Top Incomes and Human Well-being Around the World

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Abstract

The share of income held by the top 1 percent in many countries around the world has been rising persistently over the last 30 years. But we continue to know little about how the rising top income shares affect human well-being. This study combines the latest data to examine the relationship between top income share and different dimensions of subjective well-being. We find top income shares to be significantly correlated with lower life evaluation and higher levels of negative emotional well-being, but not positive emotional well-being. The results are robust to household income, individual's socio-economic status, and macroeconomic environment controls.

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There is a growing concern within the social science community over the economic and social implications of the persistent rise in top income shares in the United States and in most other rich countries around the world over the last three decades. Although much of the recent economic research on the topic of income inequality has focused on the identification of the "Top 1 percent"[1] and their dynamics over a long period of time (Atkinson, Piketty, & Saez, 2011; Burkhauser et al., 2012; Piketty & Saez 2014), we continue to know very little about the possible links between the rising share of national income accruing to the top percentile and aggregated well-being. Does income inequality at the very top matter to the average life evaluation when household income is held constant? What about the emotional quality of an individual's everyday experiences, that is, the frequency and intensity of experiences of joy, sadness, anger, and affection that make one's life pleasant or unpleasant? In other words, do the majority of people even care about the rising income shares of a small number of individuals in their country? Although these are difficult questions, they are important to our understanding of the welfare implications of rising top income shares around the world.

Our paper is the first to empirically link the rising share of national income accruing to the top percentile to aggregated well-being. Using data from the Gallup World Poll, we first present econometric evidence showing that top income shares strongly predict lower individual life evaluation and higher negative emotional daily experiences, but in most cases are not significantly correlated with positive emotional daily experiences. The magnitude of the negative top income shares coefficient in the life evaluation equation is quantitatively

[1] The top income literature is based on income tax records. Hence it focuses on the share of taxable income held by the top 1 percent of tax unit where a tax unit can be an individual or a family. The survey literature primarily focuses on households. See Burkhauser et al. (2012) for a discussion of this distinction in the context of the top income literature.

important as well as statistically significant. Holding other things constant—including log of GDP per capita, own income, and the income of a reference group—a 1% increase in the share of taxable income held by the top 1 percent has an equivalent impact on life evaluation as a 1.4% increase in the country-level unemployment rate. In a later analysis, we are able to replicate our earlier results using the British Household Panel Study (BHPS), a long-running household panel that contains life evaluation information as well as household income data. Overall, our results indicate that top income shares are one of the most statistically important and sizeable country-level determinants of international differences in how people around the world evaluate their lives.

I. Background

In recent years there has been an accumulation of empirical evidence suggesting that individuals are less satisfied with life when income inequality is high (e.g., Blanchflower and Oswald, 2003; Alesina et al., 2004; Schwarze and Harper, 2007; Ferrer-i-Carbonell and Ramos, 2009; Verme, 2011; Oishi and Kesebir, forthcoming)[2]. Yet, a more careful look into the literature suggests that the relationship between income inequality and subjective well-being (SWB) may be more complex than what it might appear to be on the surface. For example, a study by Alesina et al. (2004) shows that although European respondents' life satisfaction are substantially lower in countries where income inequality is high, such correlation is not found across states for the American sample in general. However, it seems that context matters and a closer look at the data reveals that the rich (top half of the income distribution) in America are inequality averse whereas the poor are indifferent to income inequality. The opposite is true for European citizens. The authors argue that these differences are expected because most Americans believe that they live in a highly mobile society where effort is the main determinant of income, which implies that most people who

[2] For a recent comprehensive review of the literature, see Ferrer-i-Carbonell and Ramos (2014).

are not at the top of the income distribution can perceive any income inequality as fair. Nevertheless, their finding that most Americans do not dislike income inequality appears to be in contrast with the results obtained by Blanchflower and Oswald (2003) who use the U.S. General Social Survey to show that income inequality, measured by the ratio of the mean of the fifth earnings quintile to the mean of the first, has a negative but small relationship with happiness.

The relationship between income inequality and SWB can also be positive as well as negative, especially in non-Western countries. A study by Sanfey and Teksoz (2007) shows that the association between income inequality, measured by the Gini coefficient, and self-rated happiness in the World Values Survey is negative in transitional countries and positive in non-transitional countries. In another study, Senik (2004) finds that the Gini coefficient is positive albeit statistically insignificantly different from zero in life satisfaction regressions for Russia. Jiang et al. (2012) find a positive and statistically significant association between life satisfaction of rural migrants and the Gini coefficient measured at the city-level in urban China. Using Latin American data, Graham and Felton (2005) show that happiness is highest for individuals living in medium inequality countries rather than in low or high inequality countries. In short, it appears that in some countries income inequality might in fact be good for SWB.

There is little empirical attempt in the literature to check the robustness of the results to different ways of measuring income inequality. With very few exceptions, the majority of studies in the literature use Gini as the measure of income inequality in the estimation of SWB regression equations. Although the Gini coefficient is widely accepted as a measure of income inequality, it also has its own fair share of limitations. Since the Gini coefficients are normally derived using survey data, it does a very good job at capturing the income distribution for the bottom 99 percent of the population, but a poor job (relative to tax record

data) at measuring the top 1 percent. Additionally, the Gini coefficient gives equal weight to inequality at the top, middle, and bottom of the income distribution, thus making it less sensitive to changes at the tails compared to alternative measures of income inequality that give more weights to the tails of the distribution, e.g., the Theil 0 and 2 measures of income inequality. This would not necessarily pose a problem for researchers who are not concerned about changes in the income distribution at the very top. However, it does pose a problem when changes in the income distribution come mainly from an increase in the share of income held by people at the top 1 percent of the income distribution.

Another drawback of the Gini index is that their measurements obtained from different databases – namely, the World Income Inequality Database (WIID), the United Nations University and the World Institute for Development Economics Research (UN-WIDER), and the Luxembourg Income Study (LIS) – are often not comparable with one another (for a review, see Atkinson and Brandolini, 2001). While Atkinson and Brandolini (2001) have recommended the LIS as the best source for the Gini coefficients, as it employs a consistent methodology across countries for measuring income and calculating income inequality, its main limitation is that it contains very infrequent observations of income inequality across countries and time. For example, the LIS only contains three observations of the Gini coefficients between 2001-2010 for Australia, the United Kingdom, and the United States, which inevitably limits the scope for careful econometric analysis that allows for country-specific dummy in the regression (Leigh, 2007).

The current study attempts to contribute to the literature by introducing the latest data from the World Top Incomes Database (WTID) on the share of incomes held by the top 1 percent as an alternative measure of income inequality. There are pros and cons to using top incomes shares data as a measure of income inequality in a subjective well-being regression equation. First, the tax record data are imperfect. The share of taxable income held by a given

percentile varies according to who is taxed, and the data are not adjusted for tax evasion and tax avoidance. Further, because the data measure national income inequality, the data vary only temporally and may reflect trends in other factors that also temporally vary, such as changes in medical technology.

Overall, these shortcomings are more than counterbalanced by five attractive features of tax record data. First, the administrative data measure income for samples that over time are more consistent in whom they include than other data sets—because the data include all taxes paid and all tax-paying units. Second, the data cover information about the top part of the income distribution, which is difficult to capture fully in survey data. Third, the measure correlates well with a country's Gini coefficient (Leigh, 2007). Fourth, the top income shares data are observed much more frequently than the Gini coefficient. And finally, it is hypothesized that individual's well-being will be more sensitive to information on a country's top income shares than the Gini coefficient, simply because changes in the former tend to be more widely reported in the media and comparatively easy for people to understand than changes in the latter.

II. Conceptual Issues

There is little economic theory in this field to link top income shares with an individual's SWB. One hypothesis is that the rise in top income shares affects people's well-being indirectly through its effect on economic growth, which may be either positive or negative.[3] For example, assuming that the marginal propensity to save is higher for the rich

[3] For studies that focus on detailed theoretical discussions on the links between inequality and growth, see, for example, Kaldor (1957), Galor and Zeira (1993), Aghion, Caroli, and Garcia-Peñalosa (1999), and Bénabou (2005).

than for the poor, a rise in top income shares should lead to an increase in national savings. Higher savings should, in turn, reduce the price of capital and raise investment, thus leading to more growth (e.g., Kaldor, 1957) and a potential increase in income for everyone through future redistribution (Adelmann & Robinson, 1989). In contrast, recent endogenous growth models have indicated that a rising income inequality may in fact cause socio-political instability that pressures government to produce policies that allow private individuals to appropriate less of the returns to the promotion of growth activities such as accumulation of human capital and productive knowledge (e.g., Alesina & Rodrik, 1993, 1994; Persson & Tabellini, 1994; Saint Paul & Verdier 1996).

The empirical evidence linking income inequality (not necessarily top income shares) and future growth is mixed. Findings on income inequality range from a positive correlation with future growth (e.g., Li & Zou, 1998; Forbes, 2000; Andrews, Jencks, & Leigh, 2011) to negative and quantitatively important (e.g., Clark, 1995; Alesina & Perotti, 1996; Deininger & Squire, 1998; Halter, Oechslin, & Zweimüller, 2014). Moreover, although economic growth has mainly been found not to be associated positively with an increase in long-term aggregate happiness or life satisfaction (e.g., Easterlin, 1974, 1995; Clark, Frijters, & Shields, 2008), recent evidence indicates that negative growth strongly predicts lower life satisfaction for many countries around the world (De Neve et al., 2014). Thus, depending on the true relationship between income inequality and economic growth, rising top income shares could either have a statistically insignificant relationship or a negative relationship with an individual's SWB.

Another channel through which rising top income shares may impact SWB is its possible implications for an individual's health outcomes. A rise in top income shares may, for example, promote residential segregation between the rich and the poor, thus diminishing the opportunities for social cohesion, which is considered important for both public health

and well-being (Wilkinson, 1996; Kawachi & Kennedy, 1997). There is also evidence that rising income inequality changes the nature of the political institutions and the policies that politicians pursue to balance the relative well-being of the rich and the poor. For example, Maria Araujo and co-authors (2008) and Angus Deaton (2013) suggest that income inequality is associated with the allocation of public goods related to health, such as immunizations and the provision of subsidized medical care. This line of reasoning implies that children, particularly those in households with few resources, will receive fewer health inputs if they grow up during periods of greater income inequality. In principle, these mechanisms may operate in response to local or national income inequality.

Empirical evidence on the link between top income shares and health outcomes is scarce. One exception is a study by Lillard et al. (2015), who find that the self-reported health of adults in the United States is negatively associated with the share of taxable income held by the top 1 percent when they were children. In addition, long-run evidence shows that the U.S. Senate tends to prefer policies that maintain the status quo more than redistributive and social transfer policies when the top income share is high (Enns et al., 2014). This implies that the relative differences in public good provision by top incomes shares may have a significant influence over a person's SWB.

Other than through economic growth, an individual's income, and health, economic models would predict that a rise in top income shares may also have an impact on an individual's SWB through its effects on poverty (Ravallion, 2001), crime rates (Kennedy et al., 1998), and unemployment rates (Krugman, 1994).

Economic theories indicate that the remaining relationship between top income shares and an individual's SWB, after we can condition for these important transmission mechanisms, should be small and/or statistically insignificantly different from zero.

However, recent research on the Range-Frequency Theory (RFT), in which people gain utility from (i) the ranked position of their income within a comparison group and (ii) the distance between their income and the incomes of the bottom and top earners within a comparison group, suggests the possibility of another channel—one that is purely psychological—through which rising top income shares can affect an individual's SWB.

Although economists rarely consider the implications of rank and range in utility functions,[4] the psychologist Allen Parducci (1965, 1995) has long argued that the ordered position of an individual and the distance from the bottom and the top ranked person within a ranking matters in a fundamental way to the individual's SWB through its effect on rank- and range-based status. He proposes that feelings triggered by a stimulus are determined by both its position within a range and its ordinal position more than through comparison to a social reference-group norm. Parducci's stylized model assumes an ordered set of *n* items:

$$\{x_1, x_2, \dots, x_i, \dots, x_n\} \tag{1}$$

If M_i is the subjective psychological magnitude of x_i, then the magnitude is taken to be the simple convex combination of

$$M_i = kR_i + (1-k)F_i, \tag{2}$$

where R_i is the range value of stimuli *i*,

$$R_i = \frac{x_i - x_j}{x_n - x_1}, \tag{3}$$

and F_i is the ranked ordinal position of stimuli *i* in the ordered set,

[4] Much of the research in this area tends to focus on the relationship between mean or median income of a reference group and individuals' SWB (e.g., Clark & Oswald, 1996; Ferrer-i-Carbonell, 2005; McBride, 2001), but little attention has been paid to the rank-based effect of income in a comparison group.

$$F_i = \frac{i-1}{n-1}. \quad (4)$$

The subjective magnitude of a stimulus is then a weighted average of R_i and F_i. It is a convex combination of (a) the position of the stimulus along a line made up of the lowest and highest point in the set, and (b) the rank ordered position of the stimulus with regard to the other contextual stimuli. In summary, Parducci's psychological model suggests that ordinal ranking matters—and matters greatly—to human well-being.

Some evidence exists at the micro level showing that rank income predicts an individual's satisfaction better than reference or absolute income. Using a nationally representative sample of British workers, Brown et al. (2008) find evidence consistent with the rank-income hypothesis by showing that an individual's satisfaction with pay is largely determined by the individual's ranked position within the workplace. Boyce, Brown, and Moore (2010) show that the ranked position of an individual strongly predicts the individual's life satisfaction, but that absolute income and reference income have statistically insignificant predictive power. Clark, Westergård-Nielsen, and Kristensen (2010) show that, conditional on individuals' own household income and neighborhood median income, individuals become more satisfied with their income as their percentile neighborhood ranking improves. More recently, Card et al. (2012) find that the effect of disclosing information on peers' salaries on workers' job satisfaction is a function of the individual's rank in the salary position rather than of the individual's relative pay level. They also find that the negative treatment effect is the largest among workers in the lowest quintile of the pay distribution of their pay unit. However, the economics literature is currently small, and evidence of rank-based comparison at the macro level is virtually nonexistent.

Assuming that people care greatly about their ranked position in the income distribution but have a poor idea about their true ranking within a country,[5] information (either through everyday observation or through the media) about a rise in the share of income held by the top 1 percent may *ceteris paribus* lead to a belief by individuals down the income distribution that it will become more difficult for them to move up the income rank. This psychological effect, popularly known as "status anxiety" (De Botton, 2005), should be present even when we can condition for an individual's own income, income of the reference group. It should also be present even when we can control for the income rank and range variables calculated within the survey sample, because it is the size of the top income shares of people who are less likely to be included in the survey that actually matters to the individual's psyche.[6]

Other psychological theories are also possible. Albert Hirschman's (1973) "tunnel effect" hypothesis, which assumes that individuals use information on other people's income progression as a positive signal that their turn will come soon (similar to how individuals who stuck in traffic inside a tunnel interpret movements in the other lane of cars while their lane is still immobile), implies that an increase in the share of income held by the top 1 percent may even have a positive association with the well-being of the other 99 percent, on average. Hirschman's tunnel effect has been used to explain the positive association between life

[5] A recent study by Gimpelson and Treisman (2015) shows that people generally have a poor idea about the true level of income inequality within their own country and about where they fit in the income distribution.

[6] Although we are the first to examine the relationship between top income shares and individuals' SWB, past studies have looked at the relationship between income inequality and individuals' life satisfaction (e.g., Senik, 2004; Graham & Felton, 2006; Verme, 2011). However, previous works had poor data at the household level as a control variable and/or used the Gini coefficient in their analysis and were therefore unable to capture the top part of the income distribution.

satisfaction and income inequality in studies that focus on individual's well-being in transitional economies, such as Russia in the 1990s (Senik, 2004) and countries in the Latin Americas (Graham and Fenton, 2006).

We aim to test these different hypotheses by using the latest data on top income shares obtained for many countries around the world, and by using data on individuals' SWB provided by the Gallup World Poll.

III. Data

Our primary data come from the Gallup World Poll (GWP). Established in 2005 by the Gallup Organization, the GWP continually surveys citizens in more than 150 countries around the world and interviews approximately 1,000 residents per country. Respondents in the GWP are randomly selected adults 15 years of age and older and are nationally representative. Gallup asks each respondent the survey questions in the respondent's language. The mode of the interview is telephone survey in countries where telephone coverage represents at least 80% of the population. Where telephone penetration is less than 80%, Gallup uses face-to-face interviewing.

The GWP contains a wide range of questions about the respondent's well-being. Life evaluation, which is a measure of a person's thoughts about his or her life, is elicited using the Cantril life ladder question. The exact wording of the Cantril life ladder is "*Please imagine a ladder/mountain with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder/mountain represents the best possible life for you and the bottom of the ladder/mountain represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder/mountain do you feel you personally stand at the present time?*" The corresponding response categories range from 0 (Worst possible life) to 10 (Best possible life).

There are two measures of emotional well-being—positive and negative emotional experience. Positive emotional experience (or positive experience index) is a measure of respondents' experienced well-being on the day before the survey. Questions provide a real-time measure of respondents' positive experiences and include the following: "*Did you feel well-rested yesterday?*", "*Were you treated with respect all day yesterday?*", "*Did you smile or laugh a lot yesterday?*", "*Did you learn or do something interesting yesterday?*", and "*Did you experience the following feelings during a lot of the day yesterday? How about enjoyment?*" The five items are recoded so that positive answers are scored as a "1" and all other answers (including "don't know" and "refused") are scored as a "0." An individual record has an index calculated if it has at least four out of five valid scores (0 or 1). The final score is the mean of valid items multiplied by 100.

Negative emotional experience is a real-time measure of respondents' negative experiences on the day before the survey. The index contains the following questions: "*Did you experience the following feelings during a lot of the day yesterday? How about physical pain?*", "*How about worry?*", "*How about sadness?*", "*How about stress?*", and "*How about anger?*" The five items are recoded so that affirmative answers are scored as a "1" and all other answers (including "don't know" or "refused") are a "0." An individual record has an index calculated if it has at least four out of five valid scores (0 or 1). The final score is the mean of valid items multiplied by 100.

The distinction between life evaluation and emotional well-being was the focus of a seminal study by Daniel Kahneman and Angus Deaton (2010), who find life evaluation to be sensitive to an individual's socio-economic status such as income and employment status, whereas measures of emotional well-being are sensitive to circumstances that evoke emotional responses, such as time spent commuting and caring for others.

Historical time-series data on the share of taxable national income (excluding capital gains) held by the top 1 percent at the country level come from the WTID (www.topincomes.parisschoolofeconomics.eu).

To control for movements in other country-level variables, historical time-series data on macroeconomic variables (e.g., GDP per capita, annual GDP growth, unemployment rates, inflation rates, public expenditure on health and education, and intentional homicide rates) are obtained from the World Bank Database (www.data.worldbank.org). We also obtained time-series data on the Corruption Index from Transparency International (http://www.transparency.org) and the Human Development Index from the United Nations Development Programme (http://hdr.undp.org/en/data).

We use seven waves of the GWP (2006–2012). Of the 31 countries available in the WTID, 24 have the information on the top income share at the country level between 2006 and 2012 for the countries surveyed in the GWP. This produces 105 country-year data points at the first instance. We then further restrict the GWP data to countries that have collected information on individuals' SWB, household income, and other personal characteristics. Our linked data thus provide us with a series of repeated cross-sections between 2006 and 2012 on approximately 69,000 adults (15 years of age and older) from 22 countries—Australia, Canada, Colombia, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Malaysia, Netherlands, New Zealand, Norway, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Great Britain, and the U.S.A.—which we use in our analysis. This leaves us with 66 country-year data points when personal characteristics and other macroeconomic variables are taken into account. Tables 1A and 2A in the Online Appendix describe the variables, as well as the means in the data set and the survey years used in our analysis. Roughly 57% of the sample is female, and the average age is approximately 47 years.

Measures of SWB are standardized across the entire population to have a mean of zero and a standard deviation of 1. The average income share held by the top 1 percent across the entire sample is 11.24% with a between-country standard deviation of 4.11. However, note that the within-country variation is small (within-country standard deviation = 0.42) because our GWP time series is short.

IV. Empirical Strategy

For our cross-country analysis, we estimate the following regression equation:

$$W_{ijt} = \alpha + \beta\ \mathrm{Top1percent}_{jt} + \gamma X_{ijt} + \delta M_{jt} + \theta C_{jt} + \zeta T_t + e_{ijt}, \quad (5)$$

where W_{ijt} is a measure of SWB (i.e., life evaluation, positive experiences, and negative experiences) of individual i in country j and year t. $\mathrm{Top1percent}_{jt}$ is the share of taxable income held by the top 1 percent in country j and year t. X_{ijt} is a vector of individual characteristics that includes the individual's age, age squared, age cubed, log of real household income per capita (2010 purchasing power parity-adjusted), log of average real household income per capita of "someone like me" (i.e., same age bracket, gender, education level, country, and survey year), Parducci's income rank and range variables – see Eqs. (3) and (4) – calculated within the survey sample by country and year, physical health index, number of children under the age of 15 years, and dummy variables for self-employed, employed part-time but do not want full-time job, unemployed, employed part-time but want full-time job, completed secondary/tertiary school, completed high-school/college degree, married, separated, divorced, widowed, domestic partner, and a dummy for whether the respondent is religious. M_{jt} is a vector of country-year variables, including log of real GDP per capita, annual GDP growth, total unemployment rate, inflation rate (based on Consumer Price Index), total government expenditures on health and primary education, intentional

homicide rate (per 100,000 people), Corruption Index, and Human Development Index. C_{jt} is a set of continent dummies (North America, South America, Asia, Australia/Oceania, and Africa, with Europe as the excluded reference group), which will be replaced by country-specific dummies in later analysis. T_t denotes a set of year dummies. Finally, e_{ijt} is the error term.

All regressions are estimated using ordinary least squares with standard errors adjusted for clustering at the country × year level.[7] All regressions are also estimated with sampling weights, although qualitatively similar results can still be obtained without adjusting for sampling weights. In addition to the GWP results, we also estimate a similar econometric model using the British Household Panel Study (BHPS), a long-running British longitudinal survey.

V. Results

Figures 1–3 present a first pass to the research question by plotting unconditional weighted country-year averages (N = 105) of the three different dimensions of SWB in the GWP—life evaluation, positive emotional experience, and negative emotional experience, respectively—against share of taxable income held by the top 1 percent.[8] Figure 1 shows that there is a pronounced negative correlation between country-year averages of life evaluation and taxable income share held by people in the top percentile. Fitting the best line of fit produces a coefficient on the top income shares of -0.035 ($p < 0.001$)[9]. This indicates that

[7] Although clustering at the country level also produces qualitatively similar results.

[8] For an alternative presentation of the figures—i.e. with each dot representing country-year label, we refer readers to Figures 1A-3A in the Online Appendix.

[9] Restricting the sample to 66 country-year observations, i.e., a sample with observed information on personal characteristics and other macroeconomic variables produces a similar gradient of -0.044 ($p < 0.019$).

a 1% increase in the share of taxable income held by the top percentile is associated with an average drop of 0.035 standard deviation (or 3.5% of standard deviation) in life evaluation.

In contrast, Figure 2 shows that there is virtually zero correlation between top income shares and positive emotional experience. Figure 3 shows that there is a small but nevertheless statistically significant positive relationship between top income shares and negative emotional experience. Thus, it appears that our initial results are similar to those obtained for the relationship between income and the different dimensions of SWB, that is, higher income improves evaluation of life but not emotional well-being (Kahneman & Deaton, 2010).

To explore the issue more carefully, it is natural to look at SWB regression equations that adjust for possible transmission mechanisms and confounding influences. We do this by estimating Eq. (5) and report the estimation results for each SWB outcome in Table 1.[10] This reduces our sample size from 105 to 66 country-year observations.

As can be seen in Table 1, an increase in the share of taxable income held by the top percentile continues to be negatively and statistically significantly associated with life evaluation ($\beta = -0.033, p < 0.001$); is statistically insignificantly correlated with positive emotional experience ($\beta = -0.005, p < 0.492$); and is positively and statistically significantly correlated with negative emotional experience, although the effect size is noticeably smaller than that obtained in the life evaluation regression ($\beta = 0.006, p < 0.023$). The finding in both life evaluation and negative emotional experience regressions is robust to holding constant the individual's own household income, the average household

[10] Not that both size and statistical significance of the top income coefficient remains relatively stable with each additional set of control variables while keeping the sample size balanced throughout all specifications; see Table 3A in the Online Appendix.

income of the reference group, Parducci's within-sample rank and range variables, and annual GDP growth.

Differences in life evaluation across different degrees of income inequality are not small. Holding other things constant, a 1% increase in the share of taxable income held by the top percentile is associated with approximately 0.033 standard deviation drop in the average life evaluation, which is approximately the size of a 1.4% increase in the total unemployment rate. Moreover, the average top income share is 11.24 and its standard deviation is 4.11. A move from one standard deviation below the mean of top income shares to one standard deviation above would imply a drop in the (latent) life evaluation variable of approximately 0.27 standard deviation. This is approximately three times the negative effect of a divorce and is roughly three-quarter the size of the dissatisfaction from being jobless. In addition, to compensate for it would require an average increase of 3.3% in real household income per capita.

Other results in Table 1 show log of GDP per capita to be statistically insignificantly different from zero in all three SWB regression equations. GDP growth is associated negatively and statistically significantly with both positive and negative emotional experiences but not with life evaluation. There is a positive and statistically important correlation between life evaluation and government spending on education, whereas public spending on health appears to enter the life evaluation equation in a negative and statistically significant manner. The number of intentional homicides is strongly correlated with lower life evaluation. Overall, our results indicate that top income shares are one of the most important country-level predictors of international differences in life evaluation.

A natural next step is to examine whether the estimated relationship between top income shares and SWB will continue to be statistically robust after controlling for country-

specific dummies. As a check, Table 2 presents country fixed effects estimates for all individuals and by continents—Europe, North America, Asia, Australia/NZ, and Africa/South America. Unfortunately, because of the small number of countries in our sample in most of our continents (i.e. North America, Africa, Australia/Oceania, South America), we were unable to obtain estimates of the top income share in these continents when macroeconomic conditions are controlled for in the regression.

Table 2 contains a number of findings that might have been hard to predict. Conditioning on country fixed effects, Column 1 of Panel A shows that individuals are apparently reporting higher levels of life evaluation as the within-country share of income held by the top 1 percent increases: the coefficient on top income shares is 0.044 ($p < 0.032$). What this result implies is that a short-run increase in the top income shares may on average be taken as a signal to individuals across the entire sample that it might soon be their turn, which would be more consistent with Hirschman's "tunnel effect" hypothesis (Hirschman, 1973). Nevertheless, a look across columns of sub-sample regressions seems to suggest that this finding is driven primarily by the relationship between top income shares and life evaluation in less-developed economies such as Colombia and South Africa, but also in Australia and New Zealand. The coefficient on top income share in the life evaluation equation continues to be negative in three out of five sub-samples—Europe, North America, and Asia. However, given the small number of country-year data in four out of five (North America, Asia, Africa/South America, Australia/NZ) sub-sample analysis, the coefficients on top income for these sub-samples should be treated with care. Note also that in Europe where we do have enough countries to also control for macro effects we continue to find that top income share is negative and statistically significant and increased by approximately 30% (from -0.033 to -0.044).

Table 2's other results also suggest a positive and marginally statistically significant association between within-country changes in the top income shares and positive emotional experiences when the entire sample is used in the estimation. Again, the full sample results seem to be driven primarily by countries in Africa and South America.

Given that our preferred specification is one that controls for country-specific dummies, the next three tables will focus only on the European sample where populations from different countries are similar to each other and we do have enough countries to run country fixed effects regressions.

Our next empirical analysis is to test whether the estimated relationship between top income shares and SWB varies across subsamples of the population. In Table 3 we do this by separating the data by gender, age group, and education level. Looking across columns, it can be seen that the share of taxable income held by the top 1 percent continues to enter the life evaluation regression equation in a negative and statistically significant manner for all subgroups of the population. First, we cannot reject the null hypothesis that the paired coefficients are the same between male and female sub-samples. There is, however, some evidence of heterogeneity by age group and educational group in the life evaluation and negative emotional experience regressions. For the old *versus* the young sub-sample regressions, we find an increase in the top income shares appears to be statistically significantly correlated with lower life evaluation ($\beta = -0.079, p < 0.004$) and higher negative emotional experiences for the younger age group ($\beta = 0.083, p < 0.001$), whereas the same coefficients are statistically insignificantly different from zero for the older age group. For the low versus high education sub-sample regressions, we find an increase in the top income shares appears to be statistically significantly correlated with lower life evaluation for the high school/college graduates ($\beta = -0.056, p < 0.024$), whereas the same

coefficient is statistically insignificantly different from zero for the less than high school/college graduates ($\beta = -0.007, p < 0.747$).

Table 4 tests whether the rich are more satisfied than the poor when top income share is high. The first three columns of Table 4 do this by examining the interaction between share of taxable income held by the top 1 percent and log of real household income per capita. It can be seen that the interaction term is positive and statistically significant in the life evaluation regression ($\beta = 0.005, p < 0.028$), whereas it is statistically insignificantly different from zero in both positive and negative emotional experiences regressions. For life evaluation, the coefficient on share of taxable income held by the top 1 percent is negative and statistically significant at −0.094 ($p < 0.016$). This implies that when individuals' own household income is held constant, an increase in top income share would hurt the rich less than it would hurt the poor. The estimates also imply that individuals who earn 18.8% higher income than the mean value will feel indifferent by a 1% increase in the top income share ($-0.094 + 0.005 \times 18.8 = 0$). Interestingly the main effect of income is negative and statistically significant, although this could be explained partly by the fact that rank and range variables are being held constant in the regression. In other words, an increase in household income that does not lead to an improvement in income rank is associated negatively with life evaluation. By contrast, both rank and range variables are positively and statistically significantly associated with life evaluation, which is consistent with previous evidence in the psychology literature (e.g., Brown et al., 2008; Boyce et al., 2010).

We then divide our countries into three groups based on the share of income held by their top income group: below 8%, between 8% and 12%, and greater than 12%. We then put the first group in the constant and create dummy variables for the others to replace our continuous top income share variable and report the estimates in the last three columns of

Table 4. Qualitatively similar results can still be obtained using this specification. It can also be seen that, although a rise in top income share is associated positively and statistically significantly with negative emotional experiences, some evidence indicates that the estimated effect may be smaller for the rich than for the poor.

So far our results indicate a strong negative relationship between individuals' life evaluation and the share of income held by the top 1 percent that is robust to household income, socio-economic status, and other macroeconomic controls. The estimated gradient has also changed little from a bivariate model to a regression with a full set of control variables (a change from −0.034 (N = 105 country-year) to −0.033 in the full sample (N = 66 country-year), and in −0.044 the European sample (N = 32 country-year) with country fixed effects). However, there may be other transmission mechanisms—other than the pure psychological effect of rank-based status—that have not been properly captured under the current specification, including, for example, the relationship between top income shares and social cohesion (Kawachi & Kennedy, 1997) or even with subjective poverty that is independent from income.

In an attempt to capture other possible transmission mechanisms, in Column 1 of Table 5 we introduce a range of individuals' attitudes as potential mediators of top income shares in life evaluation for the European sample. This includes community attachment, community basics, civic engagement, diversity, law and order, financial life, food and shelter, national institutions, corruption, optimism, and daily experiences.[11] For ease of interpretation, all of the attitudinal variables are standardized to have a mean of 0 and a standard deviation of 1.

[11] Please refer to Table 1A in the Online Appendix for a full description of these attitude variables.

After controlling for these possible mediators of top income shares, the coefficient on share of taxable income held by the top 1 percent continues to be negative albeit statistically insignificantly different from zero ($\beta = -0.030, p < 0.159$). Holding other variables constant, life evaluation also correlates significantly with higher levels of community attachment, community basics, civic engagement, diversity, financial life, food and shelter, optimism, and daily experiences.

Column 2 of Table 5 reports the estimates on top income shares obtained from regressing each of the attitude regression equations separately. Controlling for the same set of individuals' socio-economic status, macroeconomic variables, and country-specific dummies as in the first column, it can be seen that the share of taxable income held by the top 1 percent is statistically significantly correlated with higher levels of perceived community basics and diversity; and is negatively and statistically significantly associated with attitudes toward civic engagement, law and order, financial life, national institution, and corruption. Finally, we present in Column 3 of Table 5 the estimated indirect effects of top income shares on life evaluation through these subjective channels. We find that only a small part of the correlation between top income shares and life evaluation can be explained through reduced civic engagement (−0.004 standard deviation), increased community basics (0.001 standard deviation), and negative daily experiences (−0.001 standard deviation). The largest part of the correlation appears to be mediated through perceived financial life (−0.024 standard deviation).

A natural objection to our findings is that measures of SWB are not perfectly comparable across countries – even among countries in the European sample.[12] In an attempt

[12] For example, individuals in the United Kingdom and Continental Europe may have interpret SWB questions differently.

to account for part of this problem, we bypass the country-specific issue and re-estimate our econometric model on a long-running British Household Panel Survey (BHPS) and report the results in Table 6. In other words, the main source of variations in the top income shares is now *time* rather than *country*.

The BHPS is nationally representative of British households, contains over 10,000 individuals, and has been conducted between September and Christmas each year since 1991 (Taylor et al. 2002). The SWB measure used in the within-country analysis is the individual's overall life satisfaction, which is similar to the measure of life evaluation in the GWP. The dependent variable comes from responses to the following survey question: "*All things considered, how satisfied or dissatisfied are you with your life overall using a 1–7 scale? 1 = very dissatisfied, …, 7 = very satisfied*." Responses are then standardized across the entire population to have a mean of 0 and a standard deviation of 1. The within-country analysis used all individuals for the years 1996–2009 (waves 6–18).[13] This produces a sample of 123,571 observations (22,564 unique individuals). During this period, the average income share held by the top 1 percent in Great Britain is 13.59% with a between-year standard deviation of 0.954 and a within-country standard deviation of 0.845.

Table 6 reports the ordinary least-squares estimates for the BHPS. Allowing for time trend and other macroeconomic variables and clustering at the year level, an ordinary least-squares regression on standardized life satisfaction produces a negative and statistically significant coefficient on the share of taxable income held by the top 1 percent of –0.101

[13] The survey question about individuals' life satisfaction was introduced from wave 6 onwards, but was left out in wave 11.

($p < 0.004$), which is approximately twice the size of, but nevertheless comparable to, the result obtained in our cross-country analysis.[14]

Overall, both cross-country and within-country results provide strong empirical evidence that there is a statistically robust and quantitatively important relationship between individuals' life evaluation and the share of taxable income held by the top 1 percent that is independent from the typical transmission mechanisms predicted by traditional economic models.

VI. Conclusions

The share of income held by the top 1 percent in many countries around the world has been rising persistently over the last 30 years. However, little is known about how the rise in top income shares may affect human well-being. In this paper, we make one of the first empirical attempts to improve our understanding of this link.

Using the latest combined data from the WTID and the GWP, we examined the relationship between the share of taxable income held by the top 1 percent and different dimensions of individuals' SWB from around the world. Reported levels of life evaluation are lower and those of negative emotional well-being are higher when the share of income held by the top 1 percent is high. Our findings are robust to controls for personal characteristics, log of household income, log of relative incomes, within-sample rank and range variables, country-year variables, and country fixed effects. In contrast, in most cases, we find a statistically insignificant relationship between top income shares and individuals' positive emotional experiences. Moreover, our other results indicate that the rich are more tolerant than the poor of income inequality at the top, and that a large part of the relationship

[14] Although not reported in Table 6, we find that conditioning for individual fixed-effects model does little to change the size and significance of the top income shares coefficient.

between individuals' life evaluation and the share of income held by the top 1 percent may be transmitted through individual's perceived financial life.

There are some notable limitations to our study. First, our aim was primarily to document correlations in the data rather than to identify the cause and effect of rising top income shares on individuals' SWB. This is mainly because it is unclear what type of variables could serve as a valid instrumental variable for top income shares in a SWB equation.[15] Second, because the WTID and the GWP are still relatively new ventures, we are inevitably limited by the number of countries that could be matched and studied in our analysis. As both data sets continue to expand and include more variables and events, future research may need to return to both of these issues.

Nevertheless, there would be important normative and positive implications to our findings if we could assume to take the correlations reported in this study at face value. The evidence that top income shares matter to individuals' life evaluation independently of the individuals' own income is consistent with the recent findings by Gimpelson and Treisman (2015) that it is the perceived inequality—rather than actual inequality—that determines individuals' demand for redistribution and reported conflict between the rich and the poor. Thus, both our results lead us to argue that most theories on the political effects of inequality should be re-evaluated to take into account the psychological model of rank-based status and the effects of perceived inequality. Moreover, policy makers may need to start giving more weight to the psychological values attached to the "top 1 percent" who are not normally representative in a survey when designing redistributive policies.

[15] However, it may be believed that an individual's SWB does not itself determine the share of income held by the top 1 percent.

In addition, our paper's other main finding that top income shares matter more to life evaluation than to emotional well-being contributes to the previous literature showing that the main predictors of both positive and negative emotions are not a person's socio-economic status but everyday circumstances (e.g., Kahneman & Deaton, 2010). In other words, our results indicate that as the share of income held by the top percentile grows, people's use of time may not have shifted sufficiently toward activities that significantly reduce positive emotional experiences, therefore holding constant their budget constraints. The paper's findings thus add to the ongoing debate with respect to the question of whether life evaluation or emotional well-being is better suited for use in the assessment of human welfare and to guide policy.

More generally, although recent studies in economics have provided evidence that the rising top income shares have important consequences for human well-being, our study is the first attempt to provide clear and direct evidence on this issue.

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Figures 1-3: Top Income Shares and Different Dimensions of Subjective Well-being

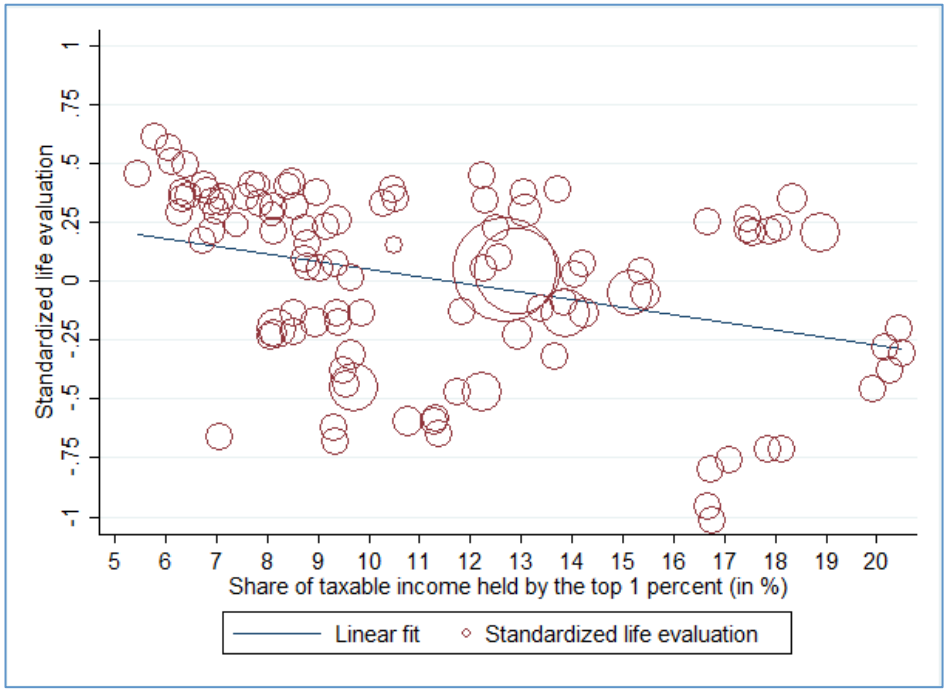

Fig. 1. Life evaluation

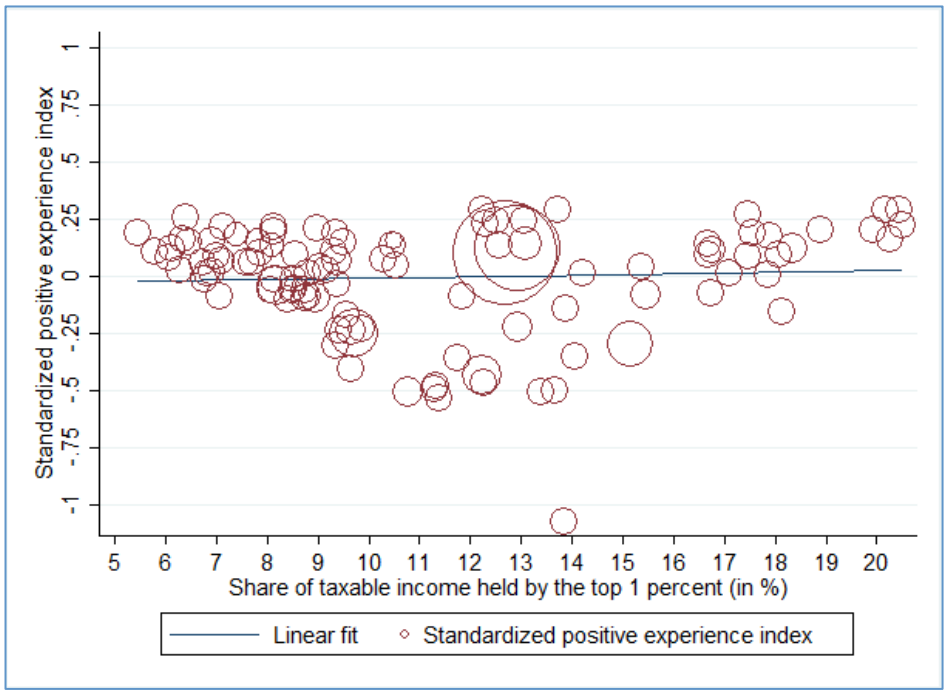

Fig.2. Positive emotional experience

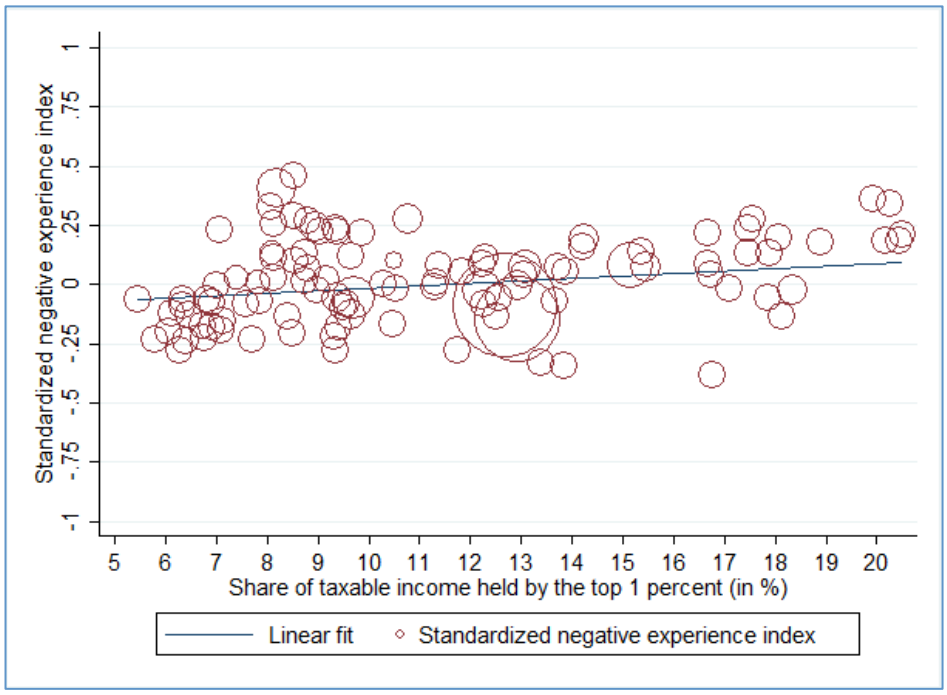

Fig. 3. Negative emotional experience

Note: Each circle represents (unconditional) raw country-year averages. Data represent 105 country-year local averages, i.e. 22 countries spanning three or four years; for specifics, see Table 2A in the Online Appendix. The size of the circles reflects the number of observations used in calculating the average. Subjective well-being measures are standardized to have zero mean and a standard deviation of 1.

Table 1: Estimates from the Life Evaluation, Positive, and Negative Emotional Well-being Equations (OLS): The Gallup World Poll, 2006-2012

VARIABLES	Life evaluation	Positive experience	Negative experience
Share of taxable income held by the top 1 percent	-0.033***	-0.005	0.006**
	(0.009)	(0.008)	(0.003)
Log of household income per capita - 2010 PPP	0.080**	0.035	-0.002
	(0.033)	(0.035)	(0.018)
Personal characteristics			
Male	-0.147***	-0.057***	-0.025***
	(0.013)	(0.016)	(0.006)
Age	-0.082***	-0.048***	0.003
	(0.007)	(0.006)	(0.003)
Age-squared	0.001***	0.001***	-0.000*
	(0.000)	(0.000)	(0.000)
Age-cubed	-0.000***	-0.000***	0.000
	(0.000)	(0.000)	(0.000)
Log(relative household income)	0.056**	0.047	0.000
	(0.028)	(0.031)	(0.017)
Parducci's within-sample rank variable	0.339***	0.073	-0.036
	(0.065)	(0.056)	(0.032)
Parducci's within-sample range variable	-0.198	-0.164	0.037
	(0.254)	(0.247)	(0.139)
Employed full time for self	0.014	0.058**	0.026*
	(0.029)	(0.027)	(0.014)
Employed PT but do not want FT job	0.061***	0.106***	-0.061***
	(0.017)	(0.024)	(0.011)
Unemployed	-0.333***	0.080***	0.057***
	(0.036)	(0.024)	(0.018)
Employed PT but want FT job	-0.087***	0.089***	0.050***
	(0.027)	(0.027)	(0.014)
Out of workforce	-0.042*	0.079***	-0.039***
	(0.022)	(0.020)	(0.013)
Completed secondary - tertiary School	0.167***	0.036*	0.000
	(0.023)	(0.019)	(0.010)
Completed high school/college degree	0.264***	0.105***	0.015
	(0.033)	(0.027)	(0.014)
Married	0.185***	0.053***	0.006
	(0.016)	(0.016)	(0.011)
Separated	-0.091*	0.022	0.032
	(0.047)	(0.031)	(0.022)
Divorced	-0.083***	0.018	0.014
	(0.021)	(0.026)	(0.016)
Widowed	-0.063**	-0.000	-0.006
	(0.028)	(0.022)	(0.014)
Domestic partner	-0.164	0.079	-0.040
	(0.105)	(0.086)	(0.053)
Number of children under aged 15	0.028***	-0.014***	0.012***
	(0.007)	(0.005)	(0.004)
Physical health index	0.009***	0.018***	-0.032***
	(0.000)	(0.000)	(0.000)

Religion is important in life	0.057***	0.135***	0.006
	(0.012)	(0.014)	(0.006)
Country-year variables			
Log of country's GDP per capita - current US$ price	0.097	-0.311	0.081
	(0.143)	(0.190)	(0.075)
GDP growth (annual %)	-0.003	-0.025*	-0.009**
	(0.005)	(0.014)	(0.004)
Unemployment rate (% of total labor force)	-0.021***	-0.004	0.014***
	(0.004)	(0.005)	(0.002)
Inflation - consumer prices (annual %)	0.024**	0.022	0.007
	(0.011)	(0.020)	(0.007)
Public health spending (% of total health expenditure)	-0.008***	0.006*	0.001
	(0.002)	(0.003)	(0.001)
Public primary education spending (% of total expenditure)	0.070***	0.014	-0.036***
	(0.026)	(0.027)	(0.012)
Intentional homicides (per 100,000 people)	-0.052**	0.027	0.003
	(0.022)	(0.025)	(0.013)
Corruption perception index/10	0.000	0.072**	-0.014
	(0.018)	(0.031)	(0.009)
Human Development Index	-0.798	-1.405	-0.366
	(1.591)	(1.820)	(0.748)
Continent dummies			
North America	0.317***	0.289***	0.075**
	(0.063)	(0.057)	(0.033)
Africa	0.779	-1.147	-0.419
	(0.720)	(0.715)	(0.407)
Australia & New Zealand	-0.085	-0.054	0.165***
	(0.069)	(0.104)	(0.033)
Asia	-0.511***	-0.248***	0.108***
	(0.063)	(0.074)	(0.029)
South America	1.996***	-1.068	-0.095
	(0.711)	(0.786)	(0.415)
Constant	-0.740	2.165**	1.977***
	(0.492)	(1.007)	(0.399)
Year dummies (7)	Yes	Yes	Yes
Country-year observations	66	66	66
Individual observations	68,919	69,263	69,263
R-squared	0.262	0.272	0.677

Note: ***<1%, **<5%, *<10%.

Subjective well-being measures are standardized to have zero mean and a standard deviation of 1. Parducci's rank and range variables are calculated within sample by country and year. The standard errors were adjusted for clustering at the country × year level. All regressions include a sampling country weight.

Table 2A: Average Top Income Shares and Subjective Well-Being by Cou

Countries	Top percentile's income share	Life evaluation	Positive emotional experience	Negative emotional experience	Ye an fu
United States	17.92	7.28	78.32	27.72	20
	(0.68)	(1.94)	(24.70)	(28.65)	
United Kingdom	13.05	6.91	76.60	21.18	20
	(0.77)	(1.85)	(24.57)	(26.44)	
France	8.65	6.69	72.18	29.21	20
	(0.32)	(1.79)	(24.66)	(28.82)	
Germany	13.27	6.52	70.09	24.28	20
	(0.79)	(1.81)	(26.14)	(26.82)	
Netherlands	6.71	7.54	76.47	20.41	20
	(0.43)	(1.26)	(22.51)	(24.22)	
Spain	8.51	6.69	73.50	30.89	20
	(0.30)	(1.93)	(24.26)	(29.04)	
Italy	9.56	6.73	67.86	28.77	20
	(0.21)	(1.86)	(28.07)	(27.94)	
Sweden	6.86	7.37	76.51	19.31	20
	(0.26)	(1.63)	(23.12)	(23.67)	
Denmark	5.96	7.84	78.07	18.79	20
	(0.32)	(1.51)	(23.22)	(23.28)	
Singapore	14.27	6.63	61.61	22.04	20
	(0.66)	(1.46)	(29.58)	(24.34)	
Japan	9.61	6.09	69.56	20.76	20
	(0.10)	(1.91)	(27.68)	(25.23)	
South Africa	17.20	5.23	74.20	21.31	20
	(0.56)	(1.98)	(28.28)	(27.22)	
Canada	12.89	7.52	80.21	25.43	20
	(0.54)	(1.64)	(22.96)	(27.22)	
Australia	9.21	7.38	76.72	23.58	20
	(0.45)	(1.66)	(24.57)	(27.27)	
New Zealand	7.94	7.38	78.79	25.08	20
	(0.27)	(1.68)	(23.16)	(26.52)	
South Korea	11.64	5.91	62.19	22.11	20
	(0.52)	(2.15)	(29.90)	(27.54)	
Colombia	20.26	6.19	80.22	30.26	20
	(0.19)	(2.46)	(24.52)	(30.87)	
Finland	8.44	7.62	72.06	18.81	20
	(0.05)	(1.45)	(24.43)	(22.60)	
Ireland	11.28	7.36	78.87	20.70	20

	(0.98)	(1.72)	(22.85)	(25.61)	
Malaysia	9.34	5.56	78.07	16.68	2009-2010
	(0.01)	(1.50)	(25.31)	(23.88)	
Norway	7.78	7.53	76.31	19.39	2008
	(0.08)	(1.56)	(23.25)	(23.35)	
Switzerland	10.41	7.47	75.77	23.18	2009
	(0.12)	(1.67)	(22.77)	(24.18)	

Note: Standard deviations are reported in parentheses.

Source: Estimated by authors using country-based data on top incomes from the World Top Income Database and individual-based data life satisfaction from the Gallup World Poll.

Figures 1A-3A: Top Income Shares and Different Dimensions of Subjective Well-being (Color-Coded by Continent)

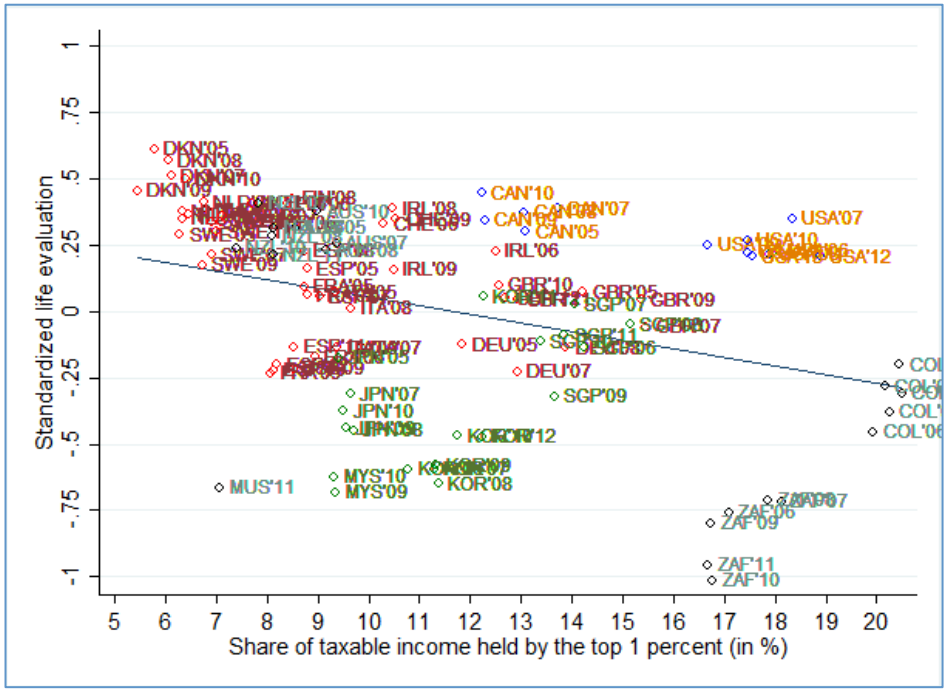

Fig. 1. Life evaluation

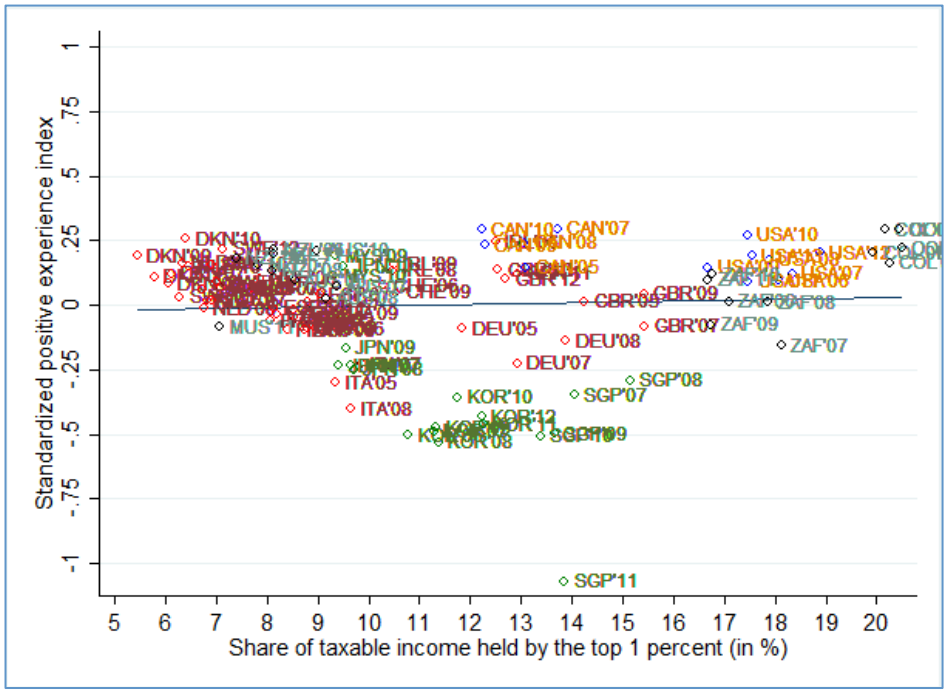

Fig.2. Positive emotional experience

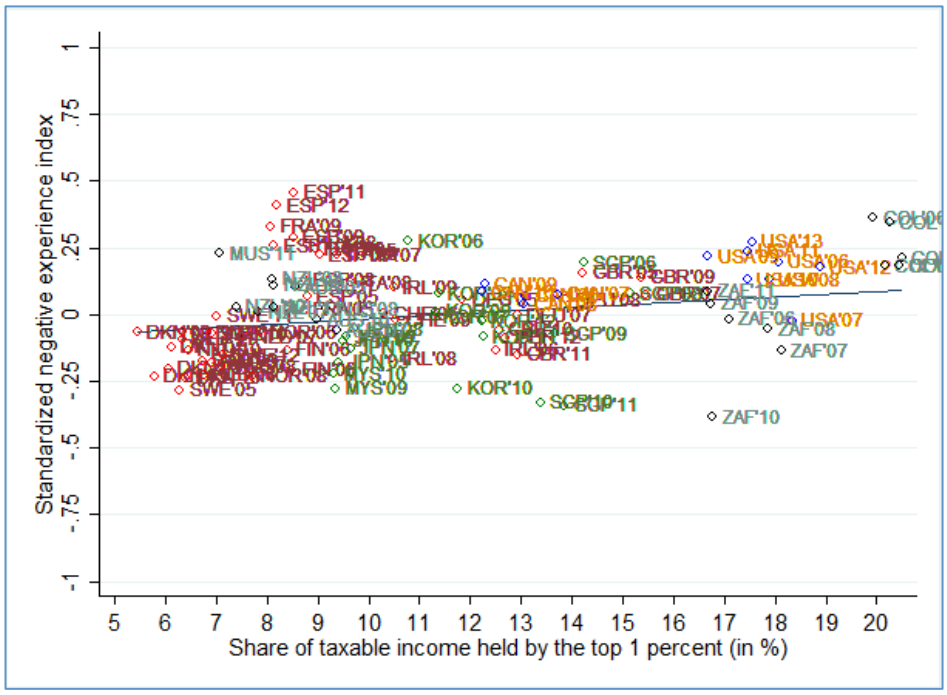

Fig.3. Negative emotional experience

Note: Each circle represents raw (unconditional) country-year averages. Data represent 105 country-year local averages, i.e. 22 countries spanning three or four years; for specifics, see Table 2A in the Online Appendix. Subjective well-being measures are standardized to have zero mean and a standard deviation of 1.

Table 3A: Estimates from the Cantril Life Ladder, Positive and Negative Emotional Well-being Equations with Each Additional Set of Control Variables

	(1)	(2)	(3)	(4)
A) Life ladder (individual N=68,919, country-year N=66)				
Share of taxable income held by the top 1 percent	-0.043***	-0.031***	-0.032***	-0.033***
	(0.010)	(0.007)	(0.009)	(0.009)
Log of household income per capita - 2010 PPP		0.182***	0.034	0.080**
		(0.014)	(0.042)	(0.033)
Log(relative household income)			0.181***	0.057**
			(0.028)	(0.028)
Parducci's within-sample rank variable			0.466***	0.339***
			(0.080)	(0.065)
Parducci's within-sample range variable			-0.028	-0.200
			(0.324)	(0.254)
Log of country's GDP per capita - current US$ price		0.214***	-0.057	0.097
		(0.056)	(0.148)	(0.143)
GDP growth (annual %)		0.003	-0.004	-0.003
		(0.007)	(0.006)	(0.005)
Unemployment rate (% of total labor force)		-0.022***	-0.028***	-0.021***
		(0.004)	(0.004)	(0.004)
Inflation - consumer prices (annual %)		0.035**	0.026*	0.024**
		(0.017)	(0.015)	(0.011)
Public health spending (% of total health expenditure)			-0.007***	-0.008***
			(0.002)	(0.002)
Public primary education spending (% of total expenditure)			0.052*	0.070***
			(0.027)	(0.026)
Intentional homicides (per 100,000 people)			-0.007	-0.052**
			(0.024)	(0.022)
Corruption perception index/10			0.030	0.000
			(0.022)	(0.018)
Human Development Index			-0.642	-0.823
			(1.635)	(1.594)
R-squared	*0.029*	*0.181*	*0.187*	*0.029*
B) Positive emotional experience (individual N=69,263, country-year N=66)				
Share of taxable income held by the top 1 percent	0.000	-0.016**	0.008	-0.005
	(0.007)	(0.008)	(0.009)	(0.008)
Log of household income per capita - 2010 PPP		0.084***	0.016	0.035
		(0.012)	(0.041)	(0.035)
Log(relative household income)			0.110***	0.047
			(0.030)	(0.031)
Parducci's within-sample rank variable			0.258***	0.073
			(0.062)	(0.056)
Parducci's within-sample range variable			-0.139	-0.164

			(0.249)	(0.247)
Log of country's GDP per capita - current US$ price		-0.180*	-0.217	-0.311
		(0.091)	(0.183)	(0.190)
GDP growth (annual %)		-0.032***	-0.023*	-0.025*
		(0.009)	(0.012)	(0.014)
Unemployment rate (% of total labor force)		-0.015***	-0.012**	-0.004
		(0.004)	(0.005)	(0.005)
Inflation - consumer prices (annual %)		-0.010	-0.002	0.022
		(0.022)	(0.017)	(0.020)
Public health spending (% of total health expenditure)			0.006**	0.006*
			(0.003)	(0.003)
Public primary education spending (% of total expenditure)			0.024	0.014
			(0.030)	(0.027)
Intentional homicides (per 100,000 people)			0.002	0.027
			(0.024)	(0.025)
Corruption perception index/10			0.061*	0.072**
			(0.031)	(0.031)
Human Development Index			-3.169*	-1.405
			(1.864)	(1.820)
R-squared	*0.000*	*0.059*	*0.067*	*0.272*
C) Negative emotional experience (Individual N=69,263, country-year N=66)				
Share of taxable income held by the top 1 percent	0.017***	0.007	-0.009	0.006**
	(0.005)	(0.006)	(0.006)	(0.003)
Log of household income per capita - 2010 PPP		-0.087***	0.022	-0.002
		(0.010)	(0.038)	(0.018)
Log(relative household income)			-0.033	0.000
			(0.027)	(0.017)
Parducci's within-sample rank variable			-0.326***	-0.036
			(0.068)	(0.032)
Parducci's within-sample range variable			-0.095	0.038
			(0.289)	(0.139)
Log of country's GDP per capita - current US$ price		0.053	-0.012	0.081
		(0.069)	(0.119)	(0.075)
GDP growth (annual %)		-0.014*	-0.018*	-0.009**
		(0.007)	(0.010)	(0.004)
Unemployment rate (% of total labor force)		0.029***	0.024***	0.014***
		(0.004)	(0.003)	(0.002)
Inflation - consumer prices (annual %)		0.023	0.033**	0.007
		(0.015)	(0.015)	(0.007)
Public health spending (% of total health expenditure)			-0.002	0.001
			(0.002)	(0.001)
Public primary education spending (% of total expenditure)			-0.038**	-0.036***
			(0.019)	(0.012)
Intentional homicides (per 100,000 people)			0.001	0.003

			(0.021)	(0.013)
Corruption perception index/10			-0.030	-0.014
			(0.019)	(0.009)
Human Development Index			1.288	-0.366
			(1.386)	(0.748)
R-squared	*0.005*	*0.046*	*0.050*	*0.677*
Demographic controls	No	Yes	Yes	Yes
Year dummies	No	Yes	Yes	Yes
Continent dummies	No	Yes	Yes	Yes
Personal characteristics	No	No	No	Yes

Note: ***P<0.01, **P<0.05, *P<0.1.

Subjective well-being measures are standardized to have zero mean and a standard deviation of 1. Standard errors are clustered at the country × year level and are reported in the parentheses. Demographic controls include for age, age-squared, age-cubed, and gender. Personal characteristics include education level, country, and survey year), individual's employment status, marital status, education level, number of children under the age of 15, physical health index, and a dummy for whether the respondent is religious are added as controls. Sample size is held the same across all specifications. The sample size is kept the same throughout different specifications.

Source: Estimated by authors using country-based data on top incomes from the World Top Income Database, individual-based data life satisfaction from the Gallup World Poll and country-based data macro-economic indicators from the World Bank Database.

Table 2: Country Fixed Effects – Sub-sample Regressions by Continents

VARIABLES	All	Europe	North America	Asia	Africa + South America	Australia + NZ
A) Cantril Life Ladder						
Share of taxable income held by the top 1 percent	**0.044****	**-0.044****	**-0.020**	**-0.004**	**0.645*****	**0.148*****
	(0.020)	**(0.022)**	**(0.112)**	**(0.154)**	**(0.159)**	**(0.015)**
Log of household income per capita - 2010 PPP	0.034	-0.044	-0.051	-0.064	0.023	0.269**
	(0.032)	(0.031)	(0.053)	(0.127)	(0.143)	(0.067)
Log(relative household income)	0.065**	-0.001	-0.043	0.080	0.039	-0.011
	(0.027)	(0.032)	(0.084)	(0.066)	(0.070)	(0.070)
Parducci's within-sample rank variable	0.290***	0.317***	0.254	0.354***	0.592**	-0.000
	(0.059)	(0.069)	(0.191)	(0.105)	(0.250)	(0.266)
Parducci's within-sample range variable	0.241	0.595**	0.945	0.912	0.395	-0.845***
	(0.212)	(0.258)	(0.621)	(0.927)	(1.126)	(0.130)
B) Positive Emotional Experiences						
Share of taxable income held by the top 1 percent	**0.056***	**0.012**	**0.020**	**0.152**	**0.227***	**0.054**
	(0.030)	**(0.023)**	**(0.105)**	**(0.125)**	**(0.114)**	**(0.052)**
Log of household income per capita - 2010 PPP	0.011	0.017	0.075	0.007	0.286	0.020
	(0.026)	(0.029)	(0.083)	(0.093)	(0.156)	(0.048)
Log(relative household income)	0.030	0.034	-0.142*	0.034	0.018	0.111*
	(0.024)	(0.029)	(0.065)	(0.062)	(0.038)	(0.049)
Parducci's within-sample rank variable	0.111**	0.163***	-0.056	0.095	-0.048	-0.168
	(0.044)	(0.049)	(0.078)	(0.128)	(0.166)	(0.231)
Parducci's within-sample range variable	0.070	0.257	0.312	0.032	1.725	0.333

Share of taxable income held by the top 1 percent	**0.015**	**0.023***	**-0.148****	**0.375*****	**0.139***	**0.054**
	(0.010)	**(0.013)**	**(0.043)**	**(0.058)**	**(0.060)**	**(0.095)**
Log of household income per capita - 2010 PPP	0.002	-0.003	0.061*	0.069	-0.006	0.034
	(0.012)	(0.019)	(0.026)	(0.049)	(0.068)	(0.144)
Log(relative household income)	-0.015	-0.003	-0.022	0.009	-0.012	0.081
	(0.014)	(0.021)	(0.058)	(0.047)	(0.031)	(0.041)
Parducci's within-sample rank variable	0.003	0.017	-0.043	-0.027	-0.051	0.079
	(0.029)	(0.034)	(0.108)	(0.069)	(0.096)	(0.162)
Parducci's within-sample range variable	-0.074	-0.106	-0.379	-0.439	0.109	-0.503
	(0.072)	(0.134)	(0.267)	(0.353)	(0.427)	(0.913)
Country-year observations	66	32	8	13	8	5
Individual observations	68,919	32,305	7,573	14,548	7,914	4,473

Note: ****P*<0.01, ***P*<0.05, **P*<0.1.

Subjective well-being measures are standardized to have zero mean and a standard deviation of 1. Standard errors are clustered at the country level and are reported in the parentheses. Same control variables are as in Table 1 (excluding macroeconomic variables).

Europe = United Kingdom, France, Germany, Netherlands, Spain, Italy, Sweden, Denmark, Finland, Ireland, Norway, Switzerland

North America = U.S. and Canada

Asia = Singapore, Japan, South Korea, Malaysia

Africa/South America = South Africa, Colombia

Australia/NZ = Australia, New Zealand

Source: Estimated by authors using country-based data on top incomes from the World Top Income Database, individual-based data life satisfaction from the Gallup World.

Table 3: Life Evaluation, Positive, and Negative Emotional Well-being Equations with Country Fixed Effects – European Sample

	A) Females			B) Males		
VARIABLES	**Life evaluation**	**Positive experience**	**Negative experience**	**Life evaluation**	**Positive experience**	**Negative experience**
Share of taxable income held by the top 1 percent	-0.045*	0.023	0.026	-0.044*	-0.005	0.021
	(0.023)	(0.021)	(0.020)	(0.024)	(0.035)	(0.013)
Observations	18,767	18,889	18,889	13,538	13,597	13,597
R-squared	0.244	0.301	0.692	0.231	0.233	0.653
	C) Age<=40			**D) Age>40**		
VARIABLES	**Life evaluation**	**Positive experience**	**Negative experience**	**Life evaluation**	**Positive experience**	**Negative experience**
Share of taxable income held by the top 1 percent	-0.079***	-0.032	0.083***	-0.013	0.035	-0.019
	(0.025)	(0.031)	(0.014)	(0.028)	(0.023)	(0.016)
Observations	10,105	10,129	10,129	22,200	22,357	22,357
R-squared	0.202	0.282	0.653	0.260	0.267	0.698
	E) High school/college			**F) Less than high school/college**		
VARIABLES	**Life evaluation**	**Positive experience**	**Negative experience**	**Life evaluation**	**Positive experience**	**Negative experience**
Share of taxable income held by the top 1 percent	-0.007	0.010	0.012	-0.056**	0.015	0.022
	(0.021)	(0.020)	(0.018)	(0.024)	(0.026)	(0.013)
Individual observations	8,276	8,310	8,310	23,752	23,888	23,888
R-squared	0.186	0.244	0.644	0.237	0.271	0.685

Note: ***<1%, **<5%, *<10%. Subjective well-being measures are standardized to have zero mean and a standard deviation of 1. The standard errors were adjusted for clustering at the country × year level. Country-year observations = 32. Control variables are as in Table 1.

Table 4: Life Evaluation, Positive, and Negative Emotional Well-being Equations with Country Fixed Effects and Interactions Between Top Income Shares and Household Income: European Sample, 2006-2012

VARIABLES	(1) Life evaluation	(2) Positive experience	(3) Negative experience	(4) Life evaluation	(5) Positive experience	(6) Negative experience
Share of taxable income held by the top 1 percent	-0.090***	-0.011	0.040*			
	(0.030)	(0.028)	(0.023)			
Log of household income per capita - 2010 PPP	-0.094**	-0.008	0.015	-0.074*	0.007	0.009
	(0.037)	(0.033)	(0.023)	(0.038)	(0.026)	(0.020)
Log(relative household income)	0.001	0.035	-0.003	0.001	0.035	-0.003
	(0.031)	(0.029)	(0.021)	(0.031)	(0.029)	(0.021)
Parducci's within-sample rank variable	0.322***	0.165***	0.016	0.311***	0.167***	0.021
	(0.070)	(0.050)	(0.034)	(0.073)	(0.049)	(0.035)
Parducci's within-sample range variable	0.616**	-0.247	-0.114	0.541**	-0.259	-0.077
	(0.256)	(0.172)	(0.134)	(0.230)	(0.172)	(0.116)
Interaction effect						
Top 1 percent income share × log(household income per capita)	0.005**	0.002	-0.002			
	(0.002)	(0.002)	(0.002)			
Share 8%-12% dummy × log(household income per capita)				0.069***	0.009	-0.034**
				(0.022)	(0.018)	(0.014)
Share more than 12% dummy × log(household income per capita)				0.057***	0.027**	-0.022**
				(0.014)	(0.012)	(0.009)
Individual observations	32,305	32,486	32,486	32,305	32,486	32,486
R-squared	0.235	0.269	0.678	0.236	0.269	0.678

Note: ***<1%, **<5%, *<10%. Subjective well-being measures are standardized to have zero mean and a standard deviation of 1. The standard errors were adjusted for clustering at the country × year level. Country-year observations = 32. Control variables are as in Table 1.

Table 5: Life Evaluation Equations with Additional Attitudinal Variab their Estimated Indirect Effects – European Sample (Country FE)

VARIABLES	(1) Life evaluation	(2) Coefficient on top income share (b_j) in each attitude a_j regression	(3) Indirec effects income share o evaluat $a_j \times b_j$
Share of taxable income held by the top 1 percent	-0.030		
	(0.021)		
Standardized attitude variables			
Community attachment (a_1)	0.086***	-0.035	-0.0030
	(0.010)	(0.028)	
Community basics (a_2)	0.019*	0.048***	0.0009
	(0.010)	(0.010)	
Civic engagement (a_3)	0.049***	-0.079***	-0.0038
	(0.007)	(0.028)	
Diversity (a_4)	0.013**	0.048**	0.0006
	(0.006)	(0.022)	
Law and order (a_5)	0.003	-0.171***	-0.0005
	(0.008)	(0.019)	
Financial life (a_6)	0.141***	-0.169***	-0.0238
	(0.010)	(0.023)	
Food and shelter (a_7)	0.081***	-0.046	-0.0037
	(0.010)	(0.031)	
National institutions (a_8)	0.017**	-0.117***	-0.0019
	(0.007)	(0.008)	
Corruption (a_9)	0.001	-0.019***	-0.0000
	(0.007)	(0.006)	
Optimism (a_{10})	0.004	-0.033	-0.0001
	(0.009)	(0.022)	
Daily experiences (a_{11})	0.171***	-0.005	-0.0008
	(0.012)	(0.013)	

Note: ***<1%, **<5%, *<10%. Subjective well-being measures and attitudinal vari standardized to have zero mean and a standard deviation of 1. The standard errors were ad clustering at the country × year level. Country-year observations = 32. Control variables Table 1.

Community attachment = satisfaction with the city or area they live in; community basics = e of everyday life in a community; civic engagement = respondent's inclination to volunteer; d a community's level of acceptance of people from different race, ethnic, or cultural groups order = respondent's level of personal security; financial life = respondent's personal situations and the economics of the community where they live; food and shelter = satisfac level of food and shelter available to them; national institutions = respondent's confiden institutions in the country; corruption = respondent's perceptions in a community about th corruption in business and government; optimism = respondent's positive attitudes about t and daily experience = respondent's experienced well-being on the day before the interview.

Table 6: Life Satisfaction Regression with Top Income Shares as the Independent Variable (OLS), British Household Panel Survey 1996-2007

VARIABLES	OLS
Share of taxable income held by the top 1 percent	-0.101**
	(0.044)
Log of real household income per capita	-0.009
	(0.018)
Personal characteristics	
Male	-0.056***
	(0.004)
Age	-0.111***
	(0.003)
Age-squared	0.002***
	(0.000)
Age-cubed	-0.000***
	(0.000)
Log(relative household income)	0.027
	(0.018)
Parducci's within-sample rank variable	0.146***
	(0.023)
Parducci's within-sample range variable	0.311
	(0.185)
Completed higher degree	-0.167***
	(0.021)
Completed 1st degree	-0.159***
	(0.014)
Completed HND, HNC	-0.121***
	(0.016)
Completed A-levels	-0.123***
	(0.009)
Completed O-levels	-0.086***
	(0.007)
Completed CSE levels	-0.035**
	(0.015)
Living as couple	-0.044***
	(0.008)
Widowed	-0.242***
	(0.013)
Divorced	-0.375***
	(0.014)
Separated	-0.517***
	(0.019)
Never married	-0.291***
	(0.009)
Employed full-time	-0.056***
	(0.007)
Unemployed	-0.375***
	(0.016)
Retired	0.051***
	(0.016)
Maternity leave	0.220***
	(0.025)
Family care	-0.090***

	(0.017)
Full-time student	-0.010
	(0.021)
Disabled	-0.389***
	(0.016)
Government training	-0.099
	(0.089)
Other type of employment	-0.153**
	(0.048)
Health: Poor	0.493***
	(0.060)
Health: Fair	0.881***
	(0.056)
Health: Good	1.236***
	(0.041)
Health: Excellent	1.500***
	(0.039)
Number of children aged 15 and under	-0.010*
	(0.005)
Country-level variables	
Log of country's GDP per capita - current US$ price	28.134***
	(7.677)
GDP growth (annual %)	-0.281***
	(0.067)
Unemployment rate (% of total labor force)	0.454***
	(0.119)
Inflation - consumer prices (annual %)	-0.107**
	(0.041)
Public health spending (% of total health expenditure)	-0.191***
	(0.031)
Public primary education spending (% of total expenditure)	-0.119***
	(0.016)
Intentional homicides (per 100,000 people)	-1.184***
	(0.142)
Time trend	-0.558***
	(0.162)
Constant	842.489***
	(247.785)
Regional fixed effects	Yes
Individual observations	123,571
Overall R-squared	0.190

Note: ***<1%, **<5%, *<10%.

Life satisfaction is standardized to have a mean zero and a standard deviation of 1. The standard errors were adjusted for clustering by survey year. The average share of taxable income held by the top 1 percent for 1996-2009 in the UK is 13.14 with an overall standard error of 1.12 and a within standard error 0f 1.01.

[FOR ONLINE PUBLICATION]

Online Appendix

Table 1A: Descriptive Statistics, the Gallup World Poll 2006-2012

Variables	M	SD	Range	Description
Life evaluation	6.81	1.95	0-10	"Please imagine a ladder/mountain with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder/mountain represents the best possible life for you and the bottom of the ladder/mountain represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder/mountain do you feel you personally stand at the present time?" The corresponding response categories range from 0 (Worst possible life) to 10 (Best possible life).
Positive daily experiences	74.43	25.79	0-100	"Did you feel well-rested yesterday?", "Were you treated with respect all day yesterday?", "Did you smile or laugh a lot yesterday?", "Did you learn or do something interesting yesterday?", and "Did you experience the following feelings during a lot of the day yesterday? How about enjoyment?" The five items are recoded so that positive answers are scored as a "1" and all other answers (including "don't know" and "refused") are scored as a "0." An individual record has an index calculated if it has at least four out of five valid scores (0 or 1), and the final score is the mean of valid items multiplied by 100.
Negative daily experiences	23.64	26.77	0-100	*"Did you experience the following feelings during a lot of the day yesterday? How about physical pain?", "How about worry?", "How about sadness?", "How about stress?",* and *"How about anger?"* The five items are recoded so that affirmative answers

				the final score is the mean of valid items multiplied by 100.
Share of taxable income held by the top 1 percent	11.24	4.11	5.44-20.49	Share of taxable income held by the top 1 percent at the country-year level (in %)
Log of household income per capita - 2010 PPP	9.24	1.21	1.94-14.99	Log of household income per capita, PPP-corrected at 2010 price
Personal characteristics				
Age	47.07	17.66	15-99	Age
Male	0.43	0.49	0-1	Male
Log(relative household income)	9.23	0.85	4.91-11.67	Log of average household income per capita, PPP-corrected at 2010 price of people within the same age group, education level, country and year
Parducci's within sample rank variable	0.50	0.28	0-1	Parducci's rank variable calculated within sample by country and year
Parducci's within sample range variable	0.59	0.14	0-1	Parducci's range variable calculated within sample by country and year
Employed full time for self	0.04	0.19	0-1	Employed full time for self
Employed PT but do not want FT job	0.06	0.23	0-1	Employed part time but do not want full time job
Unemployed	0.03	0.18	0-1	Unemployed
Employed part time but want full time job	0.03	0.18	0-1	Employed part time but want full time job
Out of workforce	0.25	0.43	0-1	Out of workforce
Completed secondary - 3 year Tert. School	0.59	0.49	0-1	Completed secondary - 3 years Tertiary School
Completed high school/college degree	0.26	0.44	0-1	Completed high school/college degree
Married	0.52	0.49	0-1	Married
Separated	0.02	0.14	0-1	Separated
Divorced	0.05	0.22	0-1	Divorced
Widowed	0.07	0.26	0-1	Widowed
Domestic partner	0.00	0.04	0-1	Domestic partner
Number of children under aged 15	0.63	1.08	0-32	Number of children under aged 15
Physical health index	75.37	25.47	0-100	Perception of one's own health

Religion is important in life	0.45	0.49	0-1	Religion is important in life
Country-year variables				
Log of country's GDP per capita - current US$ price	10.26	0.78	8.17-11.11	Log of country's sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of products divided by midyear population. Data are in constant 2005 U.S. dollars
GDP growth (annual %)	1.02	3.53	-6.37-15.24	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars
Unemployment rate (% of total labor force)	8.14	5.60	2.6-25.2	Share of the total labor force that is without work but available for and seeking employment
Inflation - consumer prices (annual %)	2.71	2.17	-4.48-10.93	Annual percentage change in the cost to the average consumer of acquiring a basket of goods and services
Public health spending (% of total health expenditure)	70.04	14.89	30.18-85.13	Public health spending (% of total health expenditure)
Public primary education spending (% of total expenditure)	5.34	1.32	2.78-8.81	Average general government expenditure (current, capital, and transfers) per student in primary education, expressed as a percentage of total government expenditure
Intentional homicides (per 100,000 people)	5.28	10.77	0.3-36.8	Estimates of unlawful homicides purposely inflicted as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, inter-gang violence over turf or control, and predatory violence and killing by armed groups
Corruption perception index/10	7.3	1.84	3.5-9.5	Index of perceived level of corruption as determined by expert assessments and opinion surveys, measured on a scale from 0 (highly corrupt) to 100 (very clean)
Human development index	0.86	0.07	0.63-0.94	A composite statistic of life expectancy, education, and per capita income indicators, measured on a scale from 0 (lowest quality of life) to 1 (highest quality of life)
Attitude indexes				
Community attachment	84.68	25.49	0-100	Satisfaction with the city or area where they live and their likelihood to move away or recommend that city or area to a friend (0 = least positive response, 100 = most positive response)

Community basics	71.53	23.04	0-100	Evaluation of everyday life in a community, including environment, housing, and infrastructure (0 = least positive response, 100 = most positive response)
Civic engagement	41.66	32.19	0-100	Respondent's inclination to volunteer their time and assistance to others (0 = least positive response, 100 = most positive response)
Diversity	66.32	35.37	0-100	A measure of community's acceptance of people from different racial, ethnic, or cultural groups (0 = least positive response, 100 = most positive response)
Law and order	76.70	27.72	0-100	Respondent's sense of personal security (0 = least safe, 100 = most safe)
Financial life	43.95	32.02	0-100	Respondent's personal economic situations and the economics of the community where they live (living least comfortably = 0, living most comfortably = 100)
Food and shelter	89.67	25.75	0-100	A measure of whether a respondent has experienced deprivation in the areas of food or shelter (0 = most deprived, 100 = least deprived)
National institutions	62.88	33.06	0-100	Respondent's confidence in key institutions prominent in a country's leadership: the military, the judicial system, the national government, and the honesty of elections (0 = least confidence, 100 = most confidence)
Corruption	47.98	44.92	0-100	Respondent's perceptions in a community about the level of corruption in business and government (0 = least corrupt, 100 = most corrupt)
Optimism	68.94	74.28	0-100	Respondent's positive attitudes about the future (0 = least positive, 100 = most positive)
Daily experiences	75.23	21.58	0-100	Respondent's experienced well-being on the day before the survey It provides a real time, composite measure of respondents' positive and negative experiences (0 = least positive, 100 = most positive)