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The Rapid Decline of Happiness: Exploring Life Satisfaction among Young People across the World

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Abstract

Adolescence and early adulthood are periods of rapid physical and emotional development and coincide with important social and economic processes in the lifecycle. This group now represents a quarter of the world's population, and the antecedents of many later-life health problems occur during this period of life. We report on the level and determinants of life satisfaction among individuals age 15–24 years across the main regions of the world and contrast these findings with those for adults age 25–59 years using Gallup World Poll data from 145 countries/territories in 2014 and 2015. We find that adolescence and youth is the age range during which life satisfaction declines most rapidly in all regions of the world, except South Asia and the Middle East and North Africa (MENA). Additionally, in the three regions where overall life satisfaction is lowest, MENA, South Asia and sub-Saharan Africa, the life satisfaction gap among youth in the poorest and richest quintile is the largest, reflecting the reality that children in some of the world's poorest countries already face adult realities and responsibilities by this age. Correlates for young people and adults are strikingly similar and include material conditions, such as financial life and food security, and noneconomic factors such as social support, health, and internet access. Differences across the life-course emerge in life satisfaction correlates of education and health, which are stronger for adults than young people.

Keywords Subjective well-being · Life satisfaction · Adolescence · Youth

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Introduction

The focus of this paper is on life satisfaction during adolescence and youth, a relatively under-studied period of life in the happiness literature. The use of terms "adolescence" and "youth" to describe an age distinct from adulthood, is a fairly recent phenomena historically. They have been described as extensions of childhood and pre-adulthood emerging more distinctly as societies become more developed and undergo modernization (Lansford & Banati, 2018). Understanding the determinants of life satisfaction during this period is interesting for several reasons. Plasticity of the adolescent brain is high, second only to the early childhood period, and is concentrated in the prefrontal cortex which governs executive functioning and future orientation (Steinberg, 2005). Hormonal changes associated with puberty and rapid physical growth are also concentrated in this period of life, as well as increased autonomy in decision-making and socialization, with peer and friends becoming important influences on behavior and value-formation (Blakemore & Robbins, 2012; Dahl, 2004; Spear, 2000). Finally, young adulthood coincides with the final development of the adult brain and increasing responsibility in terms of work and family formation. Aside from being a period of rapid change and development, a large body of evidence now also indicates that the foundations for life-long health and well-being are precisely set during this important period of life (Patton et al., 2016). Risks of cancer, cardiovascular and other non-communicable diseases start during adolescence (e.g. smoking, poor diet, physical inactivity), most mental disorders begin before age 25, and accidents and injuries account for a larger share of deaths among adolescents and young adults than any other age group (Kassebaum et al., 2017; Mokdad et al., 2016). Meanwhile, key emerging global issues such as migration, unemployment and urbanization disproportionately affect young people furthering the importance of understanding the determinants of life satisfaction among this age group.

Our empirical motivation for studying life satisfaction among adolescents and youth is shown in Fig. 1. Behind the lines in this graph are approximately 280,000 respondents from almost all countries of the world (unweighted by population sizes), collected by the Gallup World Poll (GWP) over the years 2014–2015. The question is the classical one on life satisfaction: *Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?* Two key patterns stand out in this figure. First, there is no other age range at which life satisfaction falls as rapidly as between the ages of 15 and 24, except in the regions of South Asia and sub-Saharan Africa where overall levels of life satisfaction are already extremely low relative to the rest of the world. Second, there is a clear pattern showing that the drop in young people's life satisfaction tends to be more pronounced the more economically developed the region tends to be. Given all that adolescents and young people go through physiologically, emotionally, and socially, the patterns depicted in Fig. 1 should perhaps not be so surprising.

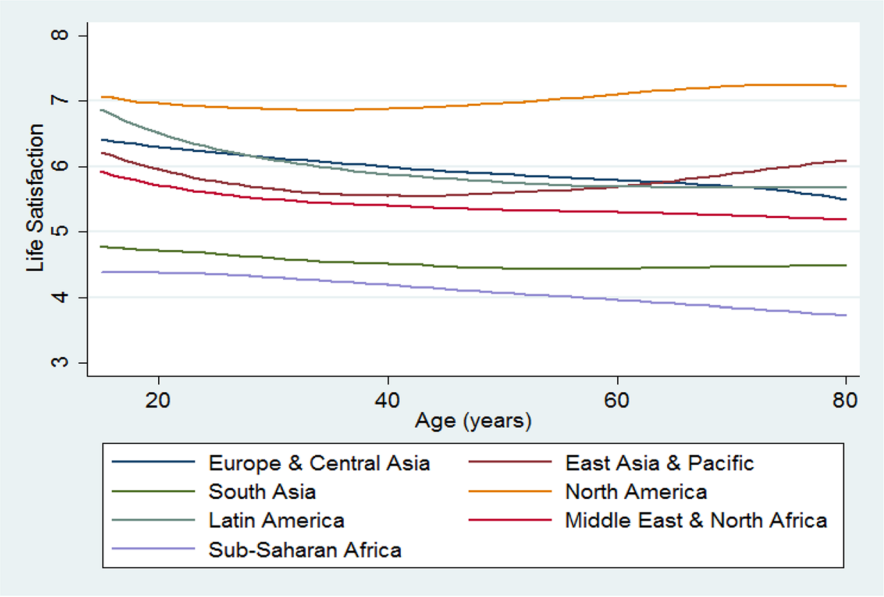

Fig. 1 Life satisfaction over the life course, by region. Notes. Data comes from the 2014 and 2015 Gallup World Poll surveys and includes approximately 58,000 young people aged 15–24 years and 241,000 old people aged 25–80 years. Life satisfaction, as shown on the y-axis, is measured using the following question: *Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*

Subjective measures of well-being and life satisfaction provide a window into understanding how social aspects compare with income and other material conditions in determining a person's overall assessment of his or her life, across the life course. Work over the last decade has shown that both dimensions are important and that life-satisfaction across the globe responds to the same set of basic life circumstances (Helliwell et al., 2009). However, because levels of income between countries varies more than within countries, a higher proportion of the cross-country difference in subjective life evaluations is explained by income, while social aspects seem to play a stronger role in explaining variations within countries (Helliwell & Barrington-Leigh, 2010).

The pattern of wealth accumulation and relative importance of social circumstances vary systematically across the life-course, and since these are key determinants of life satisfaction, it follows both that absolute levels of life satisfaction would vary over the life-course as would the determinants of those levels. Stone et al. (2010) and Van Landeghem (2012) show that life-satisfaction has a U-shape over the life-course, with happiness high at young ages, declining through the prime-ages until around age 60 or 70 and increasing thereafter. Old-age is associated with poorer health and mental capacity, yet self-reported life satisfaction increases during this period of life. Old-age also comes with a decline in work-related stress

and responsibility which increases happiness, while economic security depends on the availability of public pensions, accumulated savings from earlier in life and the strength of family support networks, suggesting a somewhat complex pattern in the determinants of life-satisfaction over the life-course (Stone et al., 2010).

The reliability and validity of life satisfaction measures are also subject to debate. Cultural differences in response patterns, ceiling effects and shifting reference points are some of the methodological issues discussed in the academic happiness literature (as discussed in subsequent sections). For instance, the empirical finding that women tend to be happier than men is questioned on the grounds that women have revealed a more positive response pattern when asked "vignette questions" about the subjective well-being (SWB) of an imaginative person with specified life circumstances. However, when correcting for this bias, the gender differences in SWB tend to disappear (Montgomery, 2016). There is a similar academic debate, largely unresolved, about a potential cultural "Latin" response pattern, which may explain the higher than expected levels of SWB in Latin America (Exton et al., 2015). Accordingly, it is possible that the dramatic fall in SWB during the age range 15–24 years may at least partially be the result of response bias, reflecting a less "mature" response pattern in youth, unrelated to concrete life circumstances or actual experience of wellbeing. To further our understanding of what contributes to young people's life satisfaction and why, and how these compare with those for older age groups, we use the 2014 and 2015 waves of the GWP, which cover approximately 60,000 young people from 150 countries across the world. We have three primary research questions:

1. How does life satisfaction among young people differ across the world?
2. Is income more or less important in determining life satisfaction among young people compared to adults, is the age gradient different across income quintiles, and how do these relationships vary across regions of the world?
3. Together with income and material circumstances what other key factors determine the life satisfaction of young people, and do these differ by age and across world regions?

This paper is the first to provide a comprehensive assessment of the prevalence and determinants of life satisfaction among adolescents and young adults across the world, including investigating the three specific research questions above.

Conceptual Framework

On the Concept of SWB and the Validity and Reliability of its Measure

When wellbeing is assessed by individuals themselves, rather than an objective metric, it is termed SWB. In the literature, it is common to distinguish among separate components of SWB: a judgmental or cognitive component such as life satisfaction; an emotional or affect component (positive or negative); and eudaimonic or

psychological wellbeing, which considers a sense of meaning or purpose in life and psychological wellbeing. (Diener et al., 1985; Exton et al., 2015; Helliwell et al., 2012; Rees et al., 2012). Affect states reflect particular experiences of emotions and feelings (i.e. "did you laugh yesterday?") while life satisfaction is an overall assessment of one's life as compared to expectations and envisioned ideal life (Van Hoorn, 2007). In the context of this paper, we focus on and ground our conceptualization as the following: life satisfaction is "*people's assessment of the quality of their lives both overall and in specific domains"* (Rees et al., 2012). The most widely used measure of life satisfaction is the question cited above where the respondent is asked to assess his/her life on a scale from zero to ten (the Cantril ladder), where zero represents the worst possible life and 10 the best possible life. The GWP has asked this question to a representative sample of individuals in nearly all countries of the world since 2006. It is the core variable used in this paper.

In the literature, the reliability and validity of this life satisfaction measure is intensely debated, and is covered elsewhere (see Weimann et al. (2015)). Here, we limit ourselves to point out the following findings from recent literature, specifically in relation to reliability over time, comparability across groups and cultures, affect versus life satisfaction measures, and the Easterlin Paradox.

Reliability over Time

The replicability of life satisfaction measures has been tested in a variety of ways. Since asking the same individual repeatedly over time does not produce perfect correlation, it is debated whether these distortions are systematic enough to be of concern, or if they can be treated more as random noise (Weimann et al., 2015). However, the reliability of country-level averages over time is very high, since individual-level random variations and personality differences are averaged away. Year-to-year correlations of country rankings in life satisfaction range from 0.88 to 0.95 for GWP and from 0.92 to 0.98 between waves of the European Social Survey (Helliwell et al., 2012). Daily weather matters to responses related to daily affect states, but not responses to the life satisfaction question. Therefore, although, the ordering of questions in surveys have been shown to matter significantly (Deaton, 2011; Nikolova & Sanfey, 2016) and reliability concerns clearly exist, they may not be a major obstacle depending on the purpose the analysis. Furthermore, the GWP runs a survey consistently over time and across all countries and is designed to overcome some of the concerns mentioned above related to cross-country comparisons.

Comparability across Groups and Cultures

Language differences can influence the scale use of respondents, and biases can arise from different response patterns that are group or culture specific. Potential translation biases have been approached by analyzing systematic patterns in responses biases depending on language groups, with reasonably reassuring results (Veenhoven, 2012). Experiments have also explored asking the same question to bilingual respondents, randomizing in which language the question is asked, with mixed results. For example, "happiness" translated to Danish was shown to yield

significantly different responses than "happiness" in English (Lolle & Andersen, 2016), while other experiments exploring language and life satisfaction show mixed results (Blishen & Atkinson, 1980; Gallup, 1976; Veenhoven, 2012). When it comes to cultural biases, it is clear that some cultures reveal higher life satisfaction rates than what would be predicted by available explanatory factors. However, it is debated if this reflects cultural biases in response patterns or rather that some cultural aspects in themselves may be good or bad for life satisfaction (Exton et al., 2015). The vignette approach is a recent attempt to address this issue. The approach gives respondents a vignette question about a hypothetical individual, with the same response categories as the self-assessment question, which then is used as an anchor to correct any response pattern bias. The approach, which also has its limitations in terms of underlying assumptions that need to be satisfied (Corrado & Weeks, 2010), has been used to analyze gender differences in life satisfaction. It has been shown that women have a tendency towards a more relative positive response pattern to vignettes, and when adjusting for the gender differences in life satisfaction largely disappears (Montgomery, 2016). We have searched, but not identified, any similar attempt to use vignettes to assess any systematic deviation in the response pattern among adolescents and youth. So, to summarize, there are concerns about biases related to culture- and group-specific response patterns. However, the fact that more than three-quarters of the cross-country differences in life satisfaction can be explained by just a handful of variables has been pointed out as somewhat reassuring (Helliwell et al., 2017).

Affect Measures versus Life Satisfaction Measures

The affect measure of wellbeing is much less correlated with major life circumstances than are the life satisfaction answers. The effect of income on wellbeing is smaller, and often statistically insignificant. Life satisfaction measures have become the preferred measure for global comparisons and analyses, such as the ones presented annually in the World Happiness Report (Helliwell et al., 2012). While affect measures are less related to concrete life circumstances than life satisfaction measures, they are more useful for assessing short terms changes in moods and the underlying explanatory factors. However, both kinds of measures have their respective shortcomings. The literature appears to have settled on the position that both affect and life satisfaction measures are relevant and can be used as complements depending on the topic of analysis (Helliwell et al., 2017).

The Easterlin Paradox

The Easterlin paradox, first put forward in the 1970s, is based on the notion that while people with higher incomes tend to report more happiness within a given country, this dynamic would not hold at a national level, creating an apparent paradox. This observation was based on data available at the time that reported happiness was not significantly associated with Gross Domestic Product (GDP) per capita among developed nations, nor was it correlated with trends in GDP growths over time. However, new data and new analyses are reassessing or diminishing the claim

of a paradox (Graham et al., 2009; Stevenson & Wolfers, 2013). Analysis of cross-country variation of GWP data on life satisfaction (rather than the affect measure used by Easterlin) come closer to a log linear relationship to income and does not support the claim that raising income above a certain level does not matter for life satisfaction. New and better data has also been able to cast doubt on the claim that there exists no relation between life satisfaction and income growth over time. What remains as undisputed from the older happiness research is the finding that relative position as well as absolute position, in terms of income, tend to matter for individuals' life satisfaction (see Weimann et al. (2015), pp 113–130 for an overview of the literature). A somewhat related issue is the debate on shifting reference points, originating from the fact that income is unbounded while the Cantril scale stops at ten. This may imply that as income grows, individuals tend to adjust how they assess the Cantril scale, thus casting doubt over some of the comparison of SWB across time periods (Weimann et al., 2015).

While the literature on SWB has shown that the study of this measure can yield important insights, it is important to keep some of the limitations outlined above in mind. For the topic of this paper, which is to compare determinants of life satisfaction between young and old, across different regions, and understand the peculiar and dynamic life satisfaction changes that occur among youth, an issue of particular concern would be if young people have a response pattern that is systematically different than that of adults. The ability of the analysis to explain this pattern of youths' life satisfaction goes some way towards validating the measure. In any case, far reaching conclusions based on non-generalizable patterns are to be avoided, while paying more attention to bigger picture patterns that appear to be both consistent and convincingly explainable.

Life Satisfaction and Life Domains

It is common to regard life satisfaction as a reflection of some underlying life domains. Among the most widely used in the wellbeing literature are income, self-reported health, education, work-related conditions and social support, among others (Frijns, 2010). Adolescent wellbeing has also been discussed in terms of underlying life domains. A recent initiative to identify globally comparable indicators related to adolescent wellbeing grouped them under the following five life domains: 1) Health; 2) Education and Learning; 3) Protection; 4) Economic Opportunities/Transition to Work; and 5) Participation and Engagement (Banati & Diers, 2016). Findings from the literature on adolescent wellbeing in the field of health and psychology support the importance of these life domains (Currie et al., 2004; UNICEF, 2011).

In its effort to identify the potential determinants of young people's life satisfaction, this paper will follow the approach of grouping indicators under life domains, similar to those in the literature cited above, and including an added dimension of material wellbeing. We consider the following domains: 1) Education and learning; 2) Health; 3) Material wellbeing; 4) Participation and engagement; 5) Protection and quality of close social relations; 6) Unemployment/underemployment.

The GWP collects data that easily can populate this framework of domains with indicators, many of them brought together in indices (further explained in the data

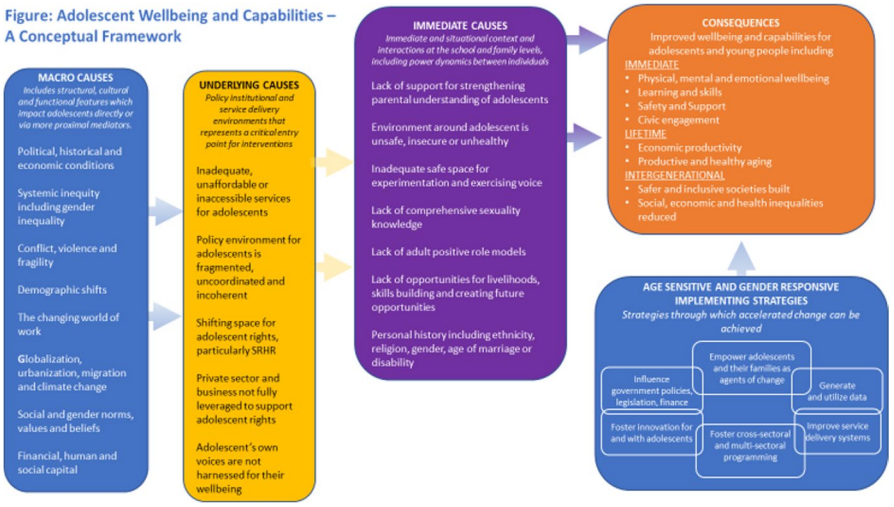

Fig. 2 Social and structural determinants of adolescent and young person's wellbeing. Notes. Unpublished framework printed with author's permission (Banati & UNICEF)

section). A core question to be asked is how these life domains matter for life satisfaction among youth, if they differ between youth and adults, and across different parts of the world. These findings will provide evidence on whether the assumptions often made about life domains that matter for youth wellbeing are supported when using responses from young people themselves.

A Social Determinants Framework

Much of the literature on outcomes for children and youth is rooted in a social determinants of health approach. It applies a framework of analysis which integrates more proximate determinants at the individual level with determinants that operate at higher levels, including at the macro level (Bell et al., 2013). Core to the approach is the notion of "nestedness" of determinants: the proximate determinants at the individual level operate in the context of, and are shaped by, a broader set of determinants at a higher ecological level.

As part of large research program on adolescent well-being, the UNICEF Office of Research—Innocenti (OoR) has developed a conceptual framework to guide research on the structural and social determinants of adolescent and young person's well-being. The conceptual framework is shown in Fig. 2 and reflects immediate, underlying and macro causes, consequences, and age-sensitive and gender-responsive implementing strategies to improve adolescent and young people's wellbeing and capabilities. Immediate causes include variables at the individual level such as sex, race, and religion, the inter-personal level such as family, peer and intimate partner relationships, and the environment around adolescents. Underlying factors consist of policy, institutional and service delivery environments including availability of services, security and safety, social protection and other systems, availability

of information, institutions, the media, and the policy process, particularly the ability of adolescents to engage or participate in the process. Finally, at the highest level are macro features of the society which include social norms and beliefs, geography and demography, and overall poverty, inequality and development.

The framework is quite broad and theoretical, but it provides a useful guide to ensure that we include indicators that represent each of these components in our empirical analysis. The data used in this study allow us to make a distinction between the individual- and macro-level indicators at the country level. An econometric strategy, using multi-level regression techniques, will be used to reach a combined explanation of the variation in life satisfaction among individuals both within and among countries.

Definitions of Adolescent, Youth, and Child

In this paper, we follow the Convention on the Rights of the Child in identifying anybody below age 18 as a child. UNICEF and the World Health Organization define an "adolescent" as a person aged between 10 and 19 years, while "youth" refers to the 15–24-year age group (Reavley & Sawyer, 2017). Available data for this paper do not cover children below 15 years. The results we present will be derived from data covering the age group 15–24 (i.e. "youth") which occasionally is broken down to specific age groups, including adolescents aged 15–19. When not referring to specific findings derived from specific age groups, in which case the exact age group will be identified, we will use the terms adolescents and youth interchangeably.

Data, Variables and Methods

Data

Data comes from the GWP administered by Gallup Worldwide Research, which consists of an individual questionnaire fielded to 1,000 people in over 150 countries around the world. Sampling is multi-stage, with a country first stratified into sampling units by population size, then a random selection of households, followed by the random selection of an individual age 15 or older for the interview within each household. The final sample is representative of the population age 15 and older after the application of sampling weights (Gallup, 2015). Interviews are administered by phone in all countries with sufficient phone coverage, and alternatively made face-to-face in countries lacking coverage. In the base model of this paper, we use the 2014–15 pooled GWP data covering a total of 145 countries and territories. From this list we drop Afghanistan (2015), Botswana (2014), Liberia (2014 & 2015), Northern Cyprus (2014 and 2015), and Turkey (2014), because of missing key variables used in the analysis. The total sample for all graphs includes approximately 58,000 young people aged 15–24 years and 241,000 older people aged 25–80 years. However, the sample for our statistical analysis includes 46,125 young people age 15–24 and 142,204 individuals age 25–59, as not all questions

were asked in all countries (Appendix A). We classify countries into seven regions: Europe and Central Asia (ECA), East Asia and the Pacific (EAP), South Asia (SA), North America (NA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), and Sub-Saharan Africa (SSA).

Variables and Survey Methods

A core questionnaire is administered in all countries, which includes basic information about the household and respondent. Enumerator training and other field work protocols are standardized across countries so that data can be as comparable as possible; all surveys are translated into relevant local languages. Our outcome variable is life satisfaction, which is based on the Cantril Ladder presented and discussed above. We estimate the correlates of life satisfaction using a linear random-effects model with covariates which allows for country-specific intercepts:

$$Y_{ij} = \left(\alpha + C_j\right) + \beta * X_{ij} + \varepsilon_{ij} \tag{1}$$

In Eq. (1), i denotes the individual and j denotes the country, C_j is the country-specific random intercept term which varies across countries but not across individuals, X is the covariate of interest for the i^{th} individual in the j^{th} country, and ε_{ij} is an individual specific random error term. The benefit of the random-effects specification is that it allows the incorporation of unobserved heterogeneity at the country level, which might determine individual self-reporting on life satisfaction. We estimate Eq. (1) separately for each of the variables described below, taken one at a time in order to understand their correlation with life satisfaction. Since the explanatory variables have different units, to facilitate the comparison of effect sizes we have standardized each variable by subtracting the mean and dividing by the standard deviation, i.e. we use the z score (within each age group: 15–24 and 25–59) so that all coefficients are in standard deviation units. This approach was also adopted in the World Happiness Reports. Life satisfaction is also similarly standardized.

Based on the social determinants framework described earlier, and the list of variables available in the GWP core questionnaire, we identify a set of covariates that represent individual and macro-level determinants of life satisfaction. The individual variables can be interpreted as explaining within country variation in life satisfaction, while the macro-level variables can be interpreted as explaining the variation in levels of life satisfaction among countries.

The individual-level variables have been grouped under the six life domains identified above, plus a category of other socio-economic variables. As the GWP have established a set of indices that closely correspond to these life domains, which facilitate the presentation of an overview with a limited set of variables, we will make use of them in our initial analysis. The indices transform a set of underlying yes/no questions and combine them on a scale 0 to 100. A full explanation of these indices is available in Gallup (2015). In the subsequent analysis, some of these indices will be further explained, in particular those related to personal health and civic engagement.

As for the macro-level variables, our base model makes use of the six macro-level variables identified by the World Happiness Report as explaining three quarters of global variation in SWB at the level of countries (Helliwell et al., 2017).[1] We also add national averages of indicators on *freedom to make life choices* and *giving money to charity*, and household Gini to the macro variables. Fixed effects for survey year and region are also included.

Table 1 presents the list of variables, including a brief description of the components underlying the indices in parentheses. We have also re-defined all GWP variables so that higher values are 'better', thus a positive coefficient can be interpreted as an increase in life satisfaction given an improvement in the independent variable.

Results

Descriptive Statistics

Summary statistics of the main variables used in the statistical analysis are presented in Table 2 for the entire world for which we present regression results later in the paper. This table allows readers to interpret the effect sizes from the regression analysis.

Income and Life Satisfaction over the Life Course

We begin by exploring life satisfaction and income to continue our discussion from Fig. 1. In Fig. 3, the same graph is produced disaggregated by country income quintiles and region. Again, a very striking pattern appears. First, life satisfaction is higher in the higher income quintiles across all regions. Second, the gradient is steepest among the poorest (solid blue line) in the youngest age group in most regions, the two exceptions again being SSA and possibly South Asia, where overall levels are already low. Estimates of the magnitude of these results are presented in Table 3, where we model life satisfaction (measured in z-scores) using five age group splines and country income quintile. Column 1 shows global estimates and confirms that the largest negative age coefficient is for 15–24-year olds, consistent with the pattern in the graphs. Column 2 adds the interaction between poorest income quintile and age group 15–24 spline, which produces a statistically significant coefficient of -0.04, again confirming that the drop in life satisfaction is indeed even larger among the poorest quintile relative to the other quintiles. The remaining columns in Table 3 reproduce the estimates in column 2 by region. The interaction coefficient is negative and statistically significant in all regions except for MENA and South Asia. Note that the interaction is statistically significant in SSA even though visually (in Fig. 3) the drop in that age group

[1] Details on sources and data elaboration of macro variables used in World Happiness Report 2017 found here: http://worldhappiness.report/wp-content/uploads/sites/2/2017/03/StatisticalAppendixWHR2017.pdf. All macro variables used downloadable from here: http://worldhappiness.report/

Table 1 Description of variables used in the analysis

Life satisfaction	
Education and learning	Higher than secondary education
	Did you learn or do something interesting yesterday?
Health	GWP Physical Health Index:
	Do you have any health problems that prevent you from doing any of the things people your age normally can do?
	Now, please think about yesterday, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt. Did you feel well-rested yesterday?
	Did you experience the following feelings during a lot of the day yesterday? How about physical pain?
	Did you experience the following feelings during a lot of the day yesterday? How about worry?
	Did you experience (health problem, well-rested, physical pain, worry, sadness yesterday)?
Material wellbeing	GWP Financial Life Index:
	Which one of these phrases comes closest to your own feelings about your household's income these days: living comfortably on present income, getting by on present income, finding it difficult on present income, or finding it very difficult on present income?
	Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?
	Right now, do you feel your standard of living is getting better or getting worse?
	Right now, do you think that economic conditions in the city or area where you live, as a whole, are getting better or getting worse?
	Food security as measured by *"Did you have enough money to buy food"*
Participation and engagement	GWP Civic Engagement Index:
	Have you done any of the following in the past month? How about donated money to a charity?
	Have you done any of the following in the past month? How about volunteered your time to an organization?
	Have you done any of the following in the past month? How about helped a stranger or someone you didn't know who needed help?
Other individual socio-economic variables	Age
	Gender (male = 1)
	Ever married (married = 1)
	Income quintile within country by year
Other	Access to internet at home
	Log per capita GDP (US$ PPP) [World Bank Development Indicators]

Data for all individual level variables are from Gallup World Poll. For more information on each of the variables included, please see Gallup (2015)

Table 2 Means of analysis variables by age group and gender (standard deviation)

Variables	Males & Females 15–24 years	Males & Females 15–19 years	Males & Females 20–24 years	Females 15–24 years	Males 15–24 years	Males & Females 25–59 years
	(1)	(2)	(3)	(4)	(5)	(6)
Life satisfaction	5.52	5.61	5.42	5.56	5.48	5.34
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Age (years)	19.39	17.01	21.94	19.47	19.32	40.12
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
Male	0.51	0.52	0.49	0.00	1.00	0.48
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Some or complete secondary or secondary vocational	0.58	0.56	0.60	0.55	0.60	0.46
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Higher than secondary education	0.06	0.01	0.11	0.07	0.05	0.16
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ever married or cohabited	0.19	0.07	0.32	0.28	0.11	0.82
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log of per capita income	6.99	6.85	7.14	6.90	7.08	7.52
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Learned something interesting	3.64	3.71	3.56	3.61	3.67	3.45
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Food security	0.66	0.67	0.65	0.65	0.68	0.65
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Personal Health Index	77.54	79.42	75.53	76.61	78.44	69.12
	(0.12)	(0.16)	(0.16)	(0.16)	(0.16)	(0.07)
Civic Engagement Index	31.36	29.79	33.04	29.96	32.73	35.80
	(0.14)	(0.21)	(0.20)	(0.19)	(0.21)	(0.08)

Table 2 (continued)

Variables	Males & Females 15–24 years	Males & Females 15–19 years	Males & Females 20–24 years	Females 15–24 years	Males 15–24 years	Males & Females 25–59 years
Financial Life Index	37.38	38.86	35.81	36.95	37.81	31.64
	(0.14)	(0.20)	(0.19)	(0.19)	(0.20)	(0.08)
Social Life Index	80.60	81.64	79.48	79.44	81.72	77.05
	(0.14)	(0.19)	(0.19)	(0.19)	(0.19)	(0.08)
Law and Order Index	66.18	66.28	66.08	63.86	68.45	70.03
	(0.14)	(0.21)	(0.20)	(0.20)	(0.21)	(0.08)
Diversity Index	51.23	50.78	51.72	51.12	51.34	52.60
	(0.15)	(0.22)	(0.21)	(0.21)	(0.22)	(0.09)
Telephone interview	0.83	0.85	0.82	0.84	0.83	0.74
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Poorest Quintile	0.20	0.20	0.20	0.21	0.19	0.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Poorer Quintile	0.20	0.19	0.20	0.20	0.19	0.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Middle Quintile	0.20	0.19	0.20	0.20	0.20	0.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Richer Quintile	0.20	0.20	0.20	0.19	0.21	0.20
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Richest Quintile	0.21	0.21	0.21	0.19	0.22	0.19
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log of household size	1.58	1.65	1.51	1.59	1.57	1.42
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Households with children < 15 years	0.60	0.64	0.56	0.64	0.56	0.62

Table 2 (continued)

Variables	Males & Females 15–24 years	Males & Females 15–19 years	Males & Females 20–24 years	Females 15–24 years	Males 15–24 years	Males & Females 25–59 years
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Social support from family or friends	0.85	0.86	0.84	0.84	0.85	0.78
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Treated with respect yesterday	0.86	0.86	0.86	0.86	0.86	0.87
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Internet access at home	0.46	0.45	0.47	0.43	0.48	0.49
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
TV at home	0.76	0.75	0.77	0.75	0.76	0.81
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Rural household	0.64	0.65	0.62	0.64	0.63	0.62
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Satisfied with education system	0.65	0.65	0.64	0.65	0.64	0.66
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Satisfied with health system	0.56	0.58	0.55	0.56	0.57	0.56
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Satisfied with water	0.68	0.68	0.67	0.67	0.69	0.68
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Proportion unemployed or employed part time and want full time, over all respondents	0.15	0.15	0.15	0.15	0.15	0.14
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Freedom to make life choices (national average)	0.74	0.74	0.74	0.74	0.74	0.75
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Charity (national average)	0.29	0.29	0.30	0.29	0.29	0.33

Table 2 (continued)

Variables	Males & Females 15–24 years	Males & Females 15–19 years	Males & Females 20–24 years	Females 15–24 years	Males 15–24 years	Males & Females 25–59 years
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Corruption (national average)	0.76	0.76	0.76	0.76	0.76	0.74
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Confidence in Government (national average)	0.52	0.52	0.52	0.52	0.52	0.50
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Healthy Life Expectancy	60.67	60.36	61.00	60.47	60.86	62.66
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Log of GDP per capita (PPP 2011)	8.92	8.86	8.98	8.89	8.94	9.26
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Democratic quality	-0.34	-0.35	-0.34	-0.35	-0.33	-0.13
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Delivery quality	-0.22	-0.25	-0.20	-0.24	-0.20	0.02
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
GINI (average 2000–2013)	0.40	0.40	0.40	0.40	0.40	0.39
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GINI (Household)	0.46	0.46	0.45	0.46	0.45	0.44
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Economic Confidence Index	5.74	9.34	1.90	4.34	7.10	-2.15
	(0.32)	(0.47)	(0.45)	(0.45)	(0.47)	(0.19)
N	46,125	21,744	24,381	24,369	21,756	142,204

Data comes from Gallup World Poll Surveys 2014–15 and includes 46,125 respondents aged 15–24 years and 142,204 respondents aged 25–59 years from 145 countries/territories. Estimates are proportions and their corresponding standard errors. Afghanistan (2015), Botswana (2014), Liberia (2014 & 2015), Northern Cyprus (2014 and 2015), and Turkey (2014) were excluded, because of missing key variables used in the analysis

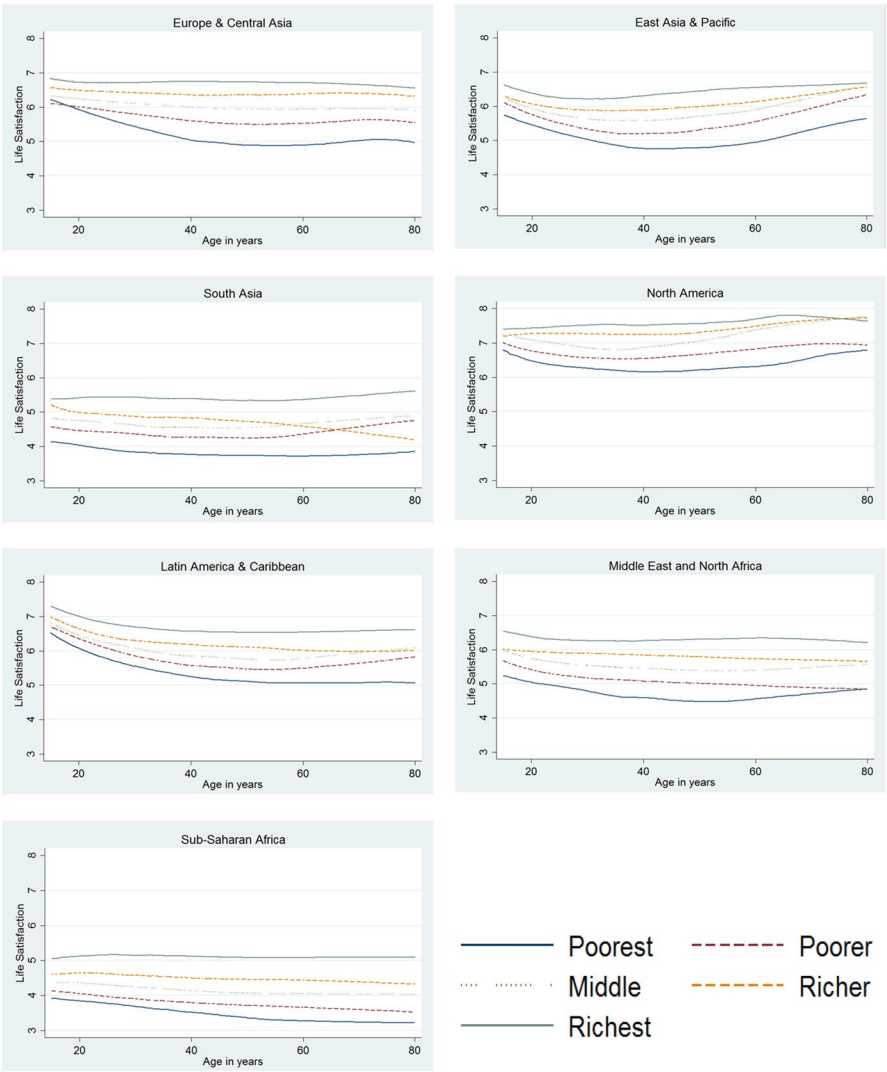

Fig. 3 Life satisfaction across the life course, by income quintile and region (non-spline version). Notes. Data comes from the Gallup World Poll surveys from 2014 and 2015, and data from seven regions: includes East and Central Asia ($N=98{,}350$), East Asia & Pacific ($N=38{,}033$), South Asia ($N=18{,}214$), North America ($N=6{,}626$), Latin America & Caribbean ($N=36{,}099$), Middle East & North Africa ($N=34{,}073$), and sub-Saharan Africa ($N=68{,}044$)

in the lowest quintile did not seem so different from the other quintiles. Results in Table 3 provide compelling evidence that the drop in life satisfaction among young people is the largest than at any other point in the life-course.

Table 3 Age group and income quintile effects on life satisfaction by region (corresponds to Fig. 3)

	Global	Global	ECA	EAP	S Asia	N America	LAC	MENA	SSA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15–24 years	-0.03***	-0.02***	-0.03***	-0.08***	-0.01	-0.04*	-0.08***	-0.06***	-0.01
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
25–34 years	-0.00	-0.00	-0.02***	0.00	-0.02**	0.01	-0.02***	0.01	-0.01**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
35–44 years	0.00	0.00	-0.01***	0.01	-0.00	-0.01	-0.02**	-0.02**	-0.01**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
45–54 years	0.01**	0.01**	-0.01***	0.01	0.00	0.02	-0.01	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
55 + years	0.01***	0.01***	0.01***	0.03***	-0.00	0.01	0.01**	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Poorer	0.45***	-0.46***	-2.09***	-0.58	-0.30	-1.34	-0.28	-0.29	-0.19
	(0.02)	(0.15)	(0.30)	(0.47)	(0.51)	(0.85)	(0.39)	(0.50)	(0.23)
Middle	0.76***	-0.14	-1.70***	-0.22	-0.06	-0.99	-0.08	0.04	0.12
	(0.02)	(0.15)	(0.30)	(0.47)	(0.51)	(0.85)	(0.39)	(0.50)	(0.23)
Richer	1.12***	0.22	-1.37***	0.01	0.17	-0.62	0.19	0.37	0.48**
	(0.02)	(0.15)	(0.30)	(0.47)	(0.51)	(0.85)	(0.39)	(0.50)	(0.23)
Richest	1.54***	0.64***	-1.07***	0.40	0.74	-0.42	0.66*	0.75	0.99***
	(0.02)	(0.15)	(0.30)	(0.47)	(0.51)	(0.84)	(0.39)	(0.50)	(0.23)
Male	-0.13***	-0.13***	-0.09***	-0.20***	-0.15***	-0.19***	-0.24***	-0.18***	0.01
	(0.01)	(0.01)	(0.02)	(0.03)	(0.04)	(0.06)	(0.03)	(0.03)	(0.02)
15–24 years*poorest		-0.04***	-0.11***	-0.04**	-0.03	-0.07**	-0.03*	-0.03	-0.02**
		(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)
Observations	272,986	272,986	90,426	35,733	15,997	6,065	34,017	31,518	59,230

Table 3 (continued)

	Global (1)	Global (2)	ECA (3)	EAP (4)	S Asia (5)	N America (6)	LAC (7)	MENA (8)	SSA (9)
R-squared	0.050	0.050	0.070	0.059	0.059	0.059	0.053	0.048	0.053

Data comes from Gallup World Poll Surveys 2014–15 and includes 46,125 respondents aged 15–24 years and 142,204 respondents aged 25–59 years from 145 countries/territories. Afghanistan (2015), Botswana (2014), Liberia (2014 & 2015), Northern Cyprus (2014 and 2015), and Turkey (2014) were excluded, because of missing key variables used in the analysis. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

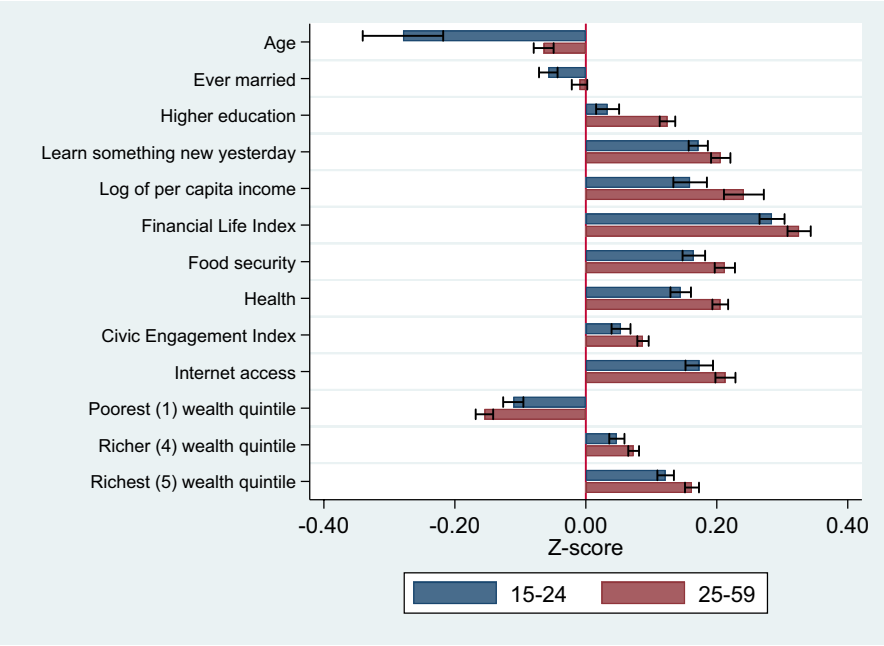

Fig. 4 Global: Selected global determinants of life satisfaction by age group. Notes. Data comes from the 2014 and 2015 Gallup World Poll surveys and includes approximately 58,000 young people aged 15–24 years and 241,000 old people aged 25–80 years

Determinants of Young People's Subjective Well-being

In this section, we report coefficient estimates of Eq. 1 estimated on different age groups. Figure 4 graphs the estimates of Eq. 1 for 15–24-year olds versus 25–59-year olds across the world for each of the explanatory variables taken one at a time. Figure 4 shows the outcomes that had statistically significant differences between the two age groups at the $p < 0.05$ level: age, ever married, higher education, learned something new in the preceding day, log of per capita income, Financial Life Index, Personal Health Index, Civic Engagement Index, internet access, and the poorest, richer, and richest income quintiles. The full set of estimates for variables as shown in Table 2 is available upon request.

Age (entered linearly) is negatively associated with life satisfaction for younger people, even within the very small band of 15–24, which again highlights a key finding in the data—the large drop in life satisfaction among young people. Being married is also negatively associated with life satisfaction, and the association is much stronger among young people. The effect size of all other determinants is larger for the older age group. Unsurprisingly, higher education had a larger association for older than younger people, likely because many young people have not yet completed higher education. The Financial Life Index has by far the largest association with life satisfaction for the older age group, followed by log of per capita income. Learning something new, food security, health, and internet access have similar

associations for the older age group; for the younger age group, health and log of income per capita matter less than learning something new, food security, and internet access. Living in a household in the poorest income quintile has negative associations for both age groups, while belonging to the richer or richest income quintiles has a positive association.

Results of Selected Variables by Income Quintile

To further explore the relationship between age and life satisfaction, we estimate the same determinants (one at a time) as above by age group and income quintile (Appendix Figures 5 and 6) to see if these correlations were stable across the country-income distribution. Among the younger age group, there are no statistically significant differences in age, ever being married, higher education, learning something new, health and civic engagement on life satisfaction by income quintile. For adults, effect sizes of variables such as health, food security and the Financial Life index tend to be higher among the richest quintile, but generally these are not statistically significant from the effect size of the lowest quintile except for the Financial Life index.

Unpacking the Indices

Three of the variables that display statistically different (stronger) associations with life satisfaction among adults relative to youth are indices (Financial Life, Personal Health and Civic Engagement). We unpack these indices to determine which individual indicators drive the strong associations with life satisfaction and how they differ across the life-course. Estimates of the individual components of the Financial Life Index are shown in Appendix Figure 7. All four individual components show stronger associations with life satisfaction among adults, the only statistically significant difference is for the indicator 'feelings about household income'. Appendix Figure 8 shows the individual estimates for the five components of the Personal Health Index—all these individual associations are statistically different across the age groups, and all are stronger among adults. The two strongest associations are estimated for the indicators of Sadness and Worry, and the weakest association is for Pain, for both age groups. Lastly, Appendix Figure 9 shows the components of the Civic Engagement Index. Here the only statistically significant association is for the indicator Donated to Charity, where the association is stronger for adults.

Discussion and Conclusion

We have examined in detail the prevalence and determinants of life satisfaction among the world's young people. Late adolescence and young adulthood are periods of rapid growth, development and social change for individuals and successful navigation of this tumultuous period can lay an important foundation for health and well-being throughout life. We find that in the age range considered in this study (15–59 years), the steepest decline in life satisfaction occurs during precisely this

period of life (age 15–24). Even more worrying is that income disparities in life satisfaction also emerge during this period and subsequently persist over the entire life-course. Specifically, globally the decline in life satisfaction among young people is even larger for those in the poorest country income quintile. This phenomenon holds in all regions of the world except South Asia and MENA. Moreover, in the three regions where overall life satisfaction is lowest, MENA, South Asia and SSA, the life satisfaction gap among youth in the poorest and richest quintile is the largest, reflecting the reality that children in some of the world's poorest countries already face adult realities and responsibilities by this age.

Regional differences in levels and determinants of life satisfaction have been situated within individualistic and collectivistic frameworks for adults and adolescents alike (Diener & Diener, 1995; Oishi et al., 2005; Park & Huebner, 2005; Proctor et al., 2009). Individualistic cultures, common among Western nations, highly value autonomy, independence, and personal feelings and interests, while self-criticism, interdependency, and family and social obligations are valued in collectivistic societies common among Asian cultures. In comparing life satisfaction across cultures, Park and Huebner (2005) find that Korean adolescents report lower life satisfaction compared to US adolescents. US adolescents also report higher satisfaction in the self-domain, compared to Korean adolescents, consistent with individualistic versus collectivist frameworks. Similar results have been found between Japanese and Swedish schoolchildren aged 10 to 15 years (Proctor et al., 2009; Tanaka et al., 2005). Our results confirm that levels of life satisfaction are indeed higher for the youngest age group in North America compared to EAP (Fig. 3).

More interestingly, however, is the decline in life satisfaction among individuals aged 15–24 years in the poorest quintile, which is more rapid in ECA and North America compared to EAP (Table 3). Prior literature has also found that economic factors contribute to regional differences in life satisfaction. For example, Oishi and colleagues (2009) demonstrate that people in wealthier nations report higher life satisfaction compared to people in poorer nations using Maslow's (1970) need-gratification theory. They further demonstrate that people in wealthier nations base their life satisfaction on higher levels of gratification, such as esteem needs (self-respect, freedom), while those in poorer nations base their life satisfaction on basic psychological and safety needs (food, thirst, security, protection). Veenhoven (1991) and Diener and Diener (1995) also find evidence that supports this theory. Among the poorest quintile, the effect of the Financial Life Index on life satisfaction is the largest in magnitude for youth and adults alike. For the poorest, the coefficient on Financial Life Index is statistically different from all other coefficients; it is also statistically different from the coefficient of the same index for the richest quintile, thus highlighting the crucial role of financial wellbeing in life satisfaction at all ages.

Despite broader cultural and economic factors that may drive similarities in youth and adults' response patterns within countries, there are striking differences that emerge between the age groups as well, reflecting perhaps different priorities and across the lifecourse. Lee and Yoo (2015) highlight the importance of family, school, and community lives as predictors of 12-year-old children's life satisfaction, while economic predictors such as GDP and inequality are not significant. In our

study, we did not find statistically significant differences between the age groups in social support from family or friends and satisfaction with the education system. However, other measures of family, school and community satisfaction, and indicators that better predict youth life satisfaction, such as used by Lee and Yoo (2015) are not included in the GWP dataset, so it is likely that we do not have the appropriate measures to capture these associations among young people. Among the variables included in our analysis, the main differences across the life-course in correlates of life satisfaction are education and health, both of which are more strongly linked to higher life satisfaction for adults as compared to young people. The difference in the association between health and life satisfaction between adults and young people is particularly noteworthy. A more detailed analysis shows that all individual components of the overall health index (sadness, worry, pain, well-rested and health problems) display stronger associations among adults relative to young people. Adults also report a lower mean score on the health index (Table 2) relative to young people, suggesting that health (both physical and mental) is a key channel for protecting life satisfaction among older adults. Again, young adults are more likely to be healthier, and so health per se may be less salient of a factor in determining their life satisfaction.

Some limitations of the study are important to note. First, the GWP data are based on self-reports, so that differential levels of reporting in life satisfaction and its determinants may reflect underlying age or cultural differences in question comprehension or social desirability. Second, as noted above, since the GWP is ultimately designed for adults, key factors that are important to the well-being of adolescents and young adults (such as body image or peer relationships) are not likely to have been captured in the data. Finally, we caution against inferring causal relationships from our analysis as our results are based on cross-sectional data.

The main contribution of this analysis is to document the highly sensitive nature of life satisfaction among the world's young people. Life satisfaction declines the most at this period compared to any other period of the life-course, and income disparities in life satisfaction manifest themselves at this age and then persist through life. Given the importance of remembered experiences in guiding future choices and actions, it follows that life satisfaction outcomes for young people can influence their future health and wellness through choices around school, work, life-style and intimate relationships. We have provided a broad overview of the correlates of life satisfaction among this age group relative to adults around the world. More detailed analysis at the country or regional level and the inclusion of appropriate measures of age-specific determinants of wellbeing will be necessary to understand in a causal framework the variations in life satisfaction that can guide policy so as to facilitate the successful transition to adulthood of one quarter of the world's population.

Appendix A Notes on calculations and sources

1. Missing variables: Not all questions were asked in every country in the Gallup World Poll, so the following adjustments were made:

A) The following countries were dropped from the analysis:

i. Afghanistan (2015) for missing the indicator on number of adults in household (WP12)
ii. Botswana (2014) for missing the indicator on number of adults in household (WP12)
iii. Liberia (2014 and 2015) for missing key income variables
iv. Northern Cyprus (2014 and 2015) for missing macro variables
v. Turkey (2014) data for missing the indicator on number of children in household (WP1230)

B) The following Index variables were replaced with region-year specific means:

Index	Year and Countries
Financial Life Index	2014: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, Netherlands, Slovenia, Spain, Sweden, Switzerland, UK
Diversity Index	2014: China, Malaysia 2015: China, Thailand
Economic Confidence Index	2014: China, Myanmar 2015: China
Law and Order Index	2014: China 2015: China, Vietnam
Social Life Index	2014: China 2015: China
Civic Engagement Index	2014: Algeria, Bahrain, Turkey 2015: Bahrain, Turkey
Diversity Index	2014: Algeria, Bahrain, Egypt, Jordan, Kuwait, Morocco, UAE 2015: Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine, Saudi Arabia, UAE, Yemen (replaced with 2014 regional mean because missing data for 13 of 16 countries)
Law and Order Index	2014: Algeria, Bahrain, Iran, Kuwait, Saudi Arabia, UAE 2015: Bahrain, Iran, Kuwait, Libya, Saudi Arabia, UAE
Diversity Index	2014: Rwanda, Senegal
Economic Confidence Index	2014: Sierra Leone
Financial Life Index	2014: Sierra Leone

C) The following macro variables were replaced with region-year specific means:

Variable	Year and Countries
Freedom (national average)	2014: Algeria, China, Iran, Myanmar, Vietnam 2015: China, Iran, Vietnam
Charity (national average)	2014: Algeria, Bahrain 2015: Bahrain, Turkey

Variable	Year and Countries
Corruption (national average)	2014: Algeria, Bahrain, China, Iran, Jordan, Kuwait, Saudi Arabia, UAE, Vietnam 2015: Bahrain, China, Iran, Jordan, Kuwait, Libya, Saudi Arabia, UAE, Vietnam
Confidence in government (national average)	2014: Algeria, Bahrain, Burundi, Cambodia, China, Iran, Jordan, Kuwait, Morocco, Myanmar, Rwanda, Saudi Arabia, Sudan, Tajikistan, UAE, Uzbekistan, Vietnam 2015: Bahrain, Cambodia, China, Jordan, Kuwait, Libya, Morocco, Myanmar, Rwanda, Saudi Arabia, Syria, Tajikistan, UAE, Uzbekistan, Vietnam
Log of GDP per capita	2014: Somalia, Taiwan 2015: Palestine, Somalia, Syria, Taiwan
Average GINI	2014: Afghanistan, Algeria, Bahrain, Belize, Hong Kong, Kuwait, Lebanon, Malta, Myanmar, New Zealand, Puerto Rico, Saudi Arabia, Singapore, Somalia, South Korea, South Sudan, Taiwan, UAE, Zimbabwe 2015: Bahrain, Kuwait, Lebanon, Libya, Malta, Myanmar, New Zealand, Saudi Arabia, Singapore, Somalia, South Korea, South Sudan, Taiwan, UAE, Zimbabwe
Household GINI	2014: Somalia 2015: Botswana, Libya, Somalia, Syria

2. Sources

   a Governance indicators were taken from the World Governance Indicators database. Indicator construction was based on Appendix 2 of the World Happiness Report 2016. Demographic quality is the average of voice and political stability. Delivery quality is the average of government effectiveness, corruption and rule of law. Data was accessed on June 1st, 2017.

   b The GINI index (2000–2013 average) and household GINI data were retrieved from Chapter 2 of the World Happiness Report 2016. Data is available online. We used 2013 data for Morocco and Nigeria for 2014, and for 2015 for Iceland. We used 2011 data for Mozambique for 2015, as it was the latest available estimate. South Sudan. Uganda and Zambia used 2014 data for 2014 and 2015.

   c We also used healthy life expectancy data from Chapter 2 of the World Happiness Report 2016. When missing, we used from the World Health Organization: 2014: Algeria, Iceland, Libya, Morocco, Nigeria, Syria; 2015: Afghanistan, Albania, Algeria, Angola, Belize, Bulgaria, Burundi, Hong Kong, Iceland, Jamaica, Mauritius, Mozambique, Namibia, Puerto Rico, South Sudan, Sudan, Uganda, Zambia. Data was accessed on June 5th, 2017.

   d The log of GDP per capita was taken from the World Development Indicators database. We used a 2011 estimate for Libya (latest available), a 2015 estimate for Somalia instead of 2014, and a 2007 estimate for Syria (latest available). GDP per capita growth rates were used to calculate GDP per capita in 2014 and 2015 for Iran, Mauritania, Puerto Rico, and Venezuela. Estimates for Taiwan were retrieved from the Trading Economics website. Data was accessed on June 19th, 2017.

   e 2014 household income Gini estimates were used for 2015 for the following countries: Bahrain, Bulgaria, Iceland, Kenya, Mongolia, Mozambique, Nigeria, Poland, South Sudan, Turkey, Uganda and Zambia.

Appendix B

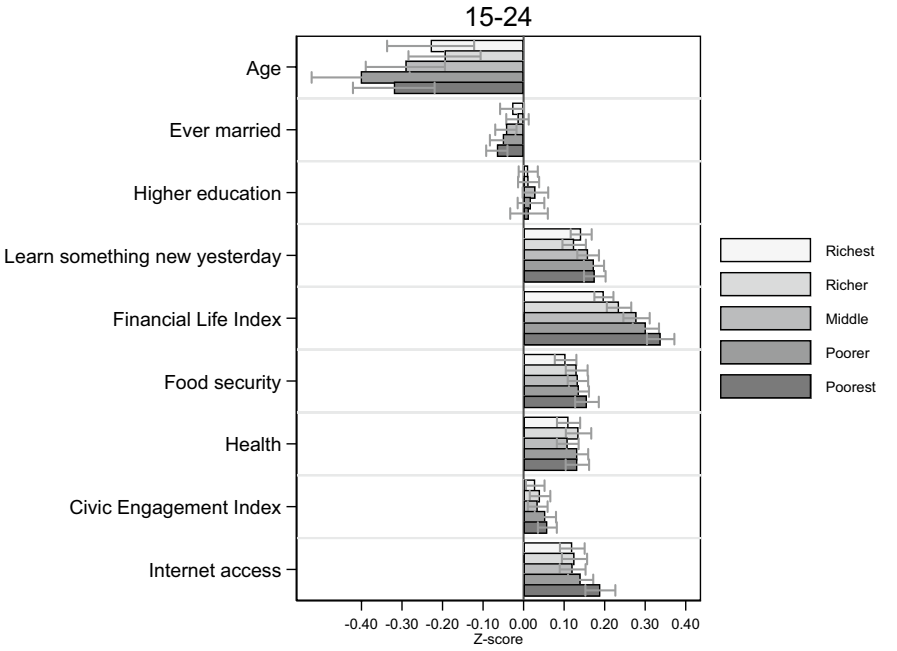

Fig. 5 Determinants of subjective wellbeing by income quintile, 15–24

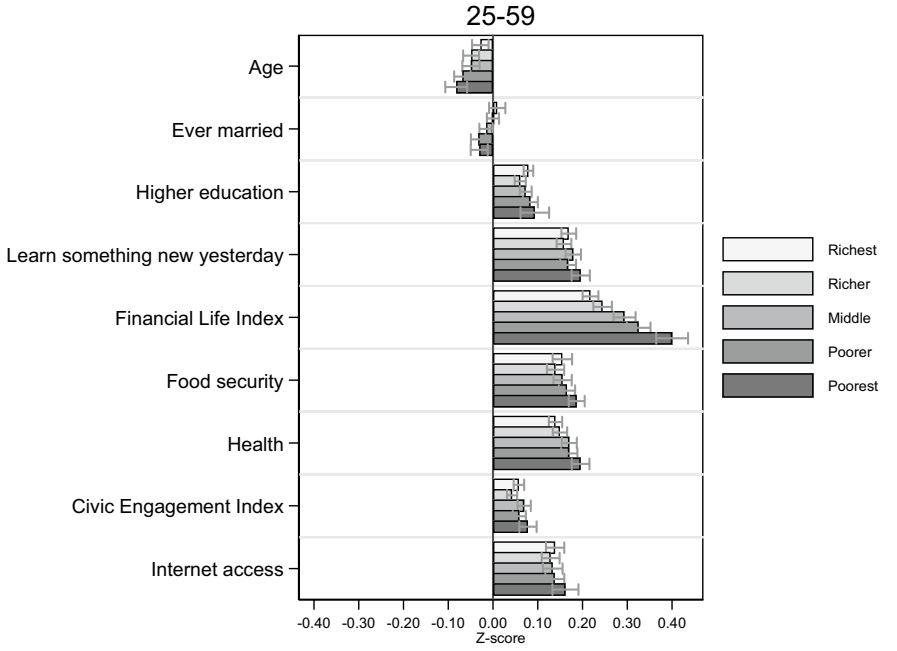

Fig. 6 Determinants of life satisfaction by income quintile, 25–59

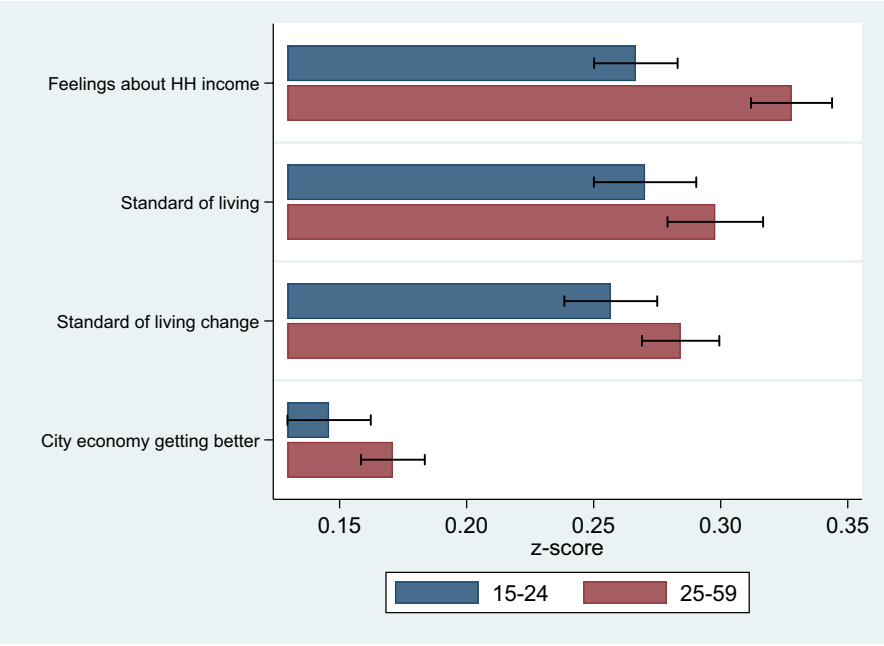

Fig. 7 Unpacking the Financial Life Index

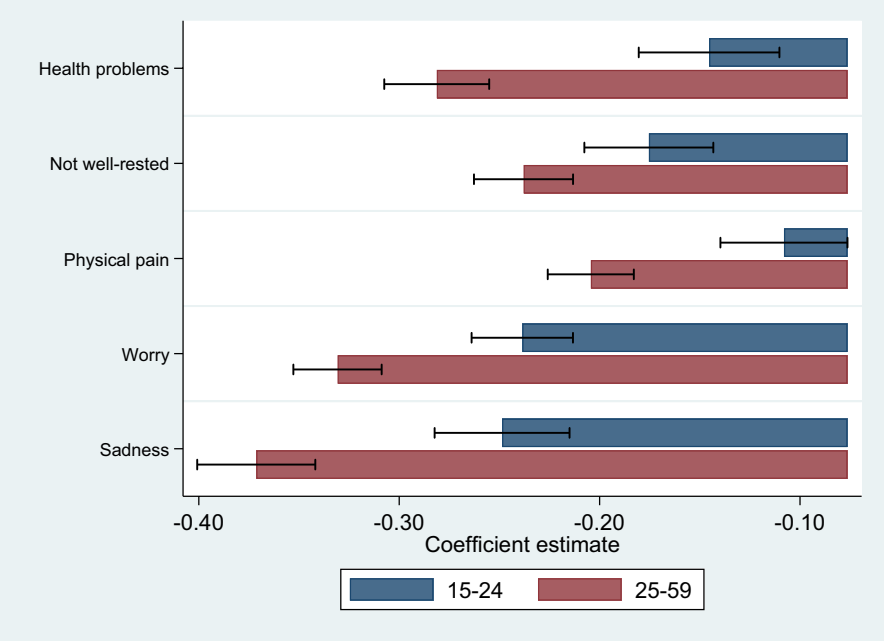

Fig. 8 Unpacking the Personal Health Index

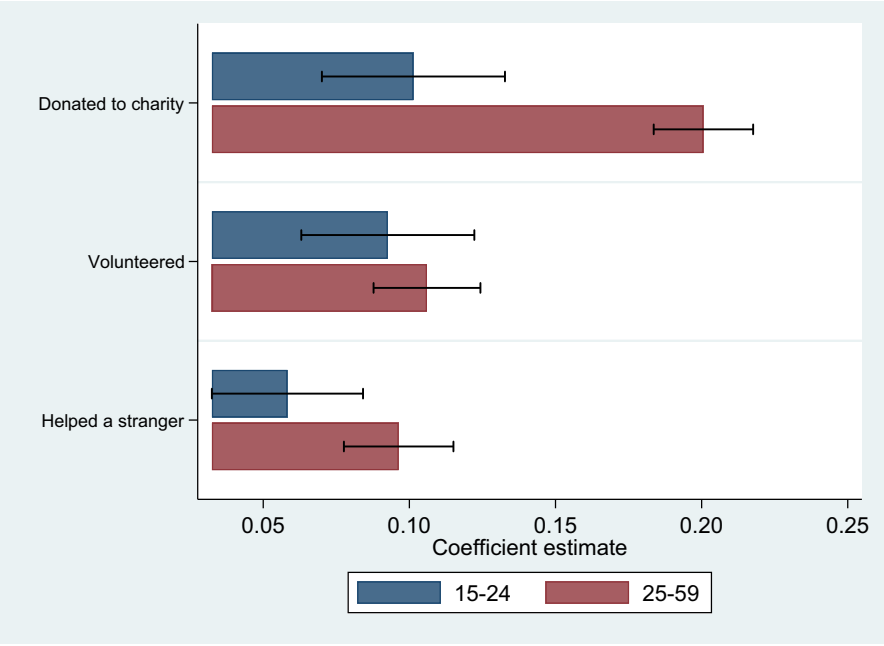

Fig. 9 Unpacking the Civic Engagement Index

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Author Contribution SH and GH conceptualized the study. AP and SH analysed the data. SH wrote the first draft of the manuscript, and all authors contributed to subsequent manuscript revisions.

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Data Availability The Gallup World Poll data that support the findings of this study were provided under a license to the authors and the UNICEF Office of Research – Innocenti, and are not publicly available.

Code Availability Relevant Stata code is available from the corresponding author on reasonable request.

Declarations

Ethics Approval This analysis used secondary data and was therefore no ethical approval was required for this study.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflicts of Interest The authors declare that they have no conflict of interest. The views expressed in this article are those of the authors and not the policies or views of affiliated institutions.

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