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Is happiness U-shaped everywhere? Age and subjective well-being in 145 countries

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Abstract

A large empirical literature has debated the existence of a U-shaped happiness-age curve. This paper re-examines the relationship between various measures of well-being and age in 145 countries, including 109 developing countries, controlling for education and marital and labor force status, among others, on samples of individuals under the age of 70. The U-shape of the curve is forcefully confirmed, with an age minimum, or nadir, in midlife around age 50 in separate analyses for developing and advanced countries as well as for the continent of Africa. The happiness curve seems to be everywhere. While panel data are largely unavailable for this issue, and the findings using such data largely confirm the cross-section results, the paper discusses insights on why cohort effects do not drive the findings. I find the age of the minima has risen over time in Europe and the USA.

Keywords Well-being · Happiness · U-shape in age

JEL codes I31 · P51 · D6

1 Introduction

In this paper, I report on the existence of a midlife nadir in well-being. The analysis is conducted mostly at the country level with happiness and life satisfaction variables, although a number of other measures are used that relate to a household's financial situation and their living standards, satisfaction with local services, and the macro economy. All produce U-shapes in age.

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Using country-level data, I identify U-shapes in age in 145 advanced and developing countries.[1] This includes 138 of the 193 member countries of the United Nations. I find this happiness curve (Rauch 2019) for 109 developing[2] and thirty-six advanced countries based on an analysis where I control for gender, education, marital and labor force status, and time. I use data from fourteen different survey series. I use these data to estimate 477 separate country-level estimates that reach a minimum, on average, at age 48.3.[3] There are 241 estimates from developed countries with an average minimum at age 46.7 and 236 estimates from developing countries with an average minimum at 49.9.

I examine cross-section time series data at the country level rather than examining panel data. Longitudinal data files that have a long run of years are restricted to the UK (BHPS and NCDS), Germany (GSOEP), and Australia (HILDA). In part, the concern with these surveys is non-random attrition bias and hence missing values over time with the least happy dropping out or even dying, which may well introduce measurement error. There is a small literature looking at age effects using panel data that I interpret as largely supportive of U-shapes, although there are some technical issues that must be considered. My interest is to see whether there is evidence of a midlife zenith in other countries besides the UK, Germany, and Australia.

I examine the importance of cohort effects to determine if younger and older age cohorts are different from those in the middle and find out that they are not. I examine the data over time and adjust for cohort effects and find remarkable consistency in the findings. I find that introducing cohort effects in the samples where I have a long time series, namely, the EU Commission's Eurobarometer series pre (1973–2002) and post the Great Recession (2009–2019), has little impact on the results. I find the minima in Europe have risen over time, from around age 40 in 1975 to over 50 in the most recent data.

I also address the issue of possible differential response rates among older people, along with the concern that happy people live longer. To minimize that concern, I focus

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[1] This is an update of Blanchflower (2020a), which found the U-shape in 132 countries. Note that Shams and Kadow (2019) have also found a U-shape in age in well-being for Pakistan.

[2] The 109 developing countries and their average minima with controls are as follows: Albania 50, Algeria 41, Argentina 45, Armenia 56, Azerbaijan 46, Bahrain 40, Bangladesh 38, Belarus 53, Benin 48, Bolivia 53, Bosnia 52, Botswana 49, Brazil 44, Burkina Faso 39, Burundi 46, Cambodia 46, Cameroon 49, Cape Verde 51, Chile 47, China 43, Colombia 45, Congo (Brazzaville) 58, Costa Rica 41, Cote d'Ivoire 46, Dominican R. 37, Ecuador 48, Egypt 41, El Salvador 54, eSwatini 52, Gabon 54, Gambia 47, Georgia 59, Ghana 51, Guatemala 57, Haiti 44, Honduras 59, Hong Kong 47, India 49, Indonesia 37, Iran 44, Iraq 40, Israel 56, Jamaica 50, Jordan 43, Kazakhstan 50, Kenya 56, Kosovo 45, Kuwait 40, Kyrgyzstan 43, Laos 38, Lebanon 53, Lesotho 57, Liberia 48, Libya 39, Macedonia 50, Madagascar 41, Malawi 50, Malaysia 34, Maldives 36, Mali 45, Mauritius 39, Mexico 45, Moldova 46, Mongolia 34, Montenegro 58, Morocco 36, Mozambique 47, Myanmar 39, Namibia 45, Nepal 40, Niger 46, Nigeria 41, Palestine 46, Panama 47, Paraguay 44, Peru 49, Philippines 42, Puerto Rico 38, Russia 49, São Tomé 50, Saudi Arabia 39, Senegal 49, Serbia 56, Singapore 39, Somaliland 49, South Africa 51, South Korea 49, Sri Lanka 49, Surinam 43, Swaziland 65, Syria 37, Taiwan 41, Tajikistan 43, Tanzania 48, Thailand 48, Togo 51, Trinidad 43, Tunisia 53, Turkey 45, Turkish Cyprus 53, Uganda 48, Ukraine 57, Uruguay 47, Uzbekistan 48, Venezuela 47, Vietnam 43, Yemen 38, Zambia 43, and Zimbabwe 55.

[3] The age minima in the 36 advanced countries with controls are as follows: Australia 41, Austria 49, Belgium 44, Bulgaria 61, Canada 49, Croatia 57, Cyprus 50, Czech Republic 52, Denmark 43, Estonia 54, Finland 47, France 52, Germany 49, Greece 63, Hungary 53, Iceland 47, Ireland 43, Italy 52, Japan 50, Latvia 61, Lithuania 57, Luxembourg 37, Malta 48, Netherlands 45, New Zealand 38, Norway 52, Poland 55, Portugal 54, Romania 53, Slovakia 53, Slovenia 53, Spain 51, Sweden 46, Switzerland 43, UK 45, and USA 45.

my analysis on people from early adulthood, which is usually age 18 but in some samples is as low as 15, to under the age of 70. I exclude older people.

It makes sense to look at as many countries as possible given the evidence that in the raw data the USA looks different. In the raw US data, essentially however measured, happiness rises initially to a peak around age 30 and then declines into midlife and then rises again after age 70. This apparent M-shape disappears once controls are included and a well-defined U-shape appears. It also disappears when the sample is split into separate married and unmarried samples. These patterns are not found elsewhere in the world. This has led to a debate in the USA especially about the importance of including control variables, although less so outside the USA where it matters little. In other countries, the U-shape generally appears whether controls are included or not, although the point at which the function reaches a minimum may differ.

It is also worth pursuing the possibility that the U-shape doesn't apply to poorer countries, where residents have shorter life expectancies. Blanchflower and Oswald (2008a) find a U-shape for 39 developing countries in World Values Survey sweeps 1–4[4] that averages out at a minimum around age 43 when including control variables. In this paper, I find there are U-shapes in age in developing countries with minima similar to those in advanced countries regardless of how well-being is measured.

I examine the presence or not of U-shapes with and without controls in the USA and find the evidence is much stronger with controls. I then turn to examining data for the UK and 36 European countries and find there is evidence of a U-shape whether controls are included or not, with very little difference in the age minima. I then proceed to examine a series of multi-country data files.

It is striking that the same finding holds across so many countries. The U-shape can be found in multiple data files and does not depend on what question is asked or how the responses are coded. I document clear patterns in the data. This paper is the mirror image of Blanchflower (2020b) that examined unhappiness data and finds comparable evidence using twenty different measures for an *unhappiness* curve that maximized with controls at age 49 compared with a zenith of happiness estimated in this paper at age 48.

2 The literature

2.1 Is there a happiness curve?

Yes, there is, despite what psychologists say. The background literature is large and there is some disagreement over whether U-shapes exist at all (see, for example, Baird et al. (2010), Blanchflower (2009), Blanchflower and Oswald (2004), Carstensen et al. (2011), Charles et al. (2001), Easterlin (2003, 2006), Frey and Stutzer (2002), Frijters and Beaton (2012), Glenn (2009), Graham and Pozuelo (2017), Hellevik (2017), Hudson et al. (2016), Lachman (2015), Leland (2018), Mroczek and Kolanz (1998),

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[4] Countries were Albania Algeria, Argentina, Bangladesh, Belarus, Brazil, Chile, China, Colombia, Dominican Republic, Egypt, India, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Mexico, Moldova, Morocco, Nigeria, Peru, Philippines, Puerto Rico, Russia, Saudi Arabia, Singapore, South Africa, Taiwan, Tanzania, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, and Zimbabwe.

Mroczek and Spiro (2005), Rauch (2018) Shields and Price (2005), Stone et al. (2010), Steptoe et al. (2015), Wunder et al. (2013), and Schwandt (2016)).

A recent review by Ulloa et al. (2013) goes so far as to draw the conclusion that existing studies show either a U-shaped, inverted U-shaped, or linear relation between aging and subjective well-being. Other studies, such as Lachman (2015), come close to arguing that there may be a midlife dip but that it is too small to be significant. Many of the studies such claims were based on had very small samples sizes and in fact did show U-shapes despite claims they didn't.

An early psychology literature suggested there was no age-happiness relationship (Cantril, 1965, and Palmore and Luikart, 1972). Myers (2000, p. 58) argued that no time in life is notably happiest and most satisfying. In contrast, Michael Argyle concluded that studies of life satisfaction found that it increased with age (Argyle, 1999, 2001). A survey by Diener et al. (1999, p. 291) concluded that life satisfaction often increases, or at least does not drop, with age. Easterlin (2006) examined data from the General Social Surveys from 1972 to 1993 and claimed that "happiness is greatest at midlife but not by a great deal. On average it rises somewhat as people progress from age 18 to 51 and declines thereafter" (2003, p.471).

A survey by Diener et al. (1999, p. 291) concluded that recent studies converge to show that life satisfaction often increases, or at least does not drop, with age. Diener and Suh (1998) examined World Values Survey data for 1994 and argued that the raw data on life satisfaction trended up slightly through age. Deaton (2008) concluded that the U-shaped relation is present solely in rich, English-speaking countries in which the elderly is relatively satisfied with their lives. (ibid., p. 8). More recently, Whitbourne (2018) has gone so far as to argue that the U-shape curve is a "myth."

Blanchflower and Graham (2020a) examine the evidence that psychologists have cited claiming no U-shape exists over the life span and found that many of the studies cited had very small sample sizes. Examples are Helson and Lohnen (1998) ($n = 80$), Freund and Baltes (1998) ($n = 206$), and Hamarat et al. 2002 ($n = 95$) to name but a few. It is hard to say much of anything about statistical differences in well-being by age with sample sizes that small.

Psychologists have also cited work by Ingelhardt (1990) as not finding any U-shapes in age. For example, Diener et al. (1999) citing Ingelhardt (1990) argue that "international studies based on representative samples from multiple countries also show that life satisfaction does not decline with age." Myers (1992) argued that Ingelhardt showed that "age differences in well-being were trivial. Does happiness then align itself more with any particular age? Do young adults have more fun? Surprisingly, and definitely, not" (p. 69).

Ingelhardt (1990) examined well-being across sixteen nations using data from Eurobarometers #13–#26 (April 1980–November 1986) and the World Values Survey on the USA, Canada, Hungary, and Japan for 1981–1982 and argued that there was "little variation by age" in well-being (p. 224). It turns out the data he used in fact show otherwise. Blanchflower and Graham (2020a) went back to the 1990 Ingelhardt book and observed he in fact reported U-shapes in the raw data in nine of the sixteen countries studied. Blanchflower and Graham examined the same data Ingelhardt used and estimated a series of happiness equations and found there were U-shapes in age with controls in all the countries and variables Ingelhardt examined.

In addition, Diener and Suh (1998) cite work by Okma and Veenhoven (1996), also used Eurobarometers, between 1980 and 1990, and argued that the paper showed an almost flat line with age. From around age 18 to 90, they argued it showed there was almost no change in life satisfaction. It didn't. Blanchflower and Graham (2020a) went back to analyze these same Eurobarometer files for the same years which are part of the publicly available Mannheim Trend file. Across these nations, the average score for those under 20 was 3.14, reaching a low point of 2.97 at age 54 and then rising to 3.20 at age 90. So, it is true that life satisfaction scores at age 90 are not that different from age 18 but that ignores the midlife drop. Without controls in a life satisfaction equation, there is a well-defined nadir in well-being in age controlling for year and nation that minimizes at age 48 and also one with controls—for gender, education, and marital and labor force status—that minimizes at age 43.

2.2 To control or not to control?

I update and extend results in an earlier paper (Blanchflower and Oswald, 2008a), where it was shown that a U-shape in age existed in well-being data across a number of countries. Using data on 500,000 randomly sampled Americans and West Europeans, the paper found that holding other factors constant, a typical individual's happiness reaches its minimum on both sides of the Atlantic for both males and females in middle age.[5] The minimum in age was broadly similar between advanced, East European, and developing nations. The function minimized on average in midlife. For example, in Europe, for both men and women, it minimized at around 47 with controls including education and marital and labor force status. For developing countries from the WVS, sweeps 1–4, minima were 43 for men and 44 for women. A maximum in age in unhappiness data for Europe was found at around age 47. Some apparent exceptions, particularly in twenty developing nations along with a few western countries, mostly where there are small numbers of observations, to the U-shape were noted.[6]

Subsequently, Glenn (2009) argued that it was inappropriate to include controls and what mattered was the raw data; Blanchflower and Oswald (2009) disagreed. Glenn claimed that the appearance of this U-shaped curve of well-being is the result of the use of inappropriate and questionable control variables and especially marital status. It is worth rehearsing the arguments we used there again. In many countries around the world, and especially in Europe, as I illustrate in detail below, the U-shape can be found

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[5] Evidence for a U-shape was found in twenty-two advanced countries (Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, and USA). Second, evidence was provided for the existence of a similar U-shape through the life course in East European, Latin American, and Asian nations. Evidence was found in fourteen ex-Soviet Republics (Albania, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Serbia, Slovakia) and thirty-eight developing countries (Argentina, Azerbaijan, Belarus, Brazil, Brunei, Brazil, Brunei, Cambodia, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Iraq, Israel, Honduras, Kyrgyzstan, Laos, Mexico, Myanmar, Nicaragua, Nigeria, Paraguay, Peru, Puerto Rico, Philippines, Russia, Singapore, South Africa, South Korea, Tanzania, Turkey, Ukraine, Uruguay, Uzbekistan, and Zimbabwe). I find evidence of a U-shape in all of these countries also.
[6] That included Algeria, Armenia, Austria, Bangladesh, Chile, Colombia, Egypt, Greece, India, Indonesia, Iran, Jordan, Luxembourg, Moldova, Morocco, New Zealand, Pakistan, Saudi Arabia, Singapore, Slovenia, Taiwan, Uganda, Venezuela, and Vietnam. In this paper, I report U-shapes for all but three of them—Bangladesh, Pakistan, and Saudi Arabia.

without any control variables, and a major problem with Glenn's analysis was that he focused too heavily on the USA.

Second, we disagreed with Glenn's methodological position, which seems to be that social scientists should not hold constant other factors when they study the relationship between well-being and age. Ultimately, in social science, the control variables that are included in multiple regression equations we noted have to be chosen with an eye on the intellectual or policy question being answered. The summary of our argument went as follows. If the aim is to describe the data, it is reasonable to leave out most or all control variables. "Smokers die at rate Z" is an acceptable statement to make. But that is not the same as "smoking changes your risk by Z," which requires other confounding variables to be controlled for such as diet, education, income, and exercise. We argued that would be an error to use an equation without controls to tell the public what impact aging has on happiness without separating out the effects of other variables such as, say, education, marriage, or unemployment. If the aim is to understand relationships, we concluded, "it seems, it will rarely be desirable to stop at bivariate patterns." That seems right and I don't stop at bivariate patterns in this paper either.

Blanchflower and Oswald (2019) examined the issue of differences between the well-being and age relationship with and without controls using seven pooled cross-country data sets, covering 51 countries and 1.3 million randomly sampled people; the paper examines the cross-sectional pattern of psychological well-being from approximately age 20 to age 90.[7] The paper described the two conceptual approaches. One studies raw numbers on well-being and age which we termed the *descriptive approach*. The second studies the patterns in regression equations for well-being (that is, adjusting for other influences). This we termed the *ceteris-paribus analytical approach*. The paper applied each and compared the patterns of life satisfaction and happiness. Using the first method, evidence of a midlife low was found in five of the seven data sets; the two that didn't were both for the USA. Using the second method, all seven data sets produced evidence consistent with a midlife low.

Deaton (2018) reported only unadjusted estimates in part he argued because of the difficulty in applying consistent controls to the Gallup data, not because the questions do not exist, but because their meaning varies so much across the globe, with different patterns of education, work, retirement, and health systems. Deaton also suggested that 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.

Deaton notes that "different authors use different countries and different data sets with different SWB questions, so it is possible that the age patterns in the Gallup data are different from those that come from other questions and different survey protocols; it would be an important (if daunting) task to make systematic comparisons." This is what I try to do here.[8]

Some psychologist have even gone as far as to argue that even if there is a U-shape it is broadly irrelevant as any change is "trivial." Jebb et al. (2020) argue, for example,

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[7] The data sets were (a) LFS survey for the UK, 2011–2015; (b) BRFSS for the USA, 2010; (c) Eurobarometer, 2016; (d) European Social Survey, 2002–2014; (e) ISSP, 2012; (f) GSS for the USA, 1972–2014; and (g) Latino Barometer, 2013 and 2015.

[8] In private communications, Sir Angus Deaton suggested that he didn't have quite this in mind. He suggested, more just a look at the questions they ask, their response rates, and whether they are even grossly consistent.

that "it is possible that the U-shaped (or other) curve exists but that it is so small that it is not practically meaningful. In other words, just because differences across age are statistically significant, that does not mean that these differences have practical significance. Researchers in past studies have generally not taken effect size into account,… At some point, an effect size becomes so small that it is truly trivial and lacks practical significance. For our Cantril ladder scale, respondents reported (and probably thought) in terms of the nearest whole scale point from 1 to 10. Therefore, it seemed that differences below 1.00 should be considered quite small."

As Blanchflower and Oswald (2019) note the claim that the size of the dip is tiny does not appear to be correct. In the seven data sets, they studied the size of the drop, in well-being to the low point in the late 40s *is equivalent in magnitude to the influence of a major life event* like unemployment or marital separation. The size of the fall in well-being from youth to midlife is large and likely highly consequential. I should also note that I know of no evidence in any well-being data involving a change anywhere approaching 1.00 for ANY life event.

2.3 Longitudinal data and differential response by age

Some have argued that no U-shape exists in longitudinal data (Frijters and Beatton 2012; Kassenboehmer and Haisken-DeNew 2012). In contrast, Cheng et al. (2017) drawing on four data sets, and only within-person changes in well-being, build on the work of Van Landeghem (2012) and document powerful support for a U-shape in longitudinal data. Three of the data sets are nationally representative household surveys, namely the British Household Panel Survey (BHPS, 1991–2008), the Household Income and Labour Dynamics in Australia (HILDA, 2001–10), and the German Socio-Economic Panel (SOEP, 1984–2008). The fourth data set comprises a relatively more homogenous sample of medical doctors from the Medicine in Australia Balancing Employment and Life (MABEL) longitudinal study. They measure the change in well-being of randomly selected individuals each year and then plot that against individuals' ages. On average, they find people's well-being gradually drops until individuals reach midlife. From then on, it picks up smoothly as people go on, in each of three countries and four data sets, to approach the age of 70.

Wunder et al. (2013) and Ranjbar and Sperlich (2019) both use semi-parametric methods on German SOEP panel data to examine the relation between age and well-being. They both get the same results. Ranjbar and Sperlich conclude "we find a clear, deep valley between the ages of 45 and 50, typically interpreted as a midlife crisis." Bleischmann (2014) also uses the GSOEP and finds "mean life satisfaction is steadily declining between 20 and 55. After this low, happiness increases strongly until the age of 70."

de Ree and Alessi (2011) have examined that the GSOEP 1986–2007 found that that "the data is indeed consistent with a U-shape in age over most of the life cycle" (p. 282) but have noted that age profiles are not identified without forcing arbitrary restrictions on the cohort/time profiles. There are clear issues though with the data they examine given they have to drop a quarter of households due to missing values. Kroh (2011) notes that less than 50% of the original 1984 sample remains after 2007. Ferrer-i-Carbonelli and Frijters (2004) also examine GSOEP data find a U-shape with controls for West German workers. The authors find the result is the same whether estimated by OLS, ordered logit, or ordered probit and include controls for time, household income, children, a steady partner, and health. When they re-estimate with fixed effect, the U-shape disappears.

Piper ([2015](#)) uses GMM dynamic panel estimation with 16 waves of the British Household Panel Study on youngsters age 16–30 and found that happiness declined over that age range, a result found by comparing the micro coefficients of the age dummies: a result in line with the overall U-shape. Furthermore, tests of the individual age group coefficients demonstrate that they are, in many cases, significantly different from each other. Additionally, because the preferred model controls for the individual waves in the sample, this decline of life satisfaction with age is a life cycle effect. The life satisfaction of young people between 16 and 30 falls, and this seems to be something that everyone, on average, experiences. Overall, his findings, Piper argues, "are in line with the common U-shape finding." Clark ([2019](#)) also finds, using the same data source and panel data methods controlling for fixed effects, that the data "continues to produce a U-shaped relationship between well-being and age."

Other commentators have expressed skepticism that the curve's trajectory holds true mainly in countries where the median wage is high and people tend to live longer or, alternatively, where the poor feel resentment more keenly during middle age and don't mind saying so. John Briley in a recent op-ed argued that "the curve is not universal – data from economically struggling countries, for example, don't show the happiness rebound."[9] Arthur Krystal[10], for example, has suggested that there may be a simpler explanation: "perhaps the people who participate in such surveys are those whose lives tend to follow the curve, while people who feel miserable at seventy or eighty, whose ennui is offset only by brooding over unrealized expectations, don't even bother to open such questionnaires." This critique of course could apply to any research based on surveys with a bias having nothing to do with age.

There is zero evidence that the U-shape has anything to do with differential response bias by age especially under the age of 70. I have the U-shape in many data sets with various happiness measures including happiness itself and life satisfaction and Cantril's ladder. It makes no difference if the dependent variable is scored, from 1 to 4 say or from 1 to 10; the results are essentially the same. The smaller numbers of observations for older age groups are an issue but that simply reflects the overall demographics in the country—there are fewer people age 80 than age 30 and especially so in countries with shorter life expectancy.[11] Helliwell ([2019](#)) recently argued that "to use a single life satisfaction question in large population-based samples might represent the best use of survey resources." Following Helliwell's advice, where feasible, I use life satisfaction as my well-being measure, where I can.

3 Data

I examine *the happiness curve* using individual micro data from thirteen distinct micro survey series. These were chosen because well-being measures of various types were

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[9] John Briley, "Does happiness in your 50s signal the end of ambition?," The Washington Post, December 18, 2019.
[10] Arthur Krystal, "Why we can't tell the truth about aging? A long life is a gift. But will we really be grateful for it?," The New Yorker, October 28, 2019.
[11] According to the Census Bureau's International Population database in 2018, there were 4,675,612 individuals age 30 in the US versus 1,483,523 age 80. In LDCs, the ratio is smaller—in Venezuela, for example, the numbers are 519,040 and 65,319 respectively, so it is 8 times there versus 3 times in the US. https://www.census.gov/data-tools/demo/idb/region.php?T=10&RT=0&A=both&Y=2019&C=US&R=

available. Mostly, the questions examined are on *happiness* or *life satisfaction.* The questions used vary a little as do the number of possible responses varying from three to eleven that I call *steps*. Other sweeps (e.g., the BRFSS from 2010), for example, did not contain happiness measures although they do contain unhappiness measures (Blanchflower, 2020a). I also examine a broader set of questions on family life, health, trust, financial situations, living standards, and more. In most cases, I have to recode the variables such that a higher number means greater happiness.

1) Three-step happiness from the General Social Survey (GSS) from 1972–2018 (Table 1)
2) Four-step life satisfaction from the 2005–2010 US Behavioral Risk Factor Surveillance System (BRFSS) (Table 1)
3) Ten-step Cantril's life satisfaction ladder from the Gallup US Daily Tracker 2008–2018 (Table 1)
4) Eleven-step life satisfaction, worthwhileness, and happiness from the Annual Population Survey for the UK, 2016–2018 (Table 2)
5) Four-step life satisfaction from the Eurobarometer Surveys from 1973–2019 (Tables 3, 4, and 5)

Table 1 Life satisfaction and happiness quadratics in age in the US

	Age	Age^2	Minimum	N
All ages				
GUSDT (Cantril's ladder)*				
Without controls	− 0.0266 (70.28)	+ 0.00032 (91.79)	41	2,534,429
With controls	− 0.0637 (136.91)	+ 0.00067 (10.82)	48	1,906,993
BRFSS (life satisfaction)				
Without controls	− 0.0029 (2.75)	+ 0.000013 (14.18)	11	4,283,582
With controls	− 0.0056 (49.93)	+ 0.00006 (61.77)	42	4,282,986
GSS (happiness)				
Without controls	+ 0.0044 (5.28)	− 0.00004 (4.07)	74 (max)	59,860
With controls	− 0.0082 (8.71)	+ 0.00010 (10.82)	41	59,707
Age < 70				
GUSDT (Cantril's ladder)*				
Without controls	− 0.0458 (71.86)	+ 0.00054 (76.93)	42	1,998,193
With controls	− 0.1048 (136.04)	+ 0.00114 (134.57)	46	1,498,817
BRFSS (life satisfaction)				
Without controls	− 0.0096 (52.48)	+ 0.00012 (13.63)	40	3,386,767
With controls	− 0.0206 (104.44)	+ 0.00024 (109.64)	43	4,283,544
GSS (happiness)				
Without controls	+ 0.0031 (2.32)	− 0.00002 (1.24)	n/a	52,545
With controls	− 0.0142 (9.58)	+ 0.00017 (10.19)	42	52,433

Source: Gallup USDT, 2008–2018; BRFSS, 2005–2010; and GSS, 1974–2018. *T*-statistics in parentheses. Sample size changes when controls are added because of missing values to the control variables

*Labor force status not available in 2008, hence the smaller sample size

Table 2 Life satisfaction and happiness quadratics in age in the UK, age < 70

	Age	Age^2	Minimum	N
1) Life satisfaction				
Without controls	− 0.04831 (23.67)	0.00052 (22.67)	47	215,064
With controls	− 0.08161 (38.59)	0.00084 (35.92)	49	214,951
2) Happiness				
Without controls	− 0.0548 (24.60)	0.00065 (27.05)	42	215,049
With controls	− 0.0628 (23.97)	0.00069 (23.66)	46	214,937
3) Worthwhile				
Without controls	− 0.0266 (14.89)	0.00033 (16.84)	41	214,618
With controls	− 0.0497 (24.08)	0.00056 (24.65)	44	214,508

Source: UK Annual Population Survey, 2016–2018. *T*-statistics in parentheses

6) Ten-step happiness using sweeps 1–9 of the European Social Surveys (ESS) 2002–2016 (Table 6)
7) Ten-step life satisfaction (Table 7) and 10-step step happiness from the European Quality of Life Survey: 2003–2016 (Table 8)
8) Seven-step happiness from the 2012 (Table 9) and 7-step life satisfaction from the 2017 sweeps of the International Social Survey Program (Table 10)
9) Ten-step life satisfaction from waves 2–6 of the World Values Survey (WVS); 1990–2014 (Table 11)
10) Five-step happiness from the Asia Barometers of 2005 (Table 12)
11) Four-step life satisfaction from the Latino Barometers of 2016 and 2017 (Table 13)
12) Eleven-step Cantril's life satisfaction ladder from the Gallup World Poll (2008–2017) (Table 14)
13) Three-step financial satisfaction from wave 6 of the WVS (Table 15)
14) Four- and 10-step measures of satisfaction with the economy family life and living standards Eurobarometer #74.1 2010, 91.5 from 2019, and the ESS Sweep 2002–2016 (Table 16)
15) Five-step satisfaction with living standards in the Afro Barometers 2016 and 2019 (Table 17)

The ISSP and WVS both contain data from four large non-European English-speaking advanced nations—Australia, Canada, New Zealand, and the USA—plus Japan. They all give U-shapes in happiness with and without controls.

4 Methods?

I use three methods to identify the U-shape. First, I run an OLS regression with the dependent variable a measure of well-being, on a pooled sample of countries across all

ages, with age and age squared, without any controls, although I do include country dummies and if there are multiple survey years, then I also include sweep dummies. I then repeat and include, as far as is feasible a consistent set of personal control variables across all studies of gender, marital status, education, and labor force status to estimate ceteris paribus effects.

Second, I then re-estimate for individual countries including the gender, education, and marital and labor force status control variables with the age of respondents limited to those under the age of 70. I do this for simplicity given very different life expectancies across countries and hence much smaller sample sizes for older age groups and likely variability at older ages. Sample sizes are often quite small for these individual country regressions, and on average many are only around 1000 observations. I find for several advanced countries that there are insignificant results using, for example, ISSP data, but when using EB or ESS when the samples are much larger, the significance of both age terms appears. I assume that there is a significant U-shape if there is a negative sign on the age coefficient and a positive sign on the square with the *T*-statistic of both above 1.5.

Finally, I re-estimate the well-being equation and replace the age and age squared term with a complete set of single year of age variables which I then plot in a series of figures. This is to ensure that the quadratic I fitted is not an inappropriate functional form. This way the form is freely estimated and then plotted, with the individual coefficients added to the constant. These figures show U-shapes.

The well-being variables are always coded from low to high, so a positive coefficient means happier. Sometimes I use happiness data and sometimes life satisfaction and the number of options available varies by survey and year. Mostly there are four options that I call 4-step, or eleven options from 0 to 10 that I call 11-step, plus I also use 3-step, 5-step, 7-step, and 10-step. It doesn't seem that this makes much of a difference. Sample size does seem to matter although it is surprising how many U-shapes are identified even with sample sizes of less than a thousand.

I am also able to identify U-shapes in age in both European and African nations using a *broader set of attitudinal questions on living standards as well as on an individual's financial conditions as well as the state of the national economy*. I focus in particular on questions about financial situations individuals find themselves in as well as on the general state of the economy. These questions are widely used in consumer confidence surveys. Respondents are asked such questions in the Eurobarometers, as well as in the monthly consumer surveys run by the European Commission in every EU country since the 1980s. These surveys have started to move down sharply from March 2020 as the COVID-19 shock hit (Bell and Blanchflower, 2020).

I also compare results of asking similar questions in Europe and Africa in relation to satisfaction with living standards. It seems the U-shape in age is more general than just in happiness and life satisfaction equations and applies to other attitudinal economic variables. This suggests the happiness curve has broader applicability to other attitudinal variables about the person and the economy.

In this section, I report the results of estimating a series of OLS well-being regressions. In each case, I report coefficients and *T*-statistics for the age and the age squared variables with and without controls for education, gender, marital and labor force status, country, and where appropriate where there are multiple survey years used a set of year dummies. The without controls equations include year and country

Table 3 Four-step life satisfaction estimates using 2009–2019 Eurobarometers with no controls, just year dummies, and age < 70

	Age	T-statistic	Age²	T-statistic	N	Age minimum
Without controls	− 0.02030	79.20	0.00021	62.23	1,024,762	48
+ 8 cohort dummies	− 0.01944	29.49	0.00017	25.17	1,024,762	57
Western Europe						
Austria	− 0.00930	5.98	0.00007	3.92	34,751	66
Belgium	− 0.01834	13.29	0.00020	12.99	34,800	46
Cyprus	− 0.02730	9.64	0.00024	9.64	19,417	57
Denmark	− 0.01210	9.58	0.00014	10.10	31,396	68
Finland	− 0.01409	10.02	0.00013	8.69	31,051	54
France	− 0.03193	20.75	0.00030	17.30	33,890	53
Greece	− 0.04138	22.36	0.00033	15.49	33,244	63
Iceland	− 0.01421	4.10	0.00009	2.08	6,337	79
Ireland	− 0.01450	9.90	0.00016	9.41	35,817	45
Italy	− 0.01088	6.95	0.00008	4.39	36,244	68
Luxembourg	− 0.01651	9.08	0.00019	8.96	19,109	43
Malta	− 0.01932	9.86	0.00016	7.41	17,685	60
Netherlands	− 0.01758	13.12	0.00018	12.03	35,034	49
Norway	− 0.01498	3.61	0.00017	3.57	3,451	44
Portugal	− 0.02166	15.17	0.00016	9.55	35,074	68
Spain	− 0.03215	20.86	0.00033	18.36	34,452	49
Sweden	− 0.01351	8.63	0.00016	9.12	27,794	42
UK	− 0.02288	17.31	0.00026	17.53	43,136	43
West Germany	− 0.01521	10.05	0.00017	9.85	31,428	45
Eastern Europe						
Bulgaria	− 0.01575	9.04	0.00005	2.51	35,925	158
Croatia	− 0.02561	14.38	0.00020	9.58	33,898	64
Czech Republic	− 0.02217	16.36	0.00019	12.45	37,802	58
East Germany	− 0.01895	8.46	0.00019	7.39	18,150	50
Estonia	− 0.02210	14.43	0.00014	7.93	31,269	79
Hungary	− 0.03007	18.19	0.00027	14.40	35,899	75
Latvia	− 0.03841	26.81	0.00033	19.97	36625	58
Lithuania	− 0.04770	28.03	0.00042	21.24	30,364	57
Poland	− 0.01469	10.66	0.00009	5.57	35,625	82
Romania	− 0.01675	10.12	0.00009	4.79	37,533	93
Slovakia	− 0.02196	13.90	0.00019	13.90	36,296	58
Slovenia	− 0.01965	13.28	0.00014	8.61	34,132	70
Developing countries						
Macedonia	− 0.03835	12.96	0.00040	11.80	14,886	48
Serbia	− 0.03210	10.09	0.00026	7.59	12,253	62
Turkish Cyprus	− 0.03368	9.38	0.00035	7.98	13662	48

Table 4 Four-step life satisfaction estimates using 2009–2019 Eurobarometers with controls for gender, marital and labor force status, and education and age < 70

	Age	T-statistic	Age²	T-statistic	N	Age minimum
With controls	− 0.03085	81.28	0.000322	75.04	1,023,015	48
+ 8 cohort dummies	− 0.02454	35.50	0.000263	35.92	1,023,015	47
Western Europe						
Austria	− 0.01328	6.77	0.00013	5.92	34,704	51
Belgium	− 0.03139	16.10	0.00038	17.45	34,717	41
Cyprus	− 0.03400	10.23	0.00036	9.66	19,407	47
Denmark	− 0.02926	18.57	0.00034	19.66	31,369	43
Finland	− 0.03236	18.13	0.00034	17.11	31,009	48
France	− 0.03573	17.81	0.00036	15.61	33,864	50
Greece	− 0.03560	13.56	0.00029	9.87	33,219	61
Iceland (non-EU)	− 0.03835	8.24	0.00036	6.92	6,293	53
Ireland	− 0.02238	12.36	0.00025	12.50	35,756	45
Italy	− 0.01214	5.44	0.00011	4.26	36,190	55
Luxembourg	− 0.01417	5.86	0.00018	6.56	19,087	39
Malta	− 0.03037	11.17	0.00032	10.58	17,646	47
Netherlands	− 0.04166	20.97	0.00047	21.95	35,011	44
Norway (non-EU)	− 0.02499	5.25	0.00027	5.14	3,451	46
Portugal	− 0.01954	10.11	0.00018	8.46	35,008	54
Spain	− 0.03917	18.67	0.00042	17.57	34,432	47
Sweden	− 0.03479	17.22	0.00039	17.96	27,961	45
UK	− 0.03605	22.61	0.00042	23.04	43,046	43
West Germany	− 0.03110	15.93	0.00035	15.80	31,394	44
EU28 Eastern Europe						
Bulgaria	− 0.01523	6.55	0.00010	3.73	35,829	76
Croatia	− 0.02929	12.82	0.00026	9.83	33,818	56
Czech Republic	− 0.02812	14.45	0.00028	12.77	37,772	50
East Germany	− 0.01538	6.20	0.00018	6.21	18,477	43
Estonia	− 0.03586	17.90	0.00034	15.40	31,225	53
Hungary	− 0.03900	17.48	0.00040	15.82	35,863	49
Latvia	− 0.03899	20.92	0.00038	17.54	36,568	51
Lithuania	− 0.04834	20.65	0.00047	17.71	30,346	51
Poland	− 0.02464	13.15	0.00023	10.61	35,405	54
Romania	− 0.01912	8.59	0.00015	5.73	37,442	64
Slovakia	− 0.02479	11.91	0.00025	10.59	36,206	50
Slovenia	− 0.02116	10.53	0.00018	8.06	34,052	59
Developing countries						
Albania	− 0.02035	3.49	0.00014	2.14	7,125	73
Macedonia	− 0.03424	8.19	0.00036	7.52	14,871	48
Montenegro	− 0.02060	3.70	0.00013	1.91	9,434	79
Serbia	− 0.02839	6.27	0.00022	4.15	12,213	65
Turkey	− 0.01173	3.43	0.00010	2.51	19,150	59
Turkish Cyprus	− 0.01104	2.86	0.00011	2.35	13,655	50

dummies and in the case of the US and the UK state or region dummies when available. I calculate the minimum of the quadratic in age by differentiating with respect to age and solving which means dividing the age coefficient by the Age^2 coefficient multiplied by 2. Hence, on row 1 of Table 1, the age coefficient is -0.0266 and the Age^2 coefficient is $+0.00032$ so the minimum is $-1 \times 0.0266/(2 \times 0.00032) = 41$. Both are highly statistically significant with t-statistics of 70 and 92 respectively.

I turn first to the two countries that have micro data files with many hundreds of thousands of observations—the USA and the UK. In this paper, I report 9 separate estimates each for the two countries, with controls and in both well-being is U-shaped and on average it minimizes in both at age 45 (footnote 1).

5 Empirical Evidence

5.1 The USA

I need to make clear at the outset that the USA does look different in the raw data. There are three main sources of well-being data in the USA—(1) Gallup's US Daily Tracker Poll (USGDTP) with 2.5 million observations from 2008 to 2018; (2) the General Social Survey from 1972 to 2018, with 60,000 observations; and (3) the Behavioral Risk Factor Surveillance System (BRFSS) which has life satisfaction

Table 5 Four-step life satisfaction estimates using Mannheim Trends File, 1973–2002, Eurobarometers, age < 70

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
Without controls	-0.01359	38.01	0.00014	32.97	587,521	49
With controls	-0.02229	44.62	0.00025	43.73	547,230	45
+ 7 cohort dummies	-0.02025	30.39	0.00022	32.80	547,230	46
With controls						
Belgium	-0.02071	11.65	0.00022	10.73	45,623	47
Denmark	-0.02274	15.48	0.00026	15.66	44,255	44
Finland	-0.03682	11.21	0.00040	10.21	8,954	46
France	-0.02590	13.69	0.00030	13.53	47,005	43
Germany	-0.01434	10.75	0.00018	11.21	65,550	39
Greece	-0.02253	9.13	0.00022	7.59	36,507	51
Ireland	-0.01551	8.70	0.00022	10.52	45,830	35
Italy	-0.02381	13.21	0.00023	11.23	48,159	52
Luxembourg	-0.01270	4.74	0.00016	5.12	18,271	40
Netherlands	-0.02987	18.47	0.00033	18.17	46,081	45
Norway	-0.02487	5.49	0.00028	5.40	6,395	44
Portugal	-0.02528	12.42	0.00025	10.52	28,515	51
Spain	-0.03012	13.31	0.00031	12.16	28,629	49
Sweden	-0.03354	10.17	0.00037	9.54	8,722	49
UK	-0.02052	13.70	0.00027	15.44	59,753	45

Table 6 Happiness estimates using European Social Surveys sweeps 1–8, 2002–2016, with controls and age < 70

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
Advanced countries						
Austria	− 0.0619	5.63	0.00056	4.32	9,197	55
Belgium	− 0.0621	7.92	0.00066	7.37	12,256	47
Bulgaria	− 0.1931	1.51	0.00161	8.01	6,594	60
Croatia	− 0.1445	6.29	0.00129	5.01	2,413	56
Cyprus	− 0.0580	3.18	0.00061	2.93	3,702	48
Czech Republic	− 0.0772	6.94	0.00070	5.68	12,766	55
Denmark	− 0.0591	7.40	0.00066	7.44	9,153	45
Estonia	− 0.0813	7.40	0.00061	4.92	9,612	67
Finland	− 0.0633	9.01	0.00061	7.47	12,145	52
France	− 0.1013	1.65	0.00093	8.39	12,512	54
Germany	− 0.1160	15.26	0.00119	14.00	19,681	49
Great Britain	− 0.0950	11.06	0.00109	11.14	14,204	44
Greece	− 0.1188	9.14	0.00109	7.47	8,025	54
Hungary	− 0.1205	9.60	0.00104	7.31	10,877	58
Iceland	− 0.0566	3.35	0.00064	3.39	1,798	44
Ireland	− 0.0880	1.68	0.00103	11.10	15,169	43
Italy	− 0.0752	4.39	0.00071	3.63	3,874	53
Lithuania	− 0.0942	5.80	0.00072	3.92	6,443	65
Luxembourg	− 0.0810	3.97	0.00104	4.46	2,703	39
Netherlands	− 0.0651	9.18	0.00069	8.77	12,700	47
Norway	− 0.0647	8.42	0.00066	7.59	11,665	49
Poland	− 0.1034	1.01	0.00091	7.61	12,220	57
Portugal	− 0.0856	8.74	0.00072	6.54	11,185	59
Slovakia	− 0.0964	7.14	0.00090	5.82	7,231	54
Slovenia	− 0.0962	8.43	0.00075	5.72	8,876	64
Spain	− 0.0980	11.53	0.00089	9.25	12,877	55
Sweden	− 0.0630	8.18	0.00064	7.23	12,089	49
Switzerland	− 0.0598	7.70	0.00064	7.20	11,697	47
Developing countries						
Israel	− 0.0892	9.74	0.00086	8.29	12,251	52
Russia	− 0.0912	7.31	0.00077	5.29	10,934	59
Turkey	− 0.1105	4.83	0.00128	4.80	3,870	43
Ukraine	− 0.1065	7.37	0.00090	5.44	7,896	59

available for the years 2005–2010, with over four million observations, but this question has been included for five states in a few years.

The first part of Table 1 reports on Cantril's 11-step life satisfaction measure used in Blanchflower and Graham (2020a) based on data from Gallup' US Daily Tracker Poll (GUSDT). The question asked is

Table 7 Life satisfaction estimates using European Quality of Life Surveys, 2003–2016, with controls and age < 70

	Age	T-statistic	Age²	T-statistic	N	Age minimum
Western Europe						
Austria	− 0.06652	3.31	0.00081	3.43	3,841	41
Belgium	− 0.05144	2.91	0.00060	2.98	3,345	43
Denmark	− 0.08627	5.41	0.00110	6.31	3,195	39
Germany	− 0.08017	5.13	0.00093	5.24	6,237	43
Greece	− 0.07585	3.44	0.00060	2.43	3,271	63
Finland	− 0.08903	6.39	0.00109	6.90	3,220	41
France	− 0.05388	3.42	0.00062	3.33	4,951	43
Iceland	− 0.09428	3.23	0.00103	3.19	864	46
Ireland	− 0.07694	4.51	0.00097	4.97	3,516	40
Italy	− 0.10651	6.97	0.00113	6.65	5,825	47
Malta	− 0.04996	2.46	0.00056	2.41	3,037	45
Netherlands	− 0.05074	3.74	0.00065	4.24	3,468	39
Portugal	− 0.07805	4.16	0.00078	3.69	3,205	50
Spain	− 0.06383	3.84	0.00064	3.40	3,694	50
Sweden	− 0.04328	2.69	0.00058	3.21	3,326	37
UK	− 0.10468	6.44	0.00121	6.45	4,742	43
Eastern Europe						
Bulgaria	− 0.10210	4.40	0.00088	3.32	3,215	58
Croatia	− 0.13545	5.21	0.00124	4.21	2,511	55
Czech Republic	− 0.05032	2.31	0.00048	1.92	3,721	52
Estonia	− 0.11630	5.27	0.00112	4.48	2,746	52
Hungary	− 0.10952	4.85	0.00104	4.00	3,308	53
Latvia	− 0.11653	5.41	0.00104	4.13	3,095	56
Lithuania	− 0.16968	7.32	0.00163	6.08	3,171	52
Poland	− 0.08900	4.93	0.00067	3.17	4,927	66
Romania	− 0.11880	5.43	0.00121	4.92	3,795	49
Slovenia	− 0.07512	3.21	0.00071	2.69	3,033	53
Slovakia	− 0.06905	2.99	0.00060	2.25	3600	58
Developing countries						
Albania	− 0.17695	3.07	0.00206	3.07	884	43
Kosovo	− 0.09104	2.18	0.00105	2.13	1,021	43
Macedonia	− 0.12693	4.61	0.00129	4.10	2,669	49
Montenegro	− 0.12326	3.92	0.00121	3.31	1,842	51
Serbia	− 0.17731	5.18	0.00171	4.35	1,824	52
Turkey	− 0.09533	5.76	0.00115	5.89	6,584	41

Q1. "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

Table 8 Happiness estimates using European Quality of Life Surveys, 2003–2016, with controls and age < 70

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
Western Europe						
Austria	− 0.07609	4.02	0.00080	3.63	3,823	48
Belgium	− 0.03418	2.14	0.00041	2.25	3,332	42
Cyprus	− 0.05727	2.52	0.00045	1.81	2,935	62
Denmark	− 0.08123	5.45	0.00094	5.72	3,180	43
Germany	− 0.06885	5.01	0.00070	4.53	6,204	49
Greece	− 0.06728	3.42	0.00047	2.13	3,267	72
Finland	− 0.07151	5.58	0.00081	5.59	3,207	44
France	− 0.06200	4.22	0.00065	3.73	4,946	48
Iceland	− 0.05860	2.31	0.00063	2.25	863	47
Ireland	− 0.04322	2.75	0.00053	2.95	3,458	41
Italy	− 0.08844	6.38	0.00080	5.20	5,788	55
Luxembourg	− 0.03942	2.08	0.00045	2.09	3,001	44
Malta	− 0.03869	2.08	0.00039	1.84	3,027	50
Norway	− 0.08163	2.61	0.00068	1.91	801	60
Netherlands	− 0.06157	4.64	0.00073	4.85	3,404	42
Portugal	− 0.08224	4.60	0.00077	3.82	3,194	53
Spain	− 0.08630	5.78	0.00079	4.62	3,674	55
Sweden	− 0.04317	2.77	0.00053	3.02	3,316	41
UK	− 0.09113	6.07	0.00104	6.03	4,741	44
Eastern Europe						
Bulgaria	− 0.09586	4.40	0.00080	3.22	3,173	60
Croatia	− 0.14282	6.03	0.00133	4.96	2,494	54
Estonia	− 0.08739	4.18	0.00076	3.21	2,740	57
Hungary	− 0.12744	6.16	0.00121	5.06	3,314	53
Latvia	− 0.09430	4.72	0.00080	3.45	3,049	59
Lithuania	− 0.14705	6.63	0.00133	5.21	3,158	55
Poland	− 0.05997	3.59	0.00035	1.79	4,913	86
Romania	− 0.10512	5.41	0.00096	4.31	3,829	55
Developing countries						
Albania	− 0.18169	2.90	0.00219	3.08	883	41
Kosovo	− 0.11663	2.86	0.00127	2.63	1,010	46
Macedonia	− 0.11875	4.54	0.00108	3.63	2,649	55
Montenegro	− 0.07410	2.73	0.00061	1.88	1,839	61
Serbia	− 0.14005	4.44	0.00124	3.44	1,816	56
Turkey	− 0.05616	3.67	0.00066	3.68	6,581	43

represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"

In the GSS, the happiness Q1 is used.

Table 9 Happiness estimates using Asia Barometers, 2005–2007

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
a) 2003 5-step happiness						
South Korea	− 0.10070	3.42	0.00112	3.11	795	45
Uzbekistan	− 0.07822	2.33	0.00080	2.82	792	49
b) 2004 5-step Happiness						
Laos	− 0.05175	2.47	0.00069	2.54	798	38
Myanmar	− 0.06889	2.72	0.00089	2.72	800	39
Singapore	− 0.04518	1.77	0.00049	1.57	793	46
c) 2005 5-step happiness						
India	− 0.03704	2.28	0.0004	2.15	1,221	46
Maldives	− 0.0277	1.63	0.00038	1.89	773	36
Mongolia	− 0.03163	1.93	0.00046	2.35	796	34
Sri Lanka	− 0.05025	3.00	0.00051	2.69	799	49
Tajikistan	− 0.06382	2.50	0.00074	2.39	794	43
d) 2006 5-step happiness						
China	− 0.03414	2.67	0.00037	2.55	1,998	46
Japan	− 0.07872	4.99	0.0008	4.66	992	49
South Korea	− 0.07771	3.87	0.00067	3.1	1,019	58
Taiwan	− 0.06723	3.10	0.00078	3.31	1,003	43
e) 2007 5-step happiness						
Philippines	− 0.02286	1.63	0.00031	1.92	996	37
Thailand	− 0.03389	2.49	0.00035	2.21	1,000	48

Q2. "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?" (my codes).

In the BRFSS, respondents are asked the following 4-step question:

Q3. "In general, how satisfied are you with your life? Very satisfied = 4; Satisfied = 3; Dissatisfied = 2 and Very dissatisfied = 1." (All my codes).

In Table 1, I report the results of estimating OLS regressions which include an age and an age squared term plus year dummies and 50 state dummies for USDTP and the BRFSS and 8 region dummies with the GSS as that is all that is available. I then repeat including controls for gender, labor force and marital status, and education. In the case of the GUSDT, the age term is negative, and the age squared term is positive without and with controls implying a minimum at 41 and 48 respectively.[12]

In the case of the BRFSS, without controls, the age term is negative, and the square term is positive, but the minimum is over 100. For the GSS, the signs are reversed but are both significant suggesting an inverted U-shape. In both cases, when I add controls, there is a significant U-shape with a minimum of 41 and 40 respectively.

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[12] Life satisfaction was included in a subset of the BRFSS for Louisiana, Minnesota, Mississippi, Rhode Island, and Tennessee in 2013–2017. I re-estimated the equation in Table 1 using these data (n = 68,888), with controls for age and its square, state, year, education, gender, race, and marital and labor force status and found the quadratic minimized at age 43.

Table 10 Life satisfaction estimates using 2017–2018 Latino Barometers with controls and age < 70

	Age	T-statistic	Age²	T-statistic	N	Age minimum
a.)2017						
Bolivia	− 0.02478	1.97	0.00022	1.53	1,140	56
Brazil	− 0.02110	2.15	0.00024	2.01	1,116	44
Columbia	− 0.01970	1.70	0.00021	1.53	1,143	46
Costa Rica	− 0.02899	2.35	0.00041	2.82	931	35
Mexico	− 0.03885	3.34	0.00040	2.92	1,097	49
Panama	− 0.03176	2.40	0.00034	2.28	924	47
Paraguay	− 0.03891	3.26	0.00044	3.17	1,161	44
Peru	− 0.03623	2.61	0.00034	2.12	1,102	53
Uruguay	− 0.02791	2.44	0.00027	5.28	1,059	52
b.) 2018						
Bolivia	− 0.02193	1.82	0.00022	1.51	1,133	50
Brazil	− 0.03451	3.47	0.00031	2.59	1,097	56
Columbia	− 0.03239	2.96	0.00035	2.67	1,126	46
Costa Rica	− 0.03634	2.83	0.00039	2.57	923	47
Ecuador	− 0.02633	2.14	0.00027	1.84	1,136	49
Honduras	− 0.03077	2.37	0.00026	1.69	945	59
Uruguay	− 0.03675	3.23	0.00041	3.09	1,058	45
Venezuela	− 0.02649	1.69	0.00028	1.51	1,145	47

The second part of the table restricts the sample to under 70 years of age. The major change is that the BRFSS data now gives a U-shape that minimizes at age 40 versus one that minimizes at age 43 with controls. In the case of the GSS, with many fewer observations, the age squared term is insignificant and hence I don't report a minimum.

It is important in the USA to look at the raw data to determine the appropriateness of fitting a quadratic to the data. Fig 1 for the BRFSS, 2005–2010, plots the two quadratics with controls from Table 1 for all ages and for ages under 70. It also plots the results of replacing the two age terms with single year of age dummy variables from equations with and without controls. In each case, the individual coefficients are added to the constant. It is clear that without controls, in the raw data, there are two hills: an early dip to the early twenties and a rise to the mid-thirties and then a fall through the mid-fifties and a rise again to the early seventies before the function dips again. Adding controls produces a clean and highly significant U-shape which turns over after the age of seventy and remains broadly flat thereafter. The upward slope flattens after around age 60 and then starts turning down around age 70.[13] It is clear that the quadratic for those age under 70, with controls, seems to fit the data better, than the one on the full sample. Fig 2 does the same with the USGDTP. The quadratic based on data under the age of 70 seems a close approximation.

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[13] Blanchflower and Oswald (2019) report happiness by single year of age plots for the GSS (1972–2014) both with and without controls.

Table 11 Happiness estimates using ISSP 2012 with controls for gender, education, marital and labor force status, and age < 70

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
Advanced						
Australia	− 0.0240	1.51	0.0002	1.50	1,297	60
Belgium	− 0.0490	3.20	0.0005	3.02	1,794	49
Canada	− 0.0537	2.33	0.0004	1.94	735	67
Finland	− 0.0402	2.24	0.0003	1.91	1,054	67
France	− 0.0432	2.85	0.0003	1.85	1,926	72
Germany	− 0.0430	3.31	0.0003	2.61	1,450	72
Iceland	− 0.0298	2.04	0.0003	1.78	1,040	50
Japan	− 0.0584	2.59	0.0004	1.91	982	73
Netherlands	− 0.0626	3.43	0.0005	2.87	1,021	63
Norway	− 0.0495	3.22	0.0004	2.79	1,292	62
Spain	− 0.0839	6.58	0.0008	5.66	2,161	52
Sweden	− 0.0372	1.83	0.0003	1.52	873	62
UK	− 0.0369	1.69	0.0003	1.56	748	62
USA	− 0.0411	2.58	0.0004	2.49	1,109	51
Eastern Europe						
Bulgaria	− 0.0737	3.20	0.0005	2.03	794	74
Croatia	− 0.0774	3.93	0.0006	2.92	915	65
Czech Republic	− 0.0635	3.5	0.0005	2.69	1,596	64
Hungary	− 0.0794	3.84	0.0007	3.30	890	57
Latvia	− 0.0800	4.29	0.0007	3.07	953	57
Lithuania	− 0.1161	6.39	0.0011	5.76	1,004	53
Poland	− 0.0733	3.95	0.0007	3.54	964	52
Slovakia	− 0.0868	3.89	0.0008	3.27	968	54
Slovenia	− 0.0819	3.52	0.0007	2.87	832	59
Developing						
Chile	− 0.0399	2.87	0.0004	2.85	1,335	45
China	− 0.0760	8.64	0.0008	8.59	5,287	46
Israel	− 0.0678	3.69	0.0006	3.00	1,049	54
Mexico	− 0.0225	1.56	0.0002	1.33	1,379	49
Russia	− 0.0485	2.93	0.0005	2.43	1,249	50
South Africa	− 0.0584	3.46	0.0006	3.31	2,316	44
South Korea	− 0.0659	2.92	0.0005	2.51	1,135	55
Taiwan	− 0.0468	3.00	0.0005	3.03	1,838	43

Of note though is that there are marked differences in the raw data in the USA between the married and the non-married that is not true elsewhere. Below I report 3-step happiness equations for the GSS and 4-step life satisfaction equations in the BRFSS with only year and region controls included as below with t-statistics in parentheses. In the case of the GSS, the positive age and negative age term suggest

the function maximizes at age 73. In contrast, there is a negative age term and a positive age squared term in the BRFSS, but this has a minimum at age 11. Of note is that if I simply split the sample into married and the unmarried subsets and re-estimate then with the same controls, there are well-defined midlife age minima. In the case of the BRFSS, they are both identical at age 45.

	Age	Age^2	N	Min/max
GSS: 1974–2018				
1) All	+0.00443 (5.31)	− 0.00003 (4.11)	59,860	74 (max)
2) Married	− 0.00254 (1.88)	0.00004 (3.16)	31,697	32
3) Not married	− 0.01265 (11.72)	0.00012 (11.86)	28,163	53
BRFSS; 2005–2010				
4) All	− 0.000285 (2.75)	0.000013 (14.18)	4,283,582	11
5) Married	− 0.002495 (15.31)	0.000028 (18.85)	2,398,444	45
6) Not married	− 0.013430 (97.30)	0.000150 (120.06)	1,885,138	45

It also should be noted that there is some evidence that the minimum of the U-shape has risen over time as life expectancy has climbed. In the USA, using data for those age under 70, it was 74 in 1980 versus 79 in 2017. The midpoint using the GSS for the years 1975–1999 was 37 and for the years 2000–2018 was 47. As we show below, there is also evidence of a slightly bigger rise in Europe, where life expectancy in many countries grew more.[14]

5.2 The UK

I now turn to examine the data, for people under age 70, from the other major large cross-section survey of well-being from the most recent sweeps available for 2016–2018, from the Annual Population Surveys for the UK. Earlier sweeps were used in Bell and Blanchflower (2019) to examine the well-being of the underemployed and the unemployed. These surveys contain data three happiness measures and overall there are about 215,000 observations on each variable. The three questions I examine are as follows.

Q4. Life Satisfaction—"Overall, how satisfied are you with your life nowadays, where nought is 'not at all satisfied' and 10 is 'completely satisfied'."

Q5. Happiness—"Overall, how happy did you feel yesterday, where nought is 'not at all happy' and 10 is "completely happy'?"

Q6. Worthwhile—"Overall, to what extent do you feel that the things you do in your life are worthwhile, where nought is 'not at all worthwhile' and 10 is 'completely worthwhile?'."

Table 2 shows that for all three variables, the age coefficient in all six specifications is significant and negative and the age squared term is significant and positive and all

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[14] According to the OECD, life expectancy at birth was as follows for 1980 and 2017 respectively: Australia (75, 83); Austria (73, 82); Belgium (73, 82); Canada (75, 82); France (74, 83); Germany (73, 81); Ireland (73, 82); Italy (74, 83); Japan (76, 84); Netherlands (76, 82); New Zealand (73, 82); Spain (75, 83); Portugal (71, 82); Sweden (76, 83); and UK (73, 81).

Table 12 Seven-step life satisfaction estimates using ISSP 2017 with controls for gender, education, marital and labor force status, and age < 70

	Age	T	Age^2	T	N	Age minimum
Advanced countries						
Australia	− 0.04215	2.18	0.00048	2.30	965	44
Austria	− 0.05726	3.00	0.00057	2.63	982	50
Czech Republic	− 0.06298	2.84	0.00061	2.45	1197	52
Croatia	− 0.05966	3.00	0.00053	2.26	950	56
Denmark	− 0.04000	1.85	0.00045	1.85	855	44
France	− 0.05346	2.09	0.00058	2.00	1,133	46
Germany	− 0.02691	1.62	0.00028	1.54	1,405	48
Japan	− 0.05663	2.55	0.00054	2.29	1,232	52
Lithuania	− 0.07204	3.02	0.00055	2.06	883	65
New Zealand	− 0.02872	1.64	0.00036	1.85	1,130	40
Spain	− 0.04027	2.37	0.00032	1.59	1,440	63
Sweden	− 0.04947	2.55	0.00055	2.57	897	45
Switzerland	− 0.06241	3.61	0.00069	3.55	914	45
UK	− 0.04805	2.71	0.00054	2.70	1,246	44
USA	− 0.04234	2.21	0.00047	2.21	1,001	45
Developing countries						
China	− 0.04507	4.20	0.00054	4.72	3,602	42
Taiwan	− 0.03097	1.98	0.00041	2.38	1,721	38
India	− 0.04818	2.41	0.00047	2.00	1,395	51
Israel	− 0.04486	2.13	0.00041	1.78	1,015	55
Russia	− 0.04625	2.39	0.00041	1.85	1,392	56
South Africa	− 0.08626	7.48	0.00103	7.59	2,853	42
Surinam	− 0.05566	2.36	0.00065	2.44	1,094	43

minimize in the forties. Fig 3 plots the single year of age coefficients for each of the three variables with the full set of controls included in each case. The minima are a little higher at around age 50. I now move to looking at data files that cover multiple countries.

For simplicity, going forward, I use a quadratic in age as a reasonable approximation to the age profiles in well-being and firstly restrict the sample to those age under 70 so that the estimated minima are not impacted by what happens in the older age groups especially as sample sizes can be small at higher ages. To report a minimum, I impose the second rule that both the coefficients on the age and age squared variables must have the right signs and T-statistics of at least 1.5. For each of the data files, I report a pooled regression with year dummies and the full set of controls are for gender; education, and marital and labor force status which are available in broadly the same form in all of the data sets. I also fit age quadratics to each sample pooled across countries with age unrestricted and then replace the quadratic with a more flexible form of single year of age dummies. I then plot the age coefficients, added to the constant, as a check on the quadratic.

Table 13 Life satisfaction estimates using WVS 2–6 with controls for gender, education, marital and labor force status, and age < 70

	Age	T	Age²	T	N	Age minimum
a.) Wave 2 10-step life satisfaction 1990–1994						
Developing						
Argentina	− 0.1152	3.20	0.00148	3.54	921	39
Brazil	− 0.1512	3.84	0.00222	4.33	1770	34
Nigeria	− 0.2765	4.43	0.00327	3.97	979	42
Russia	− 0.0678	2.04	0.00089	2.27	1812	38
South Africa	− 0.0752	2.55	0.00095	2.74	2602	40
Turkey	− 0.1104	2.50	0.00110	2.04	1001	50
Advanced						
Czech Rep.	− 0.1212	2.90	0.00138	2.82	878	44
Poland	− 0.1412	2.92	0.00158	2.87	875	45
Slovakia	− 0.1271	2.09	0.00172	2.39	446	37
b) Wave 3 10-step life satisfaction, 1995−1998						
Developing						
Albania	− 0.1169	3.18	0.00134	3.19	964	44
Azerbaijan	− 0.1040	3.04	0.00114	2.79	1,928	46
Argentine	− 0.1039	2.70	0.00113	2.54	990	46
Armenia	− 0.0922	3.03	0.00085	2.28	1,920	54
Belarus	− 0.0908	3.07	0.00084	2.39	1,902	54
Bosnia	− 0.1149	2.30	0.00111	1.94	767	52
China	− 0.0734	1.84	0.00082	1.73	1,454	45
Dominican R.	− 0.3589	3.09	0.00489	2.81	405	37
El Salvador	− 0.0809	2.31	0.00075	1.76	1,183	54
Georgia	− 0.0754	2.79	0.00051	1.61	1,887	74
Macedonia	− 0.1041	2.28	0.00092	1.67	955	57
Mexico	− 0.1511	4.86	0.00187	4.81	1,442	40
Moldova	− 0.1419	3.08	0.00153	2.70	904	46
Montenegro	− 0.1938	2.09	0.00252	2.35	228	38
Nigeria	− 0.1075	2.66	0.00143	2.87	1,943	38
Philippines	− 0.0853	2.20	0.00111	2.36	1,168	38
Russia	− 0.2076	6.24	0.00224	6.24	1,812	46
Serbia	− 0.0868	2.07	0.00092	1.91	11,617	47
South Africa	− 0.1061	3.36	0.00138	3.62	2,916	38
Turkey	− 0.1558	4.81	0.00187	4.77	1,848	42
Ukraine	− 0.0932	3.47	0.00087	2.77	2,438	54
Advanced countries						
Australia	− 0.0721	3.39	0.00083	3.30	1,836	43
Bulgaria	− 0.0996	2.37	0.00093	1.86	930	54
Croatia	− 0.0865	2.36	0.00075	1.76	1,098	58
Czech Rep.	− 0.0765	2.12	0.00086	2.08	1,015	44
Estonia	− 0.1430	3.63	0.00151	3.13	968	47

Table 13 (continued)

	Age	T	Age^2	T	N	Age minimum
Finland	− 0.1402	5.31	0.00168	5.36	911	42
Germany	− 0.0934	3.37	0.00108	3.29	1854	43
Hungary	− 0.1548	3.04	0.00133	2.25	579	58
Japan	− 0.0645	1.74	0.00065	1.59	973	50
Latvia	− 0.1912	5.07	0.00120	4.29	1,124	80
New Zealand	− 0.0843	2.26	0.00130	3.00	1008	32
Norway	− 0.1115	3.59	0.00129	3.59	1,023	43
Poland	− 0.1454	4.00	0.00153	3.74	997	48
Romania	− 0.0963	2.50	0.00092	2.10	1,162	52
Slovakia	− 0.1746	4.29	0.00204	4.31	1,009	43
Slovenia	− 0.1208	3.14	0.00122	2.68	914	50
Spain	− 0.0954	2.88	0.00091	2.42	1,062	52
Sweden	− 0.1925	3.60	0.00140	3.38	910	69
Switzerland	− 0.0828	2.29	0.00103	2.48	1,053	40
USA	− 0.0884	3.06	0.00106	3.22	1262	42
c) Wave 4 life satisfaction, 1999–2004						
Developing						
Argentina	− 0.1078	3.20	0.00110	2.82	1,169	49
Bangladesh	− 0.1448	3.54	0.00193	3.75	1,375	38
China	− 0.1214	2.14	0.00147	2.20	934	41
Iraq	− 0.0612	2.09	0.00069	1.93	2,199	44
Israel	− 0.0973	2.59	0.00077	1.74	1,046	63
Jordan	− 0.0770	1.85	0.00102	2.06	1,173	38
Mexico	− 0.0683	2.05	0.00079	1.96	1,423	43
Peru	− 0.0673	1.81	0.00081	2.78	1,483	42
Philippines	− 0.0971	2.38	0.00119	2.46	1,146	41
Puerto Rico	− 0.0777	1.81	0.00103	2.09	620	38
Singapore	− 0.0513	1.78	0.00072	2.02	1,479	36
South Africa	− 0.1691	6.36	0.00206	6.41	2,837	41
South Korea	− 0.0956	1.93	0.00125	2.18	1,159	38
Tanzania	− 0.1319	2.42	0.00162	2.48	1,067	41
Turkey	− 0.1286	4.64	0.00139	4.17	3,005	46
Zimbabwe	− 0.1581	3.31	0.00182	3.15	959	43
Advanced countries						
Canada	− 0.1388	5.64	0.00158	5.39	1,682	44
Japan	− 0.1163	3.22	0.00134	3.39	1,084	43
Macedonia	− 0.1519	3.17	0.00177	3.18	980	43
Serbia	− 0.1388	3.05	0.00129	2.52	1070	54
Sweden	− 0.0734	2.12	0.00083	2.08	927	44
USA	− 0.1522	5.49	0.00193	5.83	1,109	39
c) Wave 5 life satisfaction, 2005–2009						
Developing countries						

Table 13 (continued)

	Age	T	Age^2	T	N	Age minimum
Chile	− 0.1238	3.44	0.00123	2.95	907	50
China	− 0.1538	4.43	0.00188	4.95	1,727	41
Georgia	− 0.1501	4.46	0.00145	3.66	1,297	52
Ghana	− 0.0777	1.86	0.00083	1.66	1,498	47
Indonesia	− 0.0512	1.51	0.00069	1.71	1,880	37
Iran	− 0.1074	3.65	0.00124	3.26	2,587	43
Malaysia	− 0.0938	2.53	0.00122	2.49	1,196	38
Mali	− 0.0949	2.38	0.00098	2.03	1,169	48
Russia	− 0.1250	4.06	0.00109	2.98	1,863	57
Serbia	− 0.1185	3.02	0.00097	2.07	1,053	61
Vietnam	− 0.0624	2.28	0.00072	2.31	1,377	43
South Africa	− 0.0766	3.10	0.00092	3.08	2,804	42
Taiwan	− 0.0580	1.51	0.00066	1.53	1,138	44
Trinidad	− 0.1118	3.05	0.00126	2.86	916	44
Turkey	− 0.1040	2.95	0.00111	2.60	1,310	47
Uruguay	− 0.0795	2.45	0.00087	2.31	847	46
Advanced countries						
Australia	− 0.0904	3.13	0.00112	3.42	1,180	41
Bulgaria	− 0.1137	2.50	0.00104	2.03	871	55
Canada	− 0.1037	5.01	0.00122	4.92	1,812	43
Finland	− 0.0592	1.94	0.00067	1.90	876	44
France	− 0.1289	3.18	0.00134	2.76	854	48
Germany	− 0.1445	5.20	0.00143	4.54	1,701	51
Hungary	− 0.1526	3.80	0.00152	3.28	912	50
Italy	− 0.1233	3.52	0.00121	3.13	914	51
Japan	− 0.1628	4.21	0.00174	4.15	924	47
New Zealand	− 0.0978	2.50	0.00125	2.85	744	39
Romania	− 0.1304	3.78	0.00127	3.18	1,384	51
Slovenia	− 0.1184	3.12	0.00106	2.41	897	56
Switzerland	− 0.1142	3.48	0.00122	3.45	1,018	47
UK	− 0.0663	2.29	0.00077	2.07	885	43
USA	− 0.1258	4.45	0.00138	4.22	1,084	46
d) Wave 6 life satisfaction, 2010–2014						
Developing countries						
Algeria	− 0.2262	5.23	0.00275	5.22	1,119	41
Armenia	− 0.1442	3.08	0.00127	2.29	935	57
Belarus	− 0.1377	4.18	0.00133	3.44	1,394	52
Brazil	− 0.0514	1.76	0.00065	1.89	1,382	40
China	− 0.0513	2.03	0.00059	2.09	2,142	43
Egypt	− 0.1150	2.68	0.00145	2.85	1,452	40
Georgia	− 0.1746	4.77	0.00144	3.34	1,070	61
Iraq	− 0.0791	2.12	0.00098	2.18	1,176	40

Table 13 (continued)

	Age	T	Age^2	T	N	Age minimum
Kuwait	− 0.0859	1.93	0.00108	1.98	1,196	40
Lebanon	− 0.0715	1.99	0.00067	1.58	1,117	53
Libya	− 0.0734	2.16	0.00095	2.33	2,065	39
Mexico	− 0.0592	2.67	0.00069	2.55	1,908	43
Philippines	− 0.1024	2.31	0.00108	2.00	1,134	47
Russia	− 0.1170	4.41	0.00137	3.62	2,152	43
South Africa	− 0.0616	2.59	0.00068	2.28	3,428	45
Tunisia	− 0.1188	2.71	0.00133	2.67	1,145	45
Ukraine	− 0.0919	2.33	0.00080	1.75	1,267	57
Uzbekistan	− 0.1500	4.78	0.00159	4.07	1,411	47
Zimbabwe	− 0.0851	2.56	0.00104	2.41	1,467	43
Advanced countries						
Australia	− 0.0990	3.16	0.00185	3.47	1,198	27
Estonia	− 0.1566	5.18	0.00148	4.31	1,272	53
Germany	− 0.0737	2.94	0.00066	2.33	1,709	56
Japan	− 0.1523	5.91	0.00161	5.82	2,021	47
Netherlands	− 0.0861	3.75	0.00103	4.06	1,535	42
New Zealand	− 0.0929	2.23	0.00115	2.46	660	40
Poland	− 0.2224	5.67	0.00224	4.91	832	51
Romania	− 0.1395	3.66	0.00135	3.11	1,294	52
Slovenia	− 0.0851	1.91	0.00078	1.54	890	55
Spain	− 0.1252	3.83	0.00128	3.40	1,002	49
Sweden	− 0.1311	4.85	0.00161	5.17	997	41
USA	− 0.0740	3.36	0.00076	3.06	1,965	49

6 Europe

6.1 Eurobarometers 1973–2019

I start out using data from the Eurobarometer surveys (EB). Concern has recently been expressed over response rates to these surveys especially in relation to the questions on respondent's views on the EU, with the concern that Eurosceptics do not respond to the surveys which then suggest higher levels of support than they should. The Eurobarometer surveys differ from other surveys that use the mail or the telephone; the EU Commission only conducts interviews with members of the public face-to-face at home. This makes it even more difficult to achieve high response rates.

The EU Commission on 5 December 2019 defended the methods of its public opinion surveys in response to criticism that the low rate of responses could lead to bias towards the EU. In the most recent Eurobarometer survey for which response rates have been calculated, and obtained by the Danish newspaper, the rate was 14% in Finland, 15% in Germany, 20% in Luxembourg, 22% in Italy, 27% in the UK, 28% in Denmark, 31% in Greece and France, 33% in Ireland, 34% in Spain, 38% in Latvia,

Table 14 Eleven-step Cantril Life satisfaction estimates using Gallup World Poll, 2008–2017, with controls and age < 70

	Age	T-statistic	Age²	T-statistic	N	
Age minimum						
Bahrain	− 0.08421	8.36	0.00106	8.45	12,011	40
Cambodia	− 0.02506	2.11	0.00027	1.96	9,032	46
Congo (Brazzaville)	− 0.03829	2.74	0.00033	1.89	7036	58
Gambia	− 0.05715	1.91	0.00061	1.63	1,851	47
Guatemala	− 0.07099	5.75	0.00062	4.09	9,241	57
Haiti	− 0.02651	1.82	0.00030	1.64	4,297	44
Hong Kong	− 0.09388	9.14	0.00100	8.26	6,386	47
Jamaica	− 0.09238	3.60	0.00093	2.90	1,837	50
Kazakhstan	− 0.05524	5.18	0.00055	4.58	9,127	50
Nepal	− 0.06466	6.29	0.00081	6.55	10,237	40
Palestine	− 0.11503	11.59	0.00125	10.38	12,393	46
Saudi Arabia	− 0.08533	7.30	0.00110	7.19	14,018	39
Somaliland	− 0.04086	3.51	0.00042	2.80	5,900	49
Syria	− 0.0295	2.69	0.00040	2.80	8,607	37

and 40% in Portugal. Erik Gahner Larsen from the University of Kent in a blog[15] noted rightly that the response rate is informative but not sufficient or even necessary in order to obtain representative samples. He finds no evidence that countries with lower response rates are much more positive towards the EU in Eurobarometer compared to the European Social Survey. Of note is that there seems very little evidence that responses to questions on life satisfaction in the EB have been impacted over time by a rise in non-response rates.

Table 3 uses data on 4-step life satisfaction for over 1.2 million Europeans from forty-two sweeps of the EB for the years 2009–2019 for those age under 70 with only year dummies.[16] The question asked is:

Q7. "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead? Not at all satisfied (= 1); not very satisfied (= 2); fairly satisfied (= 3) and very satisfied (= 4)".

It establishes the facts in European countries, by which I mean the EU28 plus eight other countries (Albania, Iceland, Norway, Macedonia, Montenegro, Serbia, Turkey, and Turkish Cyprus). There are six developing countries including four ex-Soviet (Albania, Macedonia, Montenegro, and Serbia) that are not EU members plus Turkey and Turkish Cyprus in that group, all of which are so-called Candidate Countries.

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[15] "Eurobarometer and Euroscepticism" https://erikgahner.dk/2019/eurobarometer-and-euroscepticism/
[16] Information, "New data reveals serious problems with the EU's official public opinion polls", 3 December 2019.
   https://www.information.dk/udland/2019/12/new-data-reveals-serious-problems-with-the-eus-official-public-opinion-polls and Eszter Zalan, "EU Commission defends Eurobarometer methodology," EU Observer, December 5, 2019.

Table 15 Satisfaction with financial conditions in the household estimates using WVS Wave 5, 2005–2009, and Wave 6, 2010–2014, with controls and age < 70

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
1) Wave 6						
a) Developed						
Australia	− 0.1755	4.71	0.00211	5.20	1,196	42
Cyprus	− 0.1524	3.20	0.00172	3.13	913	44
Estonia	− 0.1319	3.92	0.00132	3.43	1,276	50
Germany*	− 0.0473	2.42	0.00062	3.11	1,702	38
Japan	− 0.1498	4.85	0.00171	5.17	1,964	44
Netherlands	− 0.1025	3.48	0.00134	4.12	1,534	38
New Zealand	− 0.1408	2.92	0.00169	3.12	656	42
Poland	− 0.2514	5.40	0.00261	4.92	831	48
Romania	− 0.2027	4.79	0.00199	4.11	1,297	51
Slovenia	− 0.1825	3.47	0.00204	3.41	892	45
Spain	− 0.0854	2.33	0.00113	2.66	1,012	38
Sweden	− 0.1335	3.59	0.00183	4.30	993	36
USA	− 0.1078	3.88	0.00127	4.06	1,966	42
*All ages						
b) Developing						
Algeria	− 0.1350	3.08	0.00153	2.89	1,131	44
Belarus	− 0.0947	2.82	0.00088	2.22	1,395	54
Brazil	− 0.1106	3.07	0.00129	3.03	1,384	43
Colombia	− 0.0541	1.68	0.00064	1.65	1,441	42
Ecuador	− 0.1008	3.46	0.00109	3.18	1,146	46
Egypt	− 0.1269	3.10	0.00165	3.39	1,452	38
Georgia	− 0.1766	5.13	0.00168	4.15	1,070	53
Ghana	− 0.0864	2.40	0.00096	2.16	1,533	45
Jordan	− 0.0964	2.54	0.00101	2.30	1,144	48
Kyrgyzstan	− 0.0624	1.64	0.00073	1.56	1,445	43
Libya	− 0.0948	2.61	0.00122	2.81	2,074	39
Mexico	− 0.1026	3.39	0.00118	3.18	1,908	43
Morocco	− 0.0980	2.28	0.00138	2.82	1,181	36
Peru	− 0.0808	2.29	0.00079	1.89	1,146	51
Philippines	− 0.1376	2.91	0.00140	2.58	1,134	49
Russia	− 0.1119	3.78	0.00131	3.72	2,161	43
Singapore	− 0.0551	2.21	0.00077	2.69	1,809	36
South Africa	− 0.0448	1.80	0.00051	1.63	3,416	44
South Korea	− 0.0896	2.22	0.00094	2.13	1,129	48
Trinidad	− 0.0924	2.08	0.00112	2.12	890	41
Uruguay	− 0.0779	1.97	0.00077	1.64	876	51
Yemen	− 0.0859	1.68	0.00114	1.79	969	38
Zimbabwe	− 0.0850	2.48	0.00116	2.75	1,467	37
2) WVS wave 5						

Table 15 (continued)

	Age	T-statistic	Age^2	T-statistic	N	Age minimum
a) Developed						
Australia	− 0.0583	1.53	0.00097	2.28	1,170	30
Bulgaria	− 0.1360	3.14	0.00131	2.70	894	52
Canada	− 0.2150	7.96	0.00260	8.17	1,807	41
Finland	− 0.1729	4.50	0.00228	5.14	876	38
Germany	− 0.1003	3.15	0.00112	3.09	1,694	45
Hungary	− 0.1076	2.48	0.00116	2.32	905	46
Italy	− 0.1186	3.08	0.00133	3.13	912	45
Japan	− 0.1720	3.66	0.00208	4.07	861	41
New Zealand	− 0.1084	2.28	0.00164	3.07	748	33
Poland	− 0.1687	3.86	0.00183	3.60	877	46
Romania	− 0.1391	4.00	0.00146	3.66	1,468	48
Slovenia	− 0.1565	3.65	0.00162	3.24	897	48
Sweden	− 0.20321	4.65	0.00274	5.58	873	37
Switzerland	− 0.0771	1.86	0.00104	2.32	1,024	37
UK	− 0.1758	4.26	0.00241	4.94	879	36
USA	− 0.1186	3.21	0.00135	3.24	1,077	44
b) Developing						
Brazil	− 0.0773	2.19	0.00079	1.88	1,393	49
Chile	− 0.1374	3.53	0.00151	3.34	907	45
China	− 0.1378	3.66	0.00172	4.18	1,732	40
Egypt	− 0.0540	1.94	0.00062	1.90	2,905	44
Georgia	− 0.1264	4.01	0.00110	2.99	1,307	57
Indonesia	− 0.1030	3.03	0.00144	3.51	1,867	36
Iran	− 0.1584	5.36	0.00175	4.61	2,555	45
Iraq	− 0.0511	1.94	0.00070	2.17	2,538	36
Mali	− 0.0674	1.66	0.00081	1.64	1,184	42
Malaysia	− 0.0556	1.55	0.00097	2.06	1,195	29
Taiwan	− 0.0646	1.55	0.00092	1.95	1,137	35
Thailand	− 0.0551	1.71	0.00059	1.63	1,352	47
Trinidad	− 0.1504	3.45	0.00176	3.38	916	43
Turkey	− 0.1007	3.12	0.00122	3.09	1,306	41
Uruguay	− 0.0815	2.07	0.00078	1.70	849	52
Zambia	− 0.0798	1.94	0.00093	1.73	1,421	43

First, estimates are provided for pooled samples across all countries without controls. There is a minimum in midlife at age 63. Separate estimates are provided by country and in all thirty-seven cases the age term is significant and negative and the squared term significantly positive. There is some variation with a low of 43 in Luxembourg and a high of 158 for Bulgaria. The average across the estimates is.

Table 16 Local services, the national economy, and living standards estimates, age < 70

	Age	T-statistic	Age²	T-statistic	N	Min
1) Eurobarometer #91.5, June–July 2019						
Q15. Own financial situation	− 0.00415	4.43	0.00005	5.38	29,880	41
Q16. Situation in the country	− 0.00597	5.63	0.00007	6.21	30,849	45
Q17. Situation with the national economy	− 0.00649	7.18	0.00007	7.88	30,521	45
Q18. Employment situation	− 0.00787	7.46	0.00009	8.39	30,046	44
Q19. Public services	− 0.00698	6.70	0.00008	7.48	30,338	45
Q20. Direction of the country	− 0.01843	9.12	0.00019	9.50	30,217	48
2) Eurobarometer #66.3, November–December 2006						
Q21. Quality of life where you live	− 0.01863	7.11	0.00024	7.90	22,831	39
Q22. Travel facilities	− 0.01554	5.06	0.00018	5.24	22,364	43
Q23. Time to do things you want	− 0.02678	9.27	0.00026	10.87	22,815	52
Q24. Medical services	− 0.01381	4.59	0.00018	5.38	22,062	38
Q25. Job opportunities	− 0.02842	8.03	0.00033	8.04	20,399	43
Q26. Your standard of living	− 0.03898	15.69	0.00044	15.68	22,841	44
3) Eurobarometer #74.1, 2010						
Q27. Satisfaction with standard of living	− 0.0864	19.20	0.00087	19.15	26,455	50
4) EQLS, 2003-2016						
Q27. Satisfaction with living standards	− 0.0527	24.64	0.00058	26.96	139,551	45

Q15. The financial situation of your household?

Q16. The situation in our country?

Q17. The situation of the national economy?

Q18. The employment situation in the country?

Q19. The presence of public services in our country?

Q20. At the present time, would you say that, in general, things are going in the right direction or in the wrong direction, in our country 1 = things are going in the wrong direction 2 = neither the one or the other 3 = things are going in the right direction?

I am now going to read out different aspects of everyday life. For each, could you tell me if this aspect of your life is very satisfactory (= 4), fairly satisfactory (= 3), not very satisfactory (= 2) or not at all satisfactory (= 1)?

Q21. The quality of life in the area where you live?

Q22. Travel facilities for going to work, shopping?

Q23. The time you have available to do the things you want to do?

Q24. Medical services in your area?

Q25. The job opportunities in your local area?

Q26. Your standard of living?

Q27. Could you please tell me on a scale of 1 to 10 how satisfied you are with each of the following items, where [1] means you are very dissatisfied and [10] means you are very satisfied? - Your present standard of living?

Q28. In general, how would you describe your own present living conditions? Possible responses include: 1 = Very bad, 2 = Fairly bad, 3 = Neither good nor bad, 4 = Fairly good, 5 = Very good?

Table 4 repeats the exercise adding controls and the overall equation now has a minimum of fifty-four, and there are U-shapes for every country. A set of cohort

Table 17 Satisfaction with living conditions estimates using Afrobarometers with controls for education, labor force status, and race and age < 70

	Age	T	Age^2	T	N	Age minimum
a.) 2019						
Botswana	− 0.06733	4.75	0.00075	4.44	1,144	45
Burkina Faso	0.04547	2.49	− 0.00059	2.60	1,155	39
Cameroon	− 0.05607	3.04	0.00057	2.50	1,160	49
Cote d'Ivoire	− 0.05226	2.82	0.00059	2.54	1,177	44
eSwatini	− 0.05412	3.24	0.00052	2.64	1,135	52
Kenya	− 0.06813	4.47	0.00065	3.52	1,541	52
Lesotho	− 0.03648	2.01	0.00033	1.57	1,065	55
Liberia	− 0.05874	2.66	0.00061	2.13	1,181	48
Malawi	− 0.03867	2.28	0.00037	1.75	1,146	52
Mozambique	0.02640	1.98	− 0.00028	1.69	2,285	47
Namibia	− 0.05091	2.66	0.00057	2.43	1,167	45
Niger	− 0.04689	2.86	0.00051	2.57	1,140	46
São Tomé	− 0.05139	4.01	0.00056	2.70	1,166	46
South Africa	− 0.05080	2.96	0.00053	2.60	1,766	48
Tanzania	− 0.02515	2.26	0.00026	1.93	2,308	48
Togo	− 0.06317	3.59	0.00059	2.71	1,162	54
Tunisia	− 0.06976	4.04	0.00066	3.34	1,144	53
b.) 2016						
Benin	− 0.05721	3.33	0.00059	2.84	1,176	48
Botswana	− 0.03936	2.46	0.00037	1.96	1,125	53
Burundi	− 0.03968	2.30	0.00043	2.03	1,163	46
Cape Verde*	− 0.03107	2.50	0.00031	2.08	1,126	51
Cote d'Ivoire	− 0.03110	1.73	0.00033	1.52	1,185	47
Gabon	− 0.07363	4.13	0.00068	3.16	1,183	54
Ghana	− 0.04105	3.02	0.00040	2.52	2,228	51
Kenya	− 0.03945	3.06	0.00033	2.13	2,326	60
Lesotho	− 0.04864	2.66	0.00042	2.00	1,192	58
Madagascar	− 0.02876	2.19	0.00035	2.24	1,159	41
Malawi	− 0.06053	4.77	0.00065	4.18	2,312	47
Mauritius	− 0.03583	2.30	0.00046	2.57	1,200	39
Namibia	− 0.06112	3.58	0.00069	3.37	1,141	44
Nigeria	− 0.03660	2.67	0.00045	2.53	2,353	41
São Tomé	− 0.04090	3.61	0.00038	2.70	1,134	54
Senegal	− 0.04379	2.63	0.00045	2.27	1,148	49
South Africa	− 0.04083	2.98	0.00038	2.33	2,294	54
Swaziland	− 0.04438	2.79	0.00034	1.83	1,144	65
Togo	− 0.07465	3.78	0.00079	3.23	1,158	47
Uganda	− 0.03870	3.15	0.00040	2.63	2,284	48
Zimbabwe	− 0.03061	2.64	0.00028	2.03	2,256	55

*Age < 72

dummies are added in the second row and the minimum is largely unchanged. There are U-shapes in every country with the minima ranging from 29 for Luxembourg to 80 in Montenegro.

Fig 4 uses single year of age plots with and without controls using these EB files from 2009 to 2019, and both show U-shapes. It shows an important point that in the Eurobarometer files there is always a U-shape whether controls are included or not. There is an issue raised by Morgan and O'Connor (2017), henceforth MO, over whether there is an M-shape rather than a U-shape in EB data. However, in Blanchflower (2020b), I showed that this early bump arose because MO omitted students, who are young, and happy. Once students are included, the M-shape disappears and the U-shape returns.

Table 5 now checks if the findings for the period 2009–2018 are repeated in an earlier time period using the same Q6 life satisfaction variable from the 1973–2002 Manheim Eurobarometer Trend file used by Blanchflower and Oswald (2008a) for a smaller group of eighteen EU countries plus Norway. The table confirms there are U-shapes again with and without controls in the overall sample and in every one of the 19 countries with controls for those under age 70. Somewhat surprisingly, the U-shape looks broadly similar in the years before and after the Great Recession which hit in 2008. Adding cohort dummies does lower the minimum sharply. Fig 5 reports single year of age estimates with and without controls from the Mannheim Trend File for 1973–2002 and there are U-shapes again with and without controls.

Fig 6 tracks the changes in the minima over time using these Eurobarometers for samples under the age of 70 with controls including country dummies. I use the data files used in Tables 4 and 5 and also include data for 2003–2008. There is evidence of
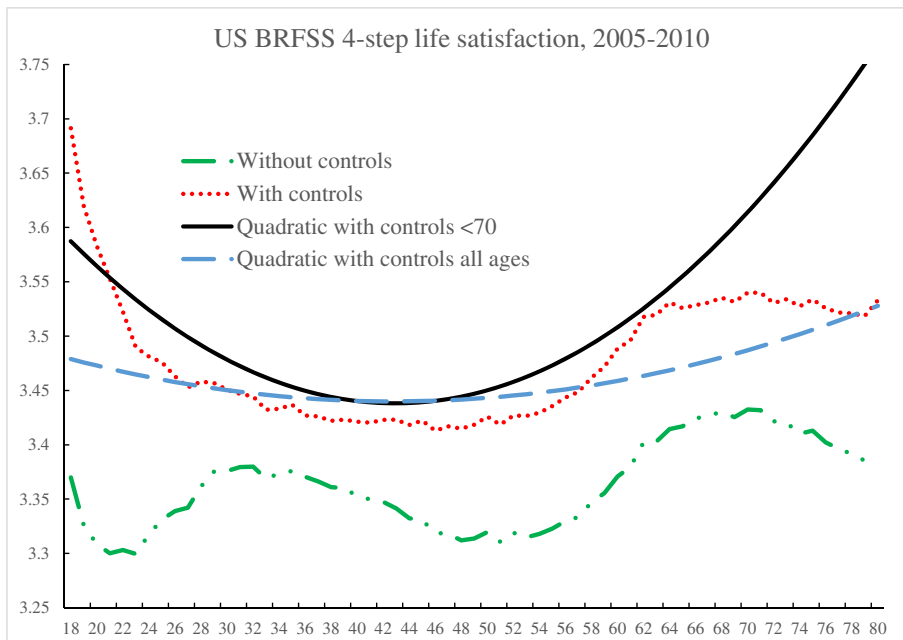
Fig. 1 US BRFSS 4-step life satisfaction, 2005-2010
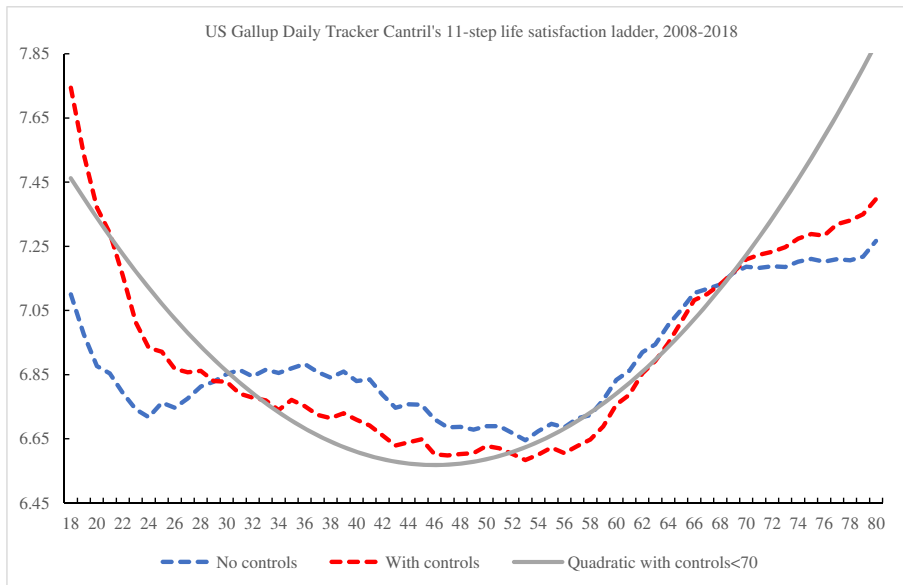
Fig. 2 US Gallup Daily Tracker Cantril's 11-step life satisfaction ladder, 2008-2018

significant U-shapes in every year, but over time the minimum has risen as we noted it did for the USA. The minimum rises from an average of 41 in 1975–1976 to over 50 since 2017.[17] Life expectancy for most of these EU countries rises even more rapidly over these years than it does in the USA. For example, based on OECD data between 1980 and 2017 in both France and Italy, life expectancy at birth rose from 74 to 83 and in both Germany and the UK it increased from 73 to 81 (see footnote above). It is perhaps surprising that the estimates from developing countries that we examine below that have lower life expectancies have broadly similar minima to advanced countries.

6.2 European Social Surveys, 2002–2016

Table 6 reports a series of happiness equations by country with controls and again restricted to age under 70, using eight sweeps of the European Social Surveys. There are over a third of a million observations overall and the question is an 11-step *happiness variable*.

Q8. "Taking all things together, how happy would you say you are, from 0 to 10 with zero 'extremely unhappy' and 10 'extremely happy?'"

The ESS contains our first data on four developing countries—Israel, Russia, Turkey, and Ukraine—plus twenty-five EU countries, minus Malta, Latvia, and Romania plus Iceland, Norway, and Switzerland. There is a minimum again in every country equation that are also in the forties and fifties and average 52. All four of the developing countries have a U-shape and there are eight advanced countries with no U-shape (Denmark, Estonia, Finland, Iceland, Italy and Lithuania, Poland, and Slovenia).

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[17] No life satisfaction data are available for 1995 or 1996. I use surveys #60.1 for 2003, #62.0 for 2004, #63.4 for 2005, #66.1 for 2006, #67.2 and #68.1 for 2007, and #69.2 for 2008 which are the only surveys with life satisfaction in them over these years.
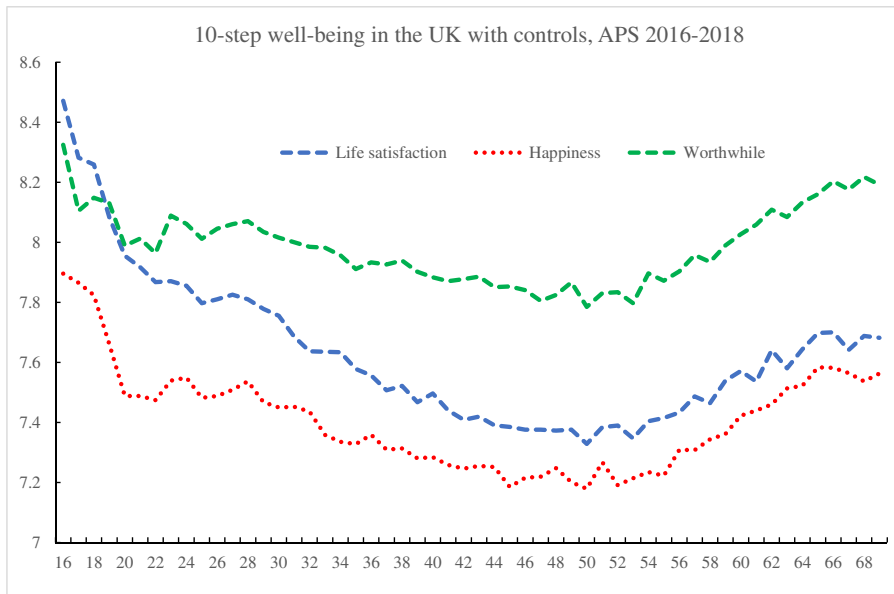
Fig. 3 10-step well-being in the UK with controls, APS 2016-2018

All six of these countries had significant U-shapes with larger samples with the EB data.

6.3 European Quality of Life Surveys, 2003–2016

The European Quality of Life Surveys (EQLS) includes the Q8 happiness question above but also a 10-step life satisfaction equation.

Q9. All things considered, how satisfied would you say you are with your life these days? Please tell me on a scale of 1 to 10, where 1 means very dissatisfied and 10 means very satisfied.

Table 7 makes use of 10-step life satisfaction data from four sweeps (2003, 2007, 2011, and 2016) of the EQLS pooled together, with controls. Table 8 does the same for life satisfaction. Results are very similar to those from the EB and the ESS. There are significant U-shapes everywhere. Minima with controls are in the fifties for western and Eastern Europe and for the four developing countries in both tables.

7 Asia

7.1 Asia Barometers, 2005–2007

Table 9 now turns to look at 5-step happiness data in five sweeps of the Asia Barometers of 2003–2007.[18] The question asked is

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[18] Blanchflower and Oswald (2008a) used data from the 2003–2005 Asia Barometers.

Q12. "All things considered would you say that you are happy these days? - Very happy = 5; pretty happy = 4 neither happy nor unhappy = 3; not too happy = 2 and very unhappy = 1?"

Once again, the numbers refer to my codes. In each case, there is a well-defined U-shape with controls and only without controls in two of the five sweeps. Significant U-shapes are found in fourteen Asian developing countries—China, India, Laos, Maldives, Mongolia, Myanmar, Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Tajikistan, Thailand, and Uzbekistan.

8 Latin America

8.1 Latino Barometers, 2017–2018

Table 10 makes use of 4-step life satisfaction data from the Latino Barometers for 2017 and 2018. The question asked was:

Q13. "Generally speaking, would you say you are satisfied with your life? Would you say you are...? Very satisfied = 4; Quite satisfied = 3 Not very satisfied = 2 and Not at all satisfied = 1?"

Blanchflower and Oswald (2008a) examined data from this survey series for the years 1997, 2000, 2001, and 2003–2005 and found a U-shape at age 50 for men and age 43 for women with a full set of controls, so this updates that analysis. For both 2017 and 2018, there are well-defined U-shapes that minimize in the forties and fifties with controls. There are U-shapes for those under the age of 70 in twelve, for Bolivia, Brazil, Columbia, Costa Rica, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela.

9 Multi-country data—ISSP, WVS, and the Gallup World Poll

9.1 International Social Survey Programme 2012 and 2017

Table 11 now moves to using 7-step life satisfaction data from the 2012 ISSP which is not limited to Europe; the sample size is only 60,000. The question asked is:

Q10. "If you were to consider your life in general, how happy or unhappy would you say you are, on the whole? Completely happy = 7; Very happy = 6; Fairly happy = 5; Neither happy nor unhappy = 4; Fairly unhappy = 3; Very unhappy = 2; completely unhappy = 1?"

Numbers are my coding to ensure a larger coefficient means more happiness. Controls are included. All 31 countries have significant U-shapes, mostly in the forties and fifties again.

Table 12 does the same but with the 2017 ISSP with a 7-step life satisfaction question and a sample size of $n = 43,775$.

Q11. "All things considered, how satisfied are you with your life as a whole nowadays? Completely satisfied = 7; Very satisfied = 6; Fairly satisfied = 5; Neither satisfied nor dissatisfied = 4; Fairly dissatisfied = 3; Very dissatisfied = 2; Completely dissatisfied = 1?"
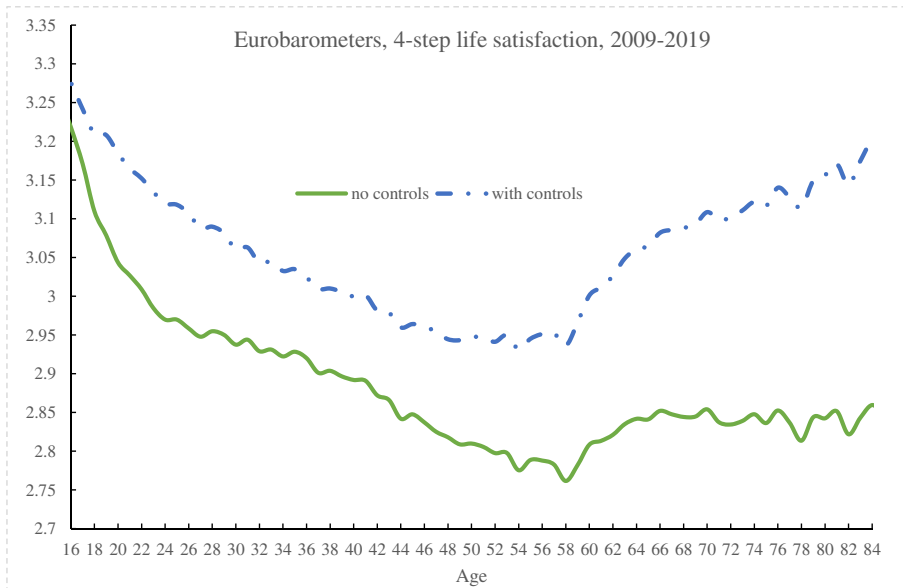
Fig. 4 Eurobarometers, 4-step life satisfaction, 2009-2019

There are U-shapes everywhere once again.

9.2 World Values Survey, 1990–2014

Table 13 looks in turn at each of the five sweeps 2–6 of the World Values Survey in turn that all use the Q9 10-step life satisfaction equation defined above. In each of the five sweeps, there is always a minimum between forty and fifty overall with controls, and only in wave 2 is there no U-shape without controls. In every one of the 137 reported country estimates, for advanced and developing countries, remarkably, given the small sample sizes, there are significant happiness curves.

9.3 Gallup World Poll, 2008–2017

Blanchflower and Graham (2020b) examined data from the Gallup World Poll from 2008 to 2017 for fourteen countries. Fourteen of those countries have significant and well-defined U-shapes in age and they are not available in any of the other data files, so in Table 14 we report results for these developing countries using the Q1 question above for Cantril's life satisfaction ladder measure.

Fig 7 plots coefficients on the single year of age dummy variables (added to the constant) for ESS sweeps 1–8. Fig 8 repeats for the EQLS 2003–2016 and the U-shapes are similar. Fig 9 has a happiness U-shape from the Asia barometers while Fig 10 has it for life satisfaction for the Latino Barometers. Fig 11 does the same for the ISSP 2012 while Fig 12 has a similar pattern for the ISSP 2017. Fig 13 has a similar picture from wave 5 (2005–2009) of the WVS. Fig 11 does the same from the 2005 Asia Barometer, with. That also has a significant U-shape in age. Fig 12 reports on 4-step life
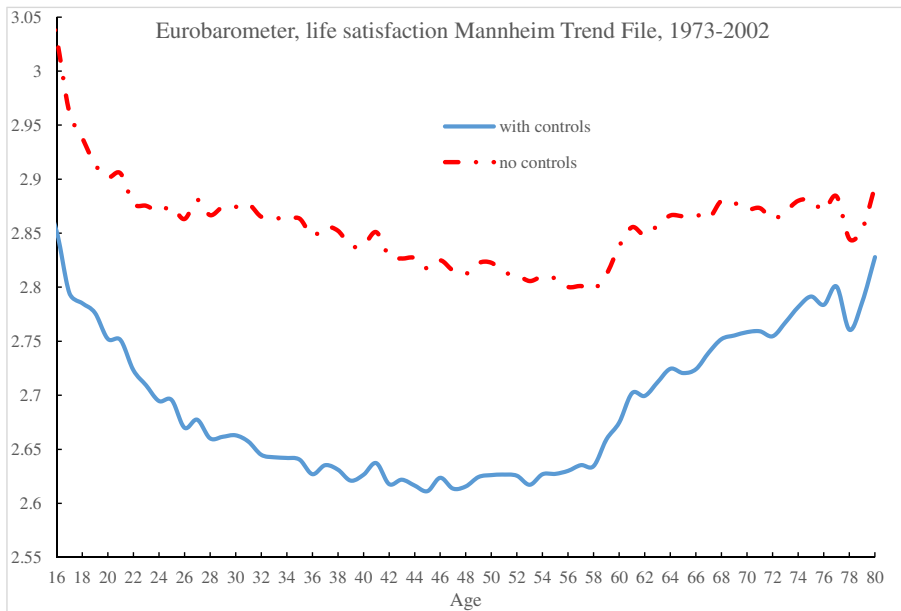
Fig. 5 Eurobarometer, life satisfaction Mannheim Trend File, 1973-2002

satisfaction equations from the Latino Barometers for 2017 and 2018 respectively with controls and once again show a clear well-defined U-shape.

To conclude, these tables and figures suggest the following:

1) There are well-being U-shapes in advanced and developing countries.
2) These answers seem to be similar using happiness or life satisfaction data.
3) It doesn't seem to matter how many steps there are in the dependent variable; essentially, the same answer is found with a 4-step, 7-step, 10-step, or an 11-step measure.
4) The answers are broadly the same whichever data file is used.
5) Adding cohort dummies does not remove the U-shape.
6) There is a minimum around age 50 with controls of the happiness curve in both advanced and developing countries, and a little higher than that without controls.

10 Satisfaction with financial situation: macro happiness and living standards

I now move away from looking at happiness and life satisfaction directly and extend my horizons by looking at other broader measures of well-being. It was already well-known that there were similarities between happiness data and assessment of someone's financial situation and their living standards, but I find the similarities do not stop there. Remarkably, this U-shape pattern emerges when I look at assessments of the national economy as well as the quality of local services. It emerges when respondents are asked about job opportunities and time to do things and the U-shape appears to have broad applicability to a wide class of qualitative measures.

10.1 Financial situation of the household

I now turn to other ways of measuring satisfaction, which it turns out also show U-shapes. All of the questions used are reported in the Appendix. Easterlin (2006) found evidence of a U-shape in age in the US General Social Survey for the years 1972–1993 in answers to Q14 which relates to how an individual is doing financially. He finds that satisfaction with one's financial situation, "declines very slightly through age 36, but thereafter rises considerably, with the biggest increase late in life." This contrasts with his findings on happiness overall as well as happiness with the family that he found followed an inverted U-shape.[19]

I took the data Easterlin (2006) used and re-estimated, with and without controls, for a longer time period, from 1972 to 2018. T-statistics are in parentheses and I restricted the sample to those under age 70 for simplicity. Without controls, year dummies are included, with controls adds controls for gender, marital status, years of education, race, and labor force status. Sample size is with controls.

	Without controls		With controls		
	Age	Age^2	Age	Age^2	N
Happiness	+ 0.0028 (2.16)	− 0.00003 (8.58)	− 0.0132 (8.91)	0.00016 (9.45)	52,433
Family situation	+ 0.0316 (7.35)	− 0.00037 (7.45)	− 0.0252 (5.32)	0.00023 (4.15)	22,231
Financial situation	− 0.0158 (10.34)	+ 0.00025 (14.40)	− 0.0246 (14.21)	0.00036 (18.37)	59,836

I confirm Easterlin's findings; both happiness and family situation without controls generate inverted U-shapes in age, whereas financial situation has a U-shape in age even without controls. All three though have U-shapes once controls for education, marital status, and work status are included. The minima are 41 for happiness, 55 for family situation, and 32 for financial situation with controls.

It is apparent that a U-shape in these GSS data seems more robust using the financial situation data than the other two measures of well-being. I explored the characteristics of this rather intriguing financial circumstance variable further as comparable data is available in WVS sweeps 5 and 6 for both developing and developed countries.

In Table 15, I model responses in turn from waves 5 and 6 of the WVS that contains a 10-step question on how satisfied the respondent is with the financial situation of the household

Q14. We are interested in how people are getting along financially these days. So far as you and your family are concerned, would you say that you are pretty well satisfied (= 3) with your present financial situation, more or less satisfied (= 2), or not satisfied at all (= 1)?

There are statistically significant U-shapes with controls in both developed and developing countries in both wave 5 and wave 6. With controls in the country

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[19] Data for satisfaction with family life are only available for the years 1972–1993 hence the sample restriction but in what follows I used data for both happiness and financial situation for the years 1972–2018. The family situation question was SATFAM: "For each area of life I am going to name, tell me the number that shows how much satisfaction you get from that area. Your family life (my codes) - 7. A very great deal; 6. A great deal; 5. Quite a bit; 4. A fair amount; 3. Some; 2. A little; 1. None."

equations with the sample restricted to those under 70 years of age, there are U-shapes in thirty-four developing countries from around the world.[20]

10.2 Macro happiness

Table 16 uses data from four different European data files. The first part uses Eurobarometer #91.5 for June–July 2019. The first question relates to the financial situation examined above and finds a U-shape also that minimizes at age 41.

I then estimate six different attitudinal questions on the individual's views on the situation in the country (Q15); the national economy (Q16); the respondent's own job if working (Q17); the respondent's own financial situation (Q18); employment situation in the country (Q19); and the presence of public services in their country (Q20). In every case, the age term is significant and negative, and the square term is positive. Each of the variables have well-defined and statistically significant U-shapes in age and the *t*-statistics on age and its square are everywhere above five. A 3-step question is also used on the direction of the country, which is often used in polling. The age minima vary from ages 41–54.

A great deal of use is made in economics of survey responses from individuals on the general state of the economy, including in Consumer Confidence measures such as the Michigan and Conference Board measures in the USA and conducted by the European Commission monthly for every EU member state. For example, respondents in the EU Commission survey are asked for their views on the "general situation of the economy over the next twelve months" that I have through March 2020.[21] These variables are then collapsed into a score. An equivalent survey from *firms* is available from HIS Markit in the form of a much-watched Composite PMI available monthly from 1998 through April 2020.[22]

In Fig 14, I plot both series for the Eurozone that seem to track each other well. Their decline in 2007 onwards gave early warnings as did other similar attitudinal variables that few spotted of the oncoming global recession in 2007 (Blanchflower 2009). Of note is their dramatic collapse in both in March and in April 2020 to new lows.[23] For example, the composite PMI hit a record low of 13.5, down from 29.5 in March and 51.6 in February. The low point in the Great Recession was 36.2 in February 2009. The general economic situation measure had the biggest collapse in the history of the series that runs back to 1985, beating the previous record collapse that occurred in August 1990 when Iraq invaded Kuwait. These *macro* happiness indicators provide a clear picture of the impact of the COVID-19 shock in March and April 2020 that the official statistics do not (Bell and Blanchflower 2020).

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[20] Algeria, Belarus, Brazil, Chile, China, Colombia, Ecuador, Egypt, Georgia, Ghana, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Libya, Mali, Malaysia, Mexico, Morocco, Peru, Philippines, Russia, Singapore, South Africa, South Korea, Taiwan, Thailand, Trinidad, Turkey, Uruguay, Yemen, Zambia, and Zimbabwe.

[21] The EU provides details of both business and consumer surveys available for download here for every EU country
  https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys/download-business-and-consumer-survey-data/time-series_en.

[22] I am grateful to Chris Williamson of Markit for providing me with these PMI data.

[23] The US composite PMI which has only been running since October 2009 fell from 49.6 in February to 40.9 in March and 27.4 in April.
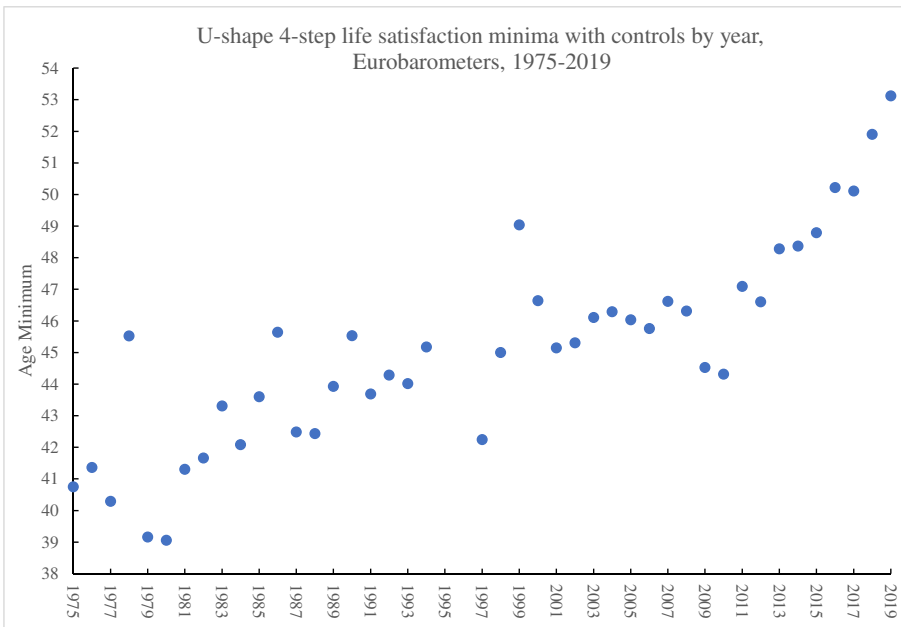
Fig. 6 U-shape 4-step life satisfaction minima with controls by year, Eurobarometers, 1975-2019

The second part of Table 16 is drawn from Eurobarometer #66.3 from 2006 with five-step questions (Q21–Q25) relating to a respondent's views on local services, including travel and medical services. They are also asked about the quality of life,
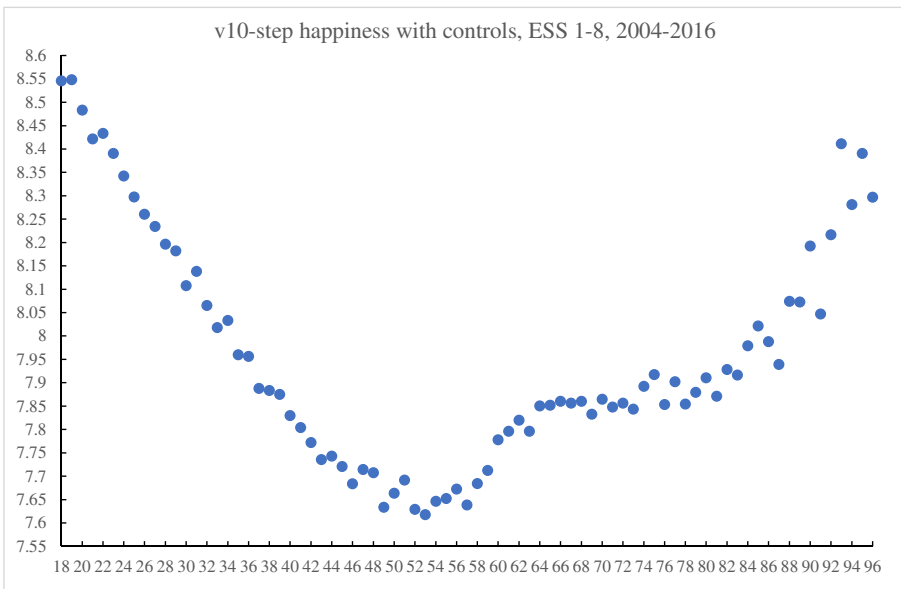

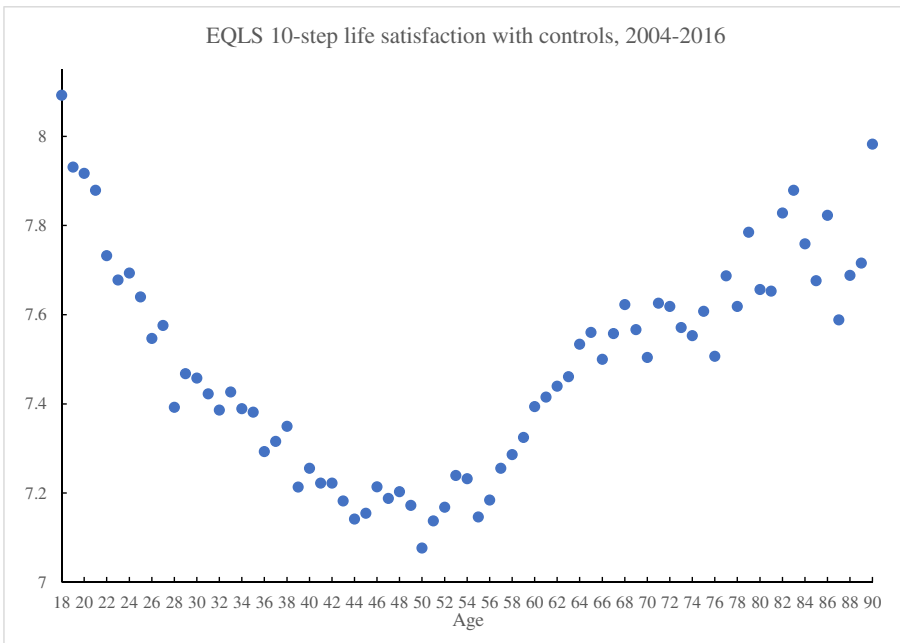**Fig. 7** 10-step happiness with controls, ESS 1-8, 2004-2016

Fig. 8 EQLS 10-step life satisfaction with controls, 2004-2016

job opportunities, and time to do things they want. The equations include controls for gender, education, labor market, and marital status. All have U-shapes.
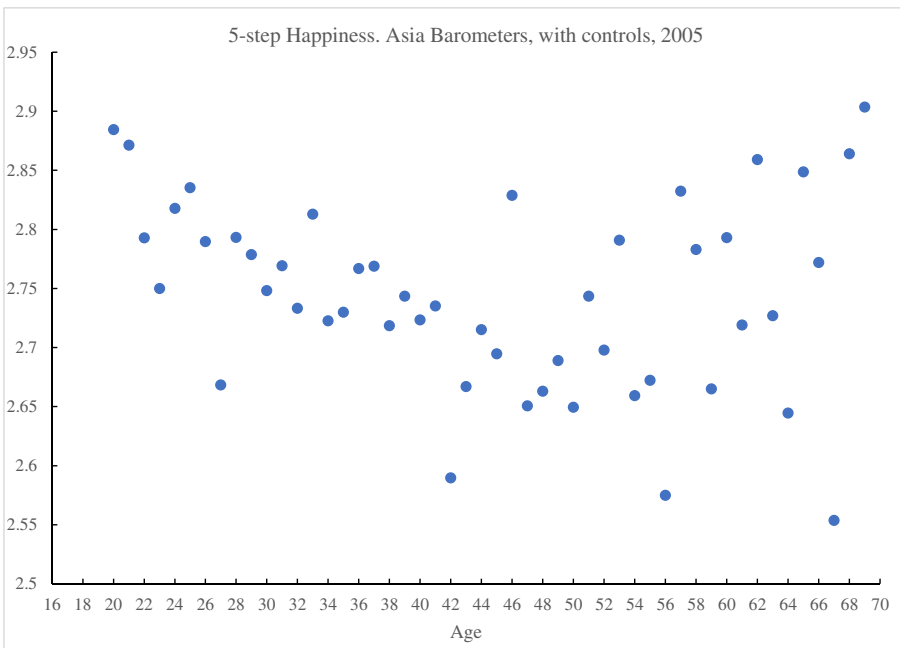
Fig. 9 5-step Happiness. Asia Barometers, with controls, 2005
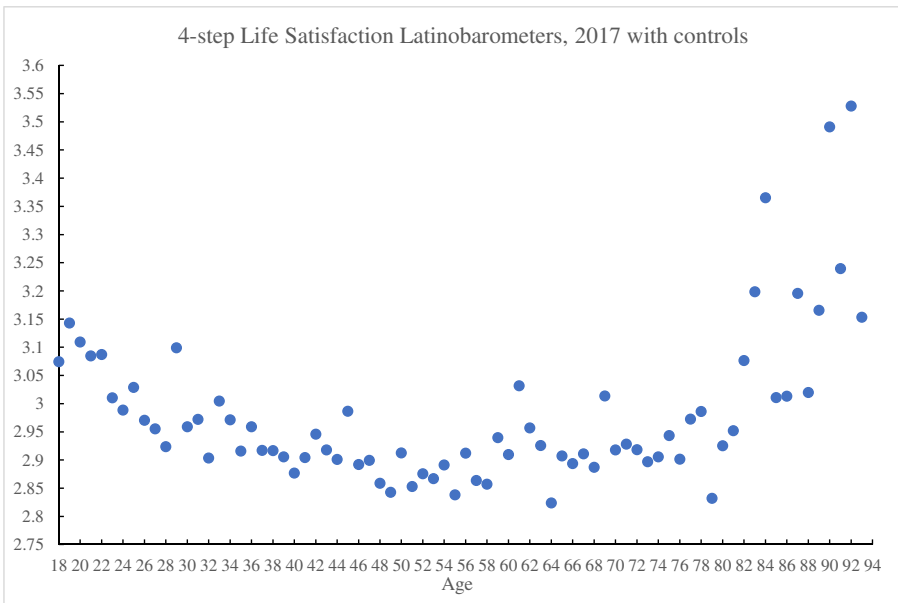
Fig. 10 4-step Life Satisfaction Latinobarometers, 2017 with controls

10.3 Living standards—Europe and Africa

The final 5-step question in part 2 of the table relates to living standards which are also U-shaped with a minimum at age 44. The third and fourth sections of Table 16 includes two

Fig. 11 7-step happiness ISSP, 2012 with control
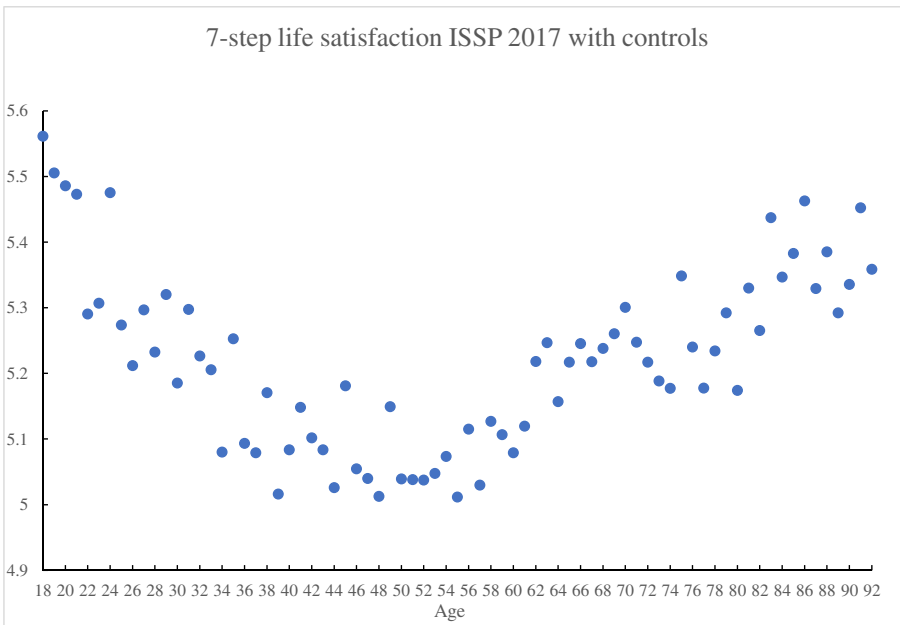
Fig. 12 7-step life satisfaction ISSP 2017 with controls

responses to a 10-step question (Q21) on satisfaction with an individual's living standards, across European countries. The data are from Eurobarometer #74.1 for 2020 and the EQLS for 2003–2016. Both equations have U-shapes with minima of 50 and 45 respectively. We now turn to examine data in Africa based on a similar living standards question.
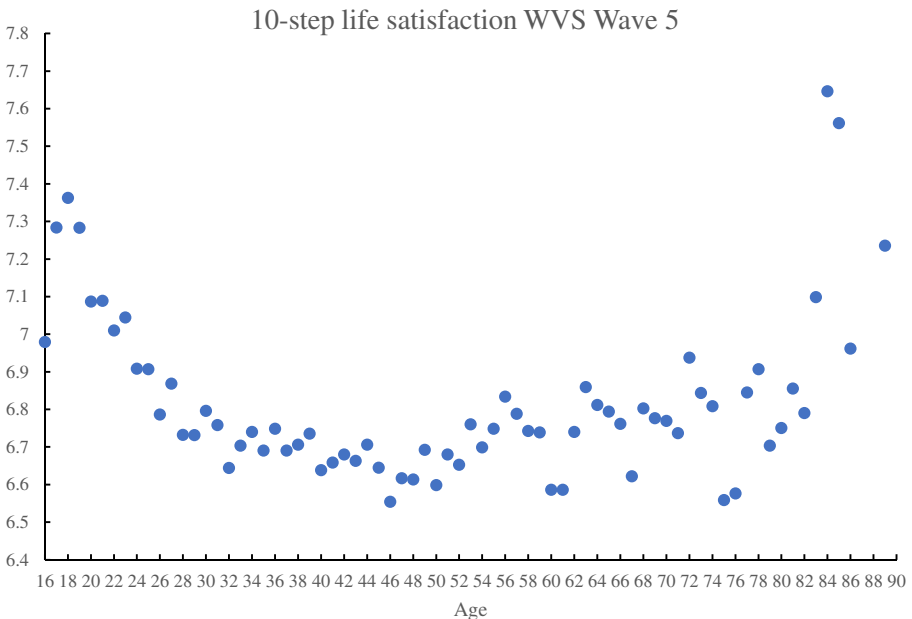
Fig. 13 10-step life satisfaction WVS Wave 5

Very little analysis has been done on how well-being and age are treated in Africa.[24] The Afro Barometers are a natural place to turn, but unfortunately, they don't contain any questions on happiness or life satisfaction. Both the 2016 and 2019 surveys do though contain a question on living standards. This living standard, measure of well-being, has been widely used in the development literature for measuring well-being in Africa. It was used by Sulemana et al. (2019) for a study of well-being in Sub-Saharan Africa. They justified its use arguing that "the question taps into the individual's evaluations of their life we used this construct as a suitable measure of subjective wellbeing." The authors argued that "many other studies have constructed well-being measures in the same way," which turns out to be correct. Deutsch et al. (2016) used this variable from the 2008 Afro Barometer as did Pokimica et al. (2012) and Sulemana (2015b) in their studies of well-being in Ghana. Sulemana (2015a) in a study of the impact of crime on well-being in Africa used data from the 4th sweep of the Afro Barometer for 2008. Sulemana et al. (2017) used this measure with the Afro Barometer data in their study of the relationship between corruption and well-being in Africa.

Others have been creative in their use of measures of well-being for Africa. Bookwalter et al. (2011) in a study of South Africa use a household level life satisfaction variable. Life satisfaction in both surveys was reported at the household level. The head of the household was asked a 5-step question Q22 on living standards.

Q22. In general, how would you describe your own present living conditions? Possible responses include: 1 = Very bad, 2 = Fairly bad, 3 = Neither good nor bad, 4 = Fairly good, 5 = Very good?

Table 17 reports the results from estimating an OLS equation with this living conditions variable as the dependent variable with and without controls by country. Limiting age to less than 70, there are 22 countries with significant U-shapes in 2016 and seventeen in 2019. Fig 15 plots the single year of age coefficients added to the constant for 2016 with controls and there are obvious U-shapes again, with minima mostly in the mid-fifties. There are U-shapes for thirty African countries using the Afro Barometer data for those under age 70.[25]

The U-shape appears to have broad applicability to a range of attitudinal questions on the economy and an individual's personal economic situation as well as to their happiness and life satisfaction. There is a happiness curve.

11 Conclusions

No ifs, no buts, well-being is U-shaped in age. The average age at which the U-shaped minimized across the 477 country-level estimates reported here is 48.3. It is in rich and poor countries.

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[24] Or indeed of happiness in Africa, for an exception, see Helliwell et al. (2019) who found evidence over the years 2006–2018 that happiness in the Middle East and North Africa had dropped steadily while Sub-Saharan Africa had no overall trend. The authors identify how much happiness has changed over the last decade and how low it is in Africa. They note big declines in happiness in Rwanda, Malawi, Tanzania, Central African Republic, and Botswana (their Figure 2.8).

[25] Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Cote d'Ivoire, eSwatini, Gabon, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, São Tomé, Senegal, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, and Zimbabwe.

I found evidence of the nadir in happiness in one hundred and forty-five countries, including one hundred and nine developing and thirty-six developed. I found it in Europe, Asia, North and South America, Australasia, and Africa. I identified it in all but six of the fifty-one European countries.[26] I have a well-being U-shape for every one of the thirty-five member countries of the OECD.[27] I have it for 138/193 member countries of the United Nations.

I found the well-being U-shape in English-speaking countries and non-English-speaking countries. A U-shape is revealed in countries ranked highly in the CIA World Factbook for countries with both high and low life expectancy at birth.[28] I found it in twelve countries ranked in the top twenty for life expectancy of 82 or more.[29] I also found a U-shape in ten countries in the bottom twenty for life expectancy of 223 countries in the world according to the CIA.[30] The curve's trajectory holds true in countries where the median wage is high and where it is not and where people tend to live longer and where they don't.

I found additional evidence from an array of attitudinal questions that were worded slightly differently. Evidence of a U-shape was found across European countries in questions relating to an individual's finances as well as to the state of the economy and democracy and how public services work. In Africa, I used a question that development scholars had used relating to living standards and found a U-shape for thirty African countries. This suggests the U-curve in age may have much broader applicability than just in well-being data. Given the robustness of these findings, it remains a puzzle why so many psychologists continue to suggest that well-being is unrelated to age.

People are struggling. In the USA, 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. Those in middle age in the years since 2008 were most vulnerable to a once-in-a-generation financial shock especially if they were poor and with low levels of education. In the USA, the employment rate in 2020 was below that in 2008. In the UK, real wages were below pre-recession levels at the onset of the COVID-19 crash in March 2020. The financial crisis did not suddenly create frailty in downtrodden communities but simply exposed underlying problems with deep roots in the long decades before. It seems it is normal to have a midlife dip in well-being, but for many, especially those with the least

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[26] There are fifty-one European countries https://www.countries-ofthe-world.com/countries-of-europe.html. Kazakhstan was the only country I had data for and did not find a U-shape. The remaining five I had no data for were all tiny—Andorra, Liechtenstein, Monaco, San Marino, and Vatican City.

[27] Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the UK, and the USA.

[28] https://www.cia.gov/library/publications/resources/the-world-factbook/fields/355rank.html

[29] Japan (2), Iceland (7), Israel (10), Malta (11), Switzerland (12), South Korea (13), Australia (14), Italy (15), Luxembourg (16), Sweden (17), Canada (18), and France (19).

[30] Lesotho (221), Mozambique (218), Uganda (217), Niger (216), Eswatini (215), Nigeria (211), Cameroon (210), Cote d'Ivoire (209), Mali (206) at 6.8, and Zimbabwe (205). Those countries ranked below 209th with life expectancies of less than 60 years at birth.
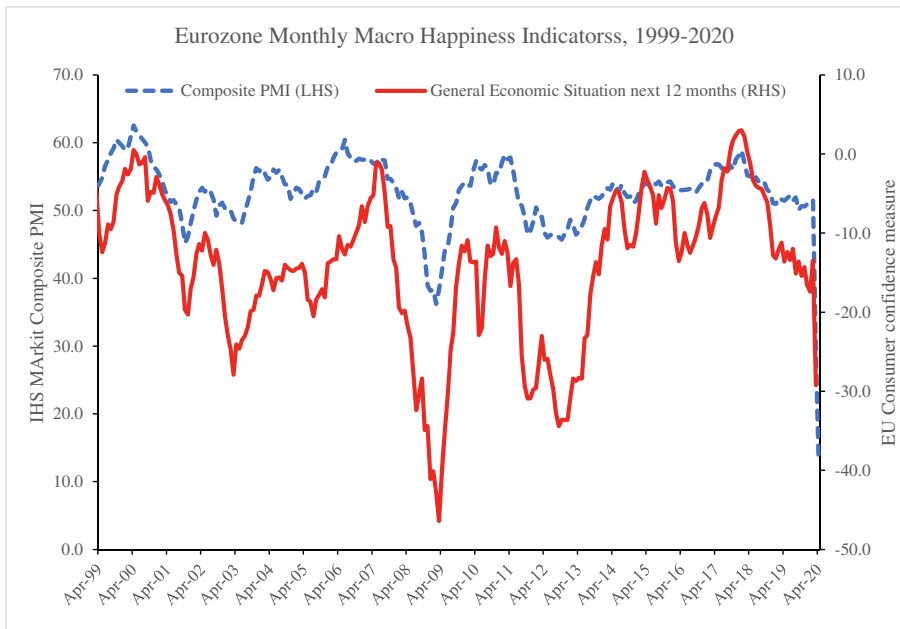
Eurozone Monthly Macro Happiness Indicatorss, 1999-2020

Fig. 14 Eurozone Monthly Macro Happiness Indicatorss, 1999-2020

skills, with little social support and few if any savings, that was too much to bear when a giant downturn came along in 2008.

The finding of a zenith in well-being in midlife likely adds important support to the notion that being in one's forties and fifties exacerbates vulnerability to disadvantages and shocks.[31] That is people with disabilities, less education, broken families, lost jobs, and so on are likely also to get hit hardest by the effects of aging. Some might face downward spirals as age and life circumstances interact. Many will not be getting the social/emotional support they need, because midlife is the worst time to present vulnerability. They will be dealing with shame and isolation, in addition to the first-order effects of whatever they are coping with in normal times at a midlife low is tough. It is made much harder when combined with a deep downturn especially when the speed of recovery and the length of lockdown is uncertain.

Interdisciplinary research is clearly needed into how to stem the worst manifestations of the midlife nadir in well-being, such as depression, lack of sleep, suicide, and higher tendency to drug and alcohol abuse. The fact that the happiness zenith occurs in developed and developing countries and it has even been found in great apes (Weiss et al. 2012) suggests there may be something deeply engrained perhaps in the genes.

The pandemic is global. Vulnerable individuals and communities around the world will be devastated by the shock, because of both job and income loss but also from bereavement. The prime aged with low levels of happiness already are especially at risk.

The happiness curve is found in 145 countries. No myth.

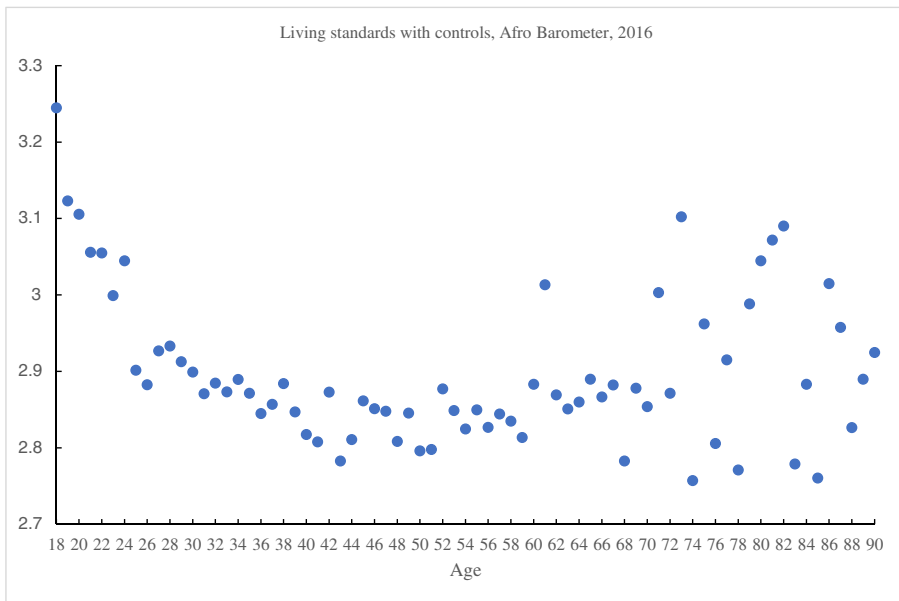[31] I am grateful to Jonathan Rauch for these suggestions that he says create a "toxic brew."

Fig. 15 Living standards with controls, Afro Barometer, 2016

Compliance with ethical standards

Conflict of interest The author declares that he has no conflicts of interest.

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