Happiness and Aging in the United States

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ABSTRACT

The past decade has brought increasing concern, in countries all over the world, of declines in mental health and well-being. Across countries, chronic depression and suicide rates peak in midlife. In the U.S., deaths of despair are most likely to occur in these years, and the patterns are robustly associated with unhappiness and stress. There is also a less-known relationship between well-being and longevity among the elderly, particularly for those over age 70. In this paper, we analyze several different data sets for the U.S. and provide extensive evidence on the middle age patterns, how they differ across the married and unmarried, and review new work on the elderly. The relationship between well-being and aging has a robust association with trends that can ruin lives and shorten life spans. It applies to much of the world's population and links to behaviors and outcomes that merit the attention of scholars and policymakers alike.

The past decade has brought increasing concern, in countries all over the world, of declines in mental health and well-being. Across countries chronic depression and suicide rates peak in midlife. In the U.S., deaths of despair are most likely to occur in the middle-aged years, and the patterns are robustly associated with unhappiness and stress. Well-being is also a factor in differential mortality rates among the old, particularly those over age 70. Better understanding the relationship between well-being and aging is not just an academic exercise. It has a robust association with trends that can ruin lives and shorten life spans. In this paper we analyze several different data sets for the U.S. and provide extensive evidence on the middle age patterns, how they differ across the married and unmarried, and review new work on the elderly. There is widespread evidence in the US and elsewhere of midlife lows in well-being data, including happiness and life satisfaction. There is also evidence of a hump-shaped relationship in unhappiness data such as depression and despair. This is consistent with evidence on deaths of despair, due to suicide and to drug and alcohol poisoning, which disproportionately occur among the prime age.

In the UK, the proportion of individuals reporting that they were depressed rose six-fold from 1997-2018 (Bell and Blanchflower, 2019). In the U.S., the rise in pain and premature mortality especially among the prime age less educated – the so-called deaths of despair – is notable (Blanchflower and Oswald, 2020, Case and Deaton, 2015, 2020). Nahin (2015) reported that a remarkable 126 million or 56 percent of American adults experienced some type of pain in 2012. Of these, 20 percent had pain daily (i.e., chronic pain).

In Gallup's U.S. Daily Tracker poll the proportion of people saying they experienced physical pain yesterday rose from 23.5% in 2008 to 27.2% in 2017. Meanwhile, almost 1 million Americans died of deaths due to suicide, opioid and other drug overdoses, and alcohol-related diseases from 2005-2018, a trend that is driving up the overall mortality rate in the U.S. and contributed to reduced life expectancy between 2014 and 2017 (Kochanek, Anderson, and Arias, (2020). In 2019, 70,630 drug overdose deaths occurred in the United States for an age-adjusted rate of 21.6 per 100,000 standard population, up from 20.7 in 2018. (https://www.cdc.gov/drugoverdose/deaths/index.html).

Concerns about well-being have been heightened further by the COVID-19 global pandemic. According to the most recent Census Bureau's Household Pulse Survey #33 for June 23rd to July 5th 2021, 80 million Americans age 16+ in the U.S. reported feeling *down, depressed or hopeless* over the prior seven-day period: 47 million said 'on several days'; 15 million said on 'more than half the days" and 18 million said "nearly every day."[1] According to weighted data from the new 2020 Gallup Covid Tracker, mean life satisfaction measured as the Cantril ladder variable was 6.62 (n=109,596). This compares with 7.06 from the (much larger) 2017 Daily Tracker.

[1] In week 33 111 million said 'not at all' while 59 million did not report. This is down from a peak at the time of the presidential election in November 2020 in week 19 of the survey (November 11-23, 2020) when 62 million said 'several days'; 22 million said 'more than half the days'; 25 million said 'nearly every day' while 88 million said 'not at all' and 52 million did not report (see Blanchflower and Bryson, 2021b).

Well-being collapsed in in the U.K. in March 2020 as the country went into lockdown. The Labour Force Surveys conducted by the ONS showed life satisfaction averaging at 7.7 (on a 0-10 scale) from April 2017-March 2020. Chart 1 plots life satisfaction approximately weekly between March 2020 and June 2021 from a study conducted at University College London survey, that asks the same question. We include the score of 7.7 in the first week in March 2020 in the chart and show the precipitous drop that month.

The average life satisfaction score dropped to 5.4 in the last week of March 2020 as lockdown started (https://www.covidsocialstudy.org/results). While there was some adaptation in the following months through September 2020 as the score picked up to 6.5, the average life satisfaction score fell again to a low of 5.6 at the end of January 2021 as new restrictions were put in place. The life satisfaction score has slowly risen since then and currently stands at 6.8 in June 2021, well below its pre-pandemic levels.[2]

Of note is that for most countries, with the major exception of Greece and Spain, the Great Recession was not happiness reducing (Bell and Blanchflower, 2015, Table 10). Given that these drops all occur in during the period that COVID incidence and death that required significant government response across a wide range of countries, the large drops in well-being are clearly associated with it and are unlikely to have be driven by unrelated political trends in individual countries.

Independent of the declines in well-being in recent years and of those related specifically to the pandemic, several earlier economic studies, including several of our own,[3] found evidence of a significant and empirically large downturn in human well-being during the mid-life years – so-called "happiness curves" (Rauch, 2018). Early work was based on life satisfaction and happiness data; the research now extends to trends in unhappiness, stress, lack of sleep, depression, and even suicide (Daly et al, 2011) and across multiple data sets and 145 countries (Blanchflower, 2020a). There is also evidence that unhappiness reaches a peak in midlife (Blanchflower, 2020b; Graham and Ruiz-Pozuelo (2017). As such, when there are significant general declines in well-being, those in the already low well-being middle aged years are likely to be particularly vulnerable.

There is within-person evidence of a U-shape from longitudinal surveys, which focus on changes in life satisfaction as a linear function of individual age (Cheng, Powdthavee and Oswald, 2017). Controlling for cohort effects has little or no impact on the U-shape (Clark, 2019 and Blanchflower, 2020b). There is a hill-shape in anti-depressant use which maximizes in the mid40s in European countries (Blanchflower and Oswald, 2016; Blanchflower and Bryson, 2021). The U-shape pattern in mid-life even extends beyond humans to apes (Weiss et al., 2012).

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[2] We thank Daisy Fancourt for providing us with these data.

[3] We have published papers on the U-shape in well-being for over a period of nearly two decades including Blanchflower and Graham (2021, 2020); Blanchflower (2020a, 2020b, 2020c); Blanchflower and Clark (2020), Blanchflower and Oswald (2020, 2019; 2016; 2009; 2008; *2004a* and 2004b; Blanchflower, Oswald and Stewart-Brown, (2013), Bell and Blanchflower (2020) and Graham, C., (2017, 2009); Graham, Eggers and Sukhtankar (2004); Graham, Laffan and Pinto (2018); Graham and Pettinato (2002) and Graham and Ruiz-Pozuelo (2017).

Most recently, the increases in the U.S. deaths of despair are occurring precisely in the middle ages of 35-64 years (Case and Deaton, 2015, 2020). The patterns in these deaths have a robust association with the same ill-being markers - unhappiness and stress - that increase in mid-life (Graham and Pinto, 2019).

Two new statistical releases in October 2020 showed drug poisoning deaths peaking in midlife. In England and Wales, the two groups with the highest rates are 30-39 and 40-49. Chart 2a illustrates. The older of the two groups showed the biggest rise in deaths from drug use over these years, taking over from the 30-39 age group in 2016.[4]

In the US, the CDC published new data in October 2020 on poisoning deaths from cocaine. These rates were stable between 2009 and 2013 and then nearly tripled from 2013 through 2018 (Hedegaard, Spencer and Garnett, 2020). In 2018, the rate of drug overdose deaths involving cocaine was highest for adults aged 35–44 (8.6 per 100,000). Chart 2b shows that age group 3544 overtook the previously highest age range of 45-54 in 2018. Of note is the death rate for African Americans from cocaine is more than double that of whites (9.0/100000 versus 4.6 in 2018), while the death rate from opioid overdose and suicides is much higher for whites.[5]

There is also recent evidence on overall trends in drug poisoning deaths by age, which have risen over time but also peak in midlife. Hedgaard, Miniño and Warner (2020) reported on the age adjusted drug overdose death rate in 2019 and estimated that it was highest for adults ages 35-44.[6] The maximum has moved around over the last twenty years between ages 35-44 and ages 45-54. The peak has been in the age range 35-44 since 2016, which is where it also was in 1990-193. The peak was 45-54 in the intervening years. As can be seen below rates have more than trebled for all age groups: 40.5/100000 for ages 35-44 is the highest percentage of any group over the last twenty years.

	Ages 15-24	Ages 35-44	Ages 45-54	Ages 55-64	Ages 65+
1999	3.2	14.0	11.1	4.2	2.7
2005	6.9	19.3	21.1	9.0	3.3
2008	8.0	21.1	25.2	12.9	4.1
2015	9.7	28.3	30.0	21.8	5.8
2017	12.6	39.0	37.7	28.0	6.9
2019	11.2	40.5	36.9	30.0	8.3

Blanchflower and Oswald (2020) show an upward rise of despair, distress and misery in the United States, using questions in the Behavioral (BRFSS) where respondents report that all the previous thirty days were bad mental health days. Blanchflower and Feir (2021) show poor mental health

[4] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/2019registrations

[5] Graham and Pinto (2019).

[6] Drug overdose death rates per 100000 in 2019 were as follows ages 15-24=11.2; ages 25-3435.6: ages 35-44=40.5; ages 45-54=36.9; ages 55-64=30.4 and 65+=8.3. https://www.cdc.gov/nchs/data/databriefs/db394-tables-508.pdf#page=2

is especially prevalent for Native Americans. Despair peaks in midlife and especially so for the least educated. Case, Deaton and Stone (2020) show that pain peaks in midlife and the most for the least educated. Blanchflower and Bryson (2021a) show that sleep duration has a U-shape in age.

Chronic depression and suicide occur disproportionately at mid-life in Europe also (Blanchflower, 2020b). A recent analysis by the OECD in How's Life, 2020 shows that deaths from suicide, alcohol abuse or drug overdoses are higher in ten OECD countries – Slovenia; Lithuania; Latvia; Korea; Denmark; Belgium; Hungary; Austria; Finland and Poland - than they are in the United States.[7]

We now move to look at evidence on the U-shape in well-being in the literature and then present evidence from several US data files. We identify differences in the raw data from the married and the non-married. We then examine the well-being of the old, which is impacted by the fact that those with low levels of wellbeing at around age 65 have higher mortality rates. In the final section we draw some conclusions.

1. Is There a U-shape in Age in Happiness and Life Satisfaction?

Despite the large body of economics research finding a dip in mid-life well-being, a few prominent papers dismiss the mid-life downturn as an illusion. As we show in the examples below, most of these critiques, many from psychologists, suffer from samples sizes that are too small to be representative, from flaws in econometric analysis, and from mixing and matching studies with and without controls for confounding factors, such as health, and employment and marriage status, among others. Results based on patterns in the raw data reflect the effects of aging plus all confounding factors as individuals age. Results based on regressions that include controls for these factors reflect the pure effect of aging on well-being. Neither approach is "correct", rather they are each asking different scientific questions. What is incorrect is failing to distinguish which approach is used to generate the findings. We address these questions in more detail in Blanchflower and Graham (2020, 2021).

[7] Rates from their Figure 5.5 are as follows per 100,000 population, 2016 (%)

	Suicide	Acute alcohol abuse.	Drug overdose.	All
SVN	18.1	10.7	0.2	29.0
LTU	26.7	0.8	0.1	27.6
LVA	18.1	8.0	0.2	26.3
KOR	24.6	1.5	0	26.1
DNK	9.4	10.5	0.5	20.4
BEL	15.9	3.0	0.5	19.4
HUN	16.2	3.2	0	19.4
AUT	12.2	4.8	1.1	18.1
FIN	13.9	3.3	0.9	18.1
POL	11.6	6.2	0	17.8
USA	13.9	2.8	0.9	17.6

An earlier review by Ulloa et al. (2013) goes as far as to draw the conclusion that "*extant studies … show either a U-shaped, inverted U-shaped or linear relation between ageing and subjective well-being.*" Myers (2000, p. 58) argued that "*although many people believe there are unhappy times of life– times of adolescent stress, midlife crisis, or old age decline – repeated surveys across the industrialized world reveal that no time in life is notably happiest and most satisfying*". In contrast, Michael Argyle, concluded that studies of life satisfaction found happiness increased with age (Argyle, 1999, 2001), while Palmore and Luikhart (1972) argue that age has little or no relationship with life satisfaction.

Even when U-shapes were found they were frequently dismissed as largely irrelevant and the scale of the effects were frequently classified as trivial. For example, Cantril (1965) is often cited as finding no evidence of a U-shape in well-being. Yet his study in fact shows them. Cantril reported that when asked to indicate their thoughts about their current life 24.2% of those age<29 responded in the high range; 22.3% of those 30-49 and 29.3% of those 50+. On the other hand, 27.5%, 29.1% and 25.2% responded in the low range of the ladder scale.[8]

In a recent survey of the literature Galambos et al (2020) summarized twenty-nine papers on the U-shapes based on three criteria : a) appeared in a peer reviewed journal, in English between 2013 and 2019, b) tested for age differences and c) spanned the teens or twenties into the sixties were published in peer reviewed journals in English between 2013 and 2019 and concluded that "*the conclusion that happiness declines from late adolescence to midlife (the first half of the U shape) is premature, and possibly wrong*". They went on to argue that the evidence "*casts doubt on the pervasiveness of the U-shape*" and claim that the U-shape is "*not as robust and generalizable as often assumed*." They repeated these claims in Galambos et al (2021).

In a response we found that four of these papers were ineligible according to Galambos et al (2020) own criteria and concluded that four of the studies had mixed results while twenty-one were a 'yes' with zero 'no' (Blanchflower and Graham, 2021a).[9] In Blanchflower and Graham (2021b) we found a further 375 papers that found U-shapes. This includes 167 papers in peer reviewed journals published between 2013 and 2019; 86 in peer reviewed journals in 2020 or 2021; 94 published in peer reviewed journals pre 2013 and 28 working papers, books, or book chapters since 2019. The U-shape appears to be a robust and generalizable finding; a conclusion that there is a U-shape in happiness in age does not seem to be '*premature*'.

In the Census Bureau's new Household Pulse Surveys (during COVID), there is evidence on whether an individual took prescription medication to help with any emotions or with concentration, behavior or mental health. Data are available in sweeps from August 2020 to June 2021 on one and a quarter million respondents.

As can be seen below the raw weighted data on anti-depressant prescriptions peak in the raw data over this period in the age band 50-54.

[8] As reported in Diener and Suh (1998), p. 307.
[9] Blanchflower and Graham (2021) found U-shapes in 25 studies but four were counted twice as they found evidence both using cross-sectional and longitudinal data. Hence the 21 papers.

Ages 18-19	18.5%	Ages 35-39	21.2%	Ages 55-59	22.1%	Ages 75-79	17.4%
Ages 20-24	19.9%	Ages 40-44	21.4%	Ages 60-64	21.3%	Ages 80-84	14.2%
Ages 25-29	20.6%	Ages 45-49	21.7%	Ages 65-69	20.6%	Ages 85-89	15.5%
Ages 30-34	21.0%	Ages 50-54	22.6%	Ages 70-74	19.2%	All Ages	20.8%

These data are analyzed in Blanchflower and Bryson (2021b) who show an inverted U-shape in age maximizing at age 40-44, when controls are included for gender, race, education, labor force and marital status, state and year. The hill shape in age is consistent with evidence reported by Blanchflower and Oswald (2016) for prescriptions of anti-depressants the European Union. Over the last year one in five American adults were taking anti-depressants.

It also interesting to look at pain, which is a physical manifestation of well-being. Case, Deaton and Stone (2020) find that "*today's elderly in the USA have experienced less pain throughout their lives than those in midlife today, who will be tomorrow's elderly*". They find that the elderly report less pain than those in midlife. The authors found that pain prevalence has been rising for less educated cohorts (who are also most represented in the deaths of despair). Blanchflower (2020b) found using the Gallup US Daily Tracker that pain peaked in midlife. Graham and Pinto (2019) find that reported pain is higher among whites than minorities, particularly rural ones, and associated with opioid addiction in the same middle age range.

Several authors such as Glenn (2009), Jebb, Morrison, Tay and Diener (2020) and Bartram (2020), have argued against the inclusion of control variables. Easterlin (2011) has also made the case that the well-being effects of aging should be analyzed without controlling for confounding factors. Deaton (2018) critiqued the use of controls: "*A weightier argument is that many possible and potentially important controls are age dependent, including income and the presence of children but especially health, disability and marital status. If we adjust for these and find, for example, relatively high SWB among the elderly, we have uncovered the not very interesting fact that people in their 70s would rate their lives highly if they were in prime health, and if their lost friends and spouses were returned to them*."

We disagree that adding controls is simply equivalent to finding that those in their 70s would be happier if they were healthier or had not lost friends. The findings with controls show that the majority of the old are happier *despite* these other things that may have happened as they age. Yet whether we include controls *or not*, we still find significant evidence of U-shapes in well-being and hill-shapes in stress. Despite Deaton's (2018) critique, Stone, Schwarz, Deaton and Steptoe (2010) reported U-shape relations with *and* without controls, for employment, percent female, having a partner and/or a child at home, in happiness and enjoyment. They found hump shapes in worry and sadness and U-shapes in life satisfaction, enjoyment and happiness in middle age.

As we note above, and as Blanchflower and Oswald (2019) recently wrote, *"it is not natural to see either approach as the 'right' or 'wrong' one"*. The reason is that they measure different things. One specification includes controls for confounding factors that also affect life satisfaction, many of which accompany the aging process, and measures the pure effects of aging, ceteris paribus.

The other measures changes in life satisfaction as people age, without separating the confounding factors. In this paper we present results both ways.

In what follows we find widespread evidence of U-shapes in well-being, focusing on life satisfaction and happiness, using data for over 6 million people, with and without the inclusion of controls. We make use of two different life satisfaction measures: a 4-step question and, Cantril's 11-step ladder, and a 3-step happiness measure. We use several different cross-section surveys from the US - analyzing the same population several different ways – and our results are consistent across them. We also report on work done on longitudinal data on the elderly (over 70) as well as life satisfaction data from an international survey of thirty countries conducted in 2017.

In both cases we examine the shape of the relationship between life satisfaction and age three ways. First, we include seven decade of age dummies. We then include a quadratic in age and from that estimate the age minimum by differentiating with respect to age, setting to zero and solving. We do this for all ages as well as for those age under seventy. Finally, to be sure we are not imposing an inappropriate structure on the relationship we estimate free of functional form by including a set of dummy variables for each year of age that we then plot and report in a chart. In each case we report estimates from OLS regressions that a) include a limited set of controls for race, gender, state and year and then b) that add a fuller set of controls for marital and labor force status and education.

We also report on the differences between the married and the unmarried separately because of the differences between the two groups. These are more pronounced for the U.S. than they are for other countries, for reasons we discuss below. We find U-shapes in age with minima in midlife.

After the age of seventy there is likely to be selection issues in terms of mortality, with less happy people more likely to die. We report on results on life satisfaction in the US using data on life satisfaction from the Health and Retirement Surveys (HRS) from 2008-2016 by Hudomiet, Hurd and Rohwedder (2020), who find that life satisfaction declines after age seventy once such selection effects are controlled for. In the US those aged sixty-five are approximately as happy as those aged eighteen, both of whom are happier than the prime age: after that, once correction is made for mortality, happiness declines.

The decline in well-being in midlife, meanwhile, seems particularly perilous for the less educated in some wealthy countries, such as in the UK and the US (Charts 2a/b), due to the declining demand for low-skilled work, and manifests itself in drug addiction and suicide, among other trends. While the U-shape holds across many countries and cohorts around the world and over time, what we don't know is whether these particularly steep declines are unique to the cohorts experiencing this labor market transition and will follow them as they age, or whether it will persist in this age group for decades to come. Better understanding this increase in despair and distress adds urgency to

including well-being questions in official surveys in the countries that do not include them regularly (such as the U.S.).[10]

2. Empirical evidence

2.1. Behavioral Risk Factor Surveillance System (BRFSS) 2005-2017 (n=2,405,840)

We examine data on life satisfaction from the BRFSS. The question asked is, with our codes in parentheses, as follows

Q1. In general, how satisfied are you with your life? Very satisfied (=4); satisfied (=3); dissatisfied (=2); very dissatisfied (=1)

The question was asked of all respondents ages 18-80, with the age 80 variable relating to those age 80 and over. The data are available from 2005-2010 with a few respondents in the early months of the following year, so there are only a few observations in 2011, mostly in Colorado (1,108) and North Carolina (883). Sample sizes in the subsequent six years average around 385,000, but only 16,000 a year subsequently. The question was fielded by a subset of six states from 20132017 in Louisiana (4901); Minnesota (58,972); Mississippi (6,704); Rhode Island (10,035); Tennessee (9,813) and Wisconsin (4,749), with the unweighted number of observations in parentheses.

Column 1 of Table 1 shows a steady decline in the coefficients through age 50-59 which then picks up through age 60-69 where they are significantly higher than the youngest age group. Column 2 adds controls and the minimum is now in the 40-49 range. The age coefficients rise through age 60-69 and then remain flat. Column 3 replaces the age bands with a quadratic and the minimum is age 36 which rises to age 44 when the sample is restricted to those under seventy.

Chart 3 now plots the coefficients from the same regressions but now using a flexible functional form which now includes a full set of 62 dummies from age 19 to age 80, with the excluded category age 18. The chart with limited controls, with the coefficients added to the constant, shows the early decline and then subsequent pick-up through the early thirties and then a subsequent decline through age fifty. The series picks up and then turns over after age 70. With controls there is an obvious U-shape rising through age seventy with a slight decline after age seventy.

[10] In comparison with other countries there is a paucity of timely well-being data in the United States. Many national statistical offices now include well-being questions in national surveys including the UK's Office of National Statistics in their Labour Force Surveys. The European Commission includes questions on life satisfaction in their Eurobarometer Surveys. Neither the Census Bureau nor the Bureau of Labor Statistics in the United States include such questions in any of the national surveys such as the American Community Survey, the Current Population Survey or the Census. The CDC included a life satisfaction in the BRFSS from 2005-2010 and then cut the question in the national survey. There is, however, some new progress in the U.S., particularly since the onset of COVID. The Census has introduced its Household Pulse Survey, the Federal Reserve, the Consumer Finance Protection Bureau (CFPB) and the HHS/CDC, for example, are all in the process of adding some questions on well-being to their surveys.

Chart 4 uses limited controls and plots the single year of age coefficients added to the constant and shows the early uptick through the thirties only applies to the married and not to those who are not married.

2.2. Gallup US Daily Tracker Poll (GUSDTP), 2008-2017 (n=2,436,798)

The GUSDTP has the same Cantril life satisfaction variable, starting in 2008 through 2017 (n=2,436,798). This measure is also available in the Gallup World Poll which there is considerable precedent in other papers (see Deaton, 2008, 2018; Stone et al, 2010; Steptoe et al, 2015, Graham and Ruiz-Pozuelo, 2017). The question in Gallup is:

Q2. "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*"

We follow the same procedures as we did, using BRFSS above, with this slightly different dependent variable, first including age bands, then a quadratic and then the single year of age coefficients. We also report separate results for the married and the non-married. The results are surprisingly similar.

Column 1 of Table 2 reports the results of regressing life satisfaction on a set of year and state dummies along with gender and six race controls. The age controls decline through age 30-39 and then pick up and then decline again reaching a low at in the 50-59 range. In the second column personal controls are added and the uptick in the thirties disappears and the coefficients reach a low in the age range 40-49, a pick-up a little in the 50-59 range before rising further through age 80, the maximum age in the data file. The coefficient on the age 80 variable is significantly higher than the young - ages 18 and 19. In column 3 we include a quadratic in age with controls which has a minimum at age 47. In the final column the sample is restricted to those under the age of 70 and the minimum is now 46.

Charts 5 and 6 using the Daily Tracker data are similar to Charts 3 and 4 that used BRFSS. There is an initial hump in the early thirties that disappears when full controls are included. Chart 6 shows once again that this hump only applies to the married but not the unmarried, as we found in Chart 4 using the BRFSS.

2.3 General Social Surveys (GSS), 1972-2018 (n=60,054).

We now examine the longest time series of happiness data available in the United States from the GSS. The 3-step question, which has been widely used in the literature (see Blanchflower and Oswald, 2004a, b) is as follows.

Q3. Taken all together, how would you say things are these days—would you say that you are very happy (=3), pretty happy (=2), or not too happy (=1)?'

Chart 7 plots the single year of age dummies with and without controls and there is an obvious U-shape in the latter case. We proceed in the usual way. Column 1 of Table 3 regresses the 3-step

happiness variable on gender, race, year and region dummies plus 8 age bands. These rise to a peak in the age 30-39 band and then fall. Adding controls in the second column takes the early uptick away and slopes down initially to a low in the forties. The quadratic gives a midpoint at age 39 while the final column restricted to those under age 70 minimizes at age 41.

Chart 8 plots the three-year moving average of the single year of age coefficients, to reduce the noise. Chart 9 does the same for the married and non-married with limited controls. There are U-shapes with controls and for the unmarried with limited controls. For the married there is the early peak in the thirties.

There is surprising amount of similarity in our findings from the three data files. In each case there is evidence of a U-shape in midlife. Without controls there is an early uptick through the early thirties and then a subsequent fall. In every case this is limited to those who are married. For the unmarried there is clear evidence of a U-shape in all three data files. The addition of controls produces clear evidence of a U-shape falling from youth through midlife and rising again. We do not focus here on what happens after the age of seventy, and whether older people are happier than the young. The issue there is that levels of health are poorer than those we have examined between ages 18 and 70, and fewer of them are employed. We address this in a separate section below.

3. Why are the married so different?

We know that married people are happier than those who are not married, and young people are especially happy. Marriage and having a job are especially important predictors of high happiness levels (Blanchflower and Oswald, 2004a). Married people have more sex than those who are single, divorced, widowed or separated (Blanchflower and Oswald, 2004b). For those under the age of thirty in the U.S., according to the GSS (1988-2018) who were not married, 15% had no sex at all over the previous year.

A major issue is why is there an early uptick in happiness and life satisfaction from the teenage years through the twenties for those who get married young? This pattern is not there for the unmarried with limited controls – the unmarried just see a steady decline in their happiness from youth to midlife around the world. It is not there once socio-economic controls are included. It is also not there in other countries where both the married and the unmarried have U-shapes in age in well-being (see Graham and Ruiz-Pozuelo, 2017). Although a recent paper by Clark, d'Albis and Greulich (2021) using data for three panel datasets (BHPS, SOEP AND HILDA) found that U-shapes are flatter for individuals who are partnered. Yet the US is different. We suspect it has to do with strong norms around marriage in the United States, which has particularly high marriage rates among the young. Yet it also has very high divorce rates, presumably as reality sets in.

Table 4 provides some background evidence. The first part of the table shows that the US has higher marriage rates than other major advanced countries. It also has a lower mean age at first marriage for males and females, and a higher divorce rate which is bad for well-being. Unlike declines in older ages, which are often attributed to increased health problems, these trends are not driven by health.

Columns 1 and 2 of the second part of the table provide the percent married and % divorced for the USA from the BRFSS. Columns 3 and 4 do the same for the UK using the Annual Population Surveys. Of note is that at age 36 the percent married is about the same in the two countries. But, at earlier ages rates are much higher in the United States. For example, at age 25 in the U.S, 23% are married compared to 10% in the UK. The other big difference is the much higher divorce rate in the U.S., which averages 4.6% versus 1.5% across this age range in the UK. At age 39 in the U.S., 10% are divorced versus 5% in the UK. At age 25 US divorce rates are ten times higher.

In Chart 10 we report evidence from the GSS (1972-2018 pooled) for the married, on their direct responses to questions on the happiness of their marriage. The question used is as follows.

Q4. Taking things all together, how would you describe your marriage? Would you say that your marriage is very happy (=3), pretty happy (=2), or not too happy (=1)?

We plot single year of age coefficients added to the constant, with limited controls for year and region, and then add education and labor force status controls. There is a very early peak in both measures in the early twenties, and then declines through a minimum in the early forties in both. Happiness in marriage declines from the early twenties through the forties and then picks up again.

The difference between the married and non-married is not repeated internationally. In Table 5 we report the results of estimating 7-step life satisfaction equations using data from the 2017 International Social Survey Program (ISSP) across thirty countries including the United States. The question asked is

Q5. *'All things considered, how satisfied are you with your life as a whole nowadays - completely dissatisfied (=1); very dissatisfied (=2); fairly dissatisfied (=3); neither (=4); fairly satisfied (=5); very satisfied (=6) and completely satisfied (=7)?'*

The first two columns include eight age bands and the first includes 29 country dummies and gender. The second column adds controls for education, marital and labor force status. Both show a low in the age band 50-59. Of note also is that the US has large positive coefficients suggesting happiness is significantly higher than in Australia. The specification in column 1 without controls is then used in column 3 for the married and in column 4 for the unmarried but replaces the age bands with a quadratic in age. In contrast to the U.S., in this sample there are U-shapes in both columns. They both have age minima in the fifties.

We cannot fully explain why there are such large differences in the happiness of the married versus unmarried in the U.S. that do not display in Europe. In theory, selection bias could be an issue, as happier people are more likely to marry each other. Yet that does not explain the differences between these two contexts, which are otherwise very similar in terms of per capita income, education levels, and other traits. We suspect that it is due to the strong marriage norm in the U.S. as opposed to Europe. In addition to that, the norm is much stronger for wealthier and more educated cohorts in the U.S., where marriage rates have stayed roughly the same over time, while they have fallen significantly among lower income cohorts (Sawhill, 2014). As such, some of the

large levels (rather than trends) differences in the raw data (e.g. without controls) may be due to income and education differences. Happier people also tend to have lower mortality risks.

4. The Old

It seems that approximately in the data happiness is approximately the same at the beginning of working life at around age 20 as it is at the end, at around seventy. After that it remains unclear what happens. Some older people who are healthy still work and report being happy. Unsurprisingly, health seems an important determinant of happiness in old age and older people with higher levels of well-being tend to have lower mortality risks.

In Chart 2 using the BRFSS life satisfaction fell after age seventy with limited controls and remained flat when controls were included. In Chart 4, based on the Cantril ladder, satisfaction rose from age seventy onwards and more so with controls. In Chart 6, using GSS, happiness fell after age seventy without controls but continued rising with them. What happens after age seventy is not consistent in our three data files, in part as patterns differ more *across* the old.

Our initial intention was to look at panel data on the old from the U.S. Health and Retirement Survey (HRS) to determine the path of well-being when old and dealing with potential mortality selection and the impact of ill-health near the end of life. We had two questions. First, is happiness at age seventy lower or higher than it was at twenty? Second, does happiness rise or fall after the age of seventy? This turns out to be a complex question, particularly in less developed countries where life expectancy varies more. For this reason, in Blanchflower (2020a) and Blanchflower and Graham (2020b), for example, the cross-country analyses were truncated at age 70.

We discovered we had been scooped by Hudomiet, Hurd and Rohwedder (2021)! They examined life satisfaction after the age of 65 using the HRS, focusing on mortality selection, much more insightfully than we could have. They have kindly discussed their important research with us and shared their findings. The 5-step life satisfaction question used in the HRS refers to life as a whole and has been asked since 2008 through 2016; they use the data as a pooled cross-section.

Q6. Please think about your life-as-a-whole. How satisfied are you with it? Are you completely satisfied, very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?

Hudomiet and co-authors found that life satisfaction rose from around age 50 to seventy, consistent with our findings of U-shapes. Yet from age seventy onwards it rose much more slowly. Life satisfaction fell sharply as health status fell, those in 'excellent' health report a life satisfaction score of 4.3 versus 3.1 if health was in the lowest category of 'poor'.

They examined 48,614 person-wave observations on life satisfaction on 15,183 individuals at age 65 and over. They find that reporting lower life satisfaction in one wave is a strong and statistically significant predictor of death in the next wave. Sample selection due to mortality strongly affects the life satisfaction pattern in the cross-section.

Their main finding supports the selection bias we noted above. Hudomiet, Hurd and Rohwedder (2020) find that "*individuals who are more satisfied with their lives tend to live longer, and this mortality selection inflates the estimated mean of life satisfaction, particularly at older ages where mortality rates are higher…In fact, we find that life satisfaction significantly declines with age in the panel, on average, and the rate of decline accelerates with age."*

Declines in health and widowhood were found to be important negative influences on life satisfaction, while getting married had a positive impact. Controlling for these factors reduced the estimated decline in life satisfaction after age 65 by about a third.

Chart 10 reports the main findings of Hudomiet, Hurd and Rohwedder (2021), kindly provided to us by the authors. It is based on their Table 4 and shows average life satisfaction by age - after adjusting for differential mortality bias and plotted in their Figure 4. There are three lines, based on different methods but all show declining life satisfaction from age 65 and onwards. The sample used in the chart is restricted to observations with non-missing life satisfaction reports in two consecutive survey waves. The solid "non-parametric" line shows average 2-year longitudinal changes sequenced together into a single line. The dashed line shows a predicted age-profile using a first-differences panel regression model with a quadratic function of age. The dotted line shows model predictions using a similar model but adding additional demographic, labor market, and health controls.

These findings using the HRS are also consistent with other studies that find rapid deterioration in life satisfaction and well-being proximate to death. Gerstorf et al. (2008a), using the German Socioeconomic Panel (GSOEP) examined 1637 individuals out of a sample of 3,519, who were ages 70 or older at one or more waves in 1984-2005 and subsequently died. On average death occurred on average 9.3 years after first assessment. The authors found that changes in life satisfaction were more strongly associated with distance to death than with distance from birth. They confirmed this result with longitudinal data on a sample of 414 deaths of those ages 70-103 from the Berlin Aging Study.

A subsequent paper documented (Gerstorf et al., 2013) that well-being declined rapidly with impending death in the US (HRS, 1994-2004), Germany (GSOEP, 1984-2005), and the UK (BHPS, 1991-2005). They use life satisfaction in the GSEOP, the GHQ score in the UK, and the Center for Epidemiologic Studies Depression scale (CESD) in the US and find "alarmingly steep" declines in well-being proximate to death. Gwodz and Sousa-Poza (2010) find happiness declines after the age of 65, with the lowest levels found for the oldest old using longitudinal data from the GSOEP, with an important role for health status, again suggestive of the selection bias at older ages.

Blazer and Hybels (2004) examined a sample of 4162 Americans ages 65-105 and found that those who scored lower on a positive affect scale were significantly more likely to die over the ten-year follow-up period. Brummett et al. (2006) followed 7000 students entering UNC Chapel Hill in the 1960s. They were followed up in 2006 and during that 40-year period 476 deaths occurred. They found that pessimistic individuals had significantly lower rates of longevity. Segerstrom et al

(2016) examine HILDA data from Australia on individuals age 55 and older and found that 11step life satisfaction was affected by differential mortality. Life satisfaction was found to rise from around age 55 to 70 and then remains flat before starting to decline sharply from around age 80. Among older adults in their 70s and 80s, observed increases in life satisfaction may have been due, in part, to differential mortality, consistent with the link between low life satisfaction and increased mortality risk. Individuals who died had tended to have lower life satisfaction, measured at least three years before death. O'Connor and Graham (2019) followed approximately 5000 U.S. adults born between 1935 and 1945 in the PSID and found that those who reported being optimistic in their 20's were more likely to be alive in 2015.

There is clear evidence that trends in well-being later in life are different than those in the earlier ages. They are strongly influenced by selection bias driven by higher and earlier death rates among those individuals with lower levels of well-being, resulting in those remaining alive having higher ex ante levels of well-being. Even these tend to decline after age 80 due to declining health.

5. Conclusion

In this paper, and in much previous work, we find a consistent happiness U-curve. We find that the U-shape holds regardless of whether we include controls or not. We also include a new focus on less known trends across the married and non-married in the U.S. and among the elderly (over age 70).

Life satisfaction in the US follows a U-shape during working age, from eighteen through retirement, with a mid-life low in the mid-forties. This is especially clear when controls are included and for those who are unmarried even without controls. The United States is different, not least as it has higher marriage rates, a lower mean age at first marriage and higher divorce rates than other advanced countries. The young married in the US also experience a decline in wellbeing from around age thirty to midlife but that is preceded by a slight uptick to around age thirty. Well-being rises for both the married and the unmarried, with and without controls from there to normal retirement age around age 65. Once adjustments are made for differential mortality rates, with those with lower well-being likely to die early, life satisfaction then declines, particularly after age 80, driven especially by widowhood and health shocks.

An early psychology literature has argued that there was no relationship between well-being and age. Mostly this appears to have been based on studies based on very small sample sizes. Other studies found a U-shape in the data but did not acknowledge their existence. More recent psychological literature has dismissed the literature on the U-curve as "*overblown*" and the scale of the effects as trifling, inconsequential or even "*trivial*". That claim, in our view, is incorrect. As noted above, the Cantril life satisfaction measure fell from 7.06 in 2017 to 6.62 in 2020 after the COVID lockdown, a fall of .44 life satisfaction points. We examined the average fall in the raw weighted Cantril life satisfaction measure in the US Gallup Daily Tracker data across the years 2008-2018, prior to COVID, to determine whether such a drop is large or small. Life satisfaction in these data fell from 7.21 at age 18 to 6.70 at age 49 – a drop of .51 life satisfaction points (n=2,560,569). The fall in life satisfaction to midlife is comparable in magnitude to the drop during a once in a century pandemic. This is certainly not trivial.[9]

The differences that we find across the married and the non-married in the U.S., with larger gaps and a steeper drop in mid-life than in countries of comparable income levels is a new finding. While we cannot fully explain this, we think it is due to the strong marriage norms in the U.S., which result in people getting married earlier – but also in divorcing more later. Part of this reflects differences in income and education, as wealthier and more educated people are more likely to stay married, while less wealthy and educated people are more likely to divorce or to not marry.

The evidence on the well-being of the old (over 70), based on a recent study from the Health and Retirement survey for the U.S., is also new (as is that from a few other studies we cite). It confirms our priors about the role of selection bias, with happy people more likely to live longer, and shows that that life satisfaction begins to decline in the 70's, once adjustments are made for differential retirement rates.

Beyond being empirically interesting, there are implications for substantial parts of the world's population. These dips in well-being are associated with higher levels of depression, including chronic depression, difficulty sleeping, and even suicide. In the U.S., deaths of despair are most likely to occur in the middle-aged years, and the patterns are robustly associated with unhappiness and stress. Across countries chronic depression and suicide rates peak in midlife. Given that the mid-life dip is associated with behaviors that result in premature mortality and/or compromised health and quality of life, we believe its causes and costs merit further scientific inquiry which in turn could yield insights into alleviating it, rather than the continuation of a debate over whether or not it exists.

The mid-life dip in well-being is robust to within person analysis, also exists with the prescribing of antidepressants, and it extends beyond humans. Well-being is also a factor in differential mortality rates among the old. It remains puzzling then why many psychologists continue to suggest that well-being is unrelated to age, as it applies to most of the world's population and links to behaviors and outcomes that merit the attention of scholars and policymakers alike.

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Table 1. OLS regressions of 4-step life satisfaction, BRFSS, 2005-2011, 2013-2017

				Age<70
Age 20-29	-.0150 (3.62)	-.1634 (39.36)		
Age 30-39	-.0153 (3.82)	-.2111 (50.39)		
Age 40-49	-.0287 (7.21)	-.2261 (54.11)		
Age 50-59	-.0337 (8.51)	-.2057 (49.17)		
Age 60-69	.0424 (10.65)	-.1292 (30.43)		
Age 70-79	.0461 (11.45)	-.1200 (27.51)		
Age 80+	.0015 (0.38)	-.1232 (27.19)		
Age			-.0026 (23.59)	-.0205 (78.67)
Age^2*100			.0037 (35.83)	.0234 (82.34)
Male	.0043 (5.23)	-.0231 (27.92)	-.0223 (26.89)	-.0207 (22.38)
Black	.1233 (76.30)	.0084 (5.34)	.0056 (3.60)	.0069 (4.04)
Asian/Pacific Islander	-.0396 (11.92)	-.0740 (23.37)	-.0750 (23.68)	-.0736 (21.81)
Native American	-.1336 (35.37)	-.0081 (2.26)	-.0090 (2.52)	-.0058 (1.50)
Other	-.1244 (54.00)	-.0488 (22.18)	-.0481 (21.84)	-.0538 (2.43)
Hispanic	-.0893 (46.87)	-.0011 (0.56)	-.0010 (0.59)	-.0002 (0.12)
Year & state dummies	Yes	Yes	Yes	Yes
Personal controls	No	Yes	Yes	Yes
Constant	3.39782	3.6520	3.4970	3.8896
Adjusted R^2	.0100	.1054	.1030	.1199
N	2,405,840	2,405,820	2,405,820	1,907,758
Age Minimum			36	44

Excluded category: <20 and white. Personal controls are marital status, labor market status and education. T-statistics in parentheses.

Table 2. OLS regressions of Cantril's 11-step ladder, Gallup US Daily Tracker Poll, 2009-2017

Age 20-29	-.2541 (25.96)	-.3735 (38.31)	
Age 30-39	-.1880 (9.49)	-.6178 (62.20)	
Age 40-49	-.3110 (32.72)	-.7606 (77.09)	
Age 50-59	-.3673 (39.19)	-.7579 (77.68)	
Age 60-69	-.0643 (6.86)	-.4134 (42.12)	
Age 70-79	.1157 (12.08)	-.1156 (11.48)	
Age 80+	.1611 (15.96)	.0494 (4.62)	
Age			-.0619 (146.80)
Age^2*100			.0665 (161.19)
Male	-.1443 (57.69)	-.2957 (118.38)	-.2970 (118.78)
Black	-.1433 (25.94)	.1626 (29.98)	.1615 (29.74)
Asian	.0468 (4.15)	-.0948 (8.65)	-.0945 (8.61)
Native American	-.4178 (22.79)	-.1217 (6.95)	-.1221 (6.97)
Hawaiian	-.1403 (4.00)	.0078 (0.24)	.0063 (0.19)
Hispanic	-.0569 (11.85)	.3181 (66.11)	.3176 (65.91)
Year & state dummies	Yes	Yes	Yes
Personal controls	No	Yes	Yes
Constant	7.1606	6.0409	6.7600
Adjusted R^2	.0182	.1006	.0993
N	2,436,798	2,355,162	2,355,162
Age Minimum			47

Excluded category: <20 and white. Personal controls are marital status, income and education.
T-statistics in parentheses

Table 3. OLS regressions of 3-step happiness, GSS, 1972-2018

				Age<70
Age 20-29	.0546 (2.65)	-.0603 (2.89)		
Age 30-39	.0913 (4.44)	-.0792 (3.69)		
Age 40-49	.0723 (3.49)	-.0917 (4.20)		
Age 50-59	.0752 (3.61)	-.0693 (3.15)		
Age 60-69	.1125 (5.33)	.0017 (0.08)		
Age 70-79	.1042 (4.80)	.0512 (2.14)		
Age 80+	.0648 (2.75)	.0670 (2.56)		
Age			-.0074 (7.94)	-.0130 (8.81)
Age^2*100			.0095 (9.92)	.0159 (9.40)
Male	-.0143 (2.75)	-.0481 (8.63)	-.0472 (8.46)	-.0501 (8.57)
Black	.2020 (26.38)	.1113 (4.64)	-.1114 (14.62)	-.1188 (14.96)
Other race	.0585 (4.92)	.0286 (2.47)	-.0272 (2.34)	-.0236 (2.00)
Year & state dummies	Yes	Yes	Yes	Yes
Personal controls	No	Yes	Yes	Yes
Constant	2.1104	2.2801	2.3419	2.4618
Adjusted R^2	.0169	.0850	.0848	.0888
N	60054	59884	59707	52433
Age Minimum			39	41

Excluded category: <20 and white. Personal controls are marital status, income and education. T-statistics in parentheses.

Table 4. Marriage and Divorce rates.

a) Marriage and divorce rates by country, 2017*

	Marriage rate /1000	Mean first age at marriage		Divorce rate
		Male	Female	
France	3.5	34	32	1.9
Germany	4.9	34	31	1.9
Italy	3.2	35	32	1.5
Japan	4.9	31	29	1.7
USA	6.9	30	27	2.9
UK	4.4	33	31	1.8

b) Marriage and divorce rates in US and UK by age under forty.

	USA		UK	
	Married %	Divorced %	Married %	Divorced %
18	1.1	0.2	0.3	0.0
19	2.2	0.1	0.4	0.0
20	4.6	0.3	0.8	0.0
21	7.8	0.5	1.6	0.0
22	11.1	0.7	2.8	0.0
23	14.8	1.4	4.4	0.1
24	18.5	1.6	7.6	0.0
25	23.2	2.3	10.7	0.2
26	27.5	3.5	15.6	0.4
27	32.7	3.3	20.5	0.4
28	36.2	4.3	28.4	0.9
29	41.6	4.9	32.8	1.0
30	45.0	5.4	38.7	1.6
31	46.6	6.8	44.3	2.0
32	52.2	6.8	47.3	2.0
33	54.7	7.2	52.9	2.2
34	54.4	7.7	53.6	2.6
35	57.4	7.9	56.1	3.3
36	57.2	9.1	57.0	4.0
37	61.3	8.8	57.9	4.7
38	60.3	9.4	61.2	4.8
39	62.6	10.2	61.8	5.1

Source: Part a) OECD Family Database http://www.oecd.org/els/family/database.htm. Part b) Source; columns 1 & 2 BRFSS, 2015-2019 and columns 3 & 4 Annual Population Surveys, 2017-2019, weighted.

Table 5. OLS regressions of 7-step life satisfaction, ISSP, 2017

	Married	Married	Not married	Not married
Age 20-29	-.1596 (4.48)	-.2437 (6.57)		
Age 30-39	-.2009 (5.71)	-.4016 (10.19)		
Age 40-49	-.2271 (6.47)	-.4325 (10.82)		
Age 50-59	-.2724 (7.79)	-.4339 (10.81)		
Age 60-69	-.2079 (5.91)	-.3027 (7.26)		
Age 70-79	-.1886 (5.08)	-.2241 (5.24)		
Age 80+	-.1993 (4.50)	-.1577 (3.05)		
Age			-.0210 (6.66)	-.0382 (15.80)
Age^2*100			.0181 (6.81)	.0353 (14.37)
Male	.0238 (2.16)	.0029 (0.26)	.0046 (0.33)	.0070 (0.40)
Austria	.2648 (5.69)	.4184 (9.02)	.1612(2.73)	.4714 (6.39)
China	-.4130 (11.12)	-.3012 (8.00)	-.5559 (12.78)	-.3670 (5.40)
Taiwan	-.0178 (0.43)	.0557 (1.35)	-.0340 (0.68)	.0036 (0.05)
Croatia	-.1185 (2.44)	.0136 (0.28)	-.2588 (4.18)	.0967 (1.26)
Czech Republic	-.1934 (4.30)	-.0580 (1.30)	-.2352 (4.08)	-.0337 (0.47)
Denmark	.1047 (2.14)	.0939 (1.95)	.0445 (0.73)	.2450 (3.09)
Finland	.0263 (0.55)	.0738 (1.56)	.0408 (0.67)	.1437 (1.87)
France	-.2979 (6.73)	-.2068 (4.73)	-.2956 (5.27)	-.1575 (2.22)
Germany	.1091 (2.54)	.0957 (2.24)	.0362 (0.70)	.2351 (3.28)
Hungary	-.6467 (13.28)	-.4655 (9.63)	-.6075 (9.13)	-.5093 (6.68)
Iceland	.3466 (7.70)	.3943 (8.91)	.4035 (7.13)	.3788 (5.18)
India	.1415 (3.17)	.3557 (7.84)	-.1258 (2.30)	.4783 (6.48)
Israel	.1465 (3.18)	.1605 (3.53)	.0897 (1.66)	.1458 (1.83)
Japan	-.5694 (13.06)	-.5890 (13.65)	-.6184 (12.11)	-.5988 (7.80)
Lithuania	-.7814 (16.16)	-.6812 (14.27)	-.8950 (14.08)	-.5751 (7.68)
Mexico	-.1351 (2.73)	-.0331 (0.68)	-.2961 (4.66)	.0618 (0.79)
New Zealand	.0813 (1.79)	.0765 (1.70)	.0954 (1.70)	.1257 (1.70)
Philippines	.2897 (6.20)	.3915 (8.41)	.1226 (2.20)	.4766 (6.01)
Russia	-.4901 (11.13)	-.4316 (9.85)	-.6210 (11.56)	-.3109 (4.28)
Slovak Republic	-.2907 (6.49)	-.1833 (4.12)	-.4685 (8.22)	-.0378 (0.53)
Slovenia	.0843 (1.75)	.1443 (3.01)	-.0230 (0.38)	.2752 (3.59)
South Africa	-.6673 (17.16)	-.4780 (8.32)	-.4937 (9.67)	-.6031 (9.66)
Spain	-.0022 (0.05)	.1139 (2.68)	-.0767 (1.48)	.1029 (1.45)
Surinam	-.2700 (5.75)	-.0001 (0.00)	-.4499 (6.51)	.0409 (0.58)
Sweden	.1493 (3.15)	.1815 (3.88)	.1266 (2.15)	.2952 (3.84)
Switzerland	.3747 (7.82)	.3822 (8.07)	.2627 (4.52)	.5185 (6.53)
Thailand	-.2308 (5.18)	-.0728 (1.57)	-.3179 (5.87)	-.1234 (1.62)
UK	-.0446 (1.02)	.0792 (1.84)	.0329 (0.60)	.0035 (0.05)
USA	.2143 (4.58)	.2941 (6.36)	.3293 (5.34)	.2699 (3.72)
Personal controls	Yes	Yes	No	No
Constant	5.4752	5.4876	6.0430	5.8681
Adjusted R^2	.0710	.1118	.0823	.0827
N	43,565	43,565	22,981	19,897
Age Minimum			58	54

Excluded category: <20 in columns 1 and 2 and Australia. Personal controls are marital and labor force status, and education. T-statistics in parentheses.

Chart 1. Life satisfaction in the UK
Source: Www.covidsocialstudy.org

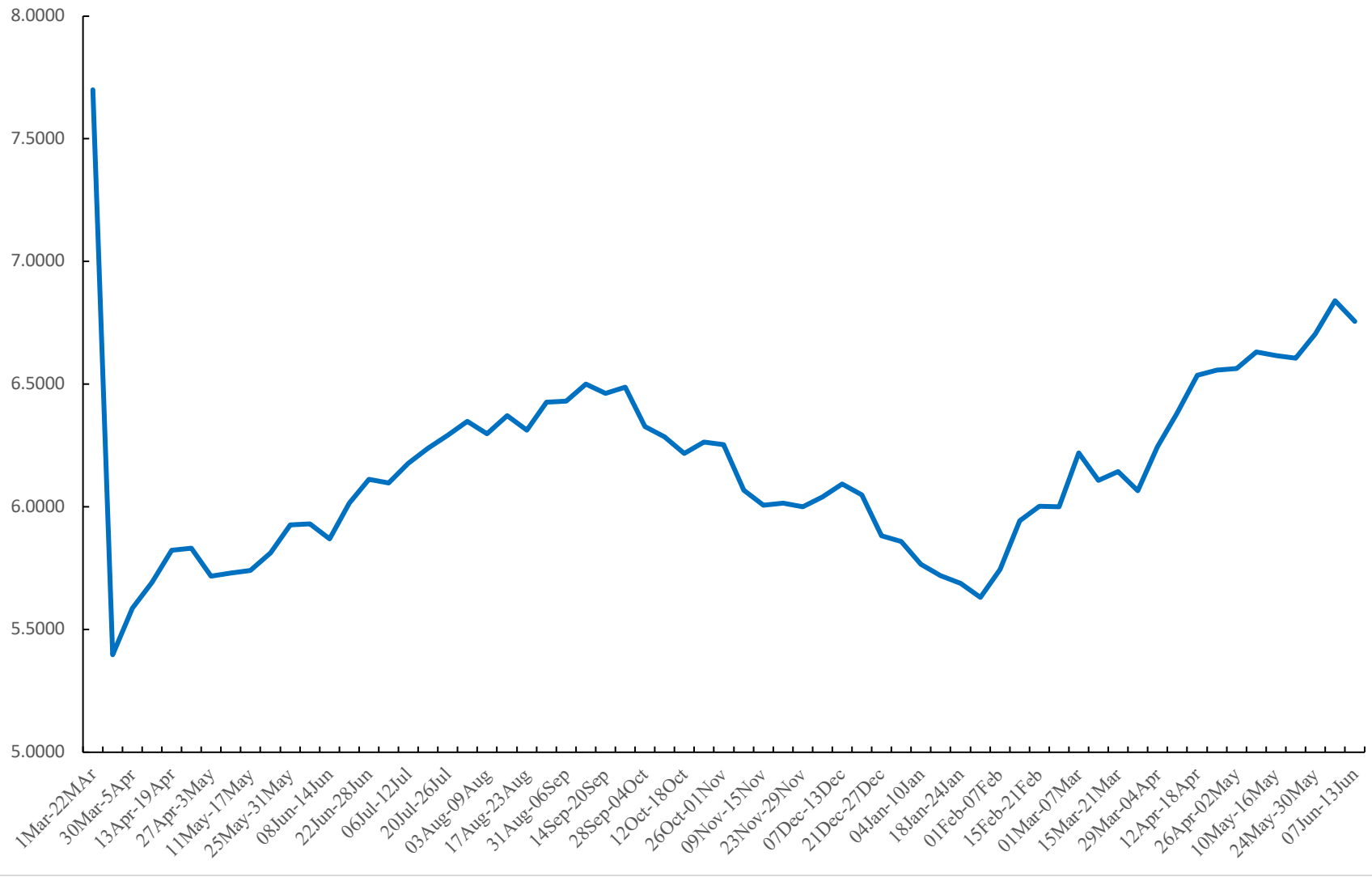


Chart 2a. Age-specific mortality rates for deaths related to drug misuse, England and Wales, registered between 1993 and 2019.

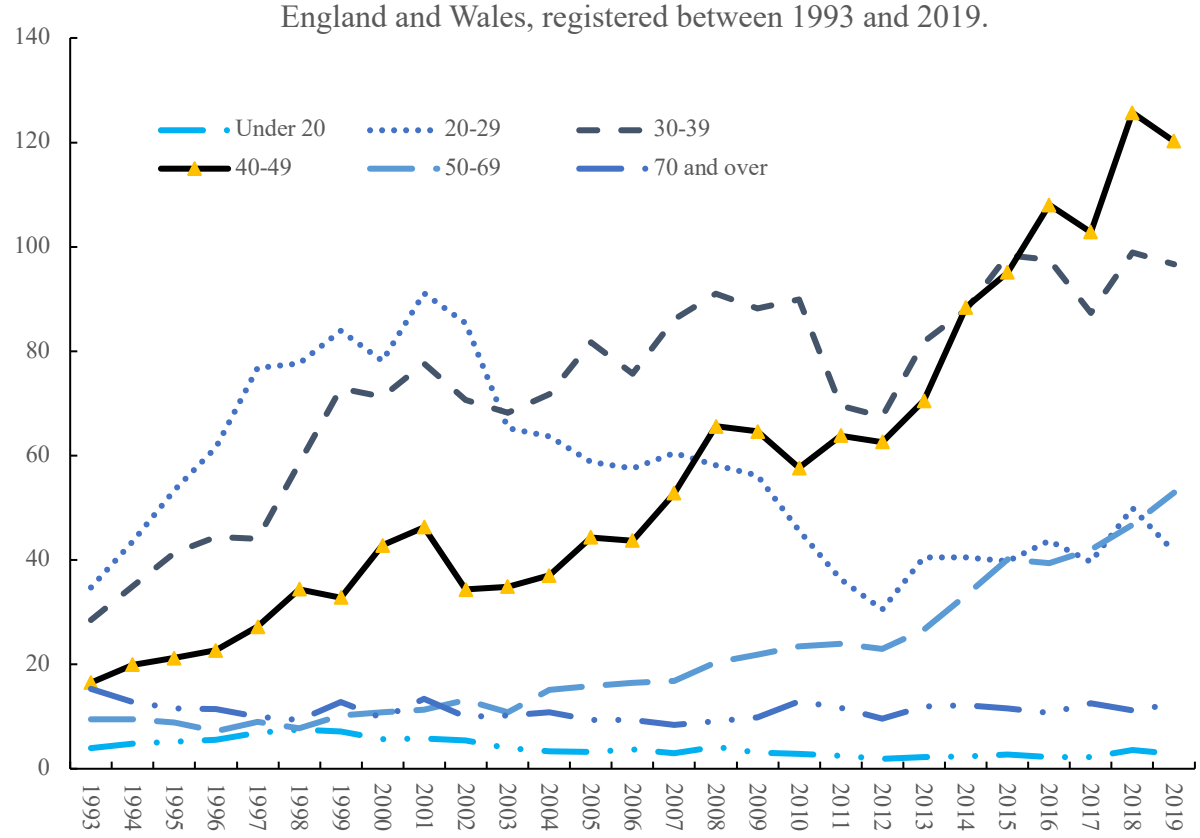
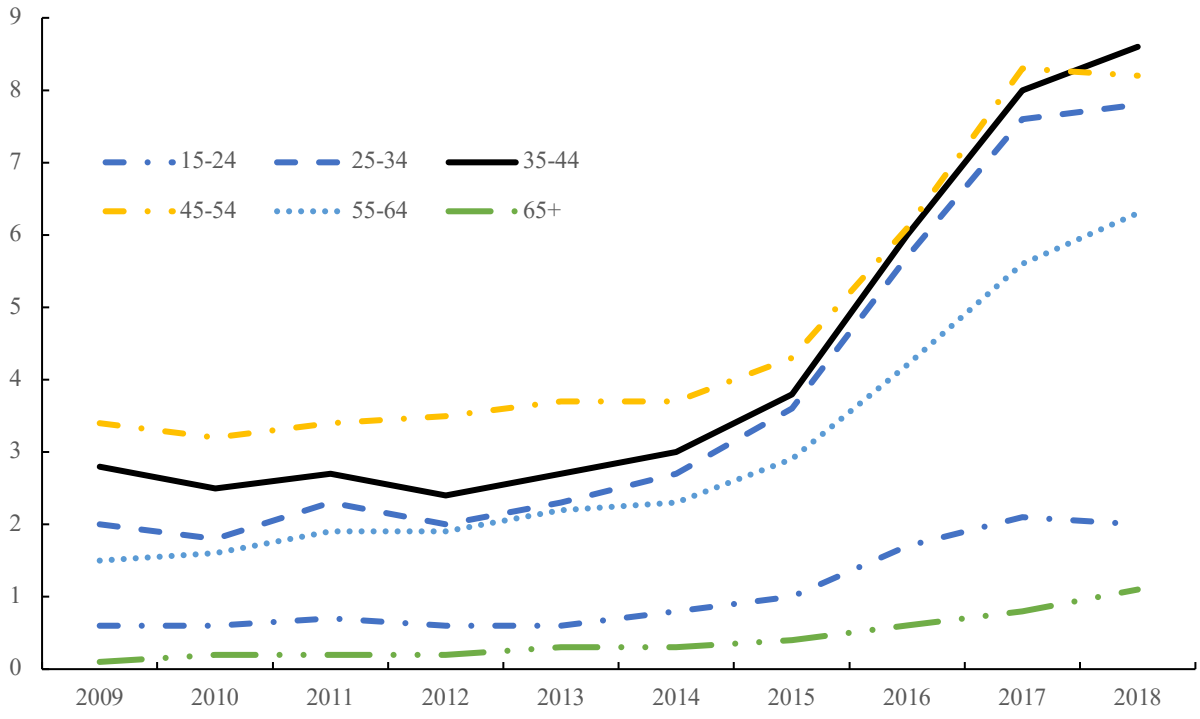


Chart 2b. Rates of drug overdose deaths by cocaine, US, 2009-2018



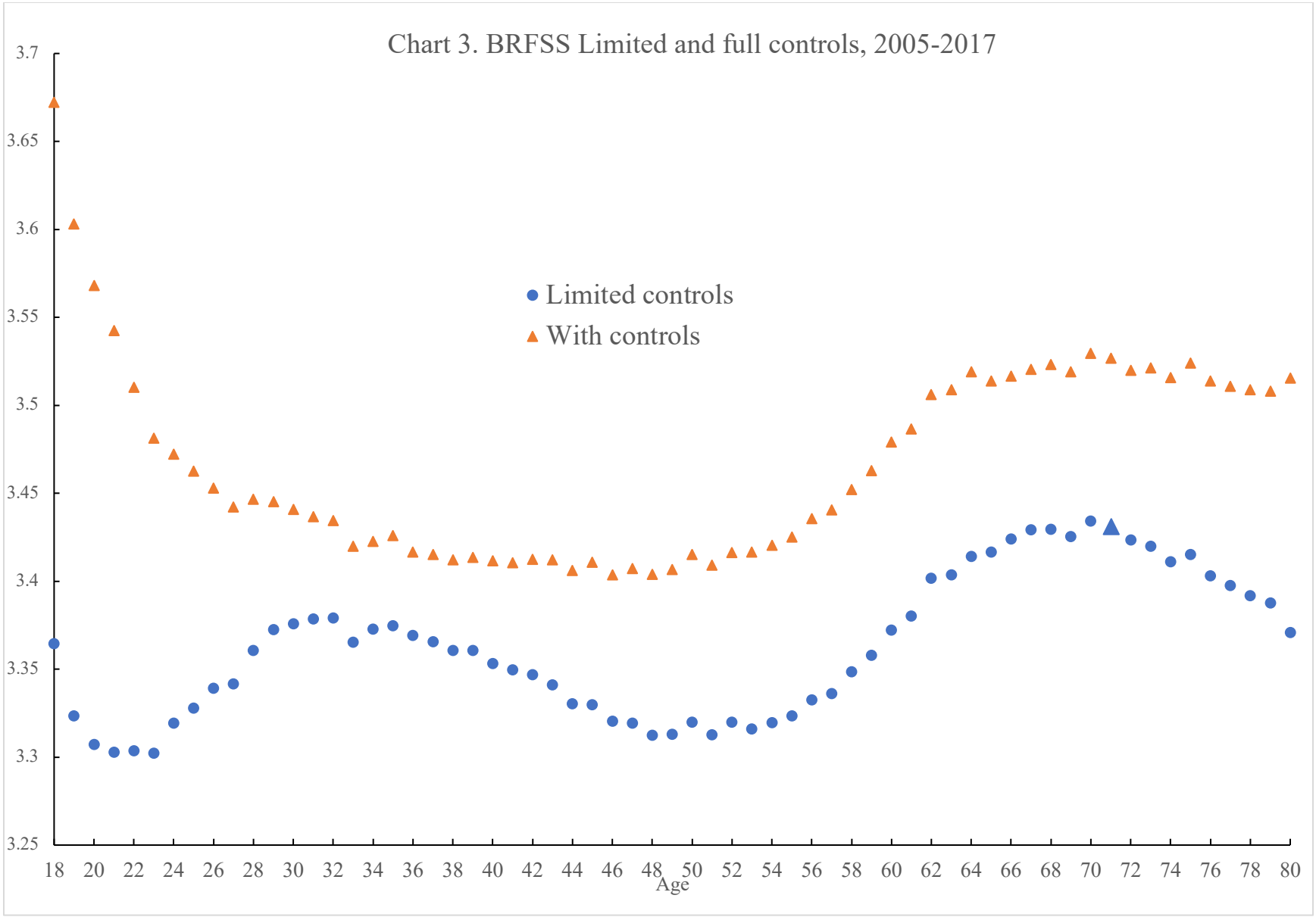
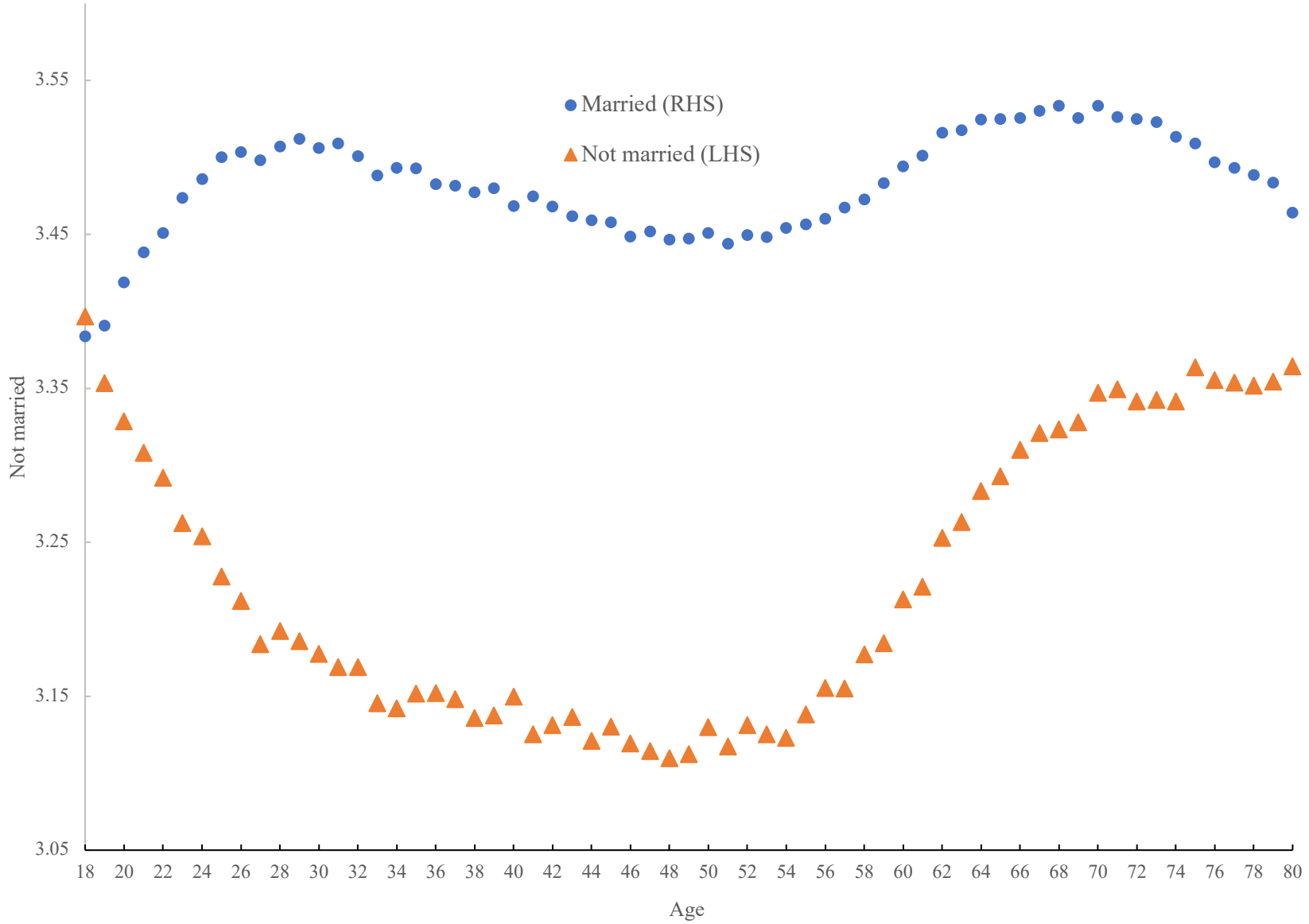


Chart 3. BRFSS Limited and full controls, 2005-2017
3.7
3.65
3.6
3.55
3.5
3.45
3.4
3.35
3.3
3.25
Limited controls
With controls
18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
Age

Chart 4. BRFSS, Limited controls by marital status, 2005-2017



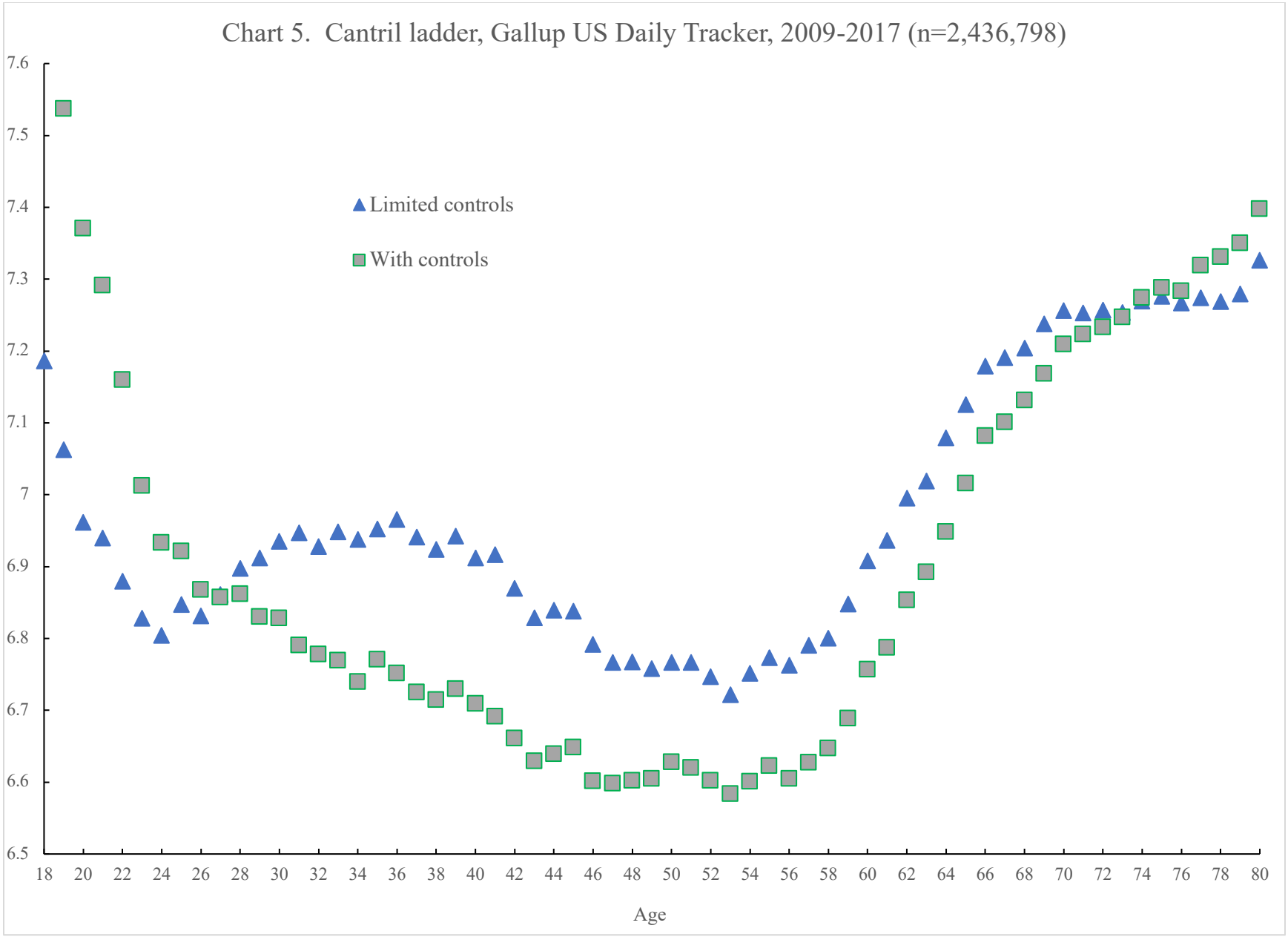


Chart 5. Cantril ladder, Gallup US Daily Tracker, 2009-2017 (n=2,436,798)
Limited controls
With controls
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
6.8
6.7
6.6
6.5
18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
Age

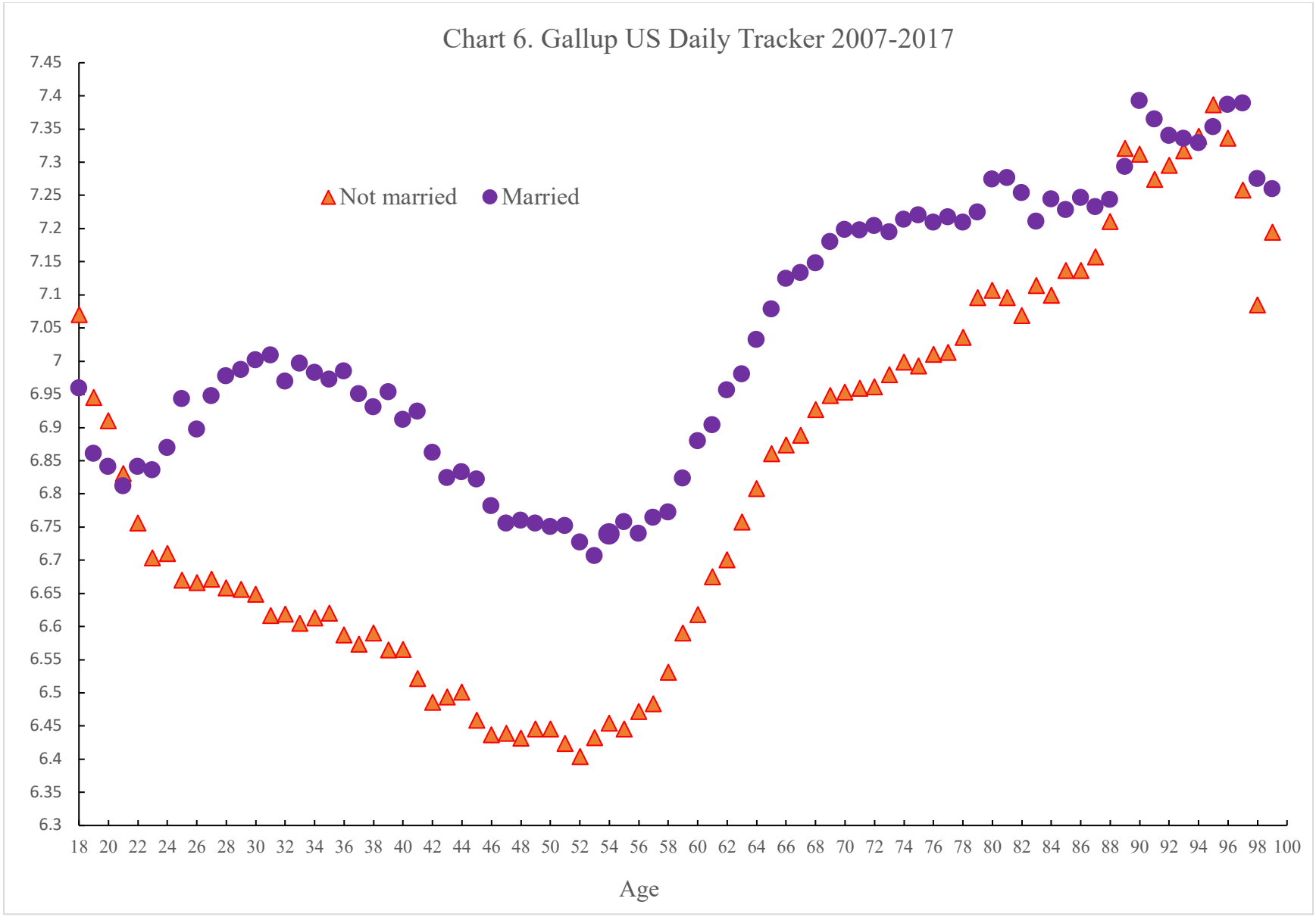


Chart 6. Gallup US Daily Tracker 2007-2017
Not married
Married
7.45
7.4
7.35
7.3
7.25
7.2
7.15
7.1
7.05
7
6.95
6.9
6.85
6.8
6.75
6.7
6.65
6.6
6.55
6.5
6.45
6.4
6.35
6.3
18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100
Age

Chart 7. 3-step happiness General Social Survey, 3yr smoothed averages, 1972-2018

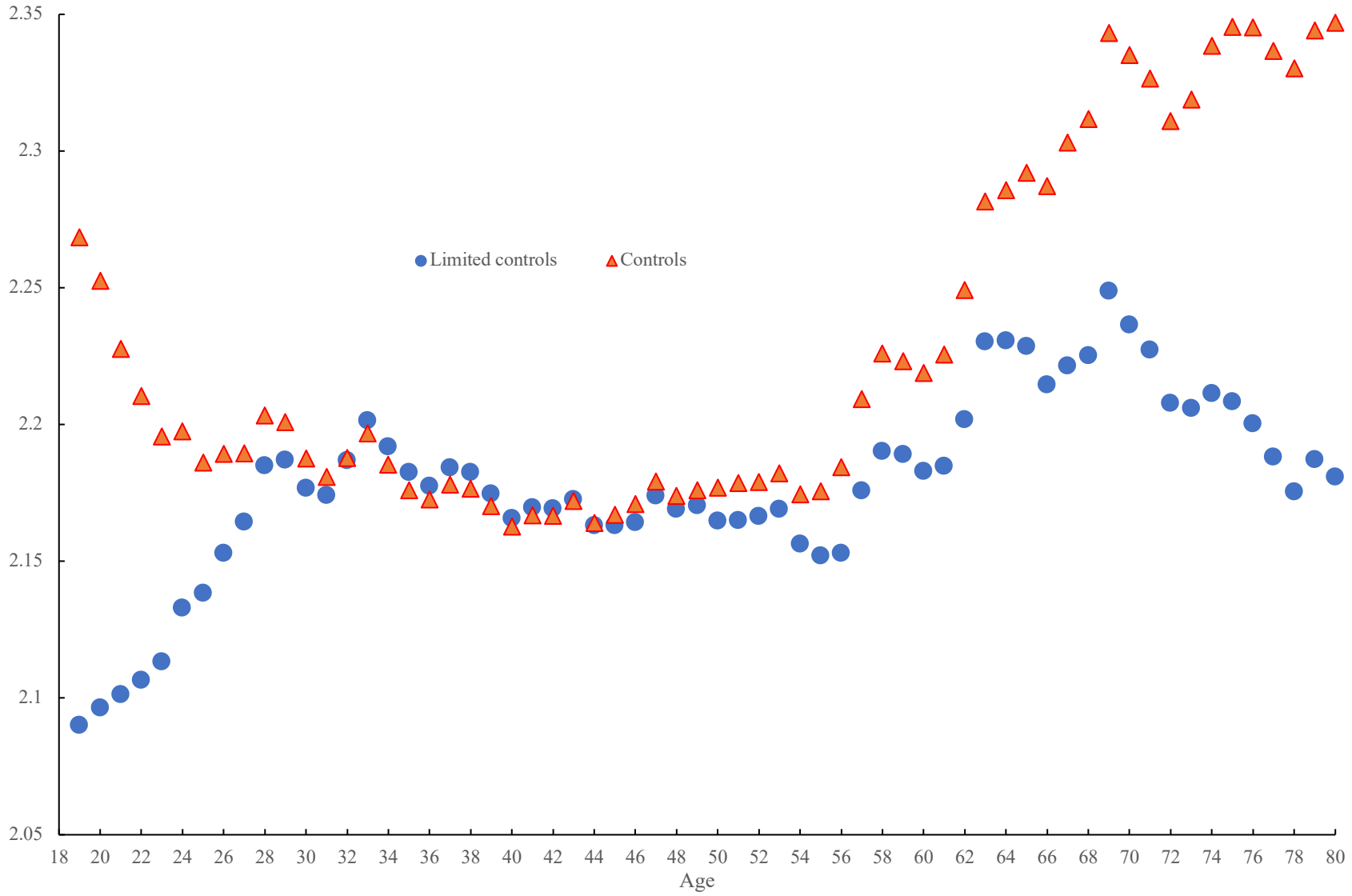


Chart 8. 3-step General Social Survey, with limited controls married and not married, 1972-2018

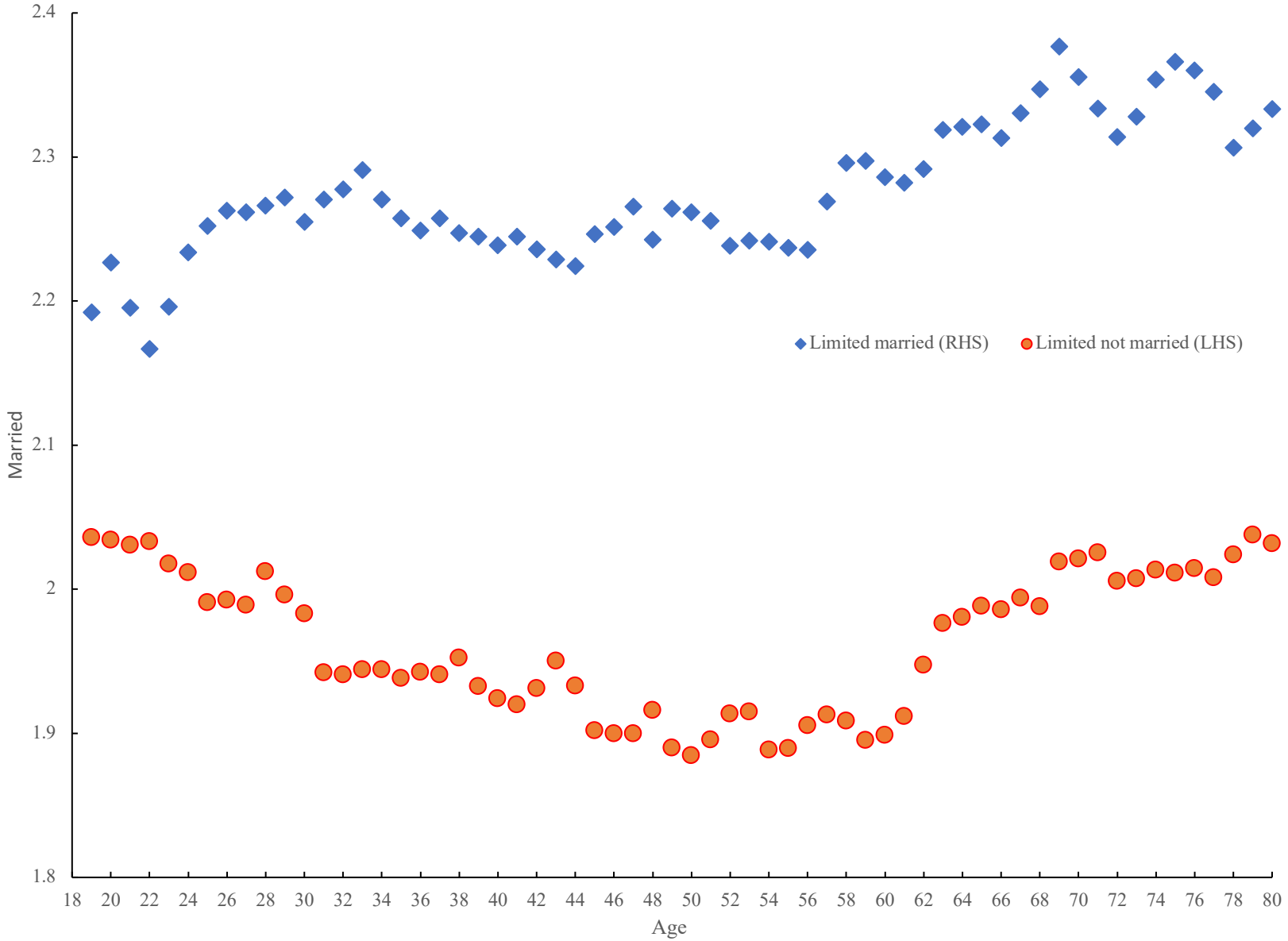
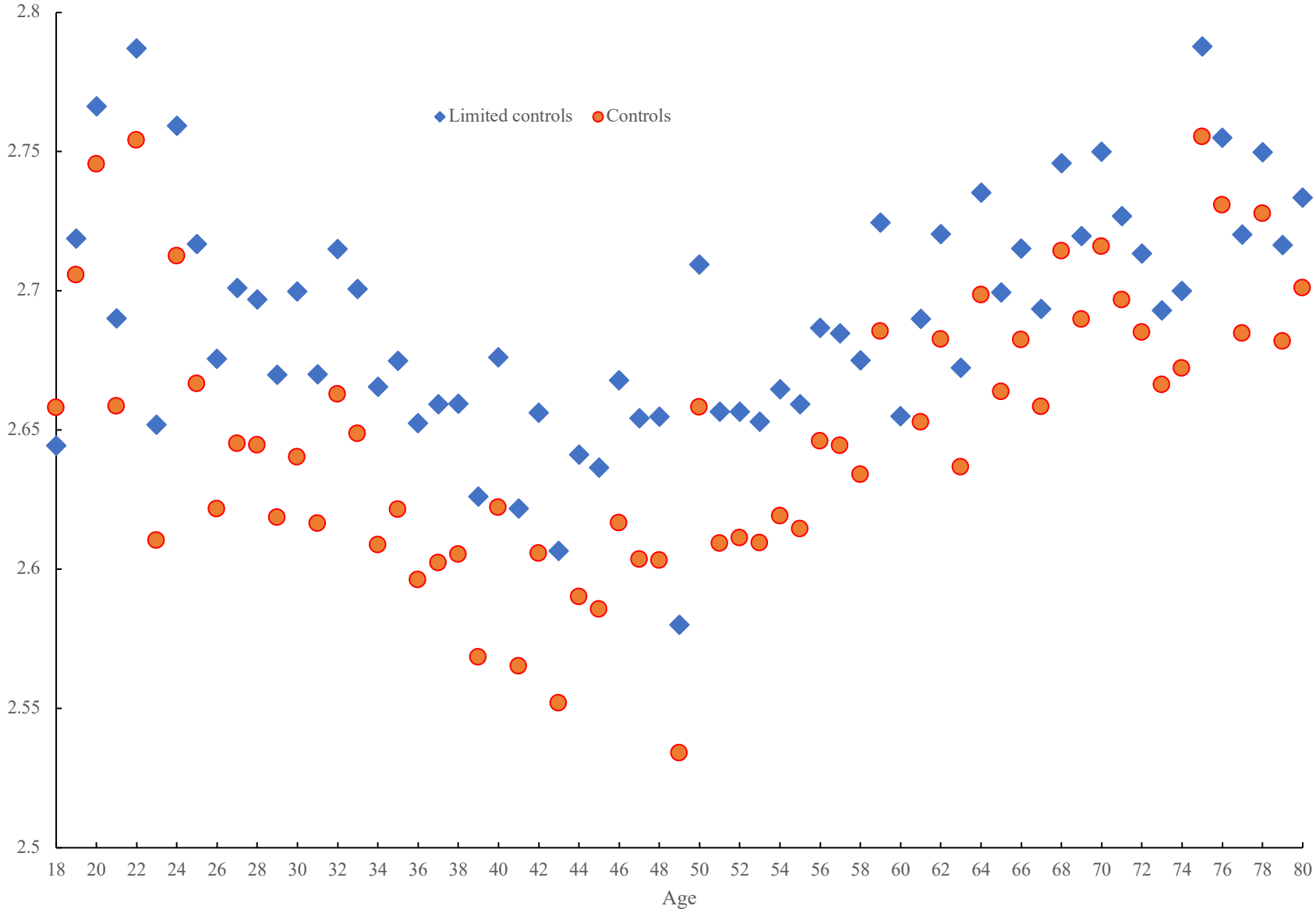


Chart 9. 3-step General Social Survey, happiness with marriage (married only), 1972-2018



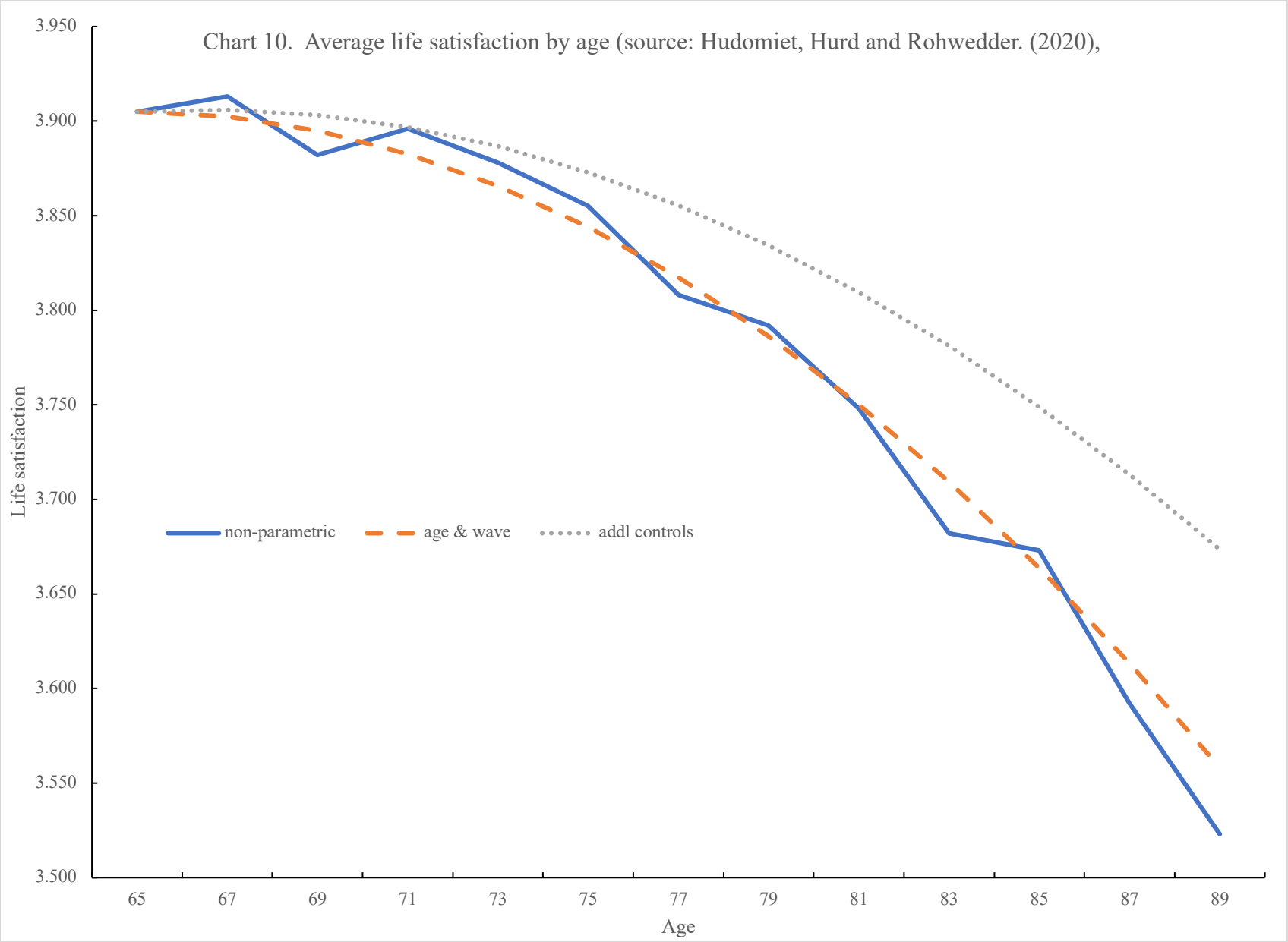


Chart 10. Average life satisfaction by age (source: Hudomiet, Hurd and Rohwedder. (2020),
3.950
3.900
3.850
3.800
3.750
3.700
3.650
3.600
3.550
3.500
Life satisfaction
non-parametric
age & wave
addl controls
65
67
69
71
73
75
77
79
81
83
85
87
89
Age