CEPREMAP

CENTRE POUR LA RECHERCHE ECONOMIQUE ET SES APPLICATIONS

Age-specific income inequality and happiness over the life cycle

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Inégalités de revenu par âge et satisfaction au cours de la vie[1]

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Résumé : L'un des principaux paradoxes soulevés par l'économie du bonheur est la relation dynamique en forme de U entre l'âge et le bonheur déclaré, avec un nadir au milieu de la vie, autour de 50-55 ans. Dans cet article, nous montrons que le milieu de la vie est également le moment où l'inégalité des revenus au sein d'un même groupe d'âge est la plus forte. Nous montrons également qu'une plus grande dispersion des revenus au sein d'un même groupe d'âge s'accompagne d'une moindre satisfaction dans la vie. En outre, cet impact négatif est plus fort pour les personnes dont le revenu est inférieur au niveau médian de leur groupe d'âge. Par conséquent, les effets de comparaison et d'aversion à l'inégalité de revenu pourraient contribuer à expliquer l'évolution de la satisfaction au cours du cycle de vie.

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Keywords : MLife satisfaction, life cycle, age-specific income inequality, I31, H24

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Abstract

One of the main puzzles uncovered by the happiness literature is the U-shaped relationship between age and self-declared happiness, with a mid-life nadir, around 50-55. In this paper, we show that mid-life is also the moment when within-age income inequality is at its most. We also show that greater within-age income inequality comes with lower life satisfaction. Moreover, this negative impact is stronger for those whose income is below the median level in their age-group. Hence, relative income concerns seem to be a factor of the trough in the age-happiness curve.

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Résumé

L'un des principaux paradoxes soulevés par l'économie du bonheur est la relation dynamique en forme de U entre l'âge et le bonheur déclaré, avec un nadir au milieu de la vie, autour de 50-55 ans. Dans cet article, nous montrons que le milieu de la vie est également le moment où l'inégalité des revenus au sein d'un même groupe d'âge est la plus forte. Nous montrons également qu'une plus grande dispersion des revenus au sein d'un même groupe d'âge s'accompagne d'une moindre satisfaction dans la vie. En outre, cet impact négatif est plus fort pour les personnes dont le revenu est inférieur au niveau médian de leur groupe d'âge. Par conséquent, les effets de comparaison et d'aversion à l'inégalité de revenu pourraient contribuer à expliquer l'évolution de la satisfaction au cours du cycle de vie.

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Introduction

Over three decades of blooming research, the happiness literature has unearthed a small number of robust and ubiquitous stylized facts. This paper suggests that the most unquestioned one, the impact of income comparisons on happiness, could contribute to explain the most puzzling one, the U-shaped age-happiness curve.

The relationship between age and self-rated happiness over the life cycle has attracted a lot of attention among scholars. In most countries of Europe, Asia and America, this relation is best depicted by U-shaped curve, with the exception of the very end of life, when health undergoes a serious degradation (Wunder et al. 2013; Deaton 2018). This evidence comes from widely used repeated cross-sectional international surveys, as well as large national surveys. This relationship is found for self-declared happiness, life satisfaction or other measures of mental health (Blanchflower and Oswald 2008), with or without controls for socio-economic and demographic characteristics (Stone et al. 2010; Frijters and Beatton 2012; Cheng et al. 2017). Conversely, suicide risk and antidepressant consumption exhibit a symmetrical midlife peak (Daly 2009).

This turning point comes as a surprise for most people. Physical weakening, loss of several potentialities, and shorter life expectancy, these companions of ageing do not seem to be potential factors of higher happiness.

Some hypotheses have been proposed, to explain the puzzle. The first one points to the distribution of time-consuming and effort-intensive activities, such as paid-work and raising children, which happens to mirror the U-shape of happiness over the life cycle. Another explanation interprets the so-called "mid-life crisis" as the moment when adjusting and giving up on unmet aspirations is most painful, but will give way to a more appeased stage (Schwandt 2015; Castellacci and Schwabe 2020). This shape could also simply be due to hormonal factors, as is suggested by a provocative paper about the mid-life low of chimpanzees and orangutans (Weiss, et al. 2012). Finally, the U-shape could be hiding a cohort effect instead of the assumed age effect (De Ree and Alessie 2011), although this is not

very likely, given that it has been observed in a large number of different countries and periods.

Another well-established stylized fact coming from the happiness literature is the influence of income gaps and comparisons on life satisfaction. Essentially, the idea is that a person's life satisfaction does not solely depend her own circumstances, but also, and perhaps primarily, on the gap between hers and that of a reference group, which serves as a benchmark. In this framework, inequality is bound to be deleterious to happiness. It is a consensual observation of the happiness literature that people mostly compare to their colleagues and professional peers, and also to their neighbors, friends and family members, as well as former schoolmates. Hence, a person's reference group is largely made of their age-peers. Here, we thus focus on the degree of income inequality within age groups and show that it contributes to the age-happiness puzzle.

Data and Empirical Approach

We use the publicly available 2013 SILC survey, which gathers nationally representative samples from 32 European countries. We consider all the relevant subjective wellbeing indicators available in the survey, i.e. life satisfaction, financial satisfaction, job satisfaction and satisfaction with personal relations. We also build a synthetic index of these variables (Kling et al. 2007).

Table 1 presents the descriptive statistics of the regression sample.

Table 1. Descriptive statistics of the regression sample

Variables	N = 246,630[1]
Age	47 (25 - 65)
Country-specific Age-group Gini	0.32 (0.20 - 0.46)
Life satisfaction	6.92 (0.00 - 10.00)
Financial satisfaction *(302 missing)*	5.84 (0.00 - 10.00)
Personal relationship satisfaction *(168 missing)*	7.85 (0.00 - 10.00)
Job satisfaction *(86,647 missing)*	7.25 (0.00 - 10.00)
Disposable income	31,817 (0 - 2,111,185)
Sex *(2 missing)*	
Female	135,497 (55%)
Male	111,131 (45%)
Status in employment	
Employee	203,669 (83%)
Family worker	2,525 (1.0%)
Self-employed with employees	7,251 (2.9%)
Self-employed without employees	21,851 (8.9%)
Unknown	11,334 (4.6%)
Marital status *(37 missing)*	
Divorced	21,853 (8.9%)
Married	156,045 (63%)
Never married	55,215 (22%)
Separated	4,162 (1.7%)
Widowed	9,318 (3.8%)

[1] *Mean (Range); n (%)*

For each age *a* between 25 and 65 in country *c*, we define *age-group a* as the subsample of individuals aged in the range of [*a-2 , a+2*] in country *c*. We construct *country-specific age-group Gini* as the Gini index of disposable income within each *age-group a* in each country *c*, where disposable income includes after-tax income and capital revenue, as well as social

benefits and pensions. We define a dummy variable *Poor,* equal to 1 if the individual's disposable income is below the median income in their country, and 0 otherwise.

We estimate the age-specific life satisfaction ($LS_{i,c}$) following equation (1) and display the values of δ_a for each age as well as the age-specific Gini indicator on Figure 1. For visual display, the values of the δ_a parameters and the Gini indicators have been normalized.

$$LS_{i,c} = \alpha + \delta_a * Age_a + \theta * X_{i,c} + \epsilon_{i,t} \quad \textbf{(1)}$$

where Age_a is a dummy that takes value 1 if individual i is of age a and 0 otherwise; and $X_{i,c}$ is a vector of socio-demographic controls including log disposable income, country, marital status, employment status, and gender fixed-effects.

We estimate life satisfaction following equations (2) and (3).

$$LS_{i,c} = \alpha + \delta * age_i + \gamma * age_i^2 + \phi * \text{Country-specific Age-group Gini}_{i,c} + \theta * X_{i,c} + \epsilon_{i,t} \quad \textbf{(2)}$$

$$LS_{i,c} = \alpha + \beta * \text{Country}_c + \delta * age_i + \gamma * age_i^2 + \phi * \text{Age-group Gini}_{i,c} + \eta * \text{Country-specific Age-group Gini}_{i,c} * Poor_{i,c} + \mu * Poor_{i,c} + \psi * \text{Log disposable income}_i + \theta * X_{i,c} + \epsilon_{i,t} \quad \textbf{(3)}$$

Where the coefficient of interest η measures the additional impact of being poor on the association between age-group Gini and life satisfaction.

Results

Figure 1 displays the estimate of life satisfaction following equation (1). It appears that the patterns of subjective well-being and age-specific income inequality are the mirror image of each other. Figure 2 illustrates the similarly U-shaped pattern of an array of other subjective wellbeing measures, and a synthetic index thereof, over the life cycle.

Figure 1. Within-age-group Gini index mirrors the Life Satisfaction U-shape over age

Variable ● Gini ● Life Satisfaction
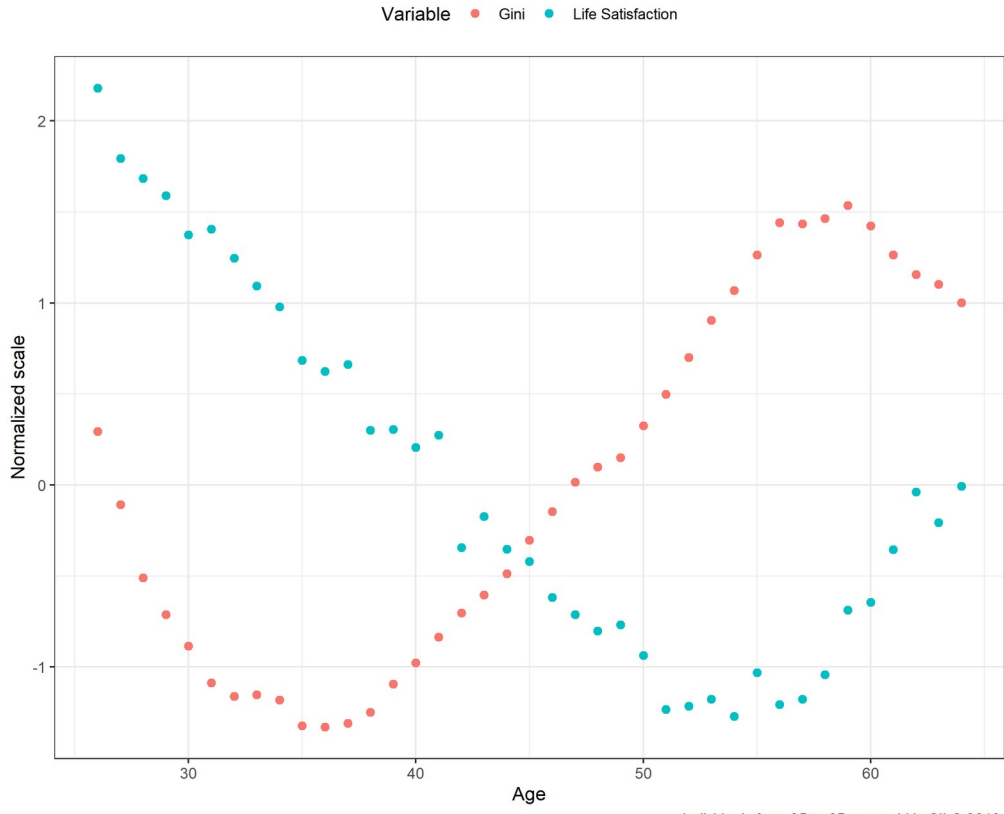
Individuals from 25 to 65 years old in SILC 2013.
Life Satisfaction values are age-specific fixed effects, controling for sex, income, country, marital and job status.
Gini values are arithmetical averages across countries of the age group Gini in the country.

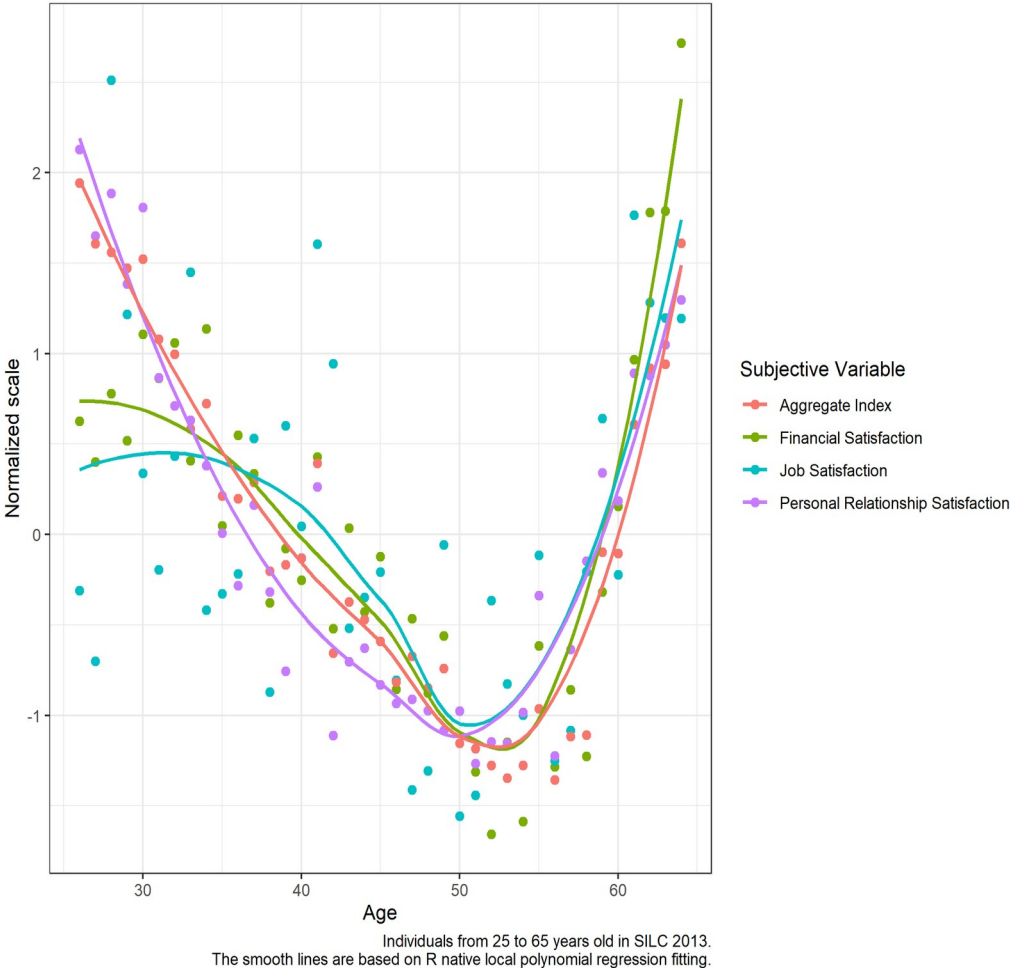Figure 2. The U-Shape of Alternative Measures of Subjective Well-Being

Individuals from 25 to 65 years old in SILC 2013.
The smooth lines are based on R native local polynomial regression fitting.

Table 2 displays OLS estimates of life satisfaction following equations (2) and (3). Columns (1) displays the classic regression of life satisfaction; column (2) replaces age and age squared with the Gini indicator, column (3) includes them altogether, and column (4) displays the estimate of equation (3). It shows that life satisfaction decreases with age-specific income inequality (columns 2 and 3), and that this negative effect is magnified for the poor, i.e. people living with less than the median income in their country (column 4).

Table 2. Age, Income Inequality, and Life Satisfaction

	Dependent variable:			
	Life Satisfaction			
	(1)	(2)	(3)	(4)
Age	-0.124***		-0.126***	-0.130***
	(0.003)		(0.003)	(0.003)
Age Square	0.001***		0.001***	0.001***
	(0.00003)		(0.00003)	(0.00003)
Country-specific Age-group Gini		-3.150***	-0.762***	
		(0.152)	(0.194)	
Country-specific Age-group Gini - 0.3				-0.454**
				(0.216)
Poor				-0.341***
				(0.011)
Poor x (Country-specific Age-group Gini - 0.3)				-0.750***
				(0.184)
Log Disposable income	0.586***	0.591***	0.586***	0.437***
	(0.005)	(0.005)	(0.005)	(0.007)
Constant	4.528***	2.282***	4.767***	6.390***
	(0.090)	(0.077)	(0.109)	(0.105)
Additional controls :				
Country	Yes	Yes	Yes	Yes
Marital Status	Yes	Yes	Yes	Yes
Employment Status	Yes	Yes	Yes	Yes
Sex	Yes	Yes	Yes	Yes
Observations	246,591	246,591	246,591	246,591
R²	0.210	0.202	0.210	0.214
Residual Std. Error	1.889 (df = 246547)	1.898 (df = 246548)	1.889 (df = 246546)	1.884 (df = 246544)

Note: *p<0.1; **p<0.05; ***p<0.01

The following controls are also included in the regression : Country, Sex, Marital Status, Employment Status
The Country-specific Age-group Gini is translated in regression (4) so that the fixed effect for Poor is the one for a Gini of 0.3

Discussion and Conclusion

These pieces of evidence show that age-specific income inequality reaches its highest degree in the vicinity of the mid-life point of European citizens. This is also the moment when their self-declared life satisfaction falls to its lowest level. We propose that the former is one of the reasons for the latter, and that this is due to the well documented aversion for disadvantageous income gaps, and for income inequality in general. Competition for relative positions peaks in mid-life, with an adverse effect on life satisfaction.

As discussed by Deaton[5], economists usually insist on the necessity to prioritize the support to the younger and the elder segments of the population, based on their lower income levels, but

not their self-stated happiness. Our results point to another type of policy measures that would redistribute income not across but within age groups.

Acknowledgments

Data availability

The data used for this research is available online. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology

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