | (.217) | (.352) | (.028) |
| 55 years old | −1.041 | −1.101 | −1.537 | −1.868 | −.965 |
| | (.271) | (.429) | (.217) | (.352) | (.029) |
| 56 years old | −.994 | −1.047 | −1.526 | −1.857 | −.954 |
| | (.271) | (.429) | (.217) | (.352) | (.029) |
| 57 years old | −.970 | −.998 | −1.519 | −1.835 | −.932 |
| | (.271) | (.429) | (.217) | (.353) | (.029) |
| 58 years old | −.979 | −.964 | −1.541 | −1.833 | −.930 |
| | (.271) | (.429) | (.218) | (.353) | (.029) |
| 59 years old | −.950 | −.907 | −1.544 | −1.820 | −.918 |
| | (.271) | (.429) | (.218) | (.353) | (.030) |
| 60 years old | −.908 | −.820 | −1.514 | −1.769 | −.867 |
| | (.271) | (.429) | (.218) | (.353) | (.030) |
| 61 years old | −.847 | −.744 | −1.476 | −1.745 | −.843 |
| | (.271) | (.429) | (.218) | (.353) | (.031) |
| 62 years old | −.844 | −.727 | −1.483 | −1.749 | −.848 |
| | (.271) | (.429) | (.218) | (.353) | (.032) |
| 63 years old | −.804 | −.664 | −1.483 | −1.717 | −.819 |
| | (.271) | (.429) | (.218) | (.353) | (.032) |
| 64 years old | −.753 | −.523 | −1.454 | −1.649 | −.752 |
| | (.271) | (.429) | (.218) | (.353) | (.034) |
| 65 years old | −.729 | −.499 | −1.460 | −1.666 | |
| | (.271) | (.429) | (.218) | (.353) | |
| 66 years old | −.716 | −.372 | −1.487 | −1.644 | |
| | (.271) | (.429) | (.218) | (.353) | |
| 67 years old | −.701 | −.375 | −1.509 | −1.653 | |
| | (.271) | (.429) | (.218) | (.353) | |
| 68 years old | −.727 | −.372 | −1.568 | −1.688 | |
| | (.271) | (.430) | (.218) | (.354) | |
| 69 years old | −.724 | −.341 | −1.582 | −1.701 | |
| | (.271) | (.430) | (.218) | (.354) | |
| Constant | 8.337 | 5.601 | 8.354 | 7.671 | 6.723 |
| | (.271) | (.429) | (.217) | (.360) | (0.084) |
| Observations | 633,376 | 510,400 | 633,376 | 510,400 | 478,386 |
| R-squared | .020 | .091 | .007 | .023 | .023 |
| Persons | | | 92,805 | 73,677 | 69,685 |

Standard errors in parentheses.
Equations include controls for region, labor force and marital status, years education, log household real income. Columns 1 & 2 include wave dummies.

(*continued on next page*)

**Table 1b**
Life satisfaction OLS and Fixed Effects with Quadratic in Age.
1. OLS, no controls.
2. OLS, controls.
3. Fixed Effects, no controls.
4. Fixed effects, controls.
5. Fixed effect, controls ages 20-64.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Age | −.038 | −.095 | −.022 | −.044 | −.033 |
| | (.001) | (.002) | (.011) | (.012) | (.013) |
| Age$^2$ * 100 | .038 | .104 | .022 | .053 | .051 |
| | (.001) | (.002) | (.002) | (.002) | (.003) |
| Years in panel | −.032 | −.042 | −.028 | −.037 | −.046 |
| | (.001) | (.001) | (.011) | (.013) | (.013) |
| (Years in panel)$^2$*100 | .046 | .079 | .066 | .074 | .072 |
| | (.004) | (.004) | (.003) | (.004) | (.004) |
| Interviewer male | .009. | .021 | −.019 | −.010 | −.006 |
| | (.005) | (.005) | (.007) | (.008) | (.008) |
| Interviewer yrs experience | .005 | −.003 | −.004 | −.004 | −.004 |
| | (.000) | (.000) | (.001) | (.001) | (.001) |
| Constant | 8.668 | 7.232 | 7.877 | 7.116 | 6.713 |
| | (.025) | (.051) | (.366) | (.424) | (.441) |
| Age minima | 50.8 | 45.8 | 49.5 | 41.6 | 32.5 |
| Observations | 531,279 | 428,929 | 531,279 | 428,929. | 403,577 |
| R-squared | .024 | .099 | .005 | .021 | .021 |
| Persons | | | 85,969 | 68,127 | 64,659 |

Standard errors in parentheses
Equations include controls for region, labor force and marital status, years education, log household real income. Columns 1 & 2 include wave dummies.

## Appendix B. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.econlet.2022.110430.

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